KD11K/KU11L

MICRODIAGNOSTICS
MD-11-DQKUB-A

EPDQKUB-A-DL-A

FICHE 1 OF 3

JUN 1977

digital

MADE IN USA

KD11K/KU11L

MICRODIAGNOSTICS

MD-11-DQKUB-A

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KD11-K

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MD-11-DQKUB-A

EP-DQKUB-A-DL-A

FICHE 3 OF 3

JUN 1977

digital

MADE IN USA

IDENTIFICATION

PRODUCT CODE: MAINDEC-11-DQKUB-A-LA

PRODUCT NAME: KD11-K MICRODIAGNOSTIC

MAINTAINER: DIAGNOSTIC ENGINEERING

AUTHOR: DON NORTH

DATE CREATED: 18-JANUARY-1977

LAST REVISION: 18-JANUARY-1977

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.TOC    * IDENTIFICATION
!
.TITLE KD11-K MICRODIAGNOSTIC






     !*****************************************************************************************************!
     !                                                                                                     !
     !                       K     K  DDDDDD          1       1           /  K     K                       !
     !                       K    K   D     D       11      11           /   K    K                        !
     !                       K   K    D     D      1 1     1 1          /    K   K                         !
     !                       KKKK     D     D  XXX    1       1        /     KKKK                          !
     !                       K   K    D     D         1       1       /      K   K                         !
     !                       K    K   D     D         1       1      /       K    K                        !
     !                       K     K  DDDDDD        11111  11111    /        K     K                       !
     !                                                                                                     !
     !                                                                                                     !
     !               DDDDDD   IIIII    AAA     GGGGG   N     N   OOOOO    SSSSS    TTTTTTT  IIIII   CCCCC  !
     !               D     D    I     A   A   G     G  NN    N  O     O  S     S      T       I    C     C !
     !   U     U     D     D    I    A     A  G        N N   N  O     O  S            T       I    C       !
     !   U     U     D     D    I    A     A  G   GGG  N  N  N  O     O   SSSSS       T       I    C       !
     !   U     U     D     D    I    AAAAAAA  G     G  N   N N  O     O        S      T       I    C       !
     !   U     U     D     D    I    A     A  G     G  N    NN  O     O  S     S      T       I    C     C !
     !  U UUUUU U    DDDDDD   IIIII  A     A   GGGGG   N     N   OOOOO    SSSSS       T     IIIII   CCCCC  !
     ! U                                                                                                   !
     ! U                                                                                                   !
     !                                                                                                     !
     !*****************************************************************************************************!



!.PAGE===============================================================================================================

.TOC    * REVISION HISTORY

.IDENT /V101A0/

       REV-NUMBER          ::=  000101         !NO BIT15 DURING EXECUTION
       REV-NUMBER-AND-B15  ::=  100101         !BUT SET W/REV. NUMBER AT EOP ONLY




!.PAGE===============================================================================================================

.TOC    * MICROWORD FIELD DEFINITIONS

!      NOTE:   THE FOLLOWING ARE THE ASSIGNED RANGES OF THE
```

```
!             MICROWORD FIELD BIT DEFINITIONS USED IN THIS
!             SOURCE LISTING:
!
!             BITS[NUMBER]       WHERE HELD
!             ------------       ----------------------------
!
!             [47:00] 48/48      MAIN MACHINE ROM,
!                                DCS MAIN ROM
!             [59:48] 12/12 *    MAIN MACHINE ROM EXTENSION,
!                                USES 12/12 BITS
!             [54:48] 7/12 *     DCS 4-BIT ROM EXTENSION,
!                                USES 7/12 BITS, [54:48]
!
!     * = NOTE OVERLAP OF BM EXTENSION/DCS EXTENSION BITS.
!             THESE BITS ARE MUTUALLY EXCLUSIVE.



!.PAGE=====================================================================================

.TOC   * MICROWORD BIT LAYOUT
!        BASE         1-EMIT                         6-RETURN                                     UCON
!        MACHINE      2-SHIFT-TREE   4-UCON-DATA     7-PAGING        9-RES-BITS       DCS       PROCESSOR
!        CONTROL      3-RESIDUAL-CTL 5-CSP-ADDRESS   8-UCON-CONTROL  10-MULTIPLE   EXTENSION     CONTROL
!        -------      -------------- -------------   --------------  -----------  -----------  ------------
!U47     ALU3         1-EMITH15      4-UCONL10                                    DCS-CTR3     PS<3:0>-CLK
!U46     ALU2         1-EMITH14      4-UCON-I/O-SEL  6-RETR11        9-HISMUXSELL DCS-CTR2
!U45     ALU1         1-EMITH13      4-UCON-WCS-SEL  6-RETR10        9-SRS1-L     DCS-CTR1
!U44     ALU0         1-EMITH12      4-UCON-KT-SEL   6-RETR09        9-SRS0-L     DCS-CTR0
!U43     BEN1
!U42     BEN0                        4-UCONL09                                                 UBREAK-CLK
!U41     BSEL1        1-EMITM11      4-UCONL08       6-RETR08        9-GUARD-EN-H ENUA11         <NU>
!U40     BSEL0        1-EMITM10      4-UCONL07       6-RETR07                     ENUA10         <NU>
!U39     AEN1         1-EMITM09      4-UCONL06       6-RETR06                     ENUA09       SEL-HBMUX1L
!U38     AEN0         1-EMITM08      4-UCONL05       6-RETR05                     ENUA08       SEL-HBMUX0L
!U37     ASEL1        1-EMITL07                      6-RETR04                     ENUA07
!U36     ASEL0        1-EMITL06      4-UCON-PROC-SEL 6-RETR03                     ENUA06
!U35     RIF2         1-EMITL05      4-UCONM12       6-RETR02                     ENUA05       FPS<7:4>-CLK
!U34     RIF1         1-EMITL04      4-UCONM11       6-RETR01                     ENUA04       PS<7:4>-CLK
!U33     RIF0         1-EMITL03      4-UCON-FP-SEL   6-RETR00                     ENUA03
!U32     COUT2        1-EMITL02      4-UCONH15       7-NEXT-PAGE2    10-MULT-SEL2 ENUA02       IR-CLOCK
!U31     COUT1        1-EMITL01      4-UCONH14       7-NEXT-PAGE1    10-MULT-SEL1 ENUA01       PS<15:12>-CLK
!U30     COUT0        1-EMITL00      4-UCONH13       7-NEXT-PAGE0    10-MULT-SEL0 ENUA00       FLAG<8:0>-CLK
!U29 *   WHEN
!U28 *   CLK-D
!U27 *   CLK-SR
!U26 *   CLK-BA
!U25 *   SET-CC
!U24 *   BEGIN
!U23     SELECT(=0)   2-BMUX         5-CSPADR3       8-SELECT(=1)
!U22     BUSCOD2      2-AMUX2        5-CSPADR2       8-FLPG0
!U21     BUSCOD1      2-AMUX1        5-CSPADR1       8-UCON-XFER
!U20     BUSCOD0      2-AMUX0        5-CSPADR0       8-UCON-LOAD
!U19 *   WRCSP
```

```
!U18   HI/LO          3-LOAD-RES
!U17   WRSEL
!U16   WRB            3-LOAD-COUNT
!U15   WRA
!U14 * MOD(=0)        3-MOD(=1)
!U13 * UBF4
!U12 * UBF3
!U11 * UBF2
!U10 * UBF1
!U09 * UBF0
!U08 * UPF8
!U07 * UPF7
!U06 * UPF6
!U05 * UPF5
!U04 * UPF4
!U03 * UPF3
!U02 * UPF2
!U01 * UPF1
!U00 * UPF0           ( * = DEDICATED TO THE CORRESPONDING SINGLE FUNCTION )



!.PAGE==========================================================================================

.TOC   * A & B & C SCRATCHPAD LAYOUT, DCS SPECIFIC
!
!      THE USE OF THE A, B, & C SCRATCHPADS AS TEMPORARY STORAGE AREAS
!      IS OUTLINED BELOW.   NOTE THAT IN MOST CASES, THE REGISTERS
!      EMPLOYED HAVE NO RESEMBLANCE  TO ANY SIMILAR NAMED REGISTER
!      IN THE KD11-K BASE MACHINE MICROCODE, EITHER LIVING OR DEAD.
!
!      THE BELOW DEFINITIONS ARE -DCS SPECIFIC- ONLY.
!
!
!      OCTAL          ASPHI          ASPLO          BSPHI          BSPLO          CSP
!      ADDRESS
!
!       00            . . .          . . .          . . .          . . .          <RETURN>
!
!       01            (000000)       . . .          (000000)       . . .          TEMP/(000152)
!
!       02            . . .          . . .          . . .          . . .          TEMP/(000125)
!
!       03            (177777)       . . .          (177777)       . . .          TEMP
!
!       04            . . .          . . .          . . .          . . .          TEMP/(125200)
!
!       05            (125252)       . . .          (125252)       . . .          TEMP/(052522)/(170360)
!
!       06            . . .          . . .          . . .          . . .          TEMP/(053433)/(007417)
!
!       07            (052525)       . . .          (052525)       . . .          TEMP
!
!       10            . . .          . . .          . . .          . . .          (052525)
```

```
!
!      11        (000001)      . . .        (000001)      . . .        (125252)
!
!      12        . . .         . . .        . . .         . . .        (177777)
!
!      13        (100000)      . . .        (100000)      . . .        (000000)
!
!      14        . . .         . . .        . . .         . . .        TEMP/(000100)/(057077)
!
!      15        (000200)      . . .        (000200)      . . .        TEMP/(000077)/(177067)
!
!      16        . . .         . . .        . . .         . . .        TEMP/(170000)
!
!      17        TEMPAHI       TEMPALO      TEMPBHI       TEMPBLO      TEMP/(007700)
!
!
!
!    NOTES:  (XXXXXX) ::= A REGISTER W/ A CONSTANT VALUE, NAMED:
!            CXXXXXX-A, IF ON THE A-SIDE, OR
!            CXXXXXX-B, IF ON THE B-SIDE
!



!.PAGE==========================================================================================

.TOC    * MICROWORD FIELD SPECIFICATION


!----------------------------------------------------------------------------------

.TOC    *   MICROWORD FIELD FORMAT

.RADIX 8                        ! ALL NUMBERS ARE OCTAL, UNLESS OTHERWISE NOTED

.WIDTH 64R                      ! MICROWORD IS 64\10 BITS WIDE, BIT <00> IS RIGHTMOST BIT

.BOUNDS         [4000:7777]             ! ADDRESSES ARE 12 BITS, ON PAGES 4:7

!.OBJECT  <15:00>'<31:16>'<47:32>'<63:48>            ! OUTPUT FORMAT (DEFAULT SPEC)

!----------------------------------------------------------------------------------

.TOC    *   NULL FIELD/MACRO SPECIFICATION

.FIELD N::=<63>
.MACRO NULL::=N/0


.TOC    *   ALU AND INTERNAL DATA BUS CONTROL



.TOC    *     <ALU>-ALU FUNCTION CONTROL BITS
```

```
!SPECIFIES ALU FUNCTION CODE AND CINMUX SELECT. ALWAYS IN EFFECT.
.FIELD ALU::=<47:44>
!                                     ---FUNCTION---      LOGIC/ARITH  ALUS<3:0> H     CINMUX L
        NOT-A::=00                    !COMPLEMENT A,           L          0000          -1
        A-PLUS-B-PLUS-PS[C]::=01 !ADD,                         A          1001          -PS[C]
        NOT-A-AND-B::=02              !AND,                    L          0010          -PS[C]
        ZERO::=03                     !ZERO,                   L          0011          -PS[C]
        A-PLUS-B-PLUS-D[C]::=04 !PLUS,                         A          1001          -D[C]
        A-PLUS-NOT-B-PLUS-D[C]::=05 !PLUS,                     A          0110          -D[C]
        A-XOR-B::=06                  !XOR,                    L          0110          -D[C]
        A-AND-NOT-B::=07              !AND,                    L          0111          -D[C]
        DIVIDE::=10                   !DIVIDE STEP,
                                      !SUB,    IF D[C]H=1      A          0110          -D[C]=-1
                                      !ADD,    IF D[C]H=0      A          1001          -D[C]=-0
        A-PLUS-B::=11                 !PLUS,                   A          1001          -0
        B::=12                        !SELECT B,               L          1010          -0
        A-AND-B::=13                  !AND,                    L          1011          -0
        A-PLUS-B-PLUS-1::=14          !PLUS,                   A          1001          -1
        A-MINUS-B::=15                !MINUS,                  A          0110          -1
        A-IOR-B::=16                  !IOR,                    L          1110          -1
        A::=17                        !SELECT A,               L          1111          -1



.TOC    *       <BEN>-B-BUS DATA SOURCE
!SPECIFIES GATING OF DATA ONTO B-BUS. ALWAYS IN EFFECT.
.FIELD BEN::=<43:42>
        BSPLO::=0                     !DIRECT BSP LOCATIONS 00-17
        BSPHI::=1                     !DIRECT BSP LOCATIONS 20-37
        CSP::=2                       !USE <CSPADDR> [SIC] AS ADDRESS (4 BIT)
        BASCON::=3                    !1 OF 4 BASE CONSTANTS IN CSP17 TO CSP14 (2 BIT)



.TOC    *       <BSEL>-B-BUS SOURCE SELECTION CONTROL
!SPECIFIES CONTROL OF INDIVIDUAL B-BUS SOURCES. ALWAYS IN EFFECT.
.FIELD BSEL::=<41:40>
!NOT USED WHEN BEN/CSP
!CSP17 TO CSP14 IMMEDIATE ADDRESS WHEN BEN/BASCON
        B17::=0                       !
        B16::=1                       !
        B15::=2                       !
        B14::=3                       !
!USED IN CONJUNCTION WITH <RIF> FOR SP ADDRESS WHEN BEN/BSPLO OR BEN/BSPHI
        DF::=0                        !DESTINATION FIELD
        SF::=1                        !SOURCE FIELD
        IMMED0::=2                    !DIRECT ADDRESS, LOW BIT=0
          R00::=2                     !FOR JOINT USE W/ RIF FIELD
          R02::=2                     !
          R04::=2                     !
          R06::=2                     !
          R10::=2                     !
          R12::=2                     !
          R14::=2                     !
```

```
		R16::=2			!
		IMMED1::=3		!DIRECT ADDRESS, LOW BIT=1
		  R01::=3		!FOR JOINT USE W/ RIF FIELD
		  R03::=3		!
		  R05::=3		!
		  R07::=3		!
		  R11::=3		!
		  R13::=3		!
		  R15::=3		!
		  R17::=3		!
		C000000::=3		!ASPHI/BSPHI CONSTANTS
		C177777::=3		!
		C125252::=3		!
		C052525::=3		!
		C000001::=3		!
		C100000::=3		!
		C000200::=3		!
.TOC	*	<AEN>-A-BUS DATA SOURCE
!SPECIFIES GATING OF DATA ONTO A-BUS. ALWAYS IN EFFECT.
.FIELD AEN::=<39:38>
	XMUX::=0		!XMUX=SR OR FLTPT ASSEMBLE
	CMUX::=1		!SHIFT TREE
	ASPLO::=2		!DIRECT ASP LOCATIONS 00-17
	ASPHI::=3		!DIRECT ASP LOCATIONS 20-37
.TOC	*	<ASEL>-A-BUS SOURCE SELECTION CONTROL
!SPECIFIES CONTROL OF INDIVIDUAL A-BUS SOURCES. ALWAYS IN EFFECT.
.FIELD ASEL0::=<36>
!XMUX CONTROL WHEN AEN/XMUX  [USES ASEL0 ONLY]
	SR::=0			!SR OUTPUT ONTO BUS-A
	FLTPT::=1		!FLTPT-ASSEMBLE ONTO BUS-A
.FIELD ASEL::=<37:36>
!CMUX CONTROL WHEN AEN/CMUX.  SHIFTS CMUX INPUT APPROPRIATE AMOUNT
	LEFT-1::=0		!LOW BIT GETS SENDMUX OUTPUT
	DIRECT::=1		!OUTPUT=INPUT
	RIGHT-1::=2		!HIGH BIT GETS D[C]
	RIGHT-2::=3		!HIGH BITS BOTH GET D[C]
!USED IN CONJUNCTION WITH <RIF> FOR SP ADDRESS WHEN AEN/ASPLO OR AEN/ASPHI
	IMMED0::=0		!DIRECT ADDRESS, LOW BIT=0
	  R00::=0		!FOR JOINT USE W/ RIF FIELD
	  R02::=0		!
	  R04::=0		!
	  R06::=0		!
	  R10::=0		!
	  R12::=0		!
	  R14::=0		!
	  R16::=0		!
	IMMED1::=1		!DIRECT ADDRESS, LOW BIT=1
	  R01::=1		!FOR JOINT USE W/ RIF FIELD
```

```
		R03::=1			!
		R05::=1			!
		R07::=1			!
		R11::=1			!
		R13::=1			!
		R15::=1			!
		R17::=1			!
	C000000::=1		!ASPHI/BSPHI CONSTANTS
	C177777::=1		!
	C125252::=1		!
	C052525::=1		!
	C000001::=1		!
	C100000::=1		!
	C000200::=1		!
	DF::=2			!DESTINATION FIELD
	SF::=3			!SOURCE FIELD



.TOC	*	<RIF>-ASP, BSP REGISTER IMMEDIATE FIELD
!SPECIFIES ADDRESSES WITH ASP, BSP ALONG WITH AEN, ASEL & BEN, BSEL
.FIELD RIF::=<35:33>
	R00-OR-01::=4		!LOW BIT IS 0/1, SPECIFIED BY
		R00::=4		!
		R01::=4		!
	R02-OR-03::=5		!USING EITHER IMMED0/IMMED1 MODES
		R02::=5		!
		R03::=5		!
	R04-OR-05::=6		!
		R04::=6		!
		R05::=6		!
	R06-OR-07::=7		!
		R06::=7		!
		R07::=7		!
	R10-OR-11::=0		!
		R10::=0		!
		R11::=0		!
	R12-OR-13::=1		!ADDR<3:0>H = -RIF<2>H # RIF<1:0>H # A/BSEL<0>H
		R12::=1		!
		R13::=1		!
	R14-OR-15::=2		!
		R14::=2		!
		R15::=2		!
	R16-OR-17::=3		!
		R16::=3		!
		R17::=3		!
	C000000::=4		!ASPHI/BSPHI CONSTANTS
	C177777::=5		!
	C125252::=6		!
	C052525::=7		!
	C000001::=0		!
	C100000::=1		!
	C000200::=2		!
```

```


.TOC	*	<COUT>-CARRY OUT BIT MUX SELECTION
!SPECIFY INPUT TO D[C] REGISTER, LOADED WHEN D REGISTER LOADED.  ALWAYS IN EFFECT.
.FIELD COUT::=<32:30>
	CIN::=0			!OUTPUT OF CINMUX [SIC]
	PS[C]::=1		!PS C-BIT
	ALU00::=2		!ALU OUTPUT BIT 00
	ALU07::=3		!ALU OUTPUT BIT 07
	ALU15::=4		!ALU OUTPUT BIT 15
	COUT07::=5		!BYTE CARRY BIT
	COUT15::=6		!WORD CARRY BIT
	D[C]::=7		!PROPOGATE [SAVE] LAST D[C]

!------------------------------------------------------------------------------------------



.TOC	*	CLOCKS



.TOC	*	<WHEN>-D/SR WHEN TO CLOCK
!SPECIFY CLOCK D/SR REGISTERS AT P2 T OR P3 T. ALWAYS IN EFFECT.
.FIELD WHEN::=<29>,0
	AT-P2-T::=0		!CLOCK D AND/OR SR AT P2 T[100 NS].
	AT-P3-T::=1		!CLOCK D AND/OR SR AT P3 T[150 NS].



.TOC	*	<CLKD>-ENABLE D-REGISTER CLOCKING
!ENABLES CLOCKING OF D-REGISTER. ALWAYS IN EFFECT.
.FIELD CLKD::=<28>,0
	NO::=0			!NOP
	YES::=1			!CLOCK D[C], D-REGISTER AT <WHEN>



.TOC	*	<CLKSR>-ENABLE SR-REGISTER CLOCKING
!ENABLES CLOCKING OF SR-REGISTER. ALWAYS IN EFFECT.
.FIELD CLKSR::=<27>,0
	NO::=0			!NOP
	YES::=1			!CLOCK SR-REGISTER AT <WHEN>



.TOC	*	<CLKBA>-ENABLE CLOCKING OF BA-REGISTER
!ENABLES CLOCKING OF BA-REGISTER AT P1 T[60 NS]. ALWAYS IN EFFECT.
.FIELD CLKBA::=<26>,0
	NO::=0			!NOP
	YES::=1			!CLOCK BA-REGISTER AT P1 T[60 NS].



```

```
.TOC    *       <SCC>-ENABLE SETTING OF PS CONDITION CODES
!ENABLE CLOCKING OF PS CONDITION CODES AT P2 T[100 NS] OF NEXT UWORD.   D MUST
!BE CLOCKED AT P2 T OR EARLIER OF PREVIOUS MICROWORD.    ALWAYS IN EFFECT.
.FIELD SCC::=<25>,0
       NO::=0                    !NOP
       YES::=1                   !ENABLE CLOCKING IN NEXT UWORD

!-----------------------------------------------------------------------------------------


.TOC    *   BUS/UCON & CSP-ADDRESS & SHIFT-TREE CONTROL


.TOC    *     BUS/UCON CONTROL


.TOC    *       <BEGIN>-BEGIN BUS/UCON OPERATION
!INITIATE BUS XOR UCON OPERATION. ALWAYS IN EFFECT.
.FIELD BEGIN::=<24>,0
       NO::=0                    !NOP FOR BUS AND UCON OPERATIONS
       YES::=1                   !BEGIN OPERATION SPECIFIED


.TOC    *       <SELECT>-SELECT BUS OR UCON
!SELECT BUS XOR UCON. ONLY USED IF BEGIN/YES.
.FIELD SELECT::=<23>
       BUS::=0                   !SELECT BUS
       UCON::=1                  !SELECT UCON


.TOC    *       BUS CONTROL


.TOC    *         <BUSCODE>-BUS CODE ACTION FIELD
!BUS ACTION CODES. ONLY USED IF BEGIN/YES & SELECT/BUS.
.FIELD BUSCODE::=<22:20>
       DATI-CLKIR::=0            !DATA IN, LOAD IR
       DATI-NOINT::=1            !DATA IN, NO INTERNAL ADDRESS
       DATO::=2                  !DATA OUT
       DATIB::=3                 !DATA IN, ALLOW: ODD ADDRESS
       DATIB[P]::=3              !DATA IN, ALLOW: ODD ADDRESS, FORCE TO PAUSE
       DATIP::=4                 !DATA IN, NO CACHE, LOCK BUS
       DATOB::=5                 !DATA OUT, ALLOW: ODD ADDRESS
       DATI::=6                  !DATA IN
       DATI[P]::=6               !DATA IN, ALLOW: FORCE TO PAUSE
       INVALIDATE::=7            !INVALIDATE CACHE  LOCATION FUNCTION


.TOC    *       UCON CONTROL
```

```
.TOC    *          <FLPGO>-START HOT FLOATING POINT
!INITIATES HOT FLOATING POINT FUNCTION.  ONLY USED IF BEGIN/YES & SELECT/UCON.
.FIELD FLPGO::=<22>
        NO::=0                  !NOP
        YES::=1                 !YELL GO

.TOC    *          <UCON-XFER>-UCON OPERATION
!EXECUTE A UCON FUNCTION. ONLY USED IF BEGIN/YES & SELECT/UCON.
.FIELD UCON-XFER::=<21>
        NO::=0                  !NOP
        YES::=1                 !START UCON OPERATION

.TOC    *          <UCON-LOAD>-LOAD UCON REGISTER
!LOAD UCON CONTROL REGISTER. ONLY USED IF BEGIN/YES & SELECT/UCON.
.FIELD UCON-LOAD::=<20>
        NO::=0                  !NOP
        YES::=1                 !LOAD UCON CONTROL REGISTER

.TOC    *       CSP ADDRESS SPECIFICATION

.TOC    *         <CSPADDR>-CSP IMMEDIATE ADDRESS
!SPECIFY CSP 4 BIT ADDRESS. ONLY USED IF BEN/CSP.
.FIELD CSPADDR::=<23:20>
        D00::=17                !NOTE INVERSION
        D01::=16                !
        D02::=15                !
        D03::=14                !
        D04::=13                !
        D05::=12                !
        D06::=11                !
        D07::=10                !
        D10::=07                !
        D11::=06                !
        D12::=05                !
        D13::=04                !
        D14::=03                !
        D15::=02                !
        D16::=01                !
        D17::=00                !
        C052525::=07            !CSP/DCS CONSTANTS
        C125252::=06            !
        C177777::=05            !
        C000000::=04            !
```

```
.TOC    *       SHIFT CONTROL


.TOC    *         <BMUX>-SECOND LEVEL OF SHIFT TREE
!BMUX CONTROLS SHIFT RIGHT OF 0 OR 4. ALWAYS IN EFFECT.
.FIELD BMUX::=<23>
        DIRECT::=0                 !AMUX<15:00>
        RIGHT-4::=1                !4*D[C] # AMUX <15:04>



.TOC    *         <AMUX>-FIRST LEVEL OF SHIFT TREE
!AMUX CONTROLS INPUT OF D-REG/COUNTER TO TREE. ALWAYS IN EFFECT.
.FIELD AMUX::=<22:20>
        DIRECT::=0                 !D<HI> # D<LO>
        D[LO]#D[LO]::=1            !D<LO> # D<LO>
        SIGNEXT::=2                !8*D[C] # D<LO>
        COUNTER#D[LO]::=3          !COUNTER # D<LO>
        COUNTER::=3                !SAME
        D[HI]#D[HI]::=4            !D<HI> # D<HI>
        SWAB::=5                   !D<LO> # D<HI>
        RIGHT-8::=6                !8*D[C] # D<HI>
        COUNTER#D[HI]::=7          !COUNTER # D<HI>

!-----------------------------------------------------------------------------------------



.TOC    *    SP REWRITE & REGISTER CLOCKS



.TOC    *       <WRCSP>-WRITE TO CSP
!WRITE CSP FROM DMUX [BUSDIN/CACHE]. ALWAYS IN EFFECT.
.FIELD WRCSP::=<19>,0
        NO::=0                     !NOP
        YES::=1                    !ON P3, 120-150 NS.



.TOC    *       <MOD>-MODE CONTROL OF FOLLOWING BITS
!CONTROLS REDEFINITION OF SP REWRITE/REGISTER CLOCK BITS. ALWAYS IN EFFECT.
.FIELD MOD::=<14>,0
        CLKSP::=0                  !CONTROL ASP/BSP CLOCKING
        LOADREG::=1                !CONTROL RES-REG/COUNTER LOADING



.TOC    *       SP REWRITE [A,B] CONTROL
!WHEN MOD/CLKSP
```

```
.TOC    *       <HILO>-SP HI/LO SELECT
!WHICH HALF OF SP'S TO REWRITE. ONLY IF MOD/CLKSP.
.FIELD HILO::=<18>
        LO::=0                  !REWRITE ENABLE A/B SP LO [00-17]
          L::=0                 !
        HI::=1                  !REWRITE ENABLE A/B SP HI [20-37]
          H::=1                 !



.TOC    *       <WRSEL>-REWRITE ADDRESS SELECT
!WHICH WRITE ADDRESS TO USE ON REWRITE. ONLY IF MOD/CLKSP.
.FIELD WRSEL::=<17>
        A-ADDR::=0              !USE A ADDRESS ON REWRITE
          A::=0                 !
        B-ADDR::=1              !USE B ADDRESS ON REWRITE
          B::=1



.TOC    *       <WRSP>-REWRITE A/B SELECT
!ENABLE REWRITE OF SPECIFIC SP'S. ONLY IF MOD/CLKSP.
.FIELD WRSP::=<16:15>
        NOP::=0                 !NO ASP/BSP REWRITE
        WR-A::=1                !WRITE ASP ONLY, ON P3 120-150 NS.
          A::=1                 !
          ASP::=1               !
        WR-B::=2                !WRITE BSP ONLY, ON P3 120-150 NS.
          B::=2                 !
          BSP::=2               !
        WR-A-AND-B::=3          !WRITE BOTH ON P3
          AB::=3                !
          BA::=3                !
          ABSP::=3              !
          BASP::=3              !
          BOTH::=3              !



.TOC    *     REGISTER LOADING
!WHEN MOD/LOADREG


.TOC    *       <LOADRES>-LOAD RESIDUAL CONTROL REGISTER
!ENABLE LOAD OF RESIDUAL CONTROL REGISTER FROM B-BUS. ONLY IF MOD/LOADREG.
.FIELD LOADRES::=<18>
        NO::=0                  !NOP
        YES::=1                 !LOAD RES WITH B-BUS<14:11>
                                !AT P2 T[100 NS], B-BUS<14> COMPLEMENTED



.TOC    *       <LOADCOUNT>-LOAD COUNTER
!ENABLE LOAD OF COUNTER FROM B-BUS <7:0>. ONLY IF MOD/LOADREG.
```

```
.FIELD LOADCOUNT::=<16>
        NO::=0                  !NOP
        YES::=1                 !LOAD COUNTER AT P2 T[100 NS].

!------------------------------------------------------------------------------------------



.TOC    *   SEQUENCING FIELD



.TOC    *       <UBF>-BUT MICROBRANCH FIELD
!SPECIFIES CONDITIONS TO MODIFY <UPF>/<J> FIELD DURING BRANCH.  ALWAYS IN EFFECT.
.FIELD UBF::=<13:9>,30

.TOC    *       NO BUT
        NULL::=30                       !SPECIFY NO MODIFICATION - DEFAULT

.TOC    *       ACTIVE ONLY
!PURELY ACTIVE BUTS GENERATE SIDE AFFECTS; THEY DO NOT MODIFY THE <UPF> FIELD
!BY THE "OR-ING"-IN-OF-CONDITIONS METHOD.  THEY MAY MODIFY EXPLICITLY THE ENTIRE <UPF> FIELD,
!AS IN BUT(RETURN)
        R-OR-1::=22                     !FORM R[SF]-IOR-"001
        CUA-TRACK::=31                  !RESUME/RESTART CUA TRACKING
        CLR-FLAG-RES-UCON::=32          !CLEAR FLAGS<2:0>, EX-FLAG<1>, RES-REGISTER, UCON-REGISTER
        DIAGNOSE::=33                   !SPECIAL DIAGNOSTIC BUT
        SUBRB::=34                      !RETURN <- EMIT<14:03>, PAGE <- EMIT<02:00>
          SUBR-B::=34                   !SYNONYMS ARE:
          GOTO::=34                     !
          GO-TO::=34                    !
        SUBRA::=35                      !RETURN <- D<14:03>, PAGE <- EMIT<02:00>
          SUBR-A::=35                   !SYNONYM
        B#36::=36                       !TBD
        RETURN::=37                     !PAGE <- RETURN<11:09>, NUA <- RETURN<08:00>

.TOC    *       INACTIVE ONLY
!INACTIVE BUTS ONLY CAUSE MODIFICATION OF THE <UPF> FIELD BY THE "OR-ING"-
!IN-OF-CONDITIONS METHOD.
                                        !----UPF MASK-----
                                        !876 543 210 OCTAL  *=NOT AFFECTED
        SR3-0::=00                      !*** **0 000 (000)
          CASE::=00                     !
          SR03::=00                     !*** **0 111 (007)
          SR02::=00                     !*** **1 011 (013)
          SR01::=00                     !*** **1 101 (015)
          SR00::=00                     !*** **1 110 (016)
        IR15-12::=01                    !*** **0 000 (000)
          DOP::=01                      !
        INSTR5::=02                     !*** *00 000 (000)
          INSTR-5::=02                  !
        IR11#FLTPT3-0::=03              !*** *00 000 (000)
          IR11-A::=03                   !*** *01 111 (017)
        IR9-6::=04                      !*** **0 000 (000)
```

```
            SOP::=04                          !
          MOV-DR7*IRS-3::=05                  !*** **0 000 (000)
            MOV-DR7::=05                      !*** **0 111 (007)
            IRS-3::=05                        !*** **1 000 (010)
          BGSERV-FPSERV*D[C]*FPRET::=07       !*** **0 000 (000)
            BGSERV-FPSERV::=07                !*** **0 111 (007)
            D[C]-C::=07                       !*** **1 011 (013)
            FPRET1-0::=07                     !*** **1 100 (014)
          COUT07*DOUT07*FPS05::=10            !*** *** 000 (000)
            COUT07::=10                       !*** *** 011 (003)
            DOUT07::=10                       !*** *** 101 (005)
            COUT07*DOUT07::=10                !*** *** 001 (001)
            FPS05::=10                        !*** *** 110 (006)
          DMO*SMO*BYTE::=11                   !*** *** 000 (000)
            DMO::=11                          !*** *** 011 (003)
            SMO::=11                          !*** *** 101 (005)
            BYTE::=11                         !*** *** 110 (006)
          GD3-2::=12                          !*** *** *00 (000)
          BG-SERVCE-L*MFSS*MULTIPLE::=14      !*** *** 000 (000)
            BG-SERVCE-L::=14                  !*** *** 011 (003)
            MFSS::=14                         !*** *** 101 (005)
            MULTIPLE::=14                     !*** *** 110 (006)
              MASKED-PS[T]::=14               !
              D00::=14                        !
              PS[N]::=14                      !
              FLAG7::=14                      !
              EXFLAG1::=14                    !
              FLTPTS::=14                     !
              EXFLAG2::=14                    !
              INIT-JAM::=14                   !
          D14-00EQ0*D15::=15                  !*** *** *0C (000)
            D14-00-EQ-0*D15::=15              !
            D14-00-EQ-0::=15                  !*** *** *01 (001)
            D15::=15                          !*** *** *10 (002)
          IR11*PS15::=16                      !*** *** *00 (000)
            IR11-B::=16                       !*** *** *01 (001)
            PS15::=16                         !*** *** *10 (002)
          VECTOR-LOAD*DR6-7L::=21             !*** *** *00 (000)
            VECTOR-LOAD::=21                  !*** *** *01 (001)
            DR6-7L::=21                       !*** *** *10 (002)
          D[C]*BA00::=23                      !*** *** *00 (000)
            D[C]-B::=23                       !*** *** *01 (001)
            BA00::=23                         !*** *** *10 (002)
          OTHER-JAM*FP-PROC::=24              !*** *** *00 (000)
            OTHER-JAM::=24                    !*** *** *01 (001)
            FP-PROC::=24                      !*** *** *10 (002)
          INTR-HIGH*INSTR-BRANCH-L::=26       !*** *** *00 (000)
            INTR-HIGH::=26                    !*** *** *01 (001)
            INSTR-BRANCH-L::=26               !*** *** *10 (002)
          PREFETCH-JAM*FP-FD::=27             !*** *** *00 (000)
            PREFETCH-JAM::=27                 !*** *** *01 (001)
            FP-FD::=27                        !*** *** *10 (002)

     .TOC    *        BOTH ACTIVE AND INACTIVE
```

```
!THESE BUTS HAVE BOTH ACTIVE AND INACTIVE EFFECTS
                                         !----UPF MASK-----
                                         !876 543 210 OCTAL   *=NOT AFFECTED
        INSTR1::=06                      !*00 000 000 (000)   BUS CONTROL, SP REWRITE DEFEAT
          INSTR-1::=06                   !
        SR1-D*COUNT-IS-377::=13          !*** *** 000 (000)   BUMP COUNTER
          SR1-D::=13                     !*** *** 001 (001)   STILL BUMP COUNTER
          COUNT-IS-377-A::=13            !*** *** 110 (006)   BUMP COUNTER
        COUNT-IS-377*D[C]::=17           !*** *** *00 (000)   BUMP COUNTER
          COUNT-IS-377-B::=17            !*** *** *01 (001)   BUMP COUNTER
          D[C]-A::=17                    !*** *** *10 (002)   STILL BUMP COUNTER
        COUNT-IS-377::=25                !*** *** **0 (000)   BUMP COUNTER
        PREFETCH-L*SERVICE::=20          !*** *** *00 (000)   TIMING
          PREFETCH-L::=20                !*** *** *01 (001)   TIMING
          SERVICE::=20                   !*** *** *10 (002)   TIMING
          LAST::=20                      !*** *** *11 (003)   TIMING




.TOC    *      <UPF>-MICRO POINTER FIELD
!SPECIFIES EITHER NEXT MICROINSTRUCTION ADDRESS OR BASE TARGET
!ADDRESS TO BE USED "UNDER" THE BUT-CODE IN <UBF>.
.FIELD          UPF::=<8:0>,000          !ACTUAL MICROWORD POINTER FIELD
.ADDRESS        J::=<8:0>                !THIS FIELD ALSO HAS MICROADDRESS QUALITIES

        !BASE MACHINE MICROCODE ENTRY POINTS:

        !THESE ENTRY POINTS HAVE BEEN FIXED AS OF 31-AUGUST-1976.
        INIT01   ::=  3412       !INITIALIZATION SUBROUTINE
        CON99    ::=  1040       !FORCE "CONSOLE-MODE HALT"
        FET01    ::=  0702       !INSTR FETCH, NO OVERLAP
        FET03    ::=  0700       !INSTR FETCH, OVERLAP
        SER01    ::=  0701       !SERVICE ENTRY, OVERLAP
        SER02    ::=  0703       !SERVICE ENTRY, NO OVERLAP

        !ENTRY POINTS INTO BASE MACHINE FOR "BUTA(DIAGNOSE)":
        !THESE ENTRY POINTS FIXED AS OF 26-OCT-76:
        MED23    ::=  3200       !FOR FLPADR:  D+ASPLO[DF]-TOP
        MED25    ::=  3020       !FOR FLPADR:  D+ASPHI[DF]-TOP
        MED27    ::=  3210       !FOR FLPADR:  ASPLO[DF]-TOP+D
        MED29    ::=  3214       !FOR FLPADR:  ASPHI[DF]-TOP+D
        MED31    ::=  3044       !FOR FLPADR:  D+BSPLO[DF]-TOP
        MED33    ::=  3230       !FOR FLPADR:  D+BSPHI[DF]-TOP
        MED35    ::=  3234       !FOR FLPADR:  BSPLO[DF]-TOP+D
        MED37    ::=  3064       !FOR FLPADR:  BSPHI[DF]-TOP+D

        BYTE01   ::=  0032       !FOR KJENAB:  DATOB*KJENAB

        RTS02    ::=  4034       !FOR SPBYKT:  DATI, BA+SP-A, SP+SP+2

        DST01    ::=  0511       !FOR ALTER:   DATIB[P]
        DST02    ::=  0512       !
        DST20    ::=  0527       !
```

```
        DST22   ::=  0525       !

        LOADNZW4 ::= 4330       !FOR FPSCC#CLKFPSCC:  D←CSP(MD)
        LOADNZW5 ::= 4332       !                 FPS<3:0>←D<3:0>

!------------------------------------------------------------------------------------------


.TOC    *    MISCELLANEOUS FIELDS



.TOC    *      <NEXT-PAGE>-NEW PAGE ADDRESS LOADED DURING BUT[SUBROUTINE]
!THESE 3 BITS ARE CLOCKED INTO PAGE REGISTER DURING A BUT[SUBRA] OR
!BUT[SUBRB].  ONLY USED WHEN UBF/BUT[SUBRA] OR UBF/BUT[SUBRB].
.FIELD NEXT-PAGE::=<32:30>


.TOC    *      <MULTIPLE>-SELECT CODE FOR BUT[MULTIPLE]
!MUST BE SET IN BOTH PREVIOUS AND CURRENT MICROWORDS WHEN BUT[MULTIPLE] IS TO BE EMPLOYED.
.FIELD MULTIPLE::=<32:30>
        MASKED-PS[T]::=0        !
        DOD::=1                 !
        PS[N]::=2               !
        FLAG7::=3               !
        EXFLAG1::=4             !
        FLTPTS::=5              !
        EXFLAG2::=6             !
        INIT-JAM::=7            !



.TOC    *      EMIT FIELD - IMMEDIATE DATA FROM MICROWORD
!USED WHENEVER LOADING IMMEDIATE DATA FROM MICROWORD
.FIELD EMIT::=<47:44>'<41:30>
.FIELD EMITH::=<47:44>
.FIELD EMITM::=<41:38>
.FIELD EMITL::=<37:30>
.FIELD EMITML::=<41:30>
.FIELD EMIT9-6::=<39:36>
.FIELD EMIT15::=<47>
.FIELD EMIT14::=<46>
.FIELD EMIT13::=<45>
.FIELD EMIT12::=<44>
.FIELD EMIT11::=<41>
.FIELD EMIT10::=<40>
.FIELD EMIT09::=<39>
.FIELD EMIT08::=<38>
.FIELD EMIT07::=<37>
.FIELD EMIT06::=<36>
.FIELD EMIT05::=<35>
.FIELD EMIT04::=<34>
.FIELD EMIT03::=<33>
```

```
.FIELD EMIT02::=<32>
.FIELD EMIT01::=<31>
.FIELD EMIT00::=<30>



.TOC   *     RETURN ADDRESS - FOR MICROSUBROUTINE CALLS
!USED WITH BUT[SUBRB] AND BUT[SUBRA]
.FIELD RETURN::=<46:44>'<41:33>          !PAGE # D.I.P.



.TOC   *     UCON SELECTION AND CONTROL FIELDS



.TOC   *            SELECTION
!SELECT PARTICULAR UCON. ONLY USED IF BEGIN/YES & SELECT/UCON.
!FIELD UCON-SEL-EMIT::=<43>               !SELECT EMIT CAN ONLY BE DONE BY USING
!       NO::=0                            !  BUTA(CLR-FLAG-RES-UCON) TO ASSERT UCON-SEL-EMIT-L
!       YES::=1                           !
.FIELD UCON-SEL-I-O::=<46>                !SELECT I-O [BUS] CONTROL
        NO::=0
        YES::=1
.FIELD UCON-SEL-WCS::=<45>                !SELECT WCS/ECS/DCS
        NO::=0
        YES::=1
.FIELD UCON-SEL-CACHEKT::=<44>            !SELECT CACHE/KT
        NO::=0
        YES::=1
.FIELD UCON-SEL-PROC::=<36>               !SELECT PROCESSOR CONTROL
        NO::=0
        YES::=1
.FIELD UCON-SEL-FLTPT::=<33>              !SELECT HOT FLOATING POINT
        NO::=0
        YES::=1



.TOC   *           CONTROL
!AFTER UCON[S] SELECTED FROM ABOVE, CONTROL COMES FROM HERE.
.FIELD UCON::=<32:30>'<35:34>'<47>'<42:38>
.FIELD UCONH::=<32:30>
.FIELD UCONM::=<35:34>
.FIELD UCONL::=<47>'<42:38>
.FIELD UCON15::=<32>
.FIELD UCON14::=<31>
.FIELD UCON13::=<30>
.FIELD UCON12::=<35>
.FIELD UCON11::=<34>
.FIELD UCON10::=<47>
.FIELD UCON09::=<42>
.FIELD UCON08::=<41>
.FIELD UCON07::=<40>
.FIELD UCON06::=<39>
```

```
.FIELD UCONOS::=<38>

!-------------------------------------------------------------------------------------------



.TOC   *   BASE MACHINE EXTENSION BITS
!
!      LAYOUT IN BASE MACHINE [NOT DCS] ADDRESS SPACE:
!
!                       ------------- PAGE --------------
!      --- NAME ---     0       1       2       3       4
!      ROMEX 00 H       X                               X
!      ROMEX 01 H                       X       X
!      ROMEX 03 H                               X
!
!      FPSEL L          X               X               X
!      SFCC L           X               X               X
!      FLPADR L         X               X       X       X
!
!      SPBYKT L         X                               X
!      UDAD01 L         X                               X
!      UDAD00 L         X                               X
!      UKJCONT L        X                               X
!      UKT01 H          X                               X
!      UKT00 H          X                               X
!      UALTER L         X                               X
!      UKTEN L          X                               X
!
!
!      NULL BIT DEFINITIONS:
!
.FIELD ROMEX00::=<60>           !ACTIVE HIGH
       ZERO::=0                 !
       ONE::=1                  !
.FIELD ROMEX01::=<61>           !ACTIVE HIGH
       ZERO::=0                 !
       ONE::=1                  !
.FIELD ROMEX03::=<62>           !ACTIVE HIGH
       ZERO::=0                 !
       ONE::=1                  !
.FIELD FPSEL::=<57>             !ACTIVE LOW
       ZERO::=1                 !
       ONE::=0                  !
.FIELD SFCC::=<58>              !ACTIVE LOW
       ZERO::=1                 !
       ONE::=0                  !
.FIELD FLPADR::=<59>            !ACTIVE LOW
       ZERO::=1                 !
       ONE::=0                  !
.FIELD SPBYKT::=<55>            !ACTIVE LOW
       ZERO::=1                 !
       ONE::=0                  !
.FIELD UDAD01::=<53>            !ACTIVE LOW
```

```
        ZERO::=1                !
        ONE::=0                 !
.FIELD  UDAD00::=<52>           !ACTIVE LOW
        ZERO::=1                !
        ONE::=0                 !
.FIELD  UKJCONT::=<54>          !ACTIVE LOW
        ZERO::=1                !
        ONE::=0                 !
.FIELD  UKT01::=<49>            !ACTIVE HIGH
        ZERO::=0                !
        ONE::=1                 !
.FIELD  UKT00::=<48>            !ACTIVE HIGH
        ZERO::=0                !
        ONE::=1                 !
.FIELD  UALTER::=<51>           !ACTIVE LOW
        ZERO::=1                !
        ONE::=0                 !
.FIELD  UKTEN::=<50>            !ACTIVE LOW
        ZERO::=1                !
        ONE::=0                 !

!------------------------------------------------------------------------------------------



.TOC    *   SPECIAL DCS FIELDS



.TOC    *     FIELDS USED IN PAGES 4, 5, OR 6 OF DCS


.TOC    *       <LOAD-DCS-CTR>-LOAD DIAGNOSTIC COUNTER FROM EMITH
!THIS CODE LOADS THE 4-BIT DCS COUNTER FROM THE CURRENT
!MICROWORD'S EMITH FIELD.  THIS COUNTER IS CLOCKED AT EVERY PO
!FOLLOWING, UNTIL THE COUNTER REACHES ZERO.  AT THIS POINT, THE
!COMPARE IS ENABLED, CLOCKING THE RESULT OF THE CURRENT ENUA:TNUA
!COMPARE INTO THE ERROR LATCH.
!ONLY USED IN PAGES 4, 5, OR 6 OF DCS.
.FIELD LOAD-DCS-CTR::=<51>,0
       NOP::=0                  !NOP
       YES::=1                  !LOAD, COUNT, AND ENABLE COMPARE



.TOC    *       <CTR>-4 BIT DCS COUNTER VALUE FROM EMIT
!THIS FOUR BIT VALUE IS LOADED INTO THE COUNTER [DIAGNOSTIC!],
!WHEN LOAD COUNTDOWN/YES.  COMPLEMENT OF ACTUAL VALUE IS USED, FOR COUNT DOWN.
!LOADING COUNTER VALUE OF 17(8) CAUSES COMPARE AT END OF THIS UWORD.
.FIELD CTR::=<47:44>
       C0.::=17
       C1.::=16
       C2.::=15
       C3.::=14
```

```
        C4.::=13
        C5.::=12
        C6.::=11
        C7.::=10
        C8.::=07
        C9.::=06
        C10.::=05
        C11.::=04
        C12.::=03
        C13.::=02
        C14.::=01
        C15.::=00



.TOC    *       <LOAD-ENUA-ERRCOD>-LOAD THE ENUA AND ERRCOD REGISTERS
!THIS CODE LOADS THE 12-BIT ENUA REGISTER FROM THE <EMITM,EMITL> FIELD
!OF THE CURRENT MICROWORD, AND LATCHES THE NUA INTO THE ERRCOD REGISTER.
!ONLY USED IN PAGES 4, 5, OR 6 OF DCS.
.FIELD LOAD-ENUA-ERRCOD::=<54>,0
        NOP::=0                 !NOP
        YES::=1                 !LOAD REGISTERS AT P0



.TOC    *       <ENUA>-ENUA VALUE FROM EMIT
!THIS 12 BIT FIELD IS LOADED FROM <EMIT> TO THE ENUA REGISTER
!WHEN LOAD ENUA-ERRCOD/YES.
.FIELD ENUA::=<41:30>



.TOC    *       <VERIFY>-VERIFY BIT FOR SELF CHECK TEST
!WHEN IN SELF TEST MODE OF DCS, SETTING THIS BIT CAUSES THE VERIFY COUNTER TO BE
!BUMPED AT THE START OF THIS MICROWORD.  THE VERIFY BIT IS IMPLICITLY SET FOR
!ANY REFERENCE TO PAGE 7 [IE, THE COUNTER IS AUTOMATICALLY BUMPED ON A REFERENCE
!TO PAGE 7].
!ONLY [EXPLICITLY] USED IN PAGES 4, 5, OR 6 OF DCS, WHEN IN SELF TEST MODE.
.FIELD VERIFY::=<48>,0
        NOP::=0                 !NO ACTION
        BUMP::=1                !BUMP VERIFY COUNTER AT P0, WHEN IN SELF TEST MODE



.TOC    *     FIELDS USED IN PAGE 7 OF DCS EXTENSION


.TOC    *       <EOP>-SIGNAL SUCCESSFUL END OF PASS
!THIS CODE SETS THE END OF PASS LATCH, LIGHTING THE EOP LED
!ONLY USED IN PAGE 7 OF DCS.
.FIELD EOP::=<49>,0
        NO::=0                  !NO EOP
        SIGNAL::=1              !SIGNAL SUCCESSFUL EOP AT P0
```

```
.TOC    *       <DAD>-DCS CONTROL OF BASE MACHINE EXTENSION DAD BITS
!THESE BITS ARE WIRE-ANDED INTO THE BASE MACHINE DAD<1:0> BITS.
!MUST BE SPECIFIED IN UWORD BEFORE CSP REFERENCE.
!ONLY USED IN PAGE 7 OF DCS.
.FIELD DAD::=<53:52>,0
        NO-DAD::=0              !
        FIRST-1-OR-2::=1        !SETUP BYTE-CONST ROM INPUT
        SECOND-1-OR-2::=2       !  "
        WRITE-BYTE::=3          !SETUP FOR BYTE WRITE TO ASP/BSP



.TOC    *     FIELDS USED IN ALL PAGES OF DCS EXTENSION


.TOC    *       <SCOPE>-SCOPE ON ERROR, DIAGNOSTIC BUT
!THIS CODE IS A SPECIAL BUT, THAT, WHEN ENABLED, CHECKS THE ERROR
!LATCH TO SEE IF IT IS SET.  IF IT IS, NUADD IS FORCED TO A ZERO!
!ELSE IT IS LEFT UNCHANGED.  USED TO IMPLEMENT FORCED SCOPE LOOP ON ERROR.
!USED IN ALL PAGES OF DCS.
.FIELD SCOPE::=<50>,0
        NOP::=0                 !NOP
        ENABLED::=1             !ENABLE SCOPE LOOPING FACILITY


!------------------------------------------------------------------------------
!END OF MICROWORD FIELD DEFINITIONS
!------------------------------------------------------------------------------



!.PAGE=====================================================================================================

.TOC    * MACRO DEFINITIONS


.TOC    *    PRIMITIVE OPERATIONS


.TOC    *     TIMING
.MACRO P0       ::= NULL        !0 NS., UP3 VIEWED AS THE START OF A MICROCYCLE

.MACRO P1       ::= NULL        !60 NS., AT P1
.MACRO P1-L     ::= NULL        !30 NS., AT P1 LEADING EDGE
.MACRO P1-T     ::= NULL        !60 NS., AT P1 TRAILING EDGE

.MACRO P2       ::= NULL        !100 NS., AT P2
.MACRO P2-L     ::= NULL        !70 NS., AT P2 LEADING EDGE
.MACRO P2-T     ::= WHEN/AT-P2-T  !100 NS., AT P2 TRAILING EDGE
.MACRO P2-U     ::= NULL        !UNSUPPRESSED P2, CLOCK CONTINUOUSLY

.MACRO P3       ::= NULL        !150 NS., 120-150 NS., AT P3
```

```
.MACRO P3-L     ::=  NULL          !120 NS., AT P3 LEADING EDGE
.MACRO P3-T     ::=  WHEN/AT-P3-T  !150 NS., AT P3 TRAILING EDGE
.MACRO P3-U     ::=  NULL          !UNSUPPRESSED P3, CLOCK CONTINUOUSLY

.MACRO UP3      ::=  NULL          !P3 DELAYED BY 5 NS., P0 VIEWED AS THE END OF A
                                   !MICROCYCLE. LATCHES NEW MICROINSTRUCTION INTO
                                   !THE MICROWORD BUFFER REGISTER.

.MACRO DEFER    ::=  NULL          !CONTROL IS ISSUED AT THIS TIME,
                                   !  ANY REQUIRED CLOCKING OCCURS LATER
.MACRO NEXT     ::=  NULL          !WHERE TO GO NEXT, CLOCKED AT UP3
.MACRO SETUP    ::=  NULL          !SETUP DATA/CONTROL
.MACRO SELECT   ::=  NULL          !MAKE A HOT-BOX SELECTION
.MACRO ISSUE    ::=  NULL          !SET/CLEAR HOT-BOX FLAG
.MACRO ENABLE   ::=  NULL          !  DITTO
.MACRO EMITC    ::=  NULL          !SPECIFY AN EMIT-CONSTANT VALUE



!.PAGE=========================================================================================================

.TOC    *     WRITING THE A AND B SCRATCH PADS
!
!  WRITING THE APPROPRIATE SCRATCH PADS:
!
!                                       (NOP        )
!                                       (A    L    A)
!                                    WR (B  , H  , B)
!                                       (AB         )
!                                      /!\  /!\  /!\
!                                       !    !    !
!       ASP, BSP, BOTH, NEITHER----------    !    !
!       LO[00-17], OR HI[20-37]---------------    !
!       USE "A" SIDE OR "B" SIDE ADDRESS-----------
!
!  WRITES CONTENTS OF D-REGISTER INTO ADDRESSED SCRATCH PADS [SEE
!       BELOW] DURING P3
!
.MACRO WR(AB,HL,ADDR)  ::=  MOD/CLKSP,          !CLOCK SP MODE
                                WRSP/@AB,       !NOP, A, ASP, B, BSP, AB, ABSP, BA, BASP, BOTH ARE CHOICES
                                HILO/@HL,       !HI, LO, H, L ARE CHOICES
                                WRSEL/@ADDR     !A, B, A-ADDR, B-ADDR ARE CHOICES



.TOC    *     ASP AND BSP PHYSICAL REGISTER ADDRESSES
!
!  ENABLE INPUT/OUTPUT [FOR READ AND/OR WRITE] OF THE APPROPRIATE SCRATCH PAD ONTO
!  EITHER BUS-A OR BUS-B VIA EXACT PHYSICAL ADDRESS
!
.MACRO ASPLO(XX)       ::=  AEN/ASPLO,          !SELECT
                                ASEL/@XX,       !REGISTER &
                                RIF/@XX         !ENABLE ON BUS-A
```

```
.MACRO ASPHI(XX)          ::=  AEN/ASPHI,           !SELECT
                                    ASEL/@XX,       !REGISTER &
                                    RIF/@XX         !ENABLE ON BUS-A

.MACRO ASP(XX)            ::=  ASEL/@XX,            !SELECT REGISTER,
                                    RIF/@XX         !NO ENABLE


.MACRO BSPLO(XX)          ::=  BEN/BSPLO,           !SELECT
                                    BSEL/@XX,       !REGISTER &
                                    RIF/@XX         !ENABLE ON BUS-B

.MACRO BSPHI(XX)          ::=  BEN/BSPHI,           !SELECT
                                    BSEL/@XX,       !REGISTER &
                                    RIF/@XX         !ENABLE ON BUS-B

.MACRO BSP(XX)            ::=  BSEL/@XX,            !SELECT REGISTER,
                                    RIF/@XX         !NO ENABLE






.TOC    *     ASP AND BSP BASE MACHINE FUNCTIONAL REGISTER ADDRESSES
!
!  ENABLE INPUT/OUTPUT [FOR READ AND/OR WRITE] OF THE APPROPRIATE SCRATCH PAD ONTO
!  EITHER BUS-A "-A" OR BUS-B "-B" VIA FUNCTIONAL REGISTER DESIGNATION
!
.MACRO R0-A               ::=  ASPLO(R00)
.MACRO R0-B               ::=  BSPLO(R00)
.MACRO R1-A               ::=  ASPLO(R01)
.MACRO R1-B               ::=  BSPLO(R01)
.MACRO R2-A               ::=  ASPLO(R02)
.MACRO R2-B               ::=  BSPLO(R02)
.MACRO R3-A               ::=  ASPLO(R03)
.MACRO R3-B               ::=  BSPLO(R03)
.MACRO R4-A               ::=  ASPLO(R04)
.MACRO R4-B               ::=  BSPLO(R04)
.MACRO R5-A               ::=  ASPLO(R05)
.MACRO R5-B               ::=  BSPLO(R05)
.MACRO SP-A               ::=  ASPLO(R06)
.MACRO SP-B               ::=  BSPLO(R06)
.MACRO PC-A               ::=  ASPLO(R07)
.MACRO PC-B               ::=  BSPLO(R07)
.MACRO FACA[0]-B          ::=  BSPHI(R10)
.MACRO FACB[0]-A          ::=  ASPHI(R10)
.MACRO FACC[0]-B          ::=  BSPLO(R10)
.MACRO FACD[0]-A          ::=  ASPLO(R10)
.MACRO FACA[1]-B          ::=  BSPHI(R11)
.MACRO FACB[1]-A          ::=  ASPHI(R11)
.MACRO FACC[1]-B          ::=  BSPLO(R11)
.MACRO FACD[1]-A          ::=  ASPLO(R11)
.MACRO FACA[2]-B          ::=  BSPHI(R12)
.MACRO FACB[2]-A          ::=  ASPHI(R12)
```

```
.MACRO FACC[2]-B        ::=  BSPLO(R12)
.MACRO FACD[2]-A        ::=  ASPLO(R12)
.MACRO FACA[3]-B        ::=  BSPHI(R13)
.MACRO FACB[3]-A        ::=  ASPHI(R13)
.MACRO FACC[3]-B        ::=  BSPLO(R13)
.MACRO FACD[3]-A        ::=  ASPLO(R13)
.MACRO FACA[4]-B        ::=  BSPHI(R14)
.MACRO FACB[4]-A        ::=  ASPHI(R14)
.MACRO FACC[4]-B        ::=  BSPLO(R14)
.MACRO FACD[4]-A        ::=  ASPLO(R14)
.MACRO FACA[5]-B        ::=  BSPHI(R15)
.MACRO FACB[5]-A        ::=  ASPHI(R15)
.MACRO FACC[5]-B        ::=  BSPLO(R15)
.MACRO FACD[5]-A        ::=  ASPLO(R15)
.MACRO FDSTA-B          ::=  BSPHI(R17)
.MACRO FDSTB-A          ::=  ASPHI(R17)
.MACRO FDSTC-B          ::=  BSPLO(R17)
.MACRO FDSTD-A          ::=  ASPLO(R17)
.MACRO FPSHI#FEC-A      ::=  ASPHI(R16)
.MACRO FEA-B            ::=  BSPHI(R16)
.MACRO USER-SP-A        ::=  ASPLO(R16)
.MACRO USER-SP-B        ::=  BSPLO(R16)
.MACRO WHAMI-A          ::=  ASPHI(R02)
.MACRO R[ZERO]-B        ::=  BSPHI(R03)
.MACRO R[IR]-A          ::=  ASPHI(R17)
.MACRO R[SRC]-B         ::=  BSPHI(R04)
.MACRO R[SRC]-A         ::=  ASPHI(R04)
.MACRO R[DST]-B         ::=  BSPHI(R05)
.MACRO R[DST]-A         ::=  ASPHI(R05)
.MACRO R[VECT]-B        ::=  BSPHI(R02)
.MACRO WCSB[0]-B        ::=  BSPHI(R00)
.MACRO WCSB[1]-B        ::=  BSPHI(R01)
.MACRO WCSA[0]-A        ::=  ASPHI(R00)
.MACRO WCSA[1]-A        ::=  ASPHI(R01)
.MACRO FPA-B            ::=  BSPHI(R06)
.MACRO CNSL-CNTL-B      ::=  BSPHI(R07)
.MACRO CNSL-CADR-A      ::=  ASPHI(R07)
.MACRO CNSL-SW-A        ::=  ASPHI(R06)
.MACRO CNSL-TMPSW-A     ::=  ASPHI(R03)



.TOC    *     ASP AND BSP INDIRECT REGISTER ADDRESSES
!
!  ENABLE INPUT/OUTPUT [FOR READ AND/OR WRITE] OF THE APPROPRIATE SCRATCH PAD
!  ON BUS-A [A] OR BUS-B [B] USING INDIRECT ADDRESSING WITH THE IR,
!  WHERE:
!
!       SF<3:0>H = [FLPADR H + KTSRCADRS3 H] # [FLTPT L * IR8 H] # [IR7 H] # [IR6 H + ROR1 H]
!
!       DF<3:0>H = [FLPADR H + KTDSTADRS3 H] # [IR2 H] # [IR1 H] # [IR0 H]
!
.MACRO R[SF]-LO-A       ::=  AEN/ASPLO,ASEL/SF
.MACRO R[SF]-LO-B       ::=  BEN/BSPLO,BSEL/SF
```

```
.MACRO R[SF]-HI-A       ::=  AEN/ASPHI,ASEL/SF
.MACRO R[SF]-HI-B       ::=  BEN/BSPHI,BSEL/SF
.MACRO R[DF]-LO-A       ::=  AEN/ASPLO,ASEL/DF
.MACRO R[DF]-LO-B       ::=  BEN/BSPLO,BSEL/DF
.MACRO R[DF]-HI-A       ::=  AEN/ASPHI,ASEL/DF
.MACRO R[DF]-HI-B       ::=  BEN/BSPHI,BSEL/DF
.MACRO R[SF]-A          ::=  R[SF]-LO-A
.MACRO R[SF]-B          ::=  R[SF]-LO-B
.MACRO R[DF]-A          ::=  R[DF]-LO-A
.MACRO R[DF]-B          ::=  R[DF]-LO-B



.TOC   *     ASP, BSP INDIRECT ADDRESSING
!
!       THESE MACROS ONLY SELECT THE ADDRESS MODE FOR THE ASP AND BSP;
!       THE SELECTED SP IS NOT ENABLED ONTO THE BUS
!
.MACRO ASP-ADDRS-R[DF] ::=  ASEL/DF
.MACRO ASP-ADDRS-R[SF] ::=  ASEL/SF
.MACRO BSP-ADDRS-R[DF] ::=  BSEL/DF
.MACRO BSP-ADDRS-R[SF] ::=  BSEL/SF




.TOC   *     ASP AND BSP DCS SPECIFIC FUNCTIONAL REGISTER ADDRESSES
!
!  ENABLE INPUT/OUTPUT [FOR READ AND/OR WRITE] OF THE APPROPRIATE SCRATCH PAD ONTO
!  EITHER BUS-A "-A" OR BUS-B "-B" VIA FUNCTIONAL REGISTER DESIGNATION
!
.MACRO C000000-A        ::=  ASPHI(C000000)      !IN R01
.MACRO C000000-B        ::=  BSPHI(C000000)      !IN R01
.MACRO C177777-A        ::=  ASPHI(C177777)      !IN R03
.MACRO C177777-B        ::=  BSPHI(C177777)      !IN R03
.MACRO C125252-A        ::=  ASPHI(C125252)      !IN R05
.MACRO C125252-B        ::=  BSPHI(C125252)      !IN R05
.MACRO C052525-A        ::=  ASPHI(C052525)      !IN R07
.MACRO C052525-B        ::=  BSPHI(C052525)      !IN R07
.MACRO C000001-A        ::=  ASPHI(C000001)      !IN R11
.MACRO C000001-B        ::=  BSPHI(C000001)      !IN R11
.MACRO C100000-A        ::=  ASPHI(C100000)      !IN R13
.MACRO C100000-B        ::=  BSPHI(C100000)      !IN R13
.MACRO C000200-A        ::=  ASPHI(C000200)      !IN R15
.MACRO C000200-B        ::=  BSPHI(C000200)      !IN R15



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.TOC   *     WRITING THE C SCRATCH PAD
!
!  WRITE DATA ON BUSDIN [ACTUALLY DMUX OUTPUT] INTO ADDRESSED CSP LOCATION
!       [SEE BELOW] DURING P3
```

```
!
.MACRO WR-CSP           ::=  WRCSP/YES



.TOC   *     CSP IMPLIED ADDRESSING
!
!  ENABLE FOR INPUT/OUTPUT [READ AND/OR WRITE] ONTO BUS-B ONLY A SPECIFIC CSP LOCATION,
!  WHERE THE ADDRESS IS DETERMINED AS FOLLOWS:
!
!      CSPADDR<3:0>H = -[ 0 # 0 # BSEL<1>H # BSEL<0>H ]
!
.MACRO CSPB(XX)         ::=  BEN/BASCON,         !USE IMMEDIATE MODE
                                BSEL/@XX         !WHICH ONE



.TOC   *     CSP DIRECT ADDRESSING
!
!  ENABLE FOR INPUT/OUTPUT [READ AND/OR WRITE] ONTO BUS-B ONLY A SPECIFIC CSP LOCATION,
!  WHERE THE ADDRESS IS DETERMINED AS FOLLOWS:
!
!      CSPADDR<3:0>H = -UWORD<23:20> H
!
.MACRO CSPD(XX)         ::=  BEN/CSP,            !USE CSP-ADDR MODE
                                CSPADDR/@XX      !WHICH ONE



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.TOC   *     SHIFT TREE SPECIFICATION
!N.B. MAY REQUIRE PRIOR SETUP OF RES-REGISTER FOR SHIFT END MUX SELECTION CONTROL
!  (EG, WHEN ASEL/LEFT-1 IS USED).

.TOC   *       ENABLED ONTO BUS A
.MACRO D-RIGHT-14            ::=  AEN/CMUX,AMUX/RIGHT-8,BMUX/RIGHT-4,ASEL/RIGHT-2
.MACRO D-RIGHT-13            ::=  AEN/CMUX,AMUX/RIGHT-8,BMUX/RIGHT-4,ASEL/RIGHT-1
.MACRO D-RIGHT-12            ::=  AEN/CMUX,AMUX/RIGHT-8,BMUX/RIGHT-4,ASEL/DIRECT
.MACRO D-RIGHT-11            ::=  AEN/CMUX,AMUX/RIGHT-8,BMUX/RIGHT-4,ASEL/LEFT-1     !SENDMUX SETUP
.MACRO D-RIGHT-10            ::=  AEN/CMUX,AMUX/RIGHT-8,BMUX/DIRECT,ASEL/RIGHT-2
.MACRO D-RIGHT-9             ::=  AEN/CMUX,AMUX/RIGHT-8,BMUX/DIRECT,ASEL/RIGHT-1
.MACRO D-RIGHT-8             ::=  AEN/CMUX,AMUX/RIGHT-8,BMUX/DIRECT,ASEL/DIRECT
.MACRO D-RIGHT-7             ::=  AEN/CMUX,AMUX/RIGHT-8,BMUX/DIRECT,ASEL/LEFT-1      !SENDMUX SETUP
.MACRO D-RIGHT-6             ::=  AEN/CMUX,AMUX/DIRECT,BMUX/RIGHT-4,ASEL/RIGHT-2
.MACRO D-RIGHT-5             ::=  AEN/CMUX,AMUX/DIRECT,BMUX/RIGHT-4,ASEL/RIGHT-1
.MACRO D-RIGHT-4             ::=  AEN/CMUX,AMUX/DIRECT,BMUX/RIGHT-4,ASEL/DIRECT
.MACRO D-RIGHT-3             ::=  AEN/CMUX,AMUX/DIRECT,BMUX/RIGHT-4,ASEL/LEFT-1      !SENDMUX SETUP
.MACRO D-RIGHT-2             ::=  AEN/CMUX,AMUX/DIRECT,BMUX/DIRECT,ASEL/RIGHT-2
.MACRO D-RIGHT-1             ::=  AEN/CMUX,AMUX/DIRECT,BMUX/DIRECT,ASEL/RIGHT-1
.MACRO D-NO-SHIFT            ::=  AEN/CMUX,AMUX/DIRECT,BMUX/DIRECT,ASEL/DIRECT
.MACRO D-DIRECT              ::=  D-NO-SHIFT
.MACRO D-LEFT-1              ::=  AEN/CMUX,AMUX/DIRECT,BMUX/DIRECT,ASEL/LEFT-1       !SENDMUX SETUP
.MACRO D-SWAB                ::=  AEN/CMUX,AMUX/SWAB,BMUX/DIRECT,ASEL/DIRECT
```

```
.MACRO D-SWAB-RIGHT-3          ::=  AEN/CMUX,AMUX/SWAB,BMUX/RIGHT-4,ASEL/LEFT-1       !SENDMUX SETUP
.MACRO D-SWAB-LEFT-1           ::=  AEN/CMUX,AMUX/SWAB,BMUX/DIRECT,ASEL/LEFT-1        !SENDMUX SETUP
.MACRO D-SIGNEXT               ::=  AEN/CMUX,AMUX/SIGNEXT,BMUX/DIRECT,ASEL/DIRECT
.MACRO D-SIGNEXT-RIGHT-1       ::=  AEN/CMUX,AMUX/SIGNEXT,BMUX/DIRECT,ASEL/RIGHT-1
.MACRO D-SIGNEXT-LEFT-1        ::=  AEN/CMUX,AMUX/SIGNEXT,BMUX/DIRECT,ASEL/LEFT-1     !SENDMUX SETUP
.MACRO NO-SHIFT                ::=  AEN/CMUX,BMUX/DIRECT,ASEL/DIRECT
.MACRO DIRECT                  ::=  NO-SHIFT
.MACRO COUNT#D[HI]             ::=  AEN/CMUX,AMUX/COUNTER#D[HI],BMUX/DIRECT,ASEL/DIRECT
.MACRO COUNT#D[LO]             ::=  AEN/CMUX,AMUX/COUNTER#D[LO],BMUX/DIRECT,ASEL/DIRECT



.TOC   *      FIRST TWO LEVELS ONLY [AMUX,BMUX]
!N.B.:  FOR USE WHEN SHIFTING SR RIGHT, SR<15> <- BMUX<00>
.MACRO D-DIRECT[BMUX]          ::=  AMUX/DIRECT,BMUX/DIRECT



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.TOC   *     ALU FUNCTIONS
![SEE FIELD DESCRIPTION OF "ALU" FOR FULL DESCRIPTION]
.MACRO ZERO                    ::=  ALU/ZERO
.MACRO A-XOR-B                 ::=  ALU/A-XOR-B
.MACRO B                       ::=  ALU/B
.MACRO A-AND-B                 ::=  ALU/A-AND-B
.MACRO A-IOR-B                 ::=  ALU/A-IOR-B
.MACRO A                       ::=  ALU/A
.MACRO NOT-A                   ::=  ALU/NOT-A
.MACRO NOT-A-AND-B             ::=  ALU/NOT-A-AND-B
.MACRO A-AND-NOT-B             ::=  ALU/A-AND-NOT-B

.MACRO DIVIDE                  ::=  ALU/DIVIDE
.MACRO A-PLUS-B                ::=  ALU/A-PLUS-B
.MACRO A-MINUS-B               ::=  ALU/A-MINUS-B
.MACRO A-PLUS-B-PLUS-PS[C]     ::=  ALU/A-PLUS-B-PLUS-PS[C]
.MACRO A-PLUS-B-PLUS-D[C]      ::=  ALU/A-PLUS-B-PLUS-D[C]
.MACRO A-PLUS-NOT-B-PLUS-D[C]  ::=  ALU/A-PLUS-NOT-B-PLUS-D[C]
.MACRO A-PLUS-B-PLUS-1         ::=  ALU/A-PLUS-B-PLUS-1


.TOC   *     COUT GENERATION
![SEE FIELD DESCRIPTION OF "COUT" FOR FULL DESCRIPTION]
.MACRO COUT←CIN                ::=  COUT/CIN
.MACRO COUT←PS[C]              ::=  COUT/PS[C]
.MACRO COUT←ALU00              ::=  COUT/ALU00
.MACRO COUT←ALU07              ::=  COUT/ALU07
.MACRO COUT←ALU15              ::=  COUT/ALU15
.MACRO COUT←COUT07             ::=  COUT/COUT07
.MACRO COUT←COUT15             ::=  COUT/COUT15
.MACRO COUT←D[C]               ::=  COUT/D[C]
```

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.TOC    *      CLOCKS



.TOC    *        BASIC REGISTER CLOCKS [D, SR, BA, CC]
.MACRO CLK-D                      ::=  CLKD/YES   !MUST SPECIFY P2 T OR P3 T
.MACRO CLK-SR                     ::=  CLKSR/YES  !MUST SPECIFY P2 T OR P3 T
.MACRO CLK-BA                     ::=  CLKBA/YES  !AT P1 T ONLY
.MACRO SET-CC                     ::=  SCC/YES    !SETUP HERE, CLOCKED AT P2 T  **OF NEXT UWORD**  ONLY
.MACRO CLK-CC                     ::=  NULL       !IN NEXT UWORD, FOR DOCUMENTATION



.TOC    *        REDEFINED FROM SP REWRITE FIELD [RES, COUNTER]
.MACRO LOAD-RES                   ::=  MOD/LOADREG,LOADRES/YES     !AT P2 T ONLY, FROM B-BUS<14:11>
.MACRO LOAD-COUNTER               ::=  MOD/LOADREG,LOADCOUNT/YES  !DURING ENTIRE UWORD, FROM B-BUS<7:0>



.TOC    *        RES REGISTER CONTROL VALUES [FROM EMIT]
!LOADED VIA:  EMIT<14:11> -> CSP[XX]<14:11> -> B-BUS<14:11> -> RES<3:0>
.MACRO SENDMUX-0123-SEL           ::=  EMIT14/1                  !FOR SHIFT TREE
.MACRO SENDMUX-4567-SEL           ::=  EMIT14/0                  !FOR SHIFT TREE
.MACRO SR-LOAD                    ::=  EMIT13/0,EMIT12/0         !FOR SR/GUARD
.MACRO SR-LEFT                    ::=  EMIT13/0,EMIT12/1         !FOR SR/GUARD
.MACRO SR-RIGHT                   ::=  EMIT13/1,EMIT12/0         !FOR SR/GUARD
.MACRO SR-NOP                     ::=  EMIT13/1,EMIT12/1         !FOR SR/GUARD
.MACRO GUARD-EN                   ::=  EMIT11/1                  !FOR SR/GUARD
.MACRO GUARD-DIS                  ::=  EMIT11/0                  !FOR SR/GUARD




.TOC    *        CC CONTROL  [FROM EMIT]
!USED VIA: BUS-U37-H -> EMIT07-H -> MODIFY-V(1)-H
.MACRO MODIFY-VBIT                ::=  EMIT07/1
.MACRO NOT-MODIFY-VBIT            ::=  EMIT07/0



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.TOC    *      BUS CONTROL MACROS
.MACRO DATI-CLKIR        ::=  BEGIN/YES,SELECT/BUS,BUSCODE/DATI-CLKIR
.MACRO DATI-NOINT        ::=  BEGIN/YES,SELECT/BUS,BUSCODE/DATI-NOINT
.MACRO DATI              ::=  BEGIN/YES,SELECT/BUS,BUSCODE/DATI
.MACRO DATI[P]           ::=  BEGIN/YES,SELECT/BUS,BUSCODE/DATI[P]        !WITH ALTER/ALLOWED
.MACRO DATO              ::=  BEGIN/YES,SELECT/BUS,BUSCODE/DATO
.MACRO DATIB             ::=  BEGIN/YES,SELECT/BUS,BUSCODE/DATIB
.MACRO DATIB[P]          ::=  BEGIN/YES,SELECT/BUS,BUSCODE/DATIB[P]       !WITH ALTER/ALLOWED
.MACRO DATIP             ::=  BEGIN/YES,SELECT/BUS,BUSCODE/DATIP
.MACRO DATOB             ::=  BEGIN/YES,SELECT/BUS,BUSCODE/DATOB
```

```
.MACRO INVALIDATE      ::=  BEGIN/YES,SELECT/BUS,BUSCODE/INVALIDATE



.TOC   *     KT/KJ CONTROL FUNCTIONS

       !THESE BITS ACTUALLY ARISE OUT OF THE BASE MACHINE EXTENSION ROMS,
       !AND AS SUCH ARENT DIRECTLY ACCESSIBLE FROM THE DCS.  THEY ARE
       !INCLUDED HERE ONLY FOR DOCUMENTATION PURPOSES.

.MACRO KJ-ENABLE       ::=  KJ/ONE

.MACRO MAINTENANCE     ::=  UKTEN/ONE
.MACRO CURRENT-MODE    ::=  UKT01/ONE,UKT00/ZERO
.MACRO KERNAL-MODE     ::=  UKT01/ONE,UKT00/ONE
.MACRO MT-MODE         ::=  UKT01/ZERO,UKT00/ONE
.MACRO MF-MODE         ::=  UKT01/ZERO,UKT00/ZERO



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.TOC   *      UCON CONTROL MACROS
.MACRO SET-UCON-CONTROL            ::=  BEGIN/YES,SELECT/UCON,UCON-LOAD/YES  !LOAD UCON CONTROL REGISTER AT PD
.MACRO UCON-OPERATION              ::=  BEGIN/YES,SELECT/UCON,UCON-XFER/YES  !PERFORM UCON OPERATION



.TOC   *        PROCESSOR UCON CONTROL SETUP
.MACRO UCON-PROC                   ::=  UCON-SEL-PROC/YES                    !SELECT PROCESSOR
.MACRO EN-CLK-IR[15-00]            ::=  UCON15/1                             !ENABLE OPERATIONS
.MACRO EN-CLK-PS[15-12]            ::=  UCON14/1                             !
.MACRO EN-CLK-FLAG[8-0]            ::=  UCON13/1                             !
.MACRO EN-CLK-FPS[7-4]             ::=  UCON12/1                             !
.MACRO EN-CLK-PS[7-4]              ::=  UCON11/1                             !
.MACRO EN-CLK-PS[3-0]              ::=  UCON10/1                             !
.MACRO EN-CLK-UBREAK[11-00]        ::=  UCON09/1                             !
       !UCON<8:7> ARE NOT USED IN PROCESSOR CONTROL
.MACRO BUSDIN←EMIT[15-00]          ::=  UCON06/0,UCON05/0                    !HBMUX SELECT
.MACRO BUSDIN←CUA[14-03]           ::=  UCON06/0,UCON05/1                    !
.MACRO BUSDIN←PS[15-00]            ::=  UCON06/1,UCON05/0                    !
.MACRO BUSDIN←FLAG[8-0]#FPS[7-0] ::=  UCON06/1,UCON05/1                      !



.TOC   *        DCS/WCS/ECS CONTROL
.MACRO UCON-DCS                    ::=  UCON-SEL-WCS/YES                     !SELECT DCS
.MACRO BUSDIN←TNUA[11-00]          ::=  UCON14/0                             !DCS BUSDIN MUX SEL
.MACRO BUSDIN←ERR#EOP#ERRCOD[11-00]    ::=  UCON14/1                         !
.MACRO START-DCS                   ::=  UCON15/1                             !
```

```
.TOC    *       CACHE/KT UCON CONTROL
.MACRO UCON-CACHE-KT                         ::=  UCON-SEL-CACHEKT/YES        !SELECT CACHE / KT UCON FUNCTION
        !UCON<15> NOT USED HERE
.MACRO EN-KT-NO-RELOCATE                     ::=  UCON14/1                    !INHIBIT KT FROM ANY RELOCATION OF BA -> PBA
.MACRO BUSDIN←BUS-INTERNAL-ADDR[15-00]       ::=  UCON13/0,UCON12/1           !FROM INTERNAL ADDR ROM
.MACRO BUSDIN←CPU-INTERNAL-ADDR[15-00]       ::=  UCON13/1,UCON12/1           ! DITTO ...
.MACRO BUSDIN←MMR2[15-00]                    ::=  UCON11/1,UCON09/0           !VIRTUAL PC
.MACRO BUSDIN←CACHE-STATUS[15-00]            ::=  UCON11/1,UCON09/1           !CACHE INFO
.MACRO BUSDIN←KT-SEL                         ::=  UCON10/1                    !FOR PAR-S, PDR-S ETC
.MACRO KT-WRITE-HIGH                         ::=  UCON08/1                    !WRITE REGISTER <15:08>
.MACRO KT-WRITE-LOW                          ::=  UCON07/1                    !WRITE REGISTER <07:00>
.MACRO KT-WRITE                              ::=  UCON08/1,UCON07/1           !WRITE REGISTER <15:00>
.MACRO KT-SEL-SLR#CCR                        ::=  UCON06/0,UCON05/0           !SELECT KT-MUX OUTPUT
.MACRO KT-SEL-MMR0                           ::=  UCON06/0,UCON05/1           !
.MACRO KT-SEL-PDR                            ::=  UCON06/1,UCON05/0           !
.MACRO KT-SEL-PAR                            ::=  UCON06/1,UCON05/1           !




.TOC    *       I/O UCON CONTROL
.MACRO UCON-I-O                    ::=  UCON-SEL-I-O/YES                      !SELECT I-O CONTROL



.TOC    *         BUS CONTROL
.MACRO EN-LOAD-DBUF[15-00]         ::=  UCON15/1                              !EN LOAD DBUF AT P3
.MACRO BUSDIN←DBUF[15-00]          ::=  UCON15/1                              !DBUF ON BUSDIN
.MACRO EN-STATUS-MUX               ::=  UCON15/0                              !STATUS-MUX ENABLE ON BUSDIN
        !UCON<14:11> ARE NOT USED IN UCON BUS CONTROL
.MACRO BUSDIN←SERVICE[15-00]       ::=  UCON10/0,UCON09/1                     !
.MACRO BUSDIN←JAM[15-00]           ::=  UCON10/1,UCON09/0                     !
.MACRO BUSDIN←PBA[15-00]           ::=  UCON10/1,UCON09/1                     !
.MACRO DMUX←CACHEDATA[15-00]       ::=  UCON08/1                              !
.MACRO EN-BC-FCN-0                 ::=  UCON07/0,UCON06/0,UCON05/0            !SELECT BUS CONTROL FUNCTION
.MACRO EN-START-DELAY              ::=  UCON07/0,UCON06/0,UCON05/1            !
.MACRO EN-CLR-JAM-ERRORS           ::=  UCON07/0,UCON06/1,UCON05/0            !
.MACRO EN-CLR-NPR-TIMEOUT          ::=  UCON07/0,UCON06/1,UCON05/1            !
.MACRO EN-CLR-PWR-FAIL             ::=  UCON07/1,UCON06/0,UCON05/0            !
.MACRO EN-CLR-YELLOW-ZONE          ::=  UCON07/1,UCON06/0,UCON05/1            !
.MACRO EN-ALLOW-BG[1]H             ::=  UCON07/1,UCON06/1,UCON05/0            !
.MACRO EN-BUS-INIT-UCON            ::=  UCON07/1,UCON06/1,UCON05/1            !



.TOC    *         CONSOLE I-O
.MACRO EN-CONSOLE-COMMAND          ::=  UCON15/0,UCON14/0                     !SETS UP UCON I-O BITS FOR CONSOLE COMMANDS
                                                                              !ALSO SELECTS STATUS-MUX ON BUSDIN
.MACRO EN-CNSL-NOP                 ::=  UCON13/0,UCON12/0,UCON11/0            !ENABLE CONSOLE NO OPERATION
.MACRO EN-CLR-COUNTR               ::=  UCON13/0,UCON12/0,UCON11/1            !ENABLE CLEAR DIGIT PAIR COUNTER
.MACRO EN-INCR-COUNTR              ::=  UCON13/0,UCON12/1,UCON11/0            !ENABLE BUMP TO NEXT DIGIT PAIR
.MACRO EN-CLR-CNSL-SRVC            ::=  UCON13/0,UCON12/1,UCON11/1            !ENABLE CLEAR CONSOLE SERVICE RQST FLOP
.MACRO EN-STRB-DISP                ::=  UCON13/1,UCON12/0,UCON11/0            !ENABLE WRITE DIGIT PAIR TO DISPLAY LATCH
.MACRO EN-CLR-CNSL                 ::=  UCON13/1,UCON12/0,UCON11/1            !ENABLE CLEAR CONSOLE LED
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.MACRO EN-SET-CNSL             ::=  UCON13/1,UCON12/1,UCON11/0      !ENABLE SET CONSOLE LED
.MACRO EN-SET-DP               ::=  UCON13/1,UCON12/1,UCON11/1      !ENABLE SET ALL DP LEDS
.MACRO BUSDIN←CONSOLE[06-00]   ::=  UCON10/0,UCON09/0               !STATUS-MUX SELECT
       !UCON<8:5> ARE NOT USED IN UCON CONSOLE CONTROL



.TOC    *      REMOTE CONSOLE INTERFACE
!N.B.:  "EN CONSOLE COMMAND" DOES NOT APPLY TO REMOTE CONSOLE
.MACRO EN-REMSTRB              ::=  UCON14/1                        !EN REMOTE CONSOLE STROBE
.MACRO EN-REMCODE1             ::=  UCON12/1                        !EN SPECIAL CODE 1
.MACRO EN-REMCODE0             ::=  UCON11/1                        !EN SPECIAL CODE 0



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.TOC    *     DCS ROM EXTENSION MACROS

.TOC    *       GENERAL FUNCTIONS
.MACRO LOAD-ENUA(MICROADDR)    ::=  LOAD-ENUA-ERRCOD/YES,       !SPECIFY LOAD
                                       ENUA/@MICROADDR          !AND VALUE
.MACRO LOAD-ERROR(MICROADDR)   ::=  LOAD-ENUA-ERRCOD/YES        !FOR EFFECT ONLY - ALWAYS ACCOMPANIES ABOVE
.MACRO BUMP-VERIFY             ::=  VERIFY/BUMP                 !BUMP VERIFY COUNTER WHEN IN SELF TEST MODE
.MACRO SIGNAL-EOP              ::=  EOP/SIGNAL                  !SIGNAL END OF PASS
.MACRO DCS-CTR(XX)             ::=  LOAD-DCS-CTR/YES,           !SPECIFY LOAD COUNTER (DCS!)
                                       CTR/@XX                  !AND VALUE



.TOC    *       DAD<1:0> BIT FUNCTIONS
.MACRO NO-DAD                  ::=  DAD/NO-DAD                  !DON'T ASSERT DAD BITS
.MACRO FIRST-1-OR-2            ::=  DAD/FIRST-1-OR-2            !SELECT CSP CONSTANT 1/2, FIRST USE
.MACRO SECOND-1-OR-2           ::=  DAD/SECOND-1-OR-2           !SELECT CSP CONSTANT 1/2, SECOND USE
.MACRO WRITE-BYTE              ::=  DAD/WRITE-BYTE              !BYTE WRITE ENABLE TO ASP/BSP
.MACRO BYTE-WRITE              ::=  DAD/WRITE-BYTE              !  "



.TOC    *       DIAGNOSTIC MODE BUT ENABLES

.MACRO BUTD[SCOPE]             ::=  SCOPE/ENABLED               !ENABLE SCOPE LOOPING CHECK
.MACRO BUTD[ERROR]             ::=  SCOPE/ENABLED               !FORCES NUA00=0 IF ERROR[1]H SET

.MACRO BUTD[VERIFY-MODE]       ::=  NULL                        !CHECK IMPLICITLY FOR VERIFY MODE
                                                                !'SIGNAL EOP' MUST BE PRESENT IN SAME WORD
                                                                !FORCES NUA01=0 IF VERIFY SWITCH SET

.MACRO BUTD[EOP-OVERFLOW]      ::=  NULL                        !AFTER 'SIGNAL EOP' GIVEN, ADDRESS IS FORCED
                                                                !TO (4000) IF HARDWARE EOP/VERIFY COUNTER
                                                                !HAS NOT YET OVERFLOWED, FORCING ANOTHER
                                                                !PASS.  ELSE ADDRESS IN UPF IS TAKEN UNMODIFIED.
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.TOC    *     MICROBRANCH FIELD MACROS
![SEE <UBF> FIELD DESCRIPTION FOR FULL INFO]

.MACRO BUT(XX)                  ::=  UBF/@XX                     !INACTIVE, FULL WIDTH
.MACRO BUTR(XX)                 ::=  UBF/@XX                     !INACTIVE, RESTRICTED WIDTH

.MACRO BUTA(XX)                 ::=  UBF/@XX                     !ACTIVE, FULL WIDTH
.MACRO BUTRA(XX)                ::=  UBF/@XX                     !ACTIVE, RESTRICTED WIDTH

.MACRO TEST(XX)                 ::=  MULTIPLE/@XX                !FOR BUTR(MULTIPLE) SETUP
.MACRO BUTM(XX)                 ::=  MULTIPLE/@XX,UBF/@XX        !A MULTIPLE BUTR



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.TOC    *     MISCELLANEOUS

.TOC    *       OTHER SOURCES ENABLED FOR A-BUS
.MACRO SR                       ::=  AEN/XMUX,ASELO/SR
.MACRO FLTPT                    ::=  AEN/XMUX,ASELO/FLTPT



.TOC    *       PAGING, RETURN REGISTER

       !PAGE FIELD ONLY:
.MACRO PAGE(X)                  ::=  NEXT-PAGE/@X

       !PAGE FIELD AND BUT[SUBR B]:
.MACRO GOTO-PAGE(X)             ::=  NEXT-PAGE/@X,UBF/SUBR-B

       !RETURN REGISTER <- D<14:03>, PAGE <- EMIT<02:00> ON BUTA(SUBR-A)
.MACRO RETURN←D[14-03]          ::=  UBF/SUBR-A



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.TOC    *   ADVANCED OPERATIONS



.TOC    *     DATA INTO CSP, AT P3 ONLY

       !N.B.:  BUSDIN IS ANY BUT EMIT [OVERLAPS BSEL<1:0>]
.MACRO CSPB[14]←BUSDIN          ::=  CSPB(B14),WR-CSP
.MACRO CSPB[15]←BUSDIN          ::=  CSPB(B15),WR-CSP
.MACRO CSPB[16]←BUSDIN          ::=  CSPB(B16),WR-CSP
.MACRO CSPB[17]←BUSDIN          ::=  CSPB(B17),WR-CSP
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        !N.B.:  GETS WHATEVER IS ON BUSDIN
.MACRO CSPD[00]+BUSDIN          ::=  CSPD(D00),WR-CSP
.MACRO CSPD[01]+BUSDIN          ::=  CSPD(D01),WR-CSP
.MACRO CSPD[02]+BUSDIN          ::=  CSPD(D02),WR-CSP
.MACRO CSPD[03]+BUSDIN          ::=  CSPD(D03),WR-CSP
.MACRO CSPD[04]+BUSDIN          ::=  CSPD(D04),WR-CSP
.MACRO CSPD[05]+BUSDIN          ::=  CSPD(D05),WR-CSP
.MACRO CSPD[06]+BUSDIN          ::=  CSPD(D06),WR-CSP
.MACRO CSPD[07]+BUSDIN          ::=  CSPD(D07),WR-CSP
.MACRO CSPD[10]+BUSDIN          ::=  CSPD(D10),WR-CSP
.MACRO CSPD[11]+BUSDIN          ::=  CSPD(D11),WR-CSP
.MACRO CSPD[12]+BUSDIN          ::=  CSPD(D12),WR-CSP
.MACRO CSPD[13]+BUSDIN          ::=  CSPD(D13),WR-CSP
.MACRO CSPD[14]+BUSDIN          ::=  CSPD(D14),WR-CSP
.MACRO CSPD[15]+BUSDIN          ::=  CSPD(D15),WR-CSP
.MACRO CSPD[16]+BUSDIN          ::=  CSPD(D16),WR-CSP
.MACRO CSPD[17]+BUSDIN          ::=  CSPD(D17),WR-CSP

        !N.B.:  REQUIRED THAT BUSDIN+EMIT[15-00] PREVIOUSLY SET UP
.MACRO CSPD[00]+EMIT            ::=  CSPD(D00),WR-CSP
.MACRO CSPD[01]+EMIT            ::=  CSPD(D01),WR-CSP
.MACRO CSPD[02]+EMIT            ::=  CSPD(D02),WR-CSP
.MACRO CSPD[03]+EMIT            ::=  CSPD(D03),WR-CSP
.MACRO CSPD[04]+EMIT            ::=  CSPD(D04),WR-CSP
.MACRO CSPD[05]+EMIT            ::=  CSPD(D05),WR-CSP
.MACRO CSPD[06]+EMIT            ::=  CSPD(D06),WR-CSP
.MACRO CSPD[07]+EMIT            ::=  CSPD(D07),WR-CSP
.MACRO CSPD[10]+EMIT            ::=  CSPD(D10),WR-CSP
.MACRO CSPD[11]+EMIT            ::=  CSPD(D11),WR-CSP
.MACRO CSPD[12]+EMIT            ::=  CSPD(D12),WR-CSP
.MACRO CSPD[13]+EMIT            ::=  CSPD(D13),WR-CSP
.MACRO CSPD[14]+EMIT            ::=  CSPD(D14),WR-CSP
.MACRO CSPD[15]+EMIT            ::=  CSPD(D15),WR-CSP
.MACRO CSPD[16]+EMIT            ::=  CSPD(D16),WR-CSP
.MACRO CSPD[17]+EMIT            ::=  CSPD(D17),WR-CSP



.TOC    *     MISC CONSTANTS INTO ASP, BSP, AT P2-T * P3

.MACRO A#BSPHI[C100000]+D       ::=  ASP(C100000),BSP(C100000),WR(AB,H,B)
.MACRO A#BSPHI[C000200]+D       ::=  ASP(C000200),BSP(C000200),WR(AB,H,B)
.MACRO A#BSPHI[C000000]+D       ::=  ASP(C000000),BSP(C000000),WR(AB,H,B)
.MACRO A#BSPHI[C177777]+D       ::=  ASP(C177777),BSP(C177777),WR(AB,H,B)
.MACRO A#BSPHI[C000001]+D       ::=  ASP(C000001),BSP(C000001),WR(AB,H,B)
.MACRO A#BSPHI[C052525]+D       ::=  ASP(C052525),BSP(C052525),WR(AB,H,B)
.MACRO A#BSPHI[C125252]+D       ::=  ASP(C125252),BSP(C125252),WR(AB,H,B)

.MACRO A#BSPHI[C100000]+D-[B]   ::=  BSP(C100000),WR(AB,H,B)
.MACRO A#BSPHI[C000200]+D-[B]   ::=  BSP(C000200),WR(AB,H,B)
.MACRO A#BSPHI[C000000]+D-[B]   ::=  BSP(C000000),WR(AB,H,B)
.MACRO A#BSPHI[C177777]+D-[B]   ::=  BSP(C177777),WR(AB,H,B)
.MACRO A#BSPHI[C000001]+D-[B]   ::=  BSP(C000001),WR(AB,H,B)
.MACRO A#BSPHI[C052525]+D-[B]   ::=  BSP(C052525),WR(AB,H,B)
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.MACRO A#BSPHI[C125252]←D-[B]  ::=  BSP(C125252),WR(AB,H,B)

.MACRO A#BSPHI[C100000]←D-[A]  ::=  ASP(C100000),WR(AB,H,A)
.MACRO A#BSPHI[C000200]←D-[A]  ::=  ASP(C000200),WR(AB,H,A)
.MACRO A#BSPHI[C000000]←D-[A]  ::=  ASP(C000000),WR(AB,H,A)
.MACRO A#BSPHI[C177777]←D-[A]  ::=  ASP(C177777),WR(AB,H,A)
.MACRO A#BSPHI[C000001]←D-[A]  ::=  ASP(C000001),WR(AB,H,A)
.MACRO A#BSPHI[C052525]←D-[A]  ::=  ASP(C052525),WR(AB,H,A)
.MACRO A#BSPHI[C125252]←D-[A]  ::=  ASP(C125252),WR(AB,H,A)



.TOC   *    DATA INTO ASP, BSP, AT P2-T * P3

.MACRO ASPLO[17]←CSPB(XX)      ::=  B,ASPLO(R17),CSPB(@XX),CLK-D,P2-T,WR(A,L,A)
.MACRO ASPLO[17]←CSPD(XX)      ::=  B,ASPLO(R17),CSPD(@XX),CLK-D,P2-T,WR(A,L,A)
.MACRO PC←D                    ::=  PC-A,WR(AB,L,A)
.MACRO RS←D                    ::=  RS-A,WR(AB,L,A)

.MACRO ASPLO[00]←D             ::=  ASP(R00),WR(A,L,A)
.MACRO ASPLO[01]←D             ::=  ASP(R01),WR(A,L,A)
.MACRO ASPLO[02]←D             ::=  ASP(R02),WR(A,L,A)
.MACRO ASPLO[03]←D             ::=  ASP(R03),WR(A,L,A)
.MACRO ASPLO[04]←D             ::=  ASP(R04),WR(A,L,A)
.MACRO ASPLO[05]←D             ::=  ASP(R05),WR(A,L,A)
.MACRO ASPLO[06]←D             ::=  ASP(R06),WR(A,L,A)
.MACRO ASPLO[07]←D             ::=  ASP(R07),WR(A,L,A)
.MACRO ASPLO[10]←D             ::=  ASP(R10),WR(A,L,A)
.MACRO ASPLO[11]←D             ::=  ASP(R11),WR(A,L,A)
.MACRO ASPLO[12]←D             ::=  ASP(R12),WR(A,L,A)
.MACRO ASPLO[13]←D             ::=  ASP(R13),WR(A,L,A)
.MACRO ASPLO[14]←D             ::=  ASP(R14),WR(A,L,A)
.MACRO ASPLO[15]←D             ::=  ASP(R15),WR(A,L,A)
.MACRO ASPLO[16]←D             ::=  ASP(R16),WR(A,L,A)
.MACRO ASPLO[17]←D             ::=  ASP(R17),WR(A,L,A)

.MACRO ASPHI[00]←D             ::=  ASP(R00),WR(A,H,A)
.MACRO ASPHI[01]←D             ::=  ASP(R01),WR(A,H,A)
.MACRO ASPHI[02]←D             ::=  ASP(R02),WR(A,H,A)
.MACRO ASPHI[03]←D             ::=  ASP(R03),WR(A,H,A)
.MACRO ASPHI[04]←D             ::=  ASP(R04),WR(A,H,A)
.MACRO ASPHI[05]←D             ::=  ASP(R05),WR(A,H,A)
.MACRO ASPHI[06]←D             ::=  ASP(R06),WR(A,H,A)
.MACRO ASPHI[07]←D             ::=  ASP(R07),WR(A,H,A)
.MACRO ASPHI[10]←D             ::=  ASP(R10),WR(A,H,A)
.MACRO ASPHI[11]←D             ::=  ASP(R11),WR(A,H,A)
.MACRO ASPHI[12]←D             ::=  ASP(R12),WR(A,H,A)
.MACRO ASPHI[13]←D             ::=  ASP(R13),WR(A,H,A)
.MACRO ASPHI[14]←D             ::=  ASP(R14),WR(A,H,A)
.MACRO ASPHI[15]←D             ::=  ASP(R15),WR(A,H,A)
.MACRO ASPHI[16]←D             ::=  ASP(R16),WR(A,H,A)
.MACRO ASPHI[17]←D             ::=  ASP(R17),WR(A,H,A)

.MACRO BSPLO[00]←D             ::=  BSP(R00),WR(B,L,B)
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.MACRO BSPLO[01]←D              ::= BSP(R01),WR(B,L,B)
.MACRO BSPLO[02]←D              ::= BSP(R02),WR(B,L,B)
.MACRO BSPLO[03]←D              ::= BSP(R03),WR(B,L,B)
.MACRO BSPLO[04]←D              ::= BSP(R04),WR(B,L,B)
.MACRO BSPLO[05]←D              ::= BSP(R05),WR(B,L,B)
.MACRO BSPLO[06]←D              ::= BSP(R06),WR(B,L,B)
.MACRO BSPLO[07]←D              ::= BSP(R07),WR(B,L,B)
.MACRO BSPLO[10]←D              ::= BSP(R10),WR(B,L,B)
.MACRO BSPLO[11]←D              ::= BSP(R11),WR(B,L,B)
.MACRO BSPLO[12]←D              ::= BSP(R12),WR(B,L,B)
.MACRO BSPLO[13]←D              ::= BSP(R13),WR(B,L,B)
.MACRO BSPLO[14]←D              ::= BSP(R14),WR(B,L,B)
.MACRO BSPLO[15]←D              ::= BSP(R15),WR(B,L,B)
.MACRO BSPLO[16]←D              ::= BSP(R16),WR(B,L,B)
.MACRO BSPLO[17]←D              ::= BSP(R17),WR(B,L,B)

.MACRO BSPHI[00]←D              ::= BSP(R00),WR(B,H,B)
.MACRO BSPHI[01]←D              ::= BSP(R01),WR(B,H,B)
.MACRO BSPHI[02]←D              ::= BSP(R02),WR(B,H,B)
.MACRO BSPHI[03]←D              ::= BSP(R03),WR(B,H,B)
.MACRO BSPHI[04]←D              ::= BSP(R04),WR(B,H,B)
.MACRO BSPHI[05]←D              ::= BSP(R05),WR(B,H,B)
.MACRO BSPHI[06]←D              ::= BSP(R06),WR(B,H,B)
.MACRO BSPHI[07]←D              ::= BSP(R07),WR(B,H,B)
.MACRO BSPHI[10]←D              ::= BSP(R10),WR(B,H,B)
.MACRO BSPHI[11]←D              ::= BSP(R11),WR(B,H,B)
.MACRO BSPHI[12]←D              ::= BSP(R12),WR(B,H,B)
.MACRO BSPHI[13]←D              ::= BSP(R13),WR(B,H,B)
.MACRO BSPHI[14]←D              ::= BSP(R14),WR(B,H,B)
.MACRO BSPHI[15]←D              ::= BSP(R15),WR(B,H,B)
.MACRO BSPHI[16]←D              ::= BSP(R16),WR(B,H,B)
.MACRO BSPHI[17]←D              ::= BSP(R17),WR(B,H,B)

.MACRO A#BSPLO[00]←D            ::= ASP(R00),BSP(R00),WR(AB,L,A)
.MACRO A#BSPLO[01]←D            ::= ASP(R01),BSP(R01),WR(AB,L,A)
.MACRO A#BSPLO[02]←D            ::= ASP(R02),BSP(R02),WR(AB,L,A)
.MACRO A#BSPLO[03]←D            ::= ASP(R03),BSP(R03),WR(AB,L,A)
.MACRO A#BSPLO[04]←D            ::= ASP(R04),BSP(R04),WR(AB,L,A)
.MACRO A#BSPLO[05]←D            ::= ASP(R05),BSP(R05),WR(AB,L,A)
.MACRO A#BSPLO[06]←D            ::= ASP(R06),BSP(R06),WR(AB,L,A)
.MACRO A#BSPLO[07]←D            ::= ASP(R07),BSP(R07),WR(AB,L,A)
.MACRO A#BSPLO[10]←D            ::= ASP(R10),BSP(R10),WR(AB,L,A)
.MACRO A#BSPLO[11]←D            ::= ASP(R11),BSP(R11),WR(AB,L,A)
.MACRO A#BSPLO[12]←D            ::= ASP(R12),BSP(R12),WR(AB,L,A)
.MACRO A#BSPLO[13]←D            ::= ASP(R13),BSP(R13),WR(AB,L,A)
.MACRO A#BSPLO[14]←D            ::= ASP(R14),BSP(R14),WR(AB,L,A)
.MACRO A#BSPLO[15]←D            ::= ASP(R15),BSP(R15),WR(AB,L,A)
.MACRO A#BSPLO[16]←D            ::= ASP(R16),BSP(R16),WR(AB,L,A)
.MACRO A#BSPLO[17]←D            ::= ASP(R17),BSP(R17),WR(AB,L,A)

.MACRO A#BSPHI[00]←D            ::= ASP(R00),BSP(R00),WR(AB,H,A)
.MACRO A#BSPHI[01]←D            ::= ASP(R01),BSP(R01),WR(AB,H,A)
.MACRO A#BSPHI[02]←D            ::= ASP(R02),BSP(R02),WR(AB,H,A)
.MACRO A#BSPHI[03]←D            ::= ASP(R03),BSP(R03),WR(AB,H,A)
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.MACRO A*BSPHI[04]←D              ::= ASP(R04),BSP(R04),WR(AB,H,A)
.MACRO A*BSPHI[05]←D              ::= ASP(R05),BSP(R05),WR(AB,H,A)
.MACRO A*BSPHI[06]←D              ::= ASP(R06),BSP(R06),WR(AB,H,A)
.MACRO A*BSPHI[07]←D              ::= ASP(R07),BSP(R07),WR(AB,H,A)
.MACRO A*BSPHI[10]←D              ::= ASP(R10),BSP(R10),WR(AB,H,A)
.MACRO A*BSPHI[11]←D              ::= ASP(R11),BSP(R11),WR(AB,H,A)
.MACRO A*BSPHI[12]←D              ::= ASP(R12),BSP(R12),WR(AB,H,A)
.MACRO A*BSPHI[13]←D              ::= ASP(R13),BSP(R13),WR(AB,H,A)
.MACRO A*BSPHI[14]←D              ::= ASP(R14),BSP(R14),WR(AB,H,A)
.MACRO A*BSPHI[15]←D              ::= ASP(R15),BSP(R15),WR(AB,H,A)
.MACRO A*BSPHI[16]←D              ::= ASP(R16),BSP(R16),WR(AB,H,A)
.MACRO A*BSPHI[17]←D              ::= ASP(R17),BSP(R17),WR(AB,H,A)

.MACRO A*BSPLO[00]←D-[A]          ::= ASP(R00),WR(AB,L,A)
.MACRO A*BSPLO[01]←D-[A]          ::= ASP(R01),WR(AB,L,A)
.MACRO A*BSPLO[02]←D-[A]          ::= ASP(R02),WR(AB,L,A)
.MACRO A*BSPLO[03]←D-[A]          ::= ASP(R03),WR(AB,L,A)
.MACRO A*BSPLO[04]←D-[A]          ::= ASP(R04),WR(AB,L,A)
.MACRO A*BSPLO[05]←D-[A]          ::= ASP(R05),WR(AB,L,A)
.MACRO A*BSPLO[06]←D-[A]          ::= ASP(R06),WR(AB,L,A)
.MACRO A*BSPLO[07]←D-[A]          ::= ASP(R07),WR(AB,L,A)
.MACRO A*BSPLO[10]←D-[A]          ::= ASP(R10),WR(AB,L,A)
.MACRO A*BSPLO[11]←D-[A]          ::= ASP(R11),WR(AB,L,A)
.MACRO A*BSPLO[12]←D-[A]          ::= ASP(R12),WR(AB,L,A)
.MACRO A*BSPLO[13]←D-[A]          ::= ASP(R13),WR(AB,L,A)
.MACRO A*BSPLO[14]←D-[A]          ::= ASP(R14),WR(AB,L,A)
.MACRO A*BSPLO[15]←D-[A]          ::= ASP(R15),WR(AB,L,A)
.MACRO A*BSPLO[16]←D-[A]          ::= ASP(R16),WR(AB,L,A)
.MACRO A*BSPLO[17]←D-[A]          ::= ASP(R17),WR(AB,L,A)

.MACRO A*BSPHI[00]←D-[A]          ::= ASP(R00),WR(AB,H,A)
.MACRO A*BSPHI[01]←D-[A]          ::= ASP(R01),WR(AB,H,A)
.MACRO A*BSPHI[02]←D-[A]          ::= ASP(R02),WR(AB,H,A)
.MACRO A*BSPHI[03]←D-[A]          ::= ASP(R03),WR(AB,H,A)
.MACRO A*BSPHI[04]←D-[A]          ::= ASP(R04),WR(AB,H,A)
.MACRO A*BSPHI[05]←D-[A]          ::= ASP(R05),WR(AB,H,A)
.MACRO A*BSPHI[06]←D-[A]          ::= ASP(R06),WR(AB,H,A)
.MACRO A*BSPHI[07]←D-[A]          ::= ASP(R07),WR(AB,H,A)
.MACRO A*BSPHI[10]←D-[A]          ::= ASP(R10),WR(AB,H,A)
.MACRO A*BSPHI[11]←D-[A]          ::= ASP(R11),WR(AB,H,A)
.MACRO A*BSPHI[12]←D-[A]          ::= ASP(R12),WR(AB,H,A)
.MACRO A*BSPHI[13]←D-[A]          ::= ASP(R13),WR(AB,H,A)
.MACRO A*BSPHI[14]←D-[A]          ::= ASP(R14),WR(AB,H,A)
.MACRO A*BSPHI[15]←D-[A]          ::= ASP(R15),WR(AB,H,A)
.MACRO A*BSPHI[16]←D-[A]          ::= ASP(R16),WR(AB,H,A)
.MACRO A*BSPHI[17]←D-[A]          ::= ASP(R17),WR(AB,H,A)

.MACRO A*BSPLO[00]←D-[B]          ::= BSP(R00),WR(AB,L,B)
.MACRO A*BSPLO[01]←D-[B]          ::= BSP(R01),WR(AB,L,B)
.MACRO A*BSPLO[02]←D-[B]          ::= BSP(R02),WR(AB,L,B)
.MACRO A*BSPLO[03]←D-[B]          ::= BSP(R03),WR(AB,L,B)
.MACRO A*BSPLO[04]←D-[B]          ::= BSP(R04),WR(AB,L,B)
.MACRO A*BSPLO[05]←D-[B]          ::= BSP(R05),WR(AB,L,B)
.MACRO A*BSPLO[06]←D-[B]          ::= BSP(R06),WR(AB,L,B)
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.MACRO A*BSPLO[07]←D-[B]        ::=  BSP(R07),WR(AB,L,B)
.MACRO A*BSPLO[10]←D-[B]        ::=  BSP(R10),WR(AB,L,B)
.MACRO A*BSPLO[11]←D-[B]        ::=  BSP(R11),WR(AB,L,B)
.MACRO A*BSPLO[12]←D-[B]        ::=  BSP(R12),WR(AB,L,B)
.MACRO A*BSPLO[13]←D-[B]        ::=  BSP(R13),WR(AB,L,B)
.MACRO A*BSPLO[14]←D-[B]        ::=  BSP(R14),WR(AB,L,B)
.MACRO A*BSPLO[15]←D-[B]        ::=  BSP(R15),WR(AB,L,B)
.MACRO A*BSPLO[16]←D-[B]        ::=  BSP(R16),WR(AB,L,B)
.MACRO A*BSPLO[17]←D-[B]        ::=  BSP(R17),WR(AB,L,B)

.MACRO A*BSPHI[00]←D-[B]        ::=  BSP(R00),WR(AB,H,B)
.MACRO A*BSPHI[01]←D-[B]        ::=  BSP(R01),WR(AB,H,B)
.MACRO A*BSPHI[02]←D-[B]        ::=  BSP(R02),WR(AB,H,B)
.MACRO A*BSPHI[03]←D-[B]        ::=  BSP(R03),WR(AB,H,B)
.MACRO A*BSPHI[04]←D-[B]        ::=  BSP(R04),WR(AB,H,B)
.MACRO A*BSPHI[05]←D-[B]        ::=  BSP(R05),WR(AB,H,B)
.MACRO A*BSPHI[06]←D-[B]        ::=  BSP(R06),WR(AB,H,B)
.MACRO A*BSPHI[07]←D-[B]        ::=  BSP(R07),WR(AB,H,B)
.MACRO A*BSPHI[10]←D-[B]        ::=  BSP(R10),WR(AB,H,B)
.MACRO A*BSPHI[11]←D-[B]        ::=  BSP(R11),WR(AB,H,B)
.MACRO A*BSPHI[12]←D-[B]        ::=  BSP(R12),WR(AB,H,B)
.MACRO A*BSPHI[13]←D-[B]        ::=  BSP(R13),WR(AB,H,B)
.MACRO A*BSPHI[14]←D-[B]        ::=  BSP(R14),WR(AB,H,B)
.MACRO A*BSPHI[15]←D-[B]        ::=  BSP(R15),WR(AB,H,B)
.MACRO A*BSPHI[16]←D-[B]        ::=  BSP(R16),WR(AB,H,B)
.MACRO A*BSPHI[17]←D-[B]        ::=  BSP(R17),WR(AB,H,B)

.MACRO ASPLO[DF]←D              ::=  ASP-ADDRS-R[DF],WR(A,L,A)
.MACRO ASPHI[DF]←D              ::=  ASP-ADDRS-R[DF],WR(A,H,A)
.MACRO BSPLO[DF]←D              ::=  BSP-ADDRS-R[DF],WR(B,L,B)
.MACRO BSPHI[DF]←D              ::=  BSP-ADDRS-R[DF],WR(B,H,B)

.MACRO ASPLO[SF]←D              ::=  ASP-ADDRS-R[SF],WR(A,L,A)
.MACRO ASPHI[SF]←D              ::=  ASP-ADDRS-R[SF],WR(A,H,A)
.MACRO BSPLO[SF]←D              ::=  BSP-ADDRS-R[SF],WR(B,L,B)
.MACRO BSPHI[SF]←D              ::=  BSP-ADDRS-R[SF],WR(B,H,B)

.MACRO A*BSPLO[DF]←D-[A]        ::=  ASP-ADDRS-R[DF],WR(AB,L,A)
.MACRO A*BSPHI[DF]←D-[A]        ::=  ASP-ADDRS-R[DF],WR(AB,H,A)
.MACRO A*BSPLO[DF]←D-[B]        ::=  BSP-ADDRS-R[DF],WR(AB,L,B)
.MACRO A*BSPHI[DF]←D-[B]        ::=  BSP-ADDRS-R[DF],WR(AB,H,B)

.MACRO A*BSPLO[SF]←D-[A]        ::=  ASP-ADDRS-R[SF],WR(AB,L,A)
.MACRO A*BSPHI[SF]←D-[A]        ::=  ASP-ADDRS-R[SF],WR(AB,H,A)
.MACRO A*BSPLO[SF]←D-[B]        ::=  BSP-ADDRS-R[SF],WR(AB,L,B)
.MACRO A*BSPHI[SF]←D-[B]        ::=  BSP-ADDRS-R[SF],WR(AB,H,B)

.MACRO A*BSPLO[SF]←D            ::=  ASP-ADDRS-R[SF],BSP-ADDRS-R[SF],WR(AB,L,A)
.MACRO A*BSPLO[DF]←D            ::=  ASP-ADDRS-R[DF],BSP-ADDRS-R[DF],WR(AB,L,A)
.MACRO A*BSPHI[SF]←D            ::=  ASP-ADDRS-R[SF],BSP-ADDRS-R[SF],WR(AB,H,A)
.MACRO A*BSPHI[DF]←D            ::=  ASP-ADDRS-R[DF],BSP-ADDRS-R[DF],WR(AB,H,A)
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!.PAGE=========================================================================================================

.TOC    #       D AND SR <- (BUS-A FCN BUS-B), AT P2-T OR P3-T

        !LOGIC FUNCTIONS:
.MACRO SR←ZERO                  ::= ZERO,CLK-SR
.MACRO SR←A-XOR-B               ::= A-XOR-B,CLK-SR
.MACRO SR←B                     ::= B,CLK-SR
.MACRO SR←A-AND-B               ::= A-AND-B,CLK-SR
.MACRO SR←A-IOR-B               ::= A-IOR-B,CLK-SR
.MACRO SR←A                     ::= A,CLK-SR
.MACRO SR←NOT-A                 ::= NOT-A,CLK-SR
.MACRO SR←NOT-A-AND-B           ::= NOT-A-AND-B,CLK-SR
.MACRO SR←A-AND-NOT-B           ::= A-AND-NOT-B,CLK-SR
.MACRO D←ZERO                   ::= ZERO,CLK-D
.MACRO D←A-XOR-B                ::= A-XOR-B,CLK-D
.MACRO D←B                      ::= B,CLK-D
.MACRO D←A-AND-B                ::= A-AND-B,CLK-D
.MACRO D←A-IOR-B                ::= A-IOR-B,CLK-D
.MACRO D←A                      ::= A,CLK-D
.MACRO D←NOT-A                  ::= NOT-A,CLK-D
.MACRO D←NOT-A-AND-B            ::= NOT-A-AND-B,CLK-D
.MACRO D←A-AND-NOT-B            ::= A-AND-NOT-B,CLK-D

        !ARITH FUNCTIONS:
.MACRO D←DIVIDE-STEP                    ::= DIVIDE,CLK-D
.MACRO D←A-PLUS-B                       ::= A-PLUS-B,CLK-D
.MACRO D←A-PLUS-B-PLUS-0                ::= A-PLUS-B,CLK-D
.MACRO D←A-MINUS-B                      ::= A-MINUS-B,CLK-D
.MACRO D←A-PLUS-B-PLUS-PS[C]            ::= A-PLUS-B-PLUS-PS[C],CLK-D
.MACRO D←A-PLUS-B-PLUS-D[C]             ::= A-PLUS-B-PLUS-D[C],CLK-D
.MACRO D←A-PLUS-NOT-B-PLUS-D[C]         ::= A-PLUS-NOT-B-PLUS-D[C],CLK-D
.MACRO D←A-PLUS-B-PLUS-1                ::= A-PLUS-B-PLUS-1,CLK-D
.MACRO SR←DIVIDE-STEP                   ::= DIVIDE,CLK-SR
.MACRO SR←A-PLUS-B                      ::= A-PLUS-B,CLK-SR
.MACRO SR←A-PLUS-B-PLUS-0               ::= A-PLUS-B,CLK-SR
.MACRO SR←A-MINUS-B                     ::= A-MINUS-B,CLK-SR
.MACRO SR←A-PLUS-B-PLUS-PS[C]           ::= A-PLUS-B-PLUS-PS[C],CLK-SR
.MACRO SR←A-PLUS-B-PLUS-D[C]            ::= A-PLUS-B-PLUS-D[C],CLK-SR
.MACRO SR←A-PLUS-NOT-B-PLUS-D[C]        ::= A-PLUS-NOT-B-PLUS-D[C],CLK-SR
.MACRO SR←A-PLUS-B-PLUS-1               ::= A-PLUS-B-PLUS-1,CLK-SR




.TOC    #       D[C] GETS SET

.MACRO D[C]←CINMUX              ::=  CLK-D,COUT←CIN
.MACRO D[C]←1                   ::=  CLK-D,COUT←CIN             !NEEDS SPECIFIC ALU/---
.MACRO D[C]←0                   ::=  CLK-D,COUT←CIN             !NEEDS SPECIFIC ALU/---
.MACRO D[C]←PS[C]               ::=  CLK-D,COUT←PS[C]
.MACRO D[C]←ALU00               ::=  CLK-D,COUT←ALU00
.MACRO D[C]←ALU07               ::=  CLK-D,COUT←ALU07
.MACRO D[C]←ALU15               ::=  CLK-D,COUT←ALU15
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.MACRO D[C]←COUT07                       ::=  CLK-D,COUT←COUT07
.MACRO D[C]←COUT15                       ::=  CLK-D,COUT←COUT15
.MACRO D[C]←D[C]                         ::=  CLK-D,COUT←D[C]
.MACRO SAVE-D[C]                         ::=  CLK-D,COUT←D[C]




.TOC   *    D-REGISTER <- [BBUS = ABUS], BITWISE, AT P2-T OR P3-T

       !N.B.:  SHIFT TREE ENABLED SEPARATELY
.MACRO D←D-SHIFTED-XOR-CSPB(XX)                 ::=  A-XOR-B,CSPB(@XX),CLK-D
.MACRO D←D-SHIFTED-XOR-BSPHI(XX)                ::=  A-XOR-B,BSPHI(@XX),CLK-D

.MACRO D←FLTPT-XOR-CSPB(XX)                     ::=  A-XOR-B,FLTPT,CSPB(@XX),CLK-D
.MACRO D←FLTPT-XOR-CSPD(XX)                     ::=  A-XOR-B,FLTPT,CSPD(@XX),CLK-D
.MACRO D←FLTPT-XOR-BSPHI(XX)                    ::=  A-XOR-B,FLTPT,BSPHI(@XX),CLK-D

.MACRO D←SR-XOR-CSPB(XX)                        ::=  A-XOR-B,SR,CSPB(@XX),CLK-D
.MACRO D←SR-XOR-CSPD(XX)                        ::=  A-XOR-B,SR,CSPD(@XX),CLK-D
.MACRO D←SR-XOR-BSPHI(XX)                       ::=  A-XOR-B,SR,BSPHI(@XX),CLK-D

.MACRO D←ASPLO[17]-XOR-CSPD(XX)                 ::=  A-XOR-B,ASPLO(R17),CSPD(@XX),CLK-D
.MACRO D←ASPLO[07]-XOR-BSPHI(XX)                ::=  A-XOR-B,ASPLO(R07),BSPHI(@XX),CLK-D
.MACRO D←ASPLO[05]-XOR-BSPHI(XX)                ::=  A-XOR-B,ASPLO(R05),BSPHI(@XX),CLK-D

.MACRO D←SR-XOR-BSPLO[SF]                       ::=  A-XOR-B,SR,R[SF]-LO-B,CLK-D
.MACRO D←SR-XOR-BSPHI[DF]                       ::=  A-XOR-B,SR,R[DF]-HI-B,CLK-D

.MACRO D←ASPLO[DF]-XOR-BSPHI[SF]                ::=  A-XOR-B,R[DF]-LO-A,R[SF]-HI-B,CLK-D
.MACRO D←ASPHI[SF]-XOR-BSPLO[DF]                ::=  A-XOR-B,R[SF]-HI-A,R[DF]-LO-B,CLK-D

.MACRO D←CSPD[05]-XOR-ASPLO(XX)                 ::=  A-XOR-B,CSPD(D05),ASPLO(@XX),CLK-D
.MACRO D←CSPD[05]-XOR-ASPHI(XX)                 ::=  A-XOR-B,CSPD(D05),ASPHI(@XX),CLK-D
.MACRO D←CSPD[06]-XOR-ASPLO(XX)                 ::=  A-XOR-B,CSPD(D06),ASPLO(@XX),CLK-D
.MACRO D←CSPD[06]-XOR-ASPHI(XX)                 ::=  A-XOR-B,CSPD(D06),ASPHI(@XX),CLK-D
.MACRO D←CSPD[17]-XOR-ASPHI(XX)                 ::=  A-XOR-B,CSPD(D17),ASPHI(@XX),CLK-D

.MACRO D←ASPLO[02]-XOR-BSPLO(XX)                ::=  A-XOR-B,ASPLO(R02),BSPLO(@XX),CLK-D
.MACRO D←ASPLO[03]-XOR-BSPLO(XX)                ::=  A-XOR-B,ASPLO(R03),BSPLO(@XX),CLK-D
.MACRO D←ASPLO[04]-XOR-BSPLO(XX)                ::=  A-XOR-B,ASPLO(R04),BSPLO(@XX),CLK-D
.MACRO D←ASPLO[05]-XOR-BSPLO(XX)                ::=  A-XOR-B,ASPLO(R05),BSPLO(@XX),CLK-D



.TOC   *    D-REGISTER <- D-REGISTER THRU SHIFT-TREE

.MACRO D←D-RIGHT-14                      ::=  A,D-RIGHT-14,CLK-D
.MACRO D←D-RIGHT-13                      ::=  A,D-RIGHT-13,CLK-D
.MACRO D←D-RIGHT-12                      ::=  A,D-RIGHT-12,CLK-D
.MACRO D←D-RIGHT-11                      ::=  A,D-RIGHT-11,CLK-D
.MACRO D←D-RIGHT-10                      ::=  A,D-RIGHT-10,CLK-D
.MACRO D←D-RIGHT-9                       ::=  A,D-RIGHT-9,CLK-D
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.MACRO D←D-RIGHT-8             ::=  A,D-RIGHT-8,CLK-D
.MACRO D←D-RIGHT-7             ::=  A,D-RIGHT-7,CLK-D
.MACRO D←D-RIGHT-6             ::=  A,D-RIGHT-6,CLK-D
.MACRO D←D-RIGHT-5             ::=  A,D-RIGHT-5,CLK-D
.MACRO D←D-RIGHT-4             ::=  A,D-RIGHT-4,CLK-D
.MACRO D←D-RIGHT-3             ::=  A,D-RIGHT-3,CLK-D
.MACRO D←D-RIGHT-2             ::=  A,D-RIGHT-2,CLK-D
.MACRO D←D-RIGHT-1             ::=  A,D-RIGHT-1,CLK-D
.MACRO D←D-NO-SHIFT            ::=  A,D-NO-SHIFT,CLK-D
.MACRO D←D-DIRECT              ::=  A,D-DIRECT,CLK-D
.MACRO D←D                     ::=  A,D-DIRECT,CLK-D
.MACRO SAVE-D                  ::=  A,D-DIRECT,CLK-D
.MACRO D←D-LEFT-1              ::=  A,D-LEFT-1,CLK-D
.MACRO D←D-SWAB                ::=  A,D-SWAB,CLK-D
.MACRO D←D-SWAB-RIGHT-3        ::=  A,D-SWAB-RIGHT-3,CLK-D
.MACRO D←D-SWAB-LEFT-1         ::=  A,D-SWAB-LEFT-1,CLK-D
.MACRO D←D-SIGNEXT             ::=  A,D-SIGNEXT,CLK-D
.MACRO D←D-SIGNEXT-RIGHT-1     ::=  A,D-SIGNEXT-RIGHT-1,CLK-D
.MACRO D←D-SIGNEXT-LEFT-1      ::=  A,D-SIGNEXT-LEFT-1,CLK-D
.MACRO D←NO-SHIFT              ::=  A,NO-SHIFT,CLK-D
.MACRO D←DIRECT                ::=  A,DIRECT,CLK-D
.MACRO D←COUNT#D[HI]           ::=  A,COUNT#D[HI],CLK-D
.MACRO D←COUNT#D[LO]           ::=  A,COUNT#D[LO],CLK-D



.TOC    *     D <- WHATEVER'S LEFT, AT P2-T OR P3-T

.MACRO D←NOT-ASPHI(XX)                  ::=  NOT-A,ASPHI(@XX),CLK-D
.MACRO D←NOT-ASPLO(XX)                  ::=  NOT-A,ASPLO(@XX),CLK-D
.MACRO D←NOT-CSPB(XX)                   ::=  A-AND-NOT-B,C177777-A,CSPB(@XX),CLK-D
.MACRO D←NOT-CSPD(XX)                   ::=  A-AND-NOT-B,C177777-A,CSPD(@XX),CLK-D

.MACRO D←CSPD(XX)                       ::=  B,CSPD(@XX),CLK-D
.MACRO D←CSPB(XX)                       ::=  B,CSPB(@XX),CLK-D
.MACRO D←CSPB[16]#D[C]←1                ::=  A-IOR-B,C000000-A,CSPB(B16),CLK-D,D[C]←CINMUX

.MACRO D←BSPHI(XX)                      ::=  B,BSPHI(@XX),CLK-D
.MACRO D←BSPLO(XX)                      ::=  B,BSPLO(@XX),CLK-D
.MACRO D←ASPHI(XX)                      ::=  A,ASPHI(@XX),CLK-D
.MACRO D←ASPLO(XX)                      ::=  A,ASPLO(@XX),CLK-D

.MACRO D←ASPLO[DF]                      ::=  A,R[DF]-LO-A,CLK-D
.MACRO D←ASPHI[DF]                      ::=  A,R[DF]-HI-A,CLK-D
.MACRO D←BSPLO[DF]                      ::=  B,R[DF]-LO-B,CLK-D
.MACRO D←BSPHI[DF]                      ::=  B,R[DF]-HI-B,CLK-D
.MACRO D←ASPLO[SF]                      ::=  A,R[SF]-LO-A,CLK-D
.MACRO D←ASPHI[SF]                      ::=  A,R[SF]-HI-A,CLK-D
.MACRO D←BSPLO[SF]                      ::=  B,R[SF]-LO-B,CLK-D
.MACRO D←BSPHI[SF]                      ::=  B,R[SF]-HI-B,CLK-D

.MACRO D←CSPD[14]-AND-ASPHI(XX)                  ::=  A-AND-B,CSPD(D14),ASPHI(@XX),CLK-D
.MACRO D←CSPD[15]-AND-ASPHI(XX)                  ::=  A-AND-B,CSPD(D15),ASPHI(@XX),CLK-D
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.MACRO SR←ASPHI[17]-AND-007700        ::=  A-AND-B,ASPHI(R17),CSPB(B17),CLK-SR
.MACRO D←SR-IOR-170000                ::=  A-IOR-B,SR,CSPB(B16),CLK-D
.MACRO SR←ASPHI[17]-AND-000077        ::=  A-AND-B,ASPHI(R17),CSPB(B15),CLK-SR
.MACRO D←SR-IOR-000100                ::=  A-IOR-B,SR,CSPB(B14),CLK-D

.MACRO D←ASPLO[17]-AND-CSPD(XX)       ::=  A-AND-B,ASPLO(R17),CSPD(@XX),CLK-D
.MACRO D←ASPHI[00]-IOR-CSPD(XX)       ::=  A-IOR-B,ASPHI(R00),CSPD(@XX),CLK-D
.MACRO D←ASPHI[00]-IOR-CSPB(XX)       ::=  A-IOR-B,ASPHI(R00),CSPB(@XX),CLK-D

.MACRO D←SR                           ::=  A,SR,CLK-D
.MACRO D←ALL-ONES                     ::=  A,C177777-A,CLK-D
.MACRO D←D-PLUS-1                     ::=  A-PLUS-B,D-DIRECT,C000001-B,CLK-D
.MACRO D←JUNK                         ::=  ZERO,CLK-D
.MACRO D←TWO                          ::=  A-PLUS-B,C000001-A,C000001-B,CLK-D



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.TOC    *      SR <- DATA, AT P2 T OR P3 T

        !N.B.:  THE PARTICULAR FUNCTION SELECTED REQUIRES THE RESIDUAL
        !       CONTROL REGISTER ("RES-REG") TO HAVE THE APPROPRIATE
        !       FUNCTION SETUP FOR THE SR OPERATION.
        !
        !       POSSIBLE FUNCTIONS:  LOAD, LEFT, RIGHT, NOP

.MACRO SR←ASPHI(XX)             ::=  A,ASPHI(@XX),CLK-SR
.MACRO SR←NOT-ASPHI(XX)         ::=  NOT-A,ASPHI(@XX),CLK-SR
.MACRO SR←CSPB(XX)              ::=  B,CSPB(@XX),CLK-SR
.MACRO SR←CSPD(XX)              ::=  B,CSPD(@XX),CLK-SR
.MACRO SR←NOT-BSPHI(XX)         ::=  A-AND-NOT-B,BSPHI(@XX),C177777-A,CLK-SR
.MACRO SR←BSPHI(XX)             ::=  B,BSPHI(@XX),CLK-SR
.MACRO SR←SR-PLUS-1             ::=  A-PLUS-B,C000001-B,SR,CLK-SR
.MACRO SR←ALL-ONES              ::=  A,C177777-A,CLK-SR
.MACRO SR←NOT-CSPB(XX)          ::=  A-AND-NOT-B,C177777-A,CSPB(@XX),CLK-SR
.MACRO SR←NOT-CSPD(XX)          ::=  A-AND-NOT-B,C177777-A,CSPD(@XX),CLK-SR
.MACRO SR←SR-RIGHT-1            ::=  D-DIRECT[BMUX],CLK-SR
.MACRO SR←SR-LEFT-1             ::=  CLK-SR
.MACRO SR←JUNK                  ::=  ZERO,CLK-SR
.MACRO SR←D                     ::=  A,D-DIRECT,CLK-SR
.MACRO SR←ASPLO[DF]             ::=  A,R[DF]-LO-A,CLK-SR
.MACRO SR←ASPHI[DF]             ::=  A,R[DF]-HI-A,CLK-SR
.MACRO SR←BSPLO[DF]             ::=  B,R[DF]-LO-B,CLK-SR
.MACRO SR←BSPHI[DF]             ::=  B,R[DF]-HI-B,CLK-SR
.MACRO SR←ASPLO[SF]             ::=  A,R[SF]-LO-A,CLK-SR
.MACRO SR←ASPHI[SF]             ::=  A,R[SF]-HI-A,CLK-SR
.MACRO SR←BSPLO[SF]             ::=  B,R[SF]-LO-B,CLK-SR
.MACRO SR←BSPHI[SF]             ::=  B,R[SF]-HI-B,CLK-SR
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.TOC    *      RES-REG OPERATION MACROS

.MACRO RES←CSPD(XX)              ::=  CSPD(@XX),LOAD-RES
.MACRO RES←CSPB(XX)              ::=  CSPB(@XX),LOAD-RES





.TOC    *      BASE MACHINE COUNTER

.MACRO COUNTER←CSPD(XX)          ::=  LOAD-COUNTER,CSPD(@XX)
.MACRO COUNTER←BSPHI(XX)         ::=  LOAD-COUNTER,BSPHI(@XX)




.TOC    *      ENABLE ON BUS-A/B ONLY

.MACRO BUS-A←ASPLO[SF]           ::=  R[SF]-LO-A
.MACRO BUS-A←ASPLO[DF]           ::=  R[DF]-LO-A
.MACRO BUS-A←ASPHI[SF]           ::=  R[SF]-HI-A
.MACRO BUS-A←ASPHI[DF]           ::=  R[DF]-HI-A
.MACRO BUS-A                     ::=  NULL
.MACRO BUS-A←ASPLO(XX)           ::=  ASPLO(@XX)
.MACRO BUS-A←ASPHI(XX)           ::=  ASPHI(@XX)
.MACRO BUS-A←SR                  ::=  SR
.MACRO BUS-A←FLTPT               ::=  FLTPT

.MACRO BUS-B←BSPLO[SF]           ::=  R[SF]-LO-B
.MACRO BUS-B←BSPLO[DF]           ::=  R[DF]-LO-B
.MACRO BUS-B←BSPHI[SF]           ::=  R[SF]-HI-B
.MACRO BUS-B←BSPHI[DF]           ::=  R[DF]-HI-B
.MACRO BUS-B                     ::=  NULL
.MACRO BUS-B←BSPLO(XX)           ::=  BSPLO(@XX)
.MACRO BUS-B←BSPHI(XX)           ::=  BSPHI(@XX)
.MACRO BUS-B←CSPD(XX)            ::=  CSPD(@XX)
.MACRO BUS-B←CSPB(XX)            ::=  CSPB(@XX)





.TOC    *      LOADING BA REGISTER
!LOADED AT P1-T ONLY, FROM BUS-B<01:00>#BUS-A<15:00> -> BA<17:00>

.MACRO BA←BSPLO(XX)              ::=  CLK-BA,BSPLO(@XX)
.MACRO BA←BSPHI(XX)              ::=  CLK-BA,BSPHI(@XX)
.MACRO BA←SR                     ::=  CLK-BA,SR
.MACRO BA←ASPLO(XX)              ::=  CLK-BA,ASPLO(@XX)
.MACRO BA←ASPHI(XX)              ::=  CLK-BA,ASPHI(@XX)
```

```


.TOC    *       D AND SR TOGETHER

.MACRO SR#D←SR-PLUS-CSPD(XX)    ::=  A-PLUS-B,SR,CSPD(@XX),CLK-D,CLK-SR



!.PAGE==============================================================================================================

.TOC    *       UCON FUNCTIONS



.TOC    *         PROCESSOR UCON FUNCTIONS

        !PREVIOUSLY SET UP [UCON-PROC, SET-UCON-CONTROL, EN "FUNCTION"]
.MACRO IR←EMIT                  ::=  UCON-OPERATION
.MACRO PS[15-12]←D[15#13]       ::=  UCON-OPERATION
.MACRO FLAG[8-0]←D[15-8]        ::=  UCON-OPERATION
.MACRO FPS[7-4]←D[7-4]          ::=  UCON-OPERATION
.MACRO PS[7-4]←D[7-4]           ::=  UCON-OPERATION
.MACRO PS[3-0]←D[3-0]           ::=  UCON-OPERATION
.MACRO PS←D                     ::=  UCON-OPERATION
.MACRO UBREAK←BUSDIN[11-00]     ::=  UCON-OPERATION

        !SETUP UCON AND EXECUTE IN 1 MICROWORD:
.MACRO PS[15-12]←D[15#13]-[I]   ::=  UCON-PROC,SET-UCON-CONTROL,UCON-OPERATION,EN-CLK-PS[15-12]
.MACRO FLAG[8-0]←D[15-8]-[I]    ::=  UCON-PROC,SET-UCON-CONTROL,UCON-OPERATION,EN-CLK-FLAG[8-0]
.MACRO FPS[7-4]←D[7-4]-[I]      ::=  UCON-PROC,SET-UCON-CONTROL,UCON-OPERATION,EN-CLK-FPS[7-4]
.MACRO PS[7-4]←D[7-4]-[I]       ::=  UCON-PROC,SET-UCON-CONTROL,UCON-OPERATION,EN-CLK-PS[7-4]
.MACRO PS[3-0]←D[3-0]-[I]       ::=  UCON-PROC,SET-UCON-CONTROL,UCON-OPERATION,EN-CLK-PS[3-0]
.MACRO PS←D-[I]                 ::=  UCON-PROC,SET-UCON-CONTROL,UCON-OPERATION,
                                        EN-CLK-PS[15-12],EN-CLK-PS[7-4],EN-CLK-PS[3-0]
.MACRO BUSDIN←CUA-[I]           ::=  UCON-PROC,SET-UCON-CONTROL,BUSDIN←CUA[14-03]
.MACRO BUSDIN←FLAGS#FPS-[I]     ::=  UCON-PROC,SET-UCON-CONTROL,BUSDIN←FLAG[8-0]#FPS[7-0]
.MACRO BUSDIN←PS-[I]            ::=  UCON-PROC,SET-UCON-CONTROL,BUSDIN←PS[15-00]
.MACRO BUSDIN←EMIT-[I]          ::=  UCON-PROC,SET-UCON-CONTROL,BUSDIN←EMIT[15-00]



.TOC    *         CACHE/KT UCON FUNCTIONS

        !SETUP, EXECUTE IN 1 MICROWORD
.MACRO KT-NO-RELOCATE-[I]                ::=  UCON-CACHE-KT,SET-UCON-CONTROL,EN-KT-NO-RELOCATE
.MACRO BUSDIN←BUS-INTERNAL-ADDR-[I]      ::=  UCON-CACHE-KT,SET-UCON-CONTROL,BUSDIN←BUS-INTERNAL-ADDR[15-00]
.MACRO BUSDIN←CPU-INTERNAL-ADDR-[I]      ::=  UCON-CACHE-KT,SET-UCON-CONTROL,BUSDIN←CPU-INTERNAL-ADDR[15-00]
.MACRO BUSDIN←MMR2-[I]                   ::=  UCON-CACHE-KT,SET-UCON-CONTROL,BUSDIN←MMR2[15-00]
.MACRO BUSDIN←CACHE-STATUS-[I]           ::=  UCON-CACHE-KT,SET-UCON-CONTROL,BUSDIN←CACHE-STATUS[15-00]
.MACRO BUSDIN←SLR#CCR-[I]                ::=  UCON-CACHE-KT,SET-UCON-CONTROL,BUSDIN←KT-SEL,KT-SEL-SLR#CCR
.MACRO BUSDIN←MMR0-[I]                   ::=  UCON-CACHE-KT,SET-UCON-CONTROL,BUSDIN←KT-SEL,KT-SEL-MMR0
.MACRO BUSDIN←PDR-[I]                    ::=  UCON-CACHE-KT,SET-UCON-CONTROL,BUSDIN←KT-SEL,KT-SEL-PDR
.MACRO BUSDIN←PAR-[I]                    ::=  UCON-CACHE-KT,SET-UCON-CONTROL,BUSDIN←KT-SEL,KT-SEL-PAR
.MACRO SLR[15-08]←D[15-08]-[I]           ::=  UCON-CACHE-KT,SET-UCON-CONTROL,UCON-OPERATION,KT-SEL-SLR#CCR,KT-WRITE-HIGH
```

```
.MACRO CCR[07-02]←D[07-02]-[I]         ::=  UCON-CACHE-KT,SET-UCON-CONTROL,UCON-OPERATION,KT-SEL-SLR#CCR,KT-WRITE-LOW
.MACRO MMR0←D-[I]                      ::=  UCON-CACHE-KT,SET-UCON-CONTROL,UCON-OPERATION,KT-SEL-MMR0,KT-WRITE
.MACRO MMR0[00]←D[00]-[I]              ::=  UCON-CACHE-KT,SET-UCON-CONTROL,UCON-OPERATION,KT-SEL-MMR0,KT-WRITE-LOW
.MACRO MMR0[15-01]←D[15-01]-[I]        ::=  UCON-CACHE-KT,SET-UCON-CONTROL,UCON-OPERATION,KT-SEL-MMR0,KT-WRITE-HIGH
.MACRO PDR←D-[I]                       ::=  UCON-CACHE-KT,SET-UCON-CONTROL,UCON-OPERATION,KT-SEL-PDR,KT-WRITE
.MACRO PDR[03-01]←D[03-01]-[I]         ::=  UCON-CACHE-KT,SET-UCON-CONTROL,UCON-OPERATION,KT-SEL-PDR,KT-WRITE-LOW
.MACRO PDR[14-08]←D[14-08]-[I]         ::=  UCON-CACHE-KT,SET-UCON-CONTROL,UCON-OPERATION,KT-SEL-PDR,KT-WRITE-HIGH
.MACRO PAR←D-[I]                       ::=  UCON-CACHE-KT,SET-UCON-CONTROL,UCON-OPERATION,KT-SEL-PAR,KT-WRITE
.MACRO PAR[07-00]←D[07-00]-[I]         ::=  UCON-CACHE-KT,SET-UCON-CONTROL,UCON-OPERATION,KT-SEL-PAR,KT-WRITE-LOW
.MACRO PAR[11-08]←D[11-08]-[I]         ::=  UCON-CACHE-KT,SET-UCON-CONTROL,UCON-OPERATION,KT-SEL-PAR,KT-WRITE-HIGH



.TOC    *       I-O UCON FUNCTIONS

        !N.B.:  SETUP IN 1 MICROWORD
.MACRO BUSDIN←JAM-[I]             ::=  UCON-I-O,EN-STATUS-MUX,SET-UCON-CONTROL,BUSDIN←JAM[15-00]
.MACRO BUSDIN←SERVICE-[I]         ::=  UCON-I-O,EN-STATUS-MUX,SET-UCON-CONTROL,BUSDIN←SERVICE[15-00]
.MACRO BUSDIN←PBA-[I]             ::=  UCON-I-O,EN-STATUS-MUX,SET-UCON-CONTROL,BUSDIN←PBA[15-00]
.MACRO BC-FCN-O-[I]               ::=  UCON-I-O,SET-UCON-CONTROL,UCON-OPERATION,EN-BC-FCN-O
.MACRO START-DELAY-[I]            ::=  UCON-I-O,SET-UCON-CONTROL,UCON-OPERATION,EN-START-DELAY
.MACRO CLR-JAM-ERRORS-[I]         ::=  UCON-I-O,SET-UCON-CONTROL,UCON-OPERATION,EN-CLR-JAM-ERRORS
.MACRO CLR-NPR-TIMEOUT-[I]        ::=  UCON-I-O,SET-UCON-CONTROL,UCON-OPERATION,EN-CLR-NPR-TIMEOUT
.MACRO CLR-PWR-FAIL-[I]           ::=  UCON-I-O,SET-UCON-CONTROL,UCON-OPERATION,EN-CLR-PWR-FAIL
.MACRO CLR-YELLOW-ZONE-[I]        ::=  UCON-I-O,SET-UCON-CONTROL,UCON-OPERATION,EN-CLR-YELLOW-ZONE
.MACRO ALLOW-BG[1]H-[I]           ::=  UCON-I-O,SET-UCON-CONTROL,UCON-OPERATION,EN-ALLOW-BG[1]H
.MACRO BUS-INIT-UCON-[I]          ::=  UCON-I-O,SET-UCON-CONTROL,UCON-OPERATION,EN-BUS-INIT-UCON


.TOC    *       DCS UCON FUNCTIONS

        !SETUP IN 1 MICROWORD:
.MACRO BUSDIN←TNUA-[I]            ::=  UCON-DCS,SET-UCON-CONTROL,BUSDIN←TNUA[11-00]
.MACRO BUSDIN←ERROR-CODE-[I]      ::=  UCON-DCS,SET-UCON-CONTROL,BUSDIN←ERR#EOP#ERRCOD[11-00]


.TOC    *       CONSOLE UCON FUNCTIONS

        !SETS UP AND PERFORMS INDICATED OPERATION IN 1 MICROWORD
.MACRO CONSOLE-NOP                     ::=  UCON-I-O,EN-CONSOLE-COMMAND,SET-UCON-CONTROL,UCON-OPERATION,EN-CNSL-NOP
.MACRO CLEAR-CONSOLE-COUNTER           ::=  UCON-I-O,EN-CONSOLE-COMMAND,SET-UCON-CONTROL,UCON-OPERATION,EN-CLR-COUNTR
.MACRO INCREMENT-CONSOLE-COUNTER       ::=  UCON-I-O,EN-CONSOLE-COMMAND,SET-UCON-CONTROL,UCON-OPERATION,EN-INCR-COUNTR
.MACRO CLEAR-CONSOLE-SERVICE           ::=  UCON-I-O,EN-CONSOLE-COMMAND,SET-UCON-CONTROL,UCON-OPERATION,EN-CLR-CNSL-SRVC
.MACRO STROBE-CONSOLE-DISPLAY          ::=  UCON-I-O,EN-CONSOLE-COMMAND,SET-UCON-CONTROL,UCON-OPERATION,EN-STRB-DISP
.MACRO CLEAR-CONSOLE-LED               ::=  UCON-I-O,EN-CONSOLE-COMMAND,SET-UCON-CONTROL,UCON-OPERATION,EN-CLR-CNSL
.MACRO SET-CONSOLE-LED                 ::=  UCON-I-O,EN-CONSOLE-COMMAND,SET-UCON-CONTROL,UCON-OPERATION,EN-SET-CNSL
.MACRO SET-CONSOLE-DP-LEDS             ::=  UCON-I-O,EN-CONSOLE-COMMAND,SET-UCON-CONTROL,UCON-OPERATION,EN-SET-DP
.MACRO BUSDIN←CONSOLE-[I]              ::=  UCON-I-O,EN-STATUS-MUX,SET-UCON-CONTROL,BUSDIN←CONSOLE[06-00]



.TOC    *       DBUF UCON FUNCTIONS

        !PREVIOUSLY SETUP UCON-I-O, EN LOAD DBUF
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.MACRO DBUF←D                  ::=  UCON-OPERATION

       !SETUP AND EXECUTE IN 1 MICROWORD:
.MACRO DBUF←D-[I]              ::=  UCON-I-O,SET-UCON-CONTROL,UCON-OPERATION,EN-LOAD-DBUF[15-00]


.TOC   *       MULTIPLE UCON FUNCTIONS

       !THESE ARE FUNCTIONS OF MORE THAN 1 UCON ENABLED SIMULTANEOUSLY

       !PREVIOUSLY SETUP:
.MACRO IR←DBUF                 ::=  UCON-OPERATION

       !SETUP AND EXECUTE IN 1 MICROWORD:
.MACRO IR←DBUF-[I]             ::=  UCON-PROC,UCON-I-O,SET-UCON-CONTROL,
                                        UCON-OPERATION,EN-CLK-IR[15-00],BUSDIN←DBUF[15-00]




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.TOC   *     SPECIFIC MACROS FOR PREFETCH/OVERLAP/SP-INHIBIT TESTS

.MACRO CSPD[17]←020010         ::=  EMIT/020010,CSPD[17]←EMIT
.MACRO A#BSPLO[OVERLAP]←D      ::=  ASPLO(R10),WR(AB,L,A)
.MACRO A#BSPHI[PATTERN]←D      ::=  ASPHI(R17),WR(AB,H,A)
.MACRO A#BSPHI[PREFETCH]←D     ::=  ASPHI(R10),WR(AB,H,A)
.MACRO ASPLO[OVERLAP]←D        ::=  ASPLO(R10),WR(A,L,A)
.MACRO BSPLO[OVERLAP]←D        ::=  BSPLO(R10),WR(B,L,B)
.MACRO ASPHI[PREFETCH]←D       ::=  ASPHI(R10),WR(A,H,A)

.MACRO D←ASPLO[OVERLAP]-PLUS-1          ::=  A-PLUS-B,ASPLO(R10),C000001-B,CLK-D
.MACRO D←BSPLO[OVERLAP]-PLUS-1          ::=  A-PLUS-B,BSPLO(R10),C000001-A,CLK-D
.MACRO D←ASPHI[PREFETCH]-PLUS-1         ::=  A-PLUS-B,ASPHI(R10),C000001-B,CLK-D
.MACRO D←ASPHI[PATTERN]-PLUS-020010-PLUS-1      ::=  A-PLUS-B-PLUS-1,ASPHI(R17),CSPB(B17),CLK-D
.MACRO D←ASPHI[PATTERN]-AND-NOT-020010          ::=  A-AND-NOT-B,ASPHI(R17),CSPB(B17),CLK-D

.MACRO D←BSPHI[PREFETCH]                ::=  B,BSPHI(R10),CLK-D
.MACRO D←ASPLO[OVERLAP]-MINUS-CSPB[EXPEC]       ::=  A-MINUS-B,ASPLO(R10),CSPB(B17),CLK-D
.MACRO D←ASPHI[PREFETCH]-MINUS-CSPB[EXPEC]      ::=  A-MINUS-B,ASPHI(R10),CSPB(B17),CLK-D
.MACRO D←ASPLO[OVERLAP]-MINUS-BSPLO[OVERLAP]    ::=  A-MINUS-B,ASPLO(R10),BSPLO(R10),CLK-D

.MACRO CSPD[EXPEC]←EMIT                 ::=  CSPD[17]←EMIT



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.TOC   *     SPECIFIC MACROS FOR BYTE/BYTE CONSTANT/D=ZERO TESTS

.MACRO D←ASPLO[DNONZERO]-PLUS-1         ::=  A-PLUS-B,ASPLO(R11),C000001-B,CLK-D
.MACRO D←BSPLO[DZERO]-PLUS-1            ::=  A-PLUS-B,C000001-A,BSPLO(R11),CLK-D
.MACRO D←BSPLO[IR-DATA]-PLUS-2          ::=  A-PLUS-B-PLUS-1,C000001-A,BSPLO(R10),CLK-D
.MACRO D←BSPHI[WORD]-PLUS-1             ::=  A-PLUS-B,C000001-A,BSPHI(R10),CLK-D
```

```
.MACRO D←BSPLO[IR-DATA]                     ::=  B,BSPLO(R10),CLK-D
.MACRO D←BSPLO[DZERO]                       ::=  B,BSPLO(R11),CLK-D
.MACRO D←SR-MINUS-BSPHI[WORD]               ::=  A-MINUS-B,SR,BSPHI(R10),CLK-D,P3-T
.MACRO D←ASPLO[DNONZERO]-MINUS-CSPD[17]            ::=  A-MINUS-B,ASPLO(R11),CSPD(D17),CLK-D,P3-T
.MACRO D←ASPHI[BYTE-FIRST]-MINUS-CSPD[17]          ::=  A-MINUS-B,ASPHI(R10),CSPD(D17),CLK-D,P3-T
.MACRO D←ASPLO[BYTE-SECOND]-MINUS-CSPD[17]         ::=  A-MINUS-B,ASPLO(R10),CSPD(D17),CLK-D,P3-T
.MACRO D←ASPHI[BYTE-FIRST]-PLUS-CSP[1-0]           ::=  A-PLUS-B,ASPHI(R10),CSPD(D13),CLK-D
.MACRO D←ASPLO[BYTE-SECOND]-PLUS-CSP[1-0]          ::=  A-PLUS-B,ASPLO(R10),CSPD(D13),CLK-D



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.TOC   *     SUBROUTINE CALL MACROS

.MACRO CALL[DISPLAY]               ::=  GOTO-PAGE(7),J/DISPLAY

.MACRO CALL[DINTOIR]               ::=  GOTO-PAGE(7),J/DINTOIR
.MACRO CALL[DINTOIR-5]             ::=  GOTO-PAGE(7),J/DINTOIR5
.MACRO CALL[SRINTOIR]              ::=  GOTO-PAGE(7),J/SRINTOIR
.MACRO CALL[SRINTOIR-5]            ::=  GOTO-PAGE(7),J/SRINTOIR5

.MACRO CALL[FLAGFPSTOD]            ::=  GOTO-PAGE(7),J/FLAGFPSTOD
.MACRO CALL[PSTOD]                 ::=  GOTO-PAGE(7),J/PSTOD
.MACRO CALL[CUATOD]                ::=  GOTO-PAGE(7),J/CUATOD
.MACRO CALL[CLRJAMTOD]             ::=  GOTO-PAGE(7),J/CLRJAMTOD
.MACRO CALL[ODDJAMTOD]             ::=  GOTO-PAGE(7),J/ODDJAMTOD
.MACRO CALL[JAMTOD]                ::=  GOTO-PAGE(7),J/JAMTOD
.MACRO CALL[CLRSERVICETOD]         ::=  GOTO-PAGE(7),J/CLRSERVICETOD
.MACRO CALL[DATISERVICETOD]        ::=  GOTO-PAGE(7),J/DATISERVICETOD
.MACRO CALL[DATOSERVICETOD]        ::=  GOTO-PAGE(7),J/DATOSERVICETOD
.MACRO CALL[CJESERVICETOD]         ::=  GOTO-PAGE(7),J/CJESERVICETOD
.MACRO CALL[SERVICETOD]            ::=  GOTO-PAGE(7),J/SERVICETOD
.MACRO CALL[PBATOD]                ::=  GOTO-PAGE(7),J/PBATOD
.MACRO CALL[PSSEQLOD]              ::=  GOTO-PAGE(7),J/PSSEQLOD
.MACRO CALL[FLAGFPSSEQLOD]         ::=  GOTO-PAGE(7),J/FLAGFPSSEQLOD
.MACRO CALL[FLAGLOD]               ::=  GOTO-PAGE(7),J/FLAGFPS03
.MACRO CALL[GETPROCDAT]            ::=  GOTO-PAGE(7),J/GETPROCDAT

.MACRO CALL[CLEAR-I-O-A]           ::=  GOTO-PAGE(7),J/CLEAR-I-O-A
.MACRO CALL[CLEAR-I-O-B]           ::=  GOTO-PAGE(7),J/CLEAR-I-O-B

.MACRO CALL[BUSDINXOR125252]       ::=  GOTO-PAGE(7),J/BDX12
.MACRO CALL[BUSDINXOR052525]       ::=  GOTO-PAGE(7),J/BDX05
.MACRO CALL[CSP17XOR125252]        ::=  GOTO-PAGE(7),J/C17X12
.MACRO CALL[CSP17XOR052525]        ::=  GOTO-PAGE(7),J/C17X05

.MACRO CALL[D15-12]                ::=  GOTO-PAGE(7),J/D[15-12]
.MACRO CALL[D11-06]                ::=  GOTO-PAGE(7),J/D[11-06]
.MACRO CALL[D05-00]                ::=  GOTO-PAGE(7),J/D[05-00]
.MACRO CALL[DZERO]                 ::=  GOTO-PAGE(7),J/DZERO

.MACRO CALL[ZEROSF04DF02]          ::=  GOTO-PAGE(7),J/ZEROSF04DF02
.MACRO CALL[ZEROSF02DF04]          ::=  GOTO-PAGE(7),J/ZEROSF02DF04
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.MACRO CALL[ZEROSFDF]          ::=  GOTO-PAGE(7),J/ZEROSFDF
.MACRO CALL[ZERODF]            ::=  GOTO-PAGE(7),J/ZERODF

.MACRO CALL[SFDFTOSR]          ::=  GOTO-PAGE(5),J/SFDFTOSR

.MACRO CALL[ALUCARRY1]         ::=  GOTO-PAGE(7),J/ALUCARRY1
.MACRO CALL[ALUCARRY2]         ::=  GOTO-PAGE(7),J/ALUCARRY2

.MACRO CALL[LOADFPSCC]         ::=  GOTO-PAGE(7),J/LOADFPSCC
.MACRO XFR-TO-BM[LOADNZW4]     ::=  GOTO-PAGE(4),J/LOADNZW4

.MACRO CALL[SETUPPSCC#DC]      ::=  GOTO-PAGE(7),J/SETUPPSCC#DC
.MACRO CALL[PSCCTOSR3-0]       ::=  GOTO-PAGE(7),J/PSCCTOSR3-0

.MACRO CALL[CSP16XORSRTOIR-5]  ::=  GOTO-PAGE(7),J/CSP16XORSRTOIR5
.MACRO CALL[CSP16XORFLTTOIR-5] ::=  GOTO-PAGE(7),J/CSP16XORFLTTOIR5

.MACRO CALL[MFSS-TEST]         ::=  GOTO-PAGE(6),J/MFSS01

.MACRO CALL[KTSRCDST]          ::=  GOTO-PAGE(7),J/KTSRCDST01
.MACRO CALL[KTDSTBSP]          ::=  GOTO-PAGE(7),J/KTSRCDST08
.MACRO CALL[KTSRCBSP]          ::=  GOTO-PAGE(7),J/KTSRCDST07

.MACRO CALL[COUNT-TEST]        ::=  GOTO-PAGE(4),J/COUNTER01



!.PAGE================================================================================================

.TOC    *      JAM UPP LOG MACROS

        !MACROS CONCERNED WITH CSP LOG AFTER UNEXPECTED JAMUPP
        !MACROS REQUIRE APPROPRIATE REGISTER ENABLED ON BUSDIN

.MACRO CSPD[00]←LOG-CUA        ::=  CSPD(D00),WR-CSP
.MACRO CSPD[01]←LOG-SERVICE    ::=  CSPD(D01),WR-CSP
.MACRO CSPD[02]←LOG-JAM        ::=  CSPD(D02),WR-CSP



!*****  END OF MACRO DEFINITIONS  *****



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.TOC    * - - -  MICRODIAGNOSTIC CODE - - - - - - - - - - - - - - - - - -

.CODE
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!*** VERSION /V101A0/ ***

!***** MICRODIAGNOSTIC INITIAL STARTUP LOCATION *****

.TOC  *   TEST001-007:  NUA SEQUENCING

!*****************************************************************************
!*
!*      TESTS:  001 - 007                                  UWORDS: 010 + 000
!*
!*      FUNCTIONS:        TESTS 001 - 007 TEST THE NUA SEQUENCING LOGIC.
!*                               PATTERNS ARE RUN THRU THE NUA LOGIC ESTABLISHING
!*                               THAT ALL BITS CAN BE SET AND CLEARED, AND THAT THE
!*                               STATE [SET, CLEARED] OF NO ONE BIT AFFECTS THE
!*                               ABILITY TO SET/CLEAR ANY OTHER BIT.  THE PAGE
!*                               CHANGING FUNCTIONS OF BUTA(SUBR-A) AND BUTA(SUBR-B)
!*                               ARE ALSO TESTED FOR PAGES 4, 5, 6, & 7.  NOTE
!*                               THAT THE RETURN ADDRESS SIMULTANEOUSLY LOADED
!*                               IS NOT CHECKED FOR VALIDITY AT THIS POINT.
!*
!*      NOTES:  TEST[N] DOES THE SETUP FOR TEST[N+1].  THE ACTUAL TEST CONSISTS
!*              OF BEING IN THE RIGHT PLACE (MICROWORD) AT THE RIGHT TIME.
!*
!*****************************************************************************




! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

!*** TEST 001 ***
!TEST   NUA LOGIC   WITH PATTERN "100 000 000 000"
4000:
TEST001:
        P0,     LOAD-ENUA(6252),                         !LOAD ENUA WITH ADDR[NEXT UWORD]
                LOAD-ERROR(TEST001),                     !ERROR DIRECTORY KEY
                DCS-CTR(C1.),                            !COMPARE AT NEXT UWORD
        NEXT,   PAGE(2), BUTA(SUBR-B),                   !CHANGING TO PAGE 2 (ACTUALLY 6), VIA SUBR-B
                J/TEST002                                !NOTE OVERLAP:  NEXTPAGE<2:0>=ENUA<2:0>
   (4000)  DCS[1.00.1.0.0.0]  BM[1110..00.11..00.10..101..010...0.0.0..0..0...0.0000...0..0000.0...11.100...010.101.010]
                                                         !NOTE ALSO DCS MODULE FORCES NUA<11>=1, SO
                                                         !PAGES 2/6 ARE EQUIVALENT REFERENCES.
```

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        ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

        !*** TEST 002 ***
        !TEST   NUA LOGIC   WITH PATTERN "010 010 101 010"
        6252:
        TEST002:
                PO,     LOAD-ENUA(6631),                        !LOAD ENUA WITH ADDR[NEXT UWORD]
                        LOAD-ERROR(TEST002),                    !ERROR DIRECTORY KEY
                        DCS-CTR(C1.),                           !COMPARE AT NEXT UWORD
                        BUMP-VERIFY,                            !COUNT
                NEXT,   J/TEST003                               !
     (6252)  DCS[1.00.1.0.0.1]  BM[1110..00.11..01.10..011..001...0.0.0..0..0...0.0000...0..0000.0...11.000...110.011.001]







        ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

        !*** TEST 003 ***
        !TEST   NUA LOGIC   WITH PATTERN "010 110 011 001"
        6631:
        TEST003:
                PO,     LOAD-ENUA(5525),                        !LOAD ENUA WITH ADDR[NEXT UWORD]
                        LOAD-ERROR(TEST003),                    !ERROR DIRECTORY KEY
                        DCS-CTR(C1.),                           !COMPARE AT NEXT UWORD
                NEXT,   PAGE(5), BUTA(SUBR-A),                  !CHANGING TO PAGE 5, VIA SUBR-A
                        J/TEST004                               !NOTE OVERLAP:  NEXTPAGE<2:0>=ENUA<2:0>
     (6631)  DCS[1.00.1.0.0.0]  BM[1110..00.10..11.01..010..101...0.0.0..0..0...0.0000...0..0000.0...11.101...101.010.101]







        ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

        !*** TEST 004 ***
        !TEST   NUA LOGIC   WITH PATTERN "101 101 010 101"
        5525:
        TEST004:
                PO,     LOAD-ENUA(5146),                        !LOAD ENUA WITH ADDR[NEXT UWORD]
                        LOAD-ERROR(TEST004),                    !ERROR DIRECTORY KEY
```

```
                      DCS-CTR(C1.),                                !COMPARE AT NEXT UWORD
                      BUMP-VERIFY,                                 !COUNT
              NEXT,   J/TEST005                                    !
    (5525)  DCS[1.00.1.0.0.1]  BM[1110..00.10..10.01..100..110...0.0.0..0..0...0.0000...0..0000.0...11.000...001.100.110]








      !-----------------------------------------------------------------

      !### TEST 005 ###
      !TEST   NUA LOGIC   WITH PATTERN "101 001 100 110"
      5146:
      TEST005:
              PO,     LOAD-ENUA(4474),                             !LOAD ENUA WITH ADDR[NEXT UWORD]
                      LOAD-ERROR(TEST005),                         !ERROR DIRECTORY KEY
                      DCS-CTR(C1.),                                !COMPARE AT NEXT UWORD
              NEXT,   PAGE(4), BUTA(SUBR-B),                       !CHANGING TO PAGE 4, VIA SUBR-B
                      J/TEST006                                    !NOTE OVERLAP:  NEXTPAGE<2:0>=ENUA<2:0>
    (5146)  DCS[1.00.1.0.0.0]  BM[1110..00.10..01.00..111..100...0.0.0..0..0...0.0000...0..0000.0...11.100...100.111.100]








      !-----------------------------------------------------------------

      !### TEST 006 ###
      !TEST   NUA LOGIC   WITH PATTERN "100 100 111 100"
      4474:
      TEST006:
              PO,     LOAD-ENUA(4377),                             !LOAD ENUA WITH ADDR[NEXT UWORD]
                      LOAD-ERROR(TEST006),                         !ERROR DIRECTORY KEY
                      DCS-CTR(C1.),                                !COMPARE AT NEXT UWORD
                      BUMP-VERIFY,                                 !COUNT
              NEXT,   J/TEST007                                    !
    (4474)  DCS[1.00.1.0.0.1]  BM[1110..00.10..00.11..111..111...0.0.0..0..0...0.0000...0..0000.0...11.000...011.111.111]








      !-----------------------------------------------------------------
```

E05


```

        !*** TEST 007 ***
        !TEST   NUA LOGIC   WITH PATTERN "100 011 111 111"
        4377:
        TEST007:
                PO,     LOAD-ENUA(7303),                                !LOAD ENUA WITH ADDR[NEXT UWORD]
                        LOAD-ERROR(TEST007),                            !ERROR DIRECTORY KEY
                        DCS-CTR(C1.),                                   !COMPARE AT NEXT UWORD
                NEXT,   PAGE(3), BUTA(SUBR-A),                          !CHANGING TO PAGE 3 (ACTUALLY 7), VIA SUBR-A
                        J/NEXT007                                       !NOTE OVERLAP:  NEXTPAGE<2:0>=ENUA<2:0>
   (4377)  DCS[1.00.1.0.0.0]  BM[1110..00.11..10.11..000..011...0.0.0..0..0...0.0000...0..0000.0...11.101...011.000.011]
                                                                        !NOTE ALSO DCS MODULE FORCES NUA<11>=1, SO
                                                                        !PAGES 3/7 ARE EQUIVALENT REFERENCES.






        ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

        !*** TEST 007-1/2 ***
        !TEST    NUA LOGIC   WITH PATTERN "011 011 000 011"
        7303:
        NEXT007:
                NEXT,   PAGE(4), BUTA(SUBR-B),                          !CHANGING TO PAGE 4, VIA SUBR B
                        J/TEST010                                       !OFF TO NEXT TEST
   (7303)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..100...0.0.0..0..0...0.0000...0..0000.0...11.100...111.111.101]



        !.PAGE=================================================================================================

        .TOC   *   TEST010-011:  MICROSUBROUTINE OPERATION

        !*************************************************************************************
        !*                                                                                   *
        !*     TESTS:  010 - 011                              UWORDS: 007 + 002              *
        !*                                                                                   *
        !*     FUNCTIONS:       THESE TWO TESTS DETERMINE THAT THE RETURN REGISTER AND       *
        !*                      ASSOCIATED DECODE, MUX, AND ENABLING LOGIC IS ABLE TO        *
        !*                      LOAD THE 12-BIT NUA RETURN REGISTER FROM THE EMIT            *
        !*                      FIELD, AND THEN ENTER THE REGISTER CONTENTS ONTO THE         *
        !*                      UWORD ADDRESS BUS [WHEN ENABLED BY A BUTA[RETURN]] IN        *
        !*                      TIME TO FETCH THE NEXT MICROWORD.  TWO ALTERNATING           *
        !*                      BIT TESTS ARE USED TO CHECK THAT EACH BIT CAN BE SET         *
        !*                      AND CLEARED, INDEPENDENT OF ADJACENT BITS.                   *
        !*                                                                                   *
        !*************************************************************************************
```

```
        !-------------------------------------------------------------

        !*** TEST 010 ***
        !TEST RETURN LOGIC WITH PATTERN "1010 1010 0101" (5245)
        4775:
        TEST010:
                PO,     LOAD-ENUA(NEXT010),                    !LOAD ENUA WITH EXPECTED RETURN ADDRESS
                        LOAD-ERROR(TEST010),                   !ERROR DIRECTORY KEY
                        DCS-CTR(C4.),                          !COMPARE ENUA:TNUA IN 4. MICROWORDS
                NEXT,   J/LOAD010                              !GO LOAD
(4775)  DCS[1.00.1.0.0.0]  BM[1011..00.10..10.10..100..101...0.0.0..0..0...0.0000...0..0000.0...11.000...001.000.000]

        4100:  !(FREE)
        LOAD010:
                SETUP,  RETURN/NEXT010,                        !SET RETURN ADDRESS FROM EMIT
                NEXT,   PAGE(7),                               !"SUBR" IS ON PAGE 7
                        BUTA(SUBR-B),                          !WITH B VERSION
                        J/SUBR010                              !"SUBR" DISP. ON PAGE
(4100)  DCS[0.00.0.0.0.0]  BM[0101..00.01..01.00..101..111...0.0.0..0..0...0.0000...0..0000.0...11.100...000.000.000]

        7000:  !(FREE)
        SUBR010:
                SETUP,  RETURN/ERROR010,                       !NOISE BITS IN EMIT-RETURN FIELD
                P3,     BUTA(CLR-FLAG-RES-UCON),               !NOISE IN UBF FIELD
                NEXT,   J/ZTARGET777                           !BEFORE DO BUTA[RETURN]
(7000)  DCS[0.00.0.0.0.0]  BM[0110..00.10..11.00..011..000...0.0.0..0..0...0.0000...0..0000.0...11.010...111.111.111]

        !   REMAINDER OF SUBROUTINE IS AT ZTARGET777 [LOCATION 7777[8]], WHICH IMMEDIATELY DOES A BUTA[RETURN]
        !   TO THE ADDRESS IN THE RETURN REGISTER, WHICH SHOULD BE THE VALUE LOADED IN WORD
        !   LOAD010.  THE RETURN REGISTER WAS SET TO POINT TO THE START OF THE NEXT TEST
        !   [NEXT010], AT WHICH POINT THE ENUA:TNUA COMPARE IS SET TO TAKE PLACE.

        6543:
        ERROR010:
                PO,     BUMP-VERIFY,                           !COUNT
                NEXT,   PAGE(4),                               !IF WE END UP HERE, THE NOISE BITS
                        J/TEST010                              !WERE LOADED INTO THE RETURN REGISTER INSTEAD
(6543)  DCS[0.00.0.0.0.1]  BM[0000..00.00..00.00..000..100...0.0.0..0..0...0.0000...0..0000.0...11.000...111.111.101]

        5245:
        NEXT010:
                PO,     BUMP-VERIFY,                           !COUNT
                NEXT,   J/TEST011                              !RETURNED OK, COMPARE ENUA:TNUA DONE HERE
(5245)  DCS[0.00.0.0.0.1]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...111.111.111]
```

```
        ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

        !*** TEST 011 ***
        !TEST RETURN LOGIC WITH PATTERN "1101 0101 1010" (6532)
        5777:
        TEST011:
                PO,     LOAD-ENUA(INITIALIZE01),                !LOAD ENUA WITH EXPECTED RETURN ADDRESS
                        LOAD-ERROR(TEST011),                    !ERROR DIRECTORY KEY
                        DCS-CTR(C3.),                           !COMPARE ENUA:TNUA IN 3. MICROWORDS
                NEXT,   J/LOAD011                               !GO LOAD
 (5777) DCS[1.00.1.0.0.0]  BM[1100..00.11..01.01..011..010...0.0.0..0..0...0.0000...0..0000.0...11.000...000.000.001]

        5001:  !(FREE)
        LOAD011:
                SETUP,  RETURN/INITIALIZE01,                    !SET RETURN ADDRESS IN EMIT
                NEXT,   PAGE(7),                                !"SUBR" IS ON PAGE 7
                        BUTA(SUBR-B),                           !VIA B VERSION
                        J/RESETUCONP                            !"SUBR" DISP. ON PAGE
 (5001) DCS[0.00.0.0.0.0]  BM[0110..00.10..10.11..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.111.001]

        !   "ONE-WORD SUBROUTINE" IS AT LABEL "RESETUCONP", WHICH IMMEDIATELY DOES A BUTA[RETURN]
        !   TO THE ADDRESS IN THE RETURN REGISTER, WHICH SHOULD BE THE VALUE LOADED AT SYMBOLIC LABEL
        !   "LOAD011".  THE RETURN REGISTER WAS SET TO POINT TO THE INITIALIZATION CODE ON THE NEXT PAGE:
        !   "INITIALIZE01", AT WHICH POINT THE ENUA:TNUA COMPARE IS SET TO TAKE PLACE.
        !   THIS SUBROUTINE ALSO 'ATTEMPTS' TO SET THE UCON CONTROL TO:  'PROC', 'BUSDIN+EMIT', AND
        !   'EN-CLK-IR', FOR USE IN THE FOLLOWING INITIALIZATION ROUTINE.



        !  +  +  +  +  +  +  +  +  +  +  +  +  +  +  +  +  +  +  +  +  +  +  +  +  +  +  +  +  +  +  +

        !       ***  BUTA(RETURN) ERROR LOOP WORDS:
        !
        !       IF AT ANY TIME, A 'BUTA(RETURN)' FAILS, ONE OF THE FOLLOWING MICROWORDS WILL BE
        !       CONTINUOUSLY LOOPED UPON.  THIS IS DUE TO THE FACT THAT FOR EACH MICROWORD THAT
        !       CONTAINS THIS 'BUTA(RETURN)', THE UPF FIELD (WHICH WOULD NORMALLY NOT BE USED IN THIS
        !       MICROWORD EXECUTION), CONTAINS THE VALUE "J/BUTERROR#", WHERE NUMBER (#) IS THE
        !       CURRENT MICROWORD'S PAGE NUMBER (4-7).

        4376:
        BUTERROR4:
                PO,     DCS-CTR(CO.),                           !FORCE AN ERROR, ERROR-CODE=LAST LOADED
                NEXT,   J/BUTERROR4                             !HANG UP
 (4376) DCS[0.00.1.0.0.0]  BM[1111..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...011.111.110]


        5376:
        BUTERROR5:
                PO,     DCS-CTR(CO.),                           !FORCE AN ERROR, ERROR-CODE=LAST LOADED
                NEXT,   J/BUTERROR5                             !HANG UP
 (5376) DCS[0.00.1.0.0.0]  BM[1111..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...011.111.110]
```

```
        6376:
        BUTERROR6:
                PO,     DCS-CTR(CO.),                       !FORCE AN ERROR, ERROR-CODE=LAST LOADED
                NEXT,   J/BUTERROR6                         !HANG UP
 (6376) DCS[0.00.1.0.0.0]  BM[1111..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...011.111.110]


        7376:
        BUTERROR7:
                PO,     !DCS-CTR(CO.),                      !FORCE AN ERROR, ERROR-CODE=LAST LOADED
                NEXT,   J/BUTERROR7                         !HANG UP
 (7376) DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...011.111.110]



        !.PAGE==============================================================================================

        .TOC    *   INIT REGISTERS, CONSOLE DEFAULT ERROR DISPLAY, REVISION CODE

        !*******************************************************************************
        !*
        !*      TESTS:  INITIALIZATION                          UWORDS:  011 + 011
        !*
        !*      FUNCTIONS:
        !*
        !*      TRY TO PUT AN OCTAL (000000) IN THE CONSOLE DISPLAY AS AN ERROR INDICATOR
        !*
        !*      PUT REVISION CODE, BIT15 CLEAR, IN GPR R5
        !*
        !*      SET FLAGS, FPS, PS, UBREAK REGISTERS TO ALL ZEROS TO DISABLE AS MUCH
        !*      AS POSSIBLE ANY SPURIOUS HOT FLOATING POINT STARTUPS, UBREAKS, ETC.
        !*
        !*      TURN OFF CACHE (SET BOTH FOFCE MISS BITS), AND TURN OFF KT (MEMORY
        !*      MANAGEMENT (BY CLEARING ENABLE BIT).
        !*
        !*******************************************************************************


                        !RETURNED OK, COMPARE OF ENUA:TNUA
                        !FOR PREV TEST DONE HERE
        6532:
        INITIALIZE01:
                SETUP,  RETURN/INITIALIZE03,                !GO TO SUBR THAT PUTS REVISION NUMBER,
                NEXT,   GOTO-PAGE(7),                       !  WITH B<15>=(0), INTO B.M. GPR "R5"
                        J/INSERTREVNO                       !
 (6532) DCS[0.00.0.0.0.0]  BM[0111..00.00..00.00..001..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.001.110]

        7001:   !(FREE)
        INITIALIZE03:
                P3,     CSPD[17]+EMIT, EMIT/000014,         !EMITCON TO DISABLE CACHE, KT
                NEXT,   J/INITIALIZE04                      !
 (7001) DCS[0.00.0.0.0.0]  BM[0000..10.00..00.00..001..100...0.0.0..0..0...0.0000...1..0000.0...11.000...000.000.011]
```

```
     7003:  !(FREE)
     INITIALIZE04:
            P2-T,     D←CSPD(D17), D[C]←0,                      !GET ABOVE CONSTANT INTO D
            P2,       RES←CSPD(D17),                            !BITS<14:11>=0/00/0 FOR SR-LOAD, GUARD-DIS
            NEXT,     J/INITIALIZE05                            !
 (7003)  DCS[0.00.0.0.0.0]  BM[1010..10.00..00.00..000..000...0.1.0..0..0...0.0000...0..1000.1...11.000...000.000.100]

     7004:  !(FREE)
     INITIALIZE05:
            P2-T,     CCR[07-02]←D[07-02]-[I],                  !LOAD CCR, DISABLING CACHE
            NEXT,     J/INITIALIZE06                            !  BITS<3:2> SET FORCE MISS
 (7004)  DCS[0.00.0.0.0.0]  BM[0001..00.01..00.00..000..000...0.0.0..0..0...1.1011...0..0000.0...11.000...000.000.101]

     7005:  !(FREE)
     INITIALIZE06:
            P2-T,     MMR0←D-[I],                               !LOAD MMR0, DISABLING KT11
            NEXT,     J/INITIALIZE07                            !  BIT<00> CLEAR DISABLES KT11
 (7005)  DCS[0.00.0.0.0.0]  BM[0001..00.11..01.00..000..000...0.0.0..0..0...1.1011...0..0000.0...11.000...000.000.110]

     7006:  !(FREE)
     INITIALIZE07:
            P2-T,     D←ZERO,                                   !DEFAULT TO ALL ZEROS FOR ERROR
                      SR←ZERO,                                  !ZERO SR FOR JAMUPP IS ERROR
            NEXT,     GOTO-PAGE(4),                             !XFER
                      J/INITIALIZE10                            !
 (7006)  DCS[0.00.0.0.0.0]  BM[0011..00.00..00.00..000..100...0.1.1..0..0...0.0000...0..0000.0...11.100...001.000.001]

     4101:  !(FREE)
     INITIALIZE10:
            SELECT,   UCON-PROC,                                !ENABLE CLOCKING THE FOLLOWING
            ENABLE,   EN-CLK-PS[15-12], EN-CLK-PS[7-4],         !  PROCESSOR REGISTERS:
                      EN-CLK-PS[3-0], EN-CLK-FLAG[8-0],         !
                      EN-CLK-FPS[7-4], EN-CLK-UBREAK[11-00],    !
                      BUSDIN←EMIT[15-00],                       !FOR UBREAK CONSTANT
            P0,       SET-UCON-CONTROL,                         !WRITE CONTROLS
                      BUMP-VERIFY,                              !COUNT
            P3,       BUTA(CUA-TRACK),                          !RESET CUA TRACKING
            NEXT,     J/INITIALIZE11                            !
 (4101)  DCS[0.00.0.0.0.1]  BM[1000..01.00..00.01..110..011...0.0.0..0..0...1.1001...0..0000.0...11.001...001.000.010]

     4102:  !(FREE)
     INITIALIZE11:
            P0,       DCS-CTR(C15.),                            !DISABLE DCS-CTR FOR NOW
            EMITC,    EMIT/000000,                              !FOR UBREAK REGISTER LOAD
            P2,       PS[3-0]←D[3-0],                           !
                      UBREAK←BUSDIN[11-00],                     !
            P3,       PS[15-12]←D[15#13], PS[7-4]←D[7-4],       !
                      FPS[7-4]←D[7-4], FLAG[8-0]←D[15-8],       !
            NEXT,     BUTD[SCOPE],                              !NO ERROR:  "INITIALIZE12" (+1. WORDS)
                      J/INITIALIZE12                            !   ERROR:  "TEST001"  (BACK AT START)
 (4102)  DCS[0.00.1.1.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...1.1010...0..0000.0...11.000...000.000.001]
```

```
4001:
INITIALIZE12:
        SETUP,  RETURN/TEST012A,                        !RETURN TO NEXT TEST START
        NEXT,   CALL[DISPLAY]                           !GO DISPLAY CONTENTS OF D-REGISTER IN LIGHTS
 (4001) DCS[0.00.0.0.0.0]  BM[0101..00.11..11.11..101..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.010.001]



!.PAGE=================================================================================================

.TOC   *   TEST012-050:  IR DECODE (INSTR1, INSTR5, FLTPT, RELATED "BUTS")

!**********************************************************************************
!*
!*      TESTS:  012 - 050                               UWORDS: 274 + 206
!*
!*      FUNCTIONS:
!*
!*      THE FOLLOWING TESTS EXERCISE THE IR-DECODE RELATED LOGIC:
!*
!*              INSTR-1, INSTR-5, FLOATING-POINT DECODE 'BUTS'
!*              IR<15:12>, IR<11> (TWO), IR<9:6>, IR<5:3> BIT 'BUTS'
!*              MOV/DR7, BYTE/DMD/SMD, DR6-7 DECODE-RELATED 'BUTS'
!*
!*      NOTE ALSO THAT THE FIRST TIME THE PROCESSOR 'UCON':
!*              BUSDIN←EMIT, AND EN-CLK-IR, IS EMPLOYED IS IN TEST-012-A.
!*
!**********************************************************************************








! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

!*** TEST 012 ***
!TEST-012 USES A DATA PATTERN OF:  "1 111 111 111 111 111" (177777)

!   -   -   -   -   -   -   -   -   -   -   -   -   -   -   -   -   -   -   -   -   -

!* PART A *
!TEST-012-A CHECKS THAT BUT[IR<15:12>] READS THE "1111" IN IR<15:12>H CORRECTLY
5775:
TEST012A:
        PO,     LOAD-ENUA(ZTARGET417),                  !LOAD EXPECTED ADDRESS AFTER "BUT"
                LOAD-ERROR(TEST012A),                   !ERROR DIRECTORY KEY
                DCS-CTR(C5.),                           !COMPARE ENUA:TNUA IN 5. MICROWORDS
        NEXT,   J/SETIRA                                !SETUP FOR IR TESTS
 (5775) DCS[1.00.1.0.0.0]  BM[1010..00.11..11.00..001..111...0.0.0..0..0...0.0000...0..0000.0...11.000...111.110.000]
```

```
!*** SETUP PROCESSOR UCON FOR BUSDIN <- EMIT, CLOCKING INSTRUCTION REGISTER ***
5760:
SETIRA:
        SELECT, UCON-PROC,                          !SELECT PROCESSOR UCON CONTROL:
        ENABLE, EN-CLK-IR[15-00],                   !  ENABLE CLOCK IR OPERATION
                BUSDIN←EMIT[15-00],                 !  PUT EMIT[15:00] ONTO BUSDIN
        PO,     SET-UCON-CONTROL,                   !LOAD UCON REGISTER AT PO
                BUMP-VERIFY,                        !COUNT
        NEXT,   J/LOAD012A                          !GO TO FIRST TEST, PART A
(5760)  DCS[0.00.0.0.0.1]  BM[0000..00.00..00.01..000..100...0.0.0..0..0...1.1001...0..0000.0...11.000...000.000.010]


5002:  !(FREE)
LOAD012A:
        P2-U,   IR←EMIT,                            !LOAD IR WITH TEST PATTERN
                EMIT/177777,                        !(177777)
        NEXT,   J/GOBUT012A                         !GO SETUP FOR "BUT"
(5002)  DCS[0.00.0.0.0.0]  BM[1111..00.11..11.11..111..111...0.0.0..0..0...1.1010...0..0000.0...11.000...000.000.011]


5003:  !(FREE)
GOBUT012A:
        SETUP,  RETURN/TEST012B,                    !RETURN TO START OF NEXT SUBTEST
        NEXT,   GOTO-PAGE(7),                       !BUT TABLE IS ON PAGE 7
                J/BUTIR15-12                        !GO DO "BUT" ON IR<15:12>H
(5003)  DCS[0.00.0.0.0.0]  BM[0101..00.11..11.11..011..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.000.000]


! - - - - - - - - - - - - - - - - - - - - - - - - - - -

!* PART B *
!TEST-012-B CHECKS THAT BUT[IR<11>#FLTPT<3:0>] READS THE "1" IN IR<11>H CORRECTLY,
!AND THE FLTPT DECODE ROM GETS ADDRESS (776), WHICH IS A CMPF/D INSTR;
!DATA OUTPUT SHOULD BE (17)
5773:
TEST012B:
        PO,     LOAD-ENUA(ZTARGET437),              !LOAD EXPECTED ADDRESS AFTER "BUT"
                LOAD-ERROR(TEST012B),               !ERROR DIRECTORY KEY
                DCS-CTR(C3.),                       !COMPARE ENUA:TNUA IN 3. MICROWORDS
        NEXT,   J/GOBUT012B                         !GO SETUP FOR "BUT"
(5773)  DCS[1.00.1.0.0.0]  BM[1100..00.11..11.00..011..111...0.0.0..0..0...0.0000...0..0000.0...11.000...000.000.100]


5004:  !(FREE)
GOBUT012B:
        SETUP,  RETURN/TEST012C,                    !RETURN TO START OF NEXT SUBTEST
        NEXT,   GOTO-PAGE(7),                       !BUT TABLE IS ON PAGE 7
                J/BUTIR11FLTPT3-0                   !GO DO "BUT" ON IR<11>H#FLTPT<3:0>H
(5004)  DCS[0.00.0.0.0.0]  BM[0101..00.11..11.11..001..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.000.010]


! - - - - - - - - - - - - - - - - - - - - - - - - - - -
```

```
    !* PART C *
    !TEST-012-C CHECKS THAT BUTR[IR<11>B] READS THE "1" IN IR<11>H CORRECTLY
    5771:
    TEST012C:
            PO,     LOAD-ENUA(ZTARGET403),              !LOAD EXPECTED ADDRESS AFTER "BUT"
                    LOAD-ERROR(TEST012C),               !ERROR DIRECTORY KEY
                    DCS-CTR(C3.),                       !COMPARE ENUA:TNUA IN 3. MICROWORDS
                    BUMP-VERIFY,                        !COUNT
            NEXT,   J/GOBUT012C                         !GO SETUP FOR "BUT"
 (5771)  DCS[1.00.1.0.0.1]  BM[1100..00.11..11.00..000..011...0.0.0..0..0...0.0000...0..0000.0...11.000...000.000.101]


    5005:  !(FREE)
    GOBUT012C:
            SETUP,  RETURN/TEST012D,                    !RETURN TO START OF NEXT SUBTEST
            NEXT,   GOTO-PAGE(7),                       !BUT TABLE IS ON PAGE 7
                    J/BUTIR11B                          !GO DO "BUT" ON IR<11>H
 (5005)  DCS[0.00.0.0.0.0]  BM[0101..00.11..11.10..111..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.010]


    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    !* PART D *
    !TEST-012-D CHECKS THAT BUT[IR<9:6>] READS THE "1111" IN IR<9:6>H CORRECTLY
    5767:
    TEST012D:
            PO,     LOAD-ENUA(ZTARGET417),              !LOAD EXPECTED ADDRESS AFTER "BUT"
                    LOAD-ERROR(TEST012D),               !ERROR DIRECTORY KEY
                    DCS-CTR(C3.),                       !COMPARE ENUA:TNUA IN 3. MICROWORDS
            NEXT,   J/GOBUT012D                         !GO SETUP FOR "BUT"
 (5767)  DCS[1.00.1.0.0.0]  BM[1100..00.11..11.00..001..111...0.0.0..0..0...0.0000...0..0000.0...11.000...000.000.110]


    5006:  !(FREE)
    GOBUT012D:
            SETUP,  RETURN/TEST012E,                    !RETURN TO START OF NEXT SUBTEST
            NEXT,   GOTO-PAGE(7),                       !BUT TABLE IS ON PAGE 7
                    J/BUTIR9-6                          !GO DO "BUT" ON IR<9:6>H
 (5006)  DCS[0.00.0.0.0.0]  BM[0101..00.11..11.10..101..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.000.100]


    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    !* PART E *
    !TEST-012-E CHECKS THAT BUT[MOV-DR7*IR<5:3>] READS THE (-FLTPT*MOV+FLTPT*DR7) AND "111" IN IR<5:3>H CORRECTLY
    5765:
    TEST012E:
            PO,     LOAD-ENUA(ZTARGET417),              !LOAD EXPECTED ADDRESS AFTER "BUT"
                    LOAD-ERROR(TEST012E),               !ERROR DIRECTORY KEY
                    DCS-CTR(C3.),                       !COMPARE ENUA:TNUA IN 3. MICROWORDS
            NEXT,   J/GOBUT012E                         !GO SETUP FOR "BUT"
```

```
(5765)  DCS[1.00.1.0.0.0]  BM[1100..00.11..11.00..001..111...0.0.0..0..0...0.0000...0..0000.0...11.000...000.000.111]


        5007:  !(FREE)
        GOBUT012E:
                SETUP,  RETURN/TEST012F,                        !RETURN TO START OF NEXT SUBTEST
                NEXT,   GOTO-PAGE(7),                           !BUT TABLE IS ON PAGE 7
                        J/BUTMOVDR7IR5-3                        !GO DO "BUT" ON (-FLTPT*MOV+FLTPT*DR7) # IR<5:3>H
(5007)  DCS[0.00.0.0.0.0]  BM[0101..00.11..11.10..100..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.000.101]


        ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

        !* PART F *
        !TEST-012-F CHECKS THAT BUT[DR6-7 L] READS THE "11" IN IR<2:1> H CORRECTLY
        !AND DOES ASSERT THE SIGNAL
        5764:
        TEST012F:
                P0,     LOAD-ENUA(ZTARGET402),                  !LOAD EXPECTED ADDRESS AFTER "BUT"
                        LOAD-ERROR(TEST012F),                   !ERROR DIRECTORY KEY
                        DCS-CTR(C3.),                           !COMPARE ENUA:TNUA IN 3. MICROWORDS
                NEXT,   J/GOBUT012F                             !GO SETUP FOR "BUT"
(5764)  DCS[1.00.1.0.0.0]  BM[1100..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...000.001.000]


        5010:  !(FREE)
        GOBUT012F:
                SETUP,  RETURN/TEST012G,                        !RETURN TO START OF NEXT SUBTEST
                P0,     BUMP-VERIFY,                            !COUNT
                NEXT,   GOTO-PAGE(7),                           !BUT TABLE IS ON PAGE 7
                        J/BUTDR6-7L                             !GO DO "BUT" ON DR 6/7 L
(5010)  DCS[0.00.0.0.0.1]  BM[0101..00.11..11.10..011..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.111]


        ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

        !* PART G *
        !TEST-012G CHECKS THAT BUT[INSTR1] READS THE ONES IN IR<15:00>H CORRECTLY
        !AS CLASS-A-FLTPT, AND CORRECTLY TARGETS TO INSTR1 FLTPT (474)
        !  BIT<1:0> = FLAG<4:5>H = "00" FROM INITIALIZATION CODE
        5763:
        TEST012G:
                P0,     LOAD-ENUA(ZTARGET474),                  !LOAD EXPECTED ADDRESS AFTER "BUT"
                        LOAD-ERROR(TEST012G),                   !ERROR DIRECTORY KEY
                        DCS-CTR(C3.),                           !COMPARE ENUA:TNUA IN 3. MICROWORDS
                NEXT,   J/GOBUT012G                             !GO SETUP FOR "BUT"
(5763)  DCS[1.00.1.0.0.0]  BM[1100..00.11..11.00..111..100...0.0.0..0..0...0.0000...0..0000.0...11.000...000.001.001]


        5011:  !(FREE)
        GOBUT012G:
                SETUP,  RETURN/SCOPE012,                        !RETURN TO SCOPE LOOP TEST WORD
```

```
          NEXT,   GOTO-PAGE(7),                              !BUT TABLE IS ON PAGE 7
                  J/BUTINSTR1                                !GO DO INSTR1 "BUT"
 (5011)  DCS[0.00.0.0.0.0]  BM[0101..00.00..00.01..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.000.110]



    5012:  !(FREE)
    SCOPE012:
          PO,     BUMP-VERIFY,                               !COUNT
          NEXT,   BUTD[SCOPE],                               !NO ERROR:  "TEST013A" [+1. WORDS]
                  J/TEST013A                                 !   ERROR:  "SETIRA"   [-16. WORDS]
 (5012)  DCS[0.00.0.1.0.1]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...111.110.001]






    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    !*** TEST 013 ***
    !TEST-013 USES AN IR DATA PATTERN OF:  "0 000 000 000 000 000" (000000)

    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    !* PART A *
    !TEST-013-A CHECKS THAT BUT [IR<15:12>] READS THE "0000" IN IR<15:12>H CORRECTLY
    5761:
    TEST013A:
          PO,     LOAD-ENUA(ZTARGET400),                     !LOAD EXPECTED ADDRESS AFTER "BUT"
                  LOAD-ERROR(TEST013A),                      !ERROR DIRECTORY KEY
                  DCS-CTR(C4.),                              !COMPARE ENUA:TNUA IN 4. MICROWORDS
          NEXT,   J/LOAD013A                                 !GO LOAD PATTERN
 (5761)  DCS[1.00.1.0.0.0]  BM[1011..00.11..11.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...111.100.100]



    5744:
    LOAD013A:
          P2-U,   IR←EMIT,                                   !LOAD IR WITH TEST PATTERN
                  EMIT/000000,                               !(000000)
          NEXT,   J/GOBUT013A                                !GO SETUP FOR "BUT"
 (5744)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...1.1010...0..0000.0...11.000...000.001.011]



    5013:  !(FREE)
    GOBUT013A:
          SETUP,  RETURN/TEST013B,                           !RETURN TO START OF NEXT SUBTEST
          NEXT,   GOTO-PAGE(7),                              !BUT TABLE IS ON PAGE 7
                  J/BUTIR15-12                               !GO DO "BUT" ON IR<15:12>H
 (5013)  DCS[0.00.0.0.0.0]  BM[0101..00.11..11.01..111..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.000.000]
```

```
        ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

        !* PART B *
        !TEST-013-B CHECKS THAT BUT[IR<11>#FLTPT<3:0>] READS THE "0" IN IR<11>H CORRECTLY,
        !AND THE FLTPT DECODE ROM GETS ADDRESS (000), WHICH IS A SETF/SETI/CFCC INSTR;
        !DATA OUTPUT SHOULD BE (00)
        5757:
        TEST013B:
                PO,     LOAD-ENUA(ZTARGET400),                  !LOAD EXPECTED ADDRESS AFTER "BUT"
                        LOAD-ERROR(TEST013B),                   !ERROR DIRECTORY KEY
                        DCS-CTR(C3.),                           !COMPARE ENUA-TNUA IN 3. MICROWORDS
                        BUMP-VERIFY,                            !COUNT
                NEXT,   J/GOBUT013B                             !GO SETUP FOR "BUT"
  (5757)  DCS[1.00.1.0.0.1]  BM[1100..00.11..11.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...000.001.100]


        5014:  !(FREE)
        GOBUT013B:
                SETUP,  RETURN/TEST013C,                        !RETURN TO START OF NEXT SUBTEST
                NEXT,   GOTO-PAGE(7),                           !BUT TABLE IS ON PAGE 7
                        J/BUTIR11FLTPT3-0                       !GO DO "BUT" ON IR<11>H#FLTPT<3:0>H
  (5014)  DCS[0.00.0.0.0.0]  BM[0101..00.11..11.01..101..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.000.010]


        ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

        !* PART C *
        !TEST-013-C CHECKS THAT BUTR[IR<11>B] READS THE "0" IN IR<11>H CORRECTLY
        5755:
        TEST013C:
                PO,     LOAD-ENUA(ZTARGET401),                  !LOAD EXPECTED ADDRESS AFTER "BUT"
                        LOAD-ERROR(TEST013C),                   !ERROR DIRECTORY KEY
                        DCS-CTR(C3.),                           !COMPARE ENUA:TNUA IN 3. MICROWORDS
                NEXT,   J/GOBUT013C                             !GO SETUP FOR "BUT"
  (5755)  DCS[1.00.1.0.0.0]  BM[1100..00.11..11.00..000..001...0.0.0..0..0...0.0000...0..0000.0...11.000...000.001.101]


        5015:  !(FREE)
        GOBUT013C:
                SETUP,  RETURN/TEST013D,                        !RETURN TO START OF NEXT SUBTEST
                NEXT,   GOTO-PAGE(7),                           !BUT TABLE IS ON PAGE 7
                        J/BUTIR11B                              !GO DO BUT ON IR<11>H
  (5015)  DCS[0.00.0.0.0.0]  BM[0101..00.11..11.01..011..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.010]


        ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

        !* PART D *
        !TEST-013-D CHECKS THAT BUT[IR<9:6>] READS THE "0000" IN IR<9:6>H CORRECTLY
        5753:
        TEST013D:
                PO,     LOAD-ENUA(ZTARGET400),                  !LOAD EXPECTED ADDRESS AFTER "BUT"
```

```
                     LOAD-ERROR(TEST013D),                         !ERROR DIRECTORY KEY
                     DCS-CTR(C3.),                                 !COMPARE ENUA:TNUA IN 3. MICROWORDS
              NEXT,  J/GOBUT013D                                   !GO SETUP FOR "BUT"
      (5753) DCS[1.00.1.0.0.0]  BM[1100..00.11..11.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...000.001.110]


        5016:  !(FREE)
        GOBUT013D:
              SETUP, RETURN/TEST013E,                              !RETURN TO START OF NEXT SUBTEST
              NEXT,  GOTO-PAGE(7),                                 !BUT TABLE IS ON PAGE 7
                     J/BUTIR9-6                                    !GO DO "BUT" ON IR<9:6>H
      (5016) DCS[0.00.0.0.0.0]  BM[0101..00.11..11.01..001..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.000.100]


        ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

        !* PART E *
        !TEST-013-E CHECKS THAT BUT[MOV-DR7#IR<5:3>] READS THE -(-FLTPT*MOV+FLTPT*DR7) AND "000" IN IR<5:3>H CORRECTLY
        5751:
        TEST013E:
              PO,    LOAD-ENUA(ZTARGET400),                        !LOAD EXPECTED ADDRESS AFTER "BUT"
                     LOAD-ERROR(TEST013E),                         !ERROR DIRECTORY KEY
                     DCS-CTR(C3.),                                 !COMPARE ENUA:TNUA IN 3. MICROWORDS
              NEXT,  J/GOBUT013E                                   !GO SETUP FOR "BUT"
      (5751) DCS[1.00.1.0.0.0]  BM[1100..00.11..11.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...000.001.111]


        5017:  !(FREE)
        GOBUT013E:
              SETUP, RETURN/TEST013F,                              !RETURN TO START OF NEXT SUBTEST
              PO,    BUMP-VERIFY,                                  !COUNT
              NEXT,  GOTO-PAGE(7),                                 !BUT TABLE IS ON PAGE 7
                     J/BUTMOVDR7IR5-3                              !GO DO "BUT" ON (-FLTPT*MOV+FLTPT*DR7) # IR<5:3>H
      (5017) DCS[0.00.0.0.0.1]  BM[0101..00.11..11.01..000..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.000.101]


        ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

        !* PART F *
        !TEST-013-F CHECKS THAT BUT[INSTRS] READS THE ZEROS IN IR<15:00>H CORRECTLY
        !AS (000000)=HALT, AND CORRECTLY TARGETS TO (434)
        5750:
        TEST013F:
              PO,    LOAD-ENUA(ZTARGET434),                        !LOAD EXPECTED ADDRESS AFTER "BUT"
                     LOAD-ERROR(TEST013F),                         !ERROR DIRECTORY KEY
                     DCS-CTR(C3.),                                 !COMPARE ENUA:TNUA IN 3. MICROWORDS
              NEXT,  J/GOBUT013F                                   !GO SETUP FOR "BUT"
      (5750) DCS[1.00.1.0.0.0]  BM[1100..00.11..11.00..011..100...0.0.0..0..0...0.0000...0..0000.0...11.000...000.010.000]


        5020:  !(FREE)
        GOBUT013F:
```

```
          SETUP,   RETURN/TEST013G,                          !RETURN TO START OF NEXT SUBTEST
          NEXT,    GOTO-PAGE(7),                             !BUT TABLE IS ON PAGE 7
                   J/BUTINSTRS                               !GO DO INSTRS "BUT"
 (5020)  DCS[0.00.0.0.0.0]  BM[0101..00.11..11.00..111..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.000.001]

   ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

   !* PART G *
   !TEST-013-G CHECKS THAT BUT[INSTR1] READS THE ZEROS IN IR<15:00>H CORRECTLY
   !AS NOT[CLASS-A THRU G], AND CORRECTLY TARGETS TO (417) [OTHER]
   5747:
   TEST013G:
          PO,      LOAD-ENUA(ZTARGET417),                    !LOAD EXPECTED ADDRESS AFTER "BUT"
                   LOAD-ERROR(TEST013G),                     !ERROR DIRECTORY KEY
                   DCS-CTR(C3.),                             !COMPARE ENUA:TNUA IN 3. MICROWORDS
          NEXT,    J/GOBUT013G                               !GO SETUP FOR "BUT"
 (5747)  DCS[1.00.1.0.0.0]  BM[1100..00.11..11.00..001..111...0.0.0..0..0...0.0000...0..0000.0...11.000...000.010.001]


   5021:  !(FREE)
   GOBUT013G:
          SETUP,   RETURN/SCOPE013,                          !RETURN TO SCOPE LOOP TEST WORD
          NEXT,    GOTO-PAGE(7),                             !BUT TABLE IS ON PAGE 7
                   J/BUTINSTR1                               !GO DO INSTR1 "BUT"
 (5021)  DCS[0.00.0.0.0.0]  BM[0101..00.00..00.10..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.000.110]



   5022:  !(FREE)
   SCOPE013:
          NEXT,    BUTD[SCOPE],                              !NO ERROR:  "TEST014A" [+1. WORD]
                   J/TEST014A                                !   ERROR:  "LOAD013A" [-14. WORDS]
 (5022)  DCS[0.00.0.1.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...111.100.101]






   !-------------------------------------------------------------------------

   !*** TEST 014 ***
   !TEST-014 USES AN IR DATA PATTERN OF:  "0 000 000 001 010 101" (000125)

   ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

   !* PART A *
   !TEST-014-A CHECKS THAT BUT[INSTRS] READS THE IR CORRECTLY
   !AS ROM ADDRESS=(125) ON THE INSTRS E88 ROM, AND RECEIVES THE DIAGNOSTIC VALUE
   !OF (12), TARGETING TO (432) AFTER THE DECODE
   5745:
   TEST014A:
```

```
          P0,     LOAD-ENUA(ZTARGET432),                        !LOAD EXPECTED ADDRESS AFTER "BUT"
                  LOAD-ERROR(TEST014A),                         !ERROR DIRECTORY KEY
                  DCS-CTR(C4.),                                 !COMPARE ENUA:TNUA IN 4. MICROWORDS
          NEXT,   J/LOAD014A                                    !GO LOAD PATTERN
(5745)  DCS[1.00.1.0.0.0]  BM[1011..00.11..11.00..011..010...0.0.0..0..0...0.0000...0..0000.0...11.000...111.100.010]


    5742:
    LOAD014A:
          P2-U,   IR←EMIT,                                      !LOAD IR WITH TEST PATTERN
                  EMIT/000125,                                  !(000125)
          NEXT,   J/GOBUT014A                                   !GO SETUP FOR "BUT"
(5742)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.01..010..101...0.0.0..0..0...1.1010...0..0000.0...11.000...000.010.011]

    5023:  !(FREE)
    GOBUT014A:
          SETUP,  RETURN/TEST014B,                              !RETURN TO START OF NEXT SUBTEST
          NEXT,   GOTO-PAGE(7),                                 !BUT TABLE IS ON PAGE 7
                  J/BUTINSTRS                                   !GO DO INSTRS "BUT"
(5023)  DCS[0.00.0.0.0.0]  BM[0101..00.11..11.01..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.000.001]


    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    !* PART B *
    !TEST-014-B CHECKS THAT BUT[DR6-7 L] READS THE "10" IN IR<2:1> H CORRECTLY
    !AND DOES NOT ASSERT THE SIGNAL
    5752:
    TEST014B:
          P0,     LOAD-ENUA(ZTARGET403),                        !LOAD EXPECTED ADDRESS AFTER "BUT"
                  LOAD-ERROR(TEST014B),                         !ERROR DIRECTORY KEY
                  DCS-CTR(C3.),                                 !COMPARE ENUA:TNUA IN 3. MICROWORDS
                  BUMP-VERIFY,                                  !COUNT
          NEXT,   J/GOBUT014B                                   !GO SETUP FOR "BUT"
(5752)  DCS[1.00.1.0.0.1]  BM[1100..00.11..11.00..000..011...0.0.0..0..0...0.0000...0..0000.0...11.000...000.010.100]


    5024:  !(FREE)
    GOBUT014B:
          SETUP,  RETURN/TEST014C,                              !RETURN TO START OF NEXT SUBTEST
          NEXT,   GOTO-PAGE(7),                                 !BUT TABLE IS ON PAGE 7
                  J/BUTDR6-7L                                   !GO DO DR 6-7 L "BUT"
(5024)  DCS[0.00.0.0.0.0]  BM[0101..00.11..11.10..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.111]

    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    !* PART C *
    !TEST-014-C CHECKS THAT BUT[INSTR1] READS THE IR CORRECTLY
    !AS CLASS-E=JMP, IR<5:3>H="010", AND TARGETS TO (652)
    5762:
    TEST014C:
          P0,     LOAD-ENUA(ZTARGET652),                        !LOAD EXPECTED ADDRESS AFTER "BUT"
```

```
                    LOAD-ERROR(TEST014C),                      !ERROR DIRECTORY KEY
                    DCS-CTR(C3.),                              !COMPARE ENUA:TNUA IN 3. MICROWORDS
            NEXT,   J/GOBUT014C                                !GO SETUP FOR "BUT"
 (5762)  DCS[1.00.1.0.0.0]  BM[1100..00.11..11.10..101..010...0.0.0..0..0...0.0000...0..0000.0...11.000...000.010.101]


     5025:  !(FREE)
     GOBUT014C:
            SETUP,  RETURN/TEST014D,                           !RETURN TO START OF NEXT SUBTEST
            NEXT,   GOTO-PAGE(7),                              !BUT TABLE IS ON PAGE 7
                    J/BUTINSTR1                                !GO DO INSTR1 "BUT"
 (5025)  DCS[0.00.0.0.0.0]  BM[0101..00.11..10.01..000..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.000.110]



     ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

     !* PART D *
     !TEST-014-D CHECKS THAT BUT[IR<11>#FLTPT<3:0>] READS THE "0" IN IR<11>H CORRECTLY,
     !AND THE FLTPT DECODE ROM GETS ADDRESS (020), WHICH IS A STST INSTR;
     !DATA OUTPUT SHOULD BE (01)
     5710:
     TEST014D:
            PO,     LOAD-ENUA(ZTARGET401),                     !LOAD EXPECTED ADDRESS AFTER "BUT"
                    LOAD-ERROR(TEST014D),                      !ERROR DIRECTORY KEY
                    DCS-CTR(C3.),                              !COMPARE ENUA:TNUA IN 3. MICROWORDS
            NEXT,   J/GOBUT014D                                !GO SETUP FOR "BUT"
 (5710)  DCS[1.00.1.0.0.0]  BM[1100..00.11..11.00..000..001...0.0.0..0..0...0.0000...0..0000.0...11.000...000.010.110]


     5026:  !(FREE)
     GOBUT014D:
            SETUP,  RETURN/SCOPE014,                           !RETURN TO SCOPE LOOP TEST WORD
            NEXT,   GOTO-PAGE(7),                              !BUT TABLE IS ON PAGE 7
                    J/BUTIR11FLTPT3-0                          !GO DO "BUT" ON IR<11>H#FLTPT<3:0>H
 (5026)  DCS[0.00.0.0.0.0]  BM[0101..00.00..00.10..111..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.000.010]



     5027:  !(FREE)
     SCOPE014:
            NEXT,   BUTD[SCOPE],                               !NO ERROR:  "TEST015A" [+1. WORD]
                    J/TEST015A                                 !   ERROR:  "LOAD014A" [-8. WORDS]
 (5027)  DCS[0.00.0.1.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...111.100.011]






     ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

```

```
      !### TEST 015 ###
      !TEST-015 USES AN IR DATA PATTERN OF:  "0 000 000 001 101 010" (000152)

      ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

      !# PART A #
      !TEST-015-A CHECKS THAT BUT[INSTRS] READS THE IR CORRECTLY
      !AS ROM ADDRESS=(152) ON THE INSTRS E88 ROM, AND RECEIVES THE DIAGNOSTIC VALUE
      !OF (05), TARGETING TO (425) AFTER THE DECODE
      5743:
      TEST015A:
              P0,       LOAD-ENUA(ZTARGET425),                   !LOAD EXPECTED ADDRESS AFTER "BUT"
                        LOAD-ERROR(TEST015A),                    !ERROR DIRECTORY KEY
                        DCS-CTR(C4.),                            !COMPARE ENUA:TNUA IN 4. MICROWORDS
              NEXT,     J/LOAD015A                               !GO LOAD PATTERN
  (5743)  DCS[1.00.1.0.0.0]  BM[1011..00.11..11.00..010..101...0.0.0..0..0...0.0000...0..0000.0...11.000...111.100.000]


      5740:
      LOAD015A:
              P0,       BUMP-VERIFY,                             !COUNT
              P2-U,     IR←EMIT,                                 !LOAD IR WITH TEST PATTERN
                        EMIT/000152,                             !(000152)
              NEXT,     J/GOBUT015A                              !GO SETUP FOR "BUT"
  (5740)  DCS[0.00.0.0.0.1]  BM[0000..00.00..00.01..101..010...0.0.0..0..0...1.1010...0..0000.0...11.000...000.011.000]

      5030:  !(FREE)
      GOBUT015A:
              SETUP,    RETURN/TEST015B,                         !RETURN TO START OF NEXT SUBTEST
              NEXT,     GOTO-PAGE(7),                            !BUT TABLE IS ON PAGE 7
                        J/BUTINSTRS                              !GO DO INSTRS "BUT"
  (5030)  DCS[0.00.0.0.0.0]  BM[0101..00.11..11.11..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.000.001]


      ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

      !# PART B #
      !TEST-015-B CHECKS THAT BUT[DR6-7 L] READS THE "01" IN IR<2:1> H CORRECTLY
      !AND DOES NOT ASSERT THE SIGNAL
      5772:
      TEST015B:
              P0,       LOAD-ENUA(ZTARGET403),                   !LOAD EXPECTED ADDRESS AFTER "BUT"
                        LOAD-ERROR(TEST015B),                    !ERROR DIRECTORY KEY
                        DCS-CTR(C3.),                            !COMPARE ENUA:TNUA IN 3. MICROWORDS
              NEXT,     J/GOBUT015B                              !GO SETUP FOR "BUT"
  (5772)  DCS[1.00.1.0.0.0]  BM[1100..00.11..11.00..000..011...0.0.0..0..0...0.0000...0..0000.0...11.000...000.011.001]


      5031:  !(FREE)
      GOBUT015B:
              SETUP,    RETURN/TEST015C,                         !RETURN TO START OF NEXT SUBTEST
              NEXT,     GOTO-PAGE(7),                            !BUT TABLE IS ON PAGE 7
                        J/BUTDR6-7L                              !GO DO DR 6-7 L "BUT"
```

```
(5031) DCS[0.00.0.0.0.0] BM[0101..00.11..10.10..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.111]

    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    !* PART C *
    !TEST-015-C CHECKS THAT BUT[INSTR1] READS THE IR CORRECTLY
    !AS CLASS-E=JMP, IR<5:3>H="101", AND TARGETS TO (655)
    5722:
    TEST015C:
            P0,     LOAD-ENUA(ZTARGET655),                  !LOAD EXPECTED ADDRESS AFTER "BUT"
                    LOAD-ERROR(TEST015C),                   !ERROR DIRECTORY KEY
                    DCS-CTR(C3.),                           !COMPARE ENUA:TNUA IN 3. MICROWORDS
            NEXT,   J/GOBUT015C                             !GO SETUP FOR "BUT"
(5722) DCS[1.00.1.0.0.0] BM[1100..00.11..11.10..101..101...0.0.0..0..0...0.0000...0..0000.0...11.000...000.011.010]


    5032:  !(FREE)
    GOBUT015C:
            SETUP,  RETURN/SCOPE015,                        !RETURN TO SCOPE LOOP TEST WORD
            NEXT,   GOTO-PAGE(7),                           !BUT TABLE IS ON PAGE 7
                    J/BUTINSTR1                             !GO DO INSTR1 "BUT"
(5032) DCS[0.00.0.0.0.0] BM[0101..00.00..00.11..011..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.000.110]

    5033:  !(FREE)
    SCOPE015:
            P0,     BUMP-VERIFY,                            !COUNT
            NEXT,   BUTD[SCOPE],                            !NO ERROR:  "TEST016A" [+1. WORD]
                    J/TEST016A                              !   ERROR:  "LOAD015A" [-6. WORDS]
(5033) DCS[0.00.0.1.0.1] BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...111.100.001]






    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    !*** TEST 016 ***
    !TEST-016 USES AN IR DATA PATTERN OF:  "1 000 000 000 000 000" (100000)

    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    !* PART A *
    !TEST-016-A CHECKS THAT BUT[INSTR1] READS THE IR CORRECTLY
    !AS CLASS-F=BRANCH, IR<14:11>H="0000", IR<15#10:08>H#"0000",
    !AND TARGETS TO (757)
    5741:
    TEST016A:
            P0,     LOAD-ENUA(ZTARGET757),                  !LOAD EXPECTED ADDRESS AFTER "BUT"
                    LOAD-ERROR(TEST016A),                   !ERROR DIRECTORY KEY
                    DCS-CTR(C4.),                           !COMPARE ENUA:TNUA IN 4. MICROWORDS
            NEXT,   J/LOAD016A                              !GO LOAD PATTERN
```

```
     (5741)  DCS[1.00.1.0.0.0]  BM[1011..00.11..11.11..101..111...0.0.0..0..0...0.0000...0..0000.0...11.000...111.011.110]

        5736:
        LOAD016A:
                P2-U,    IR+EMIT,                                   !LOAD IR WITH TEST PATTERN
                         EMIT/100000,                               !(100000)
                NEXT,    J/GOBUT016A                                !GO SETUP FOR "BUT"
     (5736)  DCS[0.00.0.0.0.0]  BM[1000..00.00..00.00..000..000...0.0.0..0..0...1.1010...0..0000.0...11.000...000.011.100]

        5034:  !(FREE)
        GOBUT016A:
                SETUP,   RETURN/SCOPE016,                           !RETURN TO SCOPE LOOP TEST WORD
                PO,      BUMP-VERIFY,                               !COUNT
                NEXT,    GOTO-PAGE(7),                              !BUT TABLE IS ON PAGE 7
                         J/BUTINSTR1                                !GO DO INSTR1 "BUT"
     (5034)  DCS[0.00.0.0.0.1]  BM[0101..00.00..00.11..101..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.000.110]

        5035:  !(FREE)
        SCOPE016:
                NEXT,    BUTD[SCOPE],                               !NO ERROR:  "TEST017A" [+1. WORD]
                         J/TEST017A                                 !   ERROR:  "LOAD016A" [-2. WORDS]
     (5035)  DCS[0.00.0.1.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...111.011.111]

        !- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

        !*** TEST 017 ***
        !TEST-017 USES A DATA PATTERN OF:  "0 000 000 101 010 010" (000522)

        !  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -

        !* PART A *
        !TEST-017-A CHECKS THAT BUT[IR<9:6>] READS THE ALTERNATING PATTERN "0101"
        !IN IR<9:6>H CORRECTLY
        5737:
        TEST017A:
                PO,      LOAD-ENUA(ZTARGET405),                     !LOAD EXPECTED ADDRESS AFTER "BUT"
                         LOAD-ERROR(TEST017A),                      !ERROR DIRECTORY KEY
                         DCS-CTR(C4.),                              !COMPARE ENUA:TNUA IN 4. MICROWORDS
                NEXT,    J/LOAD017A                                 !GO LOAD PATTERN
     (5737)  DCS[1.00.1.0.0.0]  BM[1011..00.11..11.00..000..101...0.0.0..0..0...0.0000...0..0000.0...11.000...111.011.010]

        5732:
        LOAD017A:
                P2-U,    IR+EMIT,                                   !LOAD IR WITH TEST PATTERN
```

```
                EMIT/000522,                                !(000522)
        NEXT,   J/GOBUT017A                                 !GO SETUP FOR "BUT"
(5732)  DCS[0.00.0.0.0.0]  BM[0000..00.00..01.01..010..010...0.0.0..0..0...1.1010...0..0000.0...11.000...000.011.110]


   5036:  !(FREE)
   GOBUT017A:
        SETUP,  RETURN/TEST017B,                            !RETURN TO START OF NEXT SUBTEST
        NEXT,   GOTO-PAGE(7),                               !BUT TABLE IS ON PAGE 7
                J/BUTIR9-6                                  !GO DO "BUT" ON IR<9:6>H
(5036)  DCS[0.00.0.0.0.0]  BM[0101..00.11..10.11..101..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.000.100]


   ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

   !* PART B *
   !TEST-017-B CHECKS THAT BUT[INSTR1] READS THE IR CORRECTLY
   !AS CLASS-F=BRANCH, IR<14:11>H="0000", IR<15#10:08>H#"0000",
   !AND TARGETS TO (757)
   5735:
   TEST017B:
        PO,     LOAD-ENUA(ZTARGET757),                      !LOAD EXPECTED ADDRESS AFTER "BUT"
                LOAD-ERROR(TEST017B),                       !ERROR DIRECTORY KEY
                DCS-CTR(C3.),                               !COMPARE ENUA:TNUA IN 3. MICROWORDS
                BUMP-VERIFY,                                !COUNT
        NEXT,   J/GOBUT017B                                 !GO SETUP FOR "BUT"
(5735)  DCS[1.00.1.0.0.1]  BM[1100..00.11..11.11..101..111...0.0.0..0..0...0.0000...0..0000.0...11.000...000.011.111]


   5037:  !(FREE)
   GOBUT017B:
        SETUP,  RETURN/SCOPE017,                            !RETURN TO SCOPE LOOP TEST WORD
        NEXT,   GOTO-PAGE(7),                               !BUT TABLE IS ON PAGE 7
                J/BUTINSTR1                                 !GO DO INSTR1 "BUT"
(5037)  DCS[0.00.0.0.0.0]  BM[0101..00.00..01.00..000..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.000.110]


   5040:  !(FREE)
   SCOPE017:
        NEXT,   BUTD[SCOPE],                                !NO ERROR:  "TEST020A" [+1. WORD]
                J/TEST020A                                  !   ERROR:  "LOAD017A" [-4. WORDS]
(5040)  DCS[0.00.0.1.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...111.011.011]






   ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

   !*** TEST 020 ***
   !TEST-020 USES A DATA PATTERN OF:  "0 000 001 010 101 111" (001257)
```

```

	! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

	!* PART A *
	!TEST-020-A CHECKS THAT BUT[IR<9:6>] READS THE ALTERNATING PATTERN "1010"
	!IN IR<9:6>H CORRECTLY
	5733:
	TEST020A:
		P0,	LOAD-ENUA(ZTARGET412),			!LOAD EXPECTED ADDRESS AFTER "BUT"
			LOAD-ERROR(TEST020A),			!ERROR DIRECTORY KEY
			DCS-CTR(C4.),				!COMPARE ENUA:TNUA IN 4. MICROWORDS
		NEXT,	J/LOAD020A				!GO LOAD PATTERN
(5733)	DCS[1.00.1.0.0.0]  BM[1011..00.11..11.00..001..010...0.0.0..0..0...0.0000...0..0000.0...11.000...111.010.100]


	5724:
	LOAD020A:
		P2-U,	IR←EMIT,				!LOAD IR WITH TEST PATTERN
			EMIT/001257,				!(001257)
		NEXT,	J/GOBUT020A				!GO SETUP FOR "BUT"
(5724)	DCS[0.00.0.0.0.0]  BM[0000..00.00..10.10..101..111...0.0.0..0..0...1.1010...0..0000.0...11.000...000.100.001]


	5041:	!(FREE)
	GOBUT020A:
		SETUP,	RETURN/TEST020B,			!RETURN TO START OF NEXT SUBTEST
		NEXT,	GOTO-PAGE(7),				!BUT TABLE IS ON PAGE 7
			J/BUTIR9-6				!GO DO "BUT" ON IR<9:6>H
(5041)	DCS[0.00.0.0.0.0]  BM[0101..00.11..10.11..001..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.000.100]


	! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

	!* PART B *
	!TEST-020-B CHECKS THAT BUT[MOV-DR7#IR<5:3>] READS THE -(-FLTPT*MOV+FLTPT*DR7) AND
	!ALTERNATING PATTERN "101" IN IR<5:3>H CORRECTLY
	5731:
	TEST020B:
		P0,	LOAD-ENUA(ZTARGET405),			!LOAD EXPECTED ADDRESS AFTER "BUT"
			LOAD-ERROR(TEST020B),			!ERROR DIRECTORY KEY
			DCS-CTR(C3.),				!COMPARE ENUA:TNUA IN 3. MICROWORDS
		NEXT,	J/GOBUT020B				!GO SETUP FOR "BUT"
(5731)	DCS[1.00.1.0.0.0]  BM[1100..00.11..11.00..000..101...0.0.0..0..0...0.0000...0..0000.0...11.000...000.100.010]


	5042:	!(FREE)
	GOBUT020B:
		SETUP,	RETURN/TEST020C,			!RETURN TO START OF NEXT SUBTEST
		P0,	BUMP-VERIFY,				!COUNT
		NEXT,	GOTO-PAGE(7),				!BUT TABLE IS ON PAGE 7
			J/BUTMOVDR7IR5-3			!GO DO "BUT"
(5042)	DCS[0.00.0.0.0.1]  BM[0101..00.11..10.10..111..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.000.101]
```

```
 ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

 !* PART C *
 !TEST-020-C CHECKS THAT BUT[INSTR1] READS THE IR CORRECTLY
 !AS CLASS-F=BRANCH, IR<14:11>H="0000", IR<15#10:08>H#"0000",
 !AND TARGETS TO (757)
 5727:
 TEST020C:
         P0,      LOAD-ENUA(ZTARGET757),                 !LOAD EXPECTED ADDRESS AFTER "BUT"
                  LOAD-ERROR(TEST020C),                  !ERROR DIRECTORY KEY
                  DCS-CTR(C3.),                          !COMPARE ENUA:TNUA IN 3. MICROWORDS
         NEXT,    J/GOBUT020C                            !GO SETUP FOR "BUT"
(5727) DCS[1.00.1.0.0.0] BM[1100..00.11..11.11..101..111...0.0.0..0..0...0.0000...0..0000.0...11.000...000.100.011]


 5043:  !(FREE)
 GOBUT020C:
         SETUP,   RETURN/SCOPE020,                       !RETURN TO SCOPE LOOP TEST WORD
         NEXT,    GOTO-PAGE(7),                          !BUT TABLE IS ON PAGE 7
                  J/BUTINSTR1                            !GO DO INSTR1 "BUT"
(5043) DCS[0.00.0.0.0.0] BM[0101..00.00..01.00..100..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.000.110]


 5044:  !(FREE)
 SCOPE020:
         NEXT,    BUTD[SCOPE],                           !NO ERROR:  "TEST021A" [+1. WRD]
                  J/TEST021A                             !   ERROR:  "LOAD020A" [-6. WORDS]
(5044) DCS[0.00.0.1.0.0] BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...111.010.101]







 ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

 !*** TEST 021 ***
 !TEST-021 USES A DATA PATTERN OF:  "0 000 010 011 001 101" (002315)

 ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

 !* PART A *
 !TEST-021-A CHECKS THAT BUT[DMO#SMO#BYTE],
 !DM=IR<5:3>H="001", DMOH=0; SM=IR<11:9>H="010", SMOH=0; BYTE H=0
 5725:
 TEST021A:
         P0,      LOAD-ENUA(ZTARGET400),                 !LOAD EXPECTED ADDRESS AFTER "BUT"
                  LOAD-ERROR(TEST021A),                  !ERROR DIRECTORY KEY
                  DCS-CTR(C4.),                          !COMPARE ENUA:TNUA IN 4. MICROWORDS
         NEXT,    J/LOAD021A                             !GO LOAD PATTERN
(5725) DCS[1.00.1.0.0.0] BM[1011..00.11..11.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...111.010.000]
```

```
5720:
LOAD021A:
        P0,     BUMP-VERIFY,                            !COUNT
        P2-U,   IR←EMIT,                                !LOAD IR WITH TEST PATTERN
                EMIT/002315,                            !(002315)
        NEXT,   J/GOBUT021A                             !GO SETUP FOR "BUT"
(5720)  DCS[0.00.0.0.0.1]  BM[0000..00.01..00.11..001..101...0.0.0..0..0...1.1010...0..0000.0...11.000...000.100.101]


5045:  !(FREE)
GOBUT021A:
        SETUP,  RETURN/TEST021B,                        !RETURN TO START OF NEXT SUBTEST
        NEXT,   GOTO-PAGE(7),                           !BUT TABLE IS ON PAGE 7
                J/BUTDMSMBYTE                           !GO DO "BUT" ON DMO#SMO#BYTE
(5045)  DCS[0.00.0.0.0.0]  BM[0101..00.11..10.10..011..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.001.011]


!  - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

!* PART B *
!TEST-021-B CHECKS THAT BUT[INSTR1] READS THE IR CORRECTLY
!AS CLASS-F=BRANCH, IR<14:11>H="0000", IR<15#10:08>H#"0000",
!AND TARGETS TO (757)
5723:
TEST021B:
        P0,     LOAD-ENUA(ZTARGET757),                  !LOAD EXPECTED ADDRESS AFTER "BUT"
                LOAD-ERROR(TEST021B),                   !ERROR DIRECTORY KEY
                DCS-CTR(C3.),                           !COMPARE ENUA:TNUA IN 3. MICROWORDS
        NEXT,   J/GOBUT021B                             !GO SETUP FOR "BUT"
(5723)  DCS[1.00.1.0.0.0]  BM[1100..00.11..11.11..101..111...0.0.0..0..0...0.0000...0..0000.0...11.000...000.100.110]


5046:  !(FREE)
GOBUT021B:
        SETUP,  RETURN/TEST021C,                        !RETURN TO START OF NEXT SUBTEST
        NEXT,   GOTO-PAGE(7),                           !BUT TABLE IS ON PAGE 7
                J/BUTINSTR1                             !GO DO INSTR1 "BUT"
(5046)  DCS[0.00.0.0.0.0]  BM[0101..00.11..11.11..100..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.000.110]



!  - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

!* PART C *
!TEST-021-C CHECKS THAT BUT[IR<11>#FLTPT<3:0>] READS THE "0" IN IR<11>H CORRECTLY,
!AND THE FLTPT DECODE ROM GETS ADDRESS (462), WHICH IS A ADDF/D MODE1-7 INSTR;
!DATA OUTPUT SHOULD BE (11)
5774:
TEST021C:
        P0,     LOAD-ENUA(ZTARGET411),                  !LOAD EXPECTED ADDRESS AFTER "BUT"
```

```
                        LOAD-ERROR(TEST021C),                             !ERROR DIRECTORY KEY
                        DCS-CTR(C3.),                                     !COMPARE ENUA:TNUA IN 3. MICROWORDS
                NEXT,   J/GOBUT021C                                       !GO SETUP FOR "BUT"
        (5774)  DCS[1.00.1.0.0.0]  BM[1100..00.11..11.00..001..001...0.0.0..0..0...0.0000...0..0000.0...11.000...000.100.111]


        5047:   !(FREE)
        GOBUT021C:
                SETUP,  RETURN/SCOPE021,                                  !RETURN TO SCOPE LOOP TEST WORD
                NEXT,   GOTO-PAGE(7),                                     !BUT TABLE IS ON PAGE 7
                        J/BUTIR11FLTPT3-0                                 !GO DO "BUT" ON IR<11>H#FLTPT<3:0>H
        (5047)  DCS[0.00.0.0.0.0]  BM[0101..00.00..01.01..000..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.000.010]


        5050:   !(FREE)
        SCOPE021:
                NEXT,   BUTD[SCOPE],                                      !NO ERROR:  "TEST022A" [+1. WORDS]
                        J/TEST022A                                        !   ERROR:  "LOAD021A" [-6. WORDS]
        (5050)  DCS[0.00.0.1.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...111.010.001]






        ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

        !*** TEST 022 ***
        !TEST-022 USES A DATA PATTERN OF:  "0 000 011 000 110 011" (003063)

        ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

        !* PART A *
        !TEST-022-A CHECKS THAT BUT[INSTR1] READS THE IR CORRECTLY
        !AS CLASS-F=BRANCH, IR<14:11>H="0000", IR<15#10:08>H#"0000",
        !AND TARGETS TO (757)
        5721:
        TEST022A:
                P0,     LOAD-ENUA(ZTARGET757),                            !LOAD EXPECTED ADDRESS AFTER "BUT"
                        LOAD-ERROR(TEST022A),                             !ERROR DIRECTORY KEY
                        DCS-CTR(C4.),                                     !COMPARE ENUA:TNUA IN 4. MICROWORDS
                NEXT,   J/LOAD022A                                        !GO LOAD PATTERN
        (5721)  DCS[1.00.1.0.0.0]  BM[1011..00.11..11.11..101..111...0.0.0..0..0...0.0000...0..0000.0...11.000...111.001.110]


        5716:
        LOAD022A:
                P2-U,   IR←EMIT,                                          !LOAD IR WITH TEST PATTERN
                        EMIT/003063,                                      !(003063)
                NEXT,   J/GOBUT022A                                       !GO SETUP FOR "BUT"
        (5716)  DCS[0.00.0.0.0.0]  BM[0000..00.01..10.00..110..011...0.0.0..0..0...1.1010...0..0000.0...11.000...000.101.001]
```

```
        5051:  !(FREE)
        GOBUT022A:
                SETUP,  RETURN/SCOPE022,                    !RETURN TO SCOPE LOOP TEST WORD
                NEXT,   GOTO-PAGE(7),                       !BUT TABLE IS ON PAGE 7
                        J/BUTINSTR1                         !GO DO INSTR1 "BUT"
 (5051)  DCS[0.00.0.0.0.0]  BM[0101..00.00..01.01..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.000.110]



        5052:  !(FREE)
        SCOPE022:
                NEXT,   BUTD[SCOPE],                        !NO ERROR:  "TEST023A" [+1. WORD]
                        J/TEST023A                          !   ERROR:  "LOAD022A" [-2. WORDS]
 (5052)  DCS[0.00.0.1.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...111.001.111]






        !- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

        !*** TEST 023 ***
        !TEST-023 USES A DATA PATTERN OF:  "1 000 110 000 000 100" (106004)

        ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

        !* PART A *
        !TEST-023-A CHECKS THAT BUT[INSTR1] READS THE IR CORRECTLY
        !AS CLASS-D=SOP*DMO; IR<14:06>H="000 110 000"; IR<15>H="1";
        !DM=IR<5:3>H="000", DMOH=1; AND TARGETS TO (560)
        5717:
        TEST023A:
                P0,     LOAD-ENUA(ZTARGET560),              !LOAD EXPECTED ADDRESS AFTER "BUT"
                        LOAD-ERROR(TEST023A),               !ERROR DIRECTORY KEY
                        DCS-CTR(C4.),                       !COMPARE ENUA:TNUA IN 4. MICROWORDS
                NEXT,   J/LOAD023A                          !GO LOAD PATTERN
 (5717)  DCS[1.00.1.0.0.0]  BM[1011..00.11..11.01..110..000...0.0.0..0..0...0.0000...0..0000.0...11.000...111.001.100]


        5714:
        LOAD023A:
                P2-U,   IR←EMIT,                            !LOAD IR WITH TEST PATTERN
                        EMIT/106004,                        !(106004)
                NEXT,   J/GOBUT023A                         !GO SETUP FOR "BUT"
 (5714)  DCS[0.00.0.0.0.0]  BM[1000..00.11..00.00..000..100...0.0.0..0..0...1.1010...0..0000.0...11.000...000.101.011]


        5053:  !(FREE)
        GOBUT023A:
                SETUP,  RETURN/SCOPE023,                    !RETURN TO SCOPE LOOP TEST WORD
                NEXT,   GOTO-PAGE(7),                       !BUT TABLE IS ON PAGE 7
                        J/BUTINSTR1                         !GO DO INSTR1 "BUT"
```

```
(5053) DCS[0.00.0.0.0.0] BM[0101..00.00..01.01..100..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.000.110]


5054: !(FREE)
SCOPE023:
        PO,     BUMP-VERIFY,                            !COUNT
        NEXT,   BUTD[SCOPE],                            !NO ERROR:  "TEST024A" [+1. WORD]
                J/TEST024A                              !    ERROR:  "LOAD023A" [-2. WORDS]
(5054) DCS[0.00.0.1.0.1] BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...111.001.101]






!- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

!*** TEST 024 ***
!TEST-024 USES A DATA PATTERN OF:  "0 000 101 111 000 110" (005706)

! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

!* PART A *
!TEST-024-A CHECKS THAT BUT[DR6-7 L] READS THE "11" IN IR<2:1> H CORRECTLY
!AND DOES ASSERT THE SIGNAL
5715:
TEST024A:
        PO,     LOAD-ENUA(ZTARGET402),                  !LOAD EXPECTED ADDRESS AFTER "BUT"
                LOAD-ERROR(TEST024A),                   !ERROR DIRECTORY KEY
                DCS-CTR(C4.),                           !COMPARE ENUA:TNUA IN 4. MICROWORDS
        NEXT,   J/LOAD024A                              !
(5715) DCS[1.00.1.0.0.0] BM[1011..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...111.000.110]


5706:
LOAD024A:
        PO,     BUMP-VERIFY,                            !COUNT
        P2-U,   IR←EMIT,                                !LOAD IR WITH TEST PATTERN
                EMIT/005706,                            !(005706)
        NEXT,   J/GOBUT024A                             !GO SETUP FOR "BUT"
(5706) DCS[0.00.0.0.0.1] BM[0000..00.10..11.11..000..110...0.0.0..0..0...1.1010...0..0000.0...11.000...000.101.101]


5055: !(FREE)
GOBUT024A:
        SETUP,  RETURN/TEST024B,                        !RETURN TO START OF NEXT SUBTEST
        NEXT,   GOTO-PAGE(7),                           !BUT TABLE IS ON PAGE 7
                J/BUTDR6-7L                             !GO DO "BUT" ON DR 6/7 L
(5055) DCS[0.00.0.0.0.0] BM[0101..00.11..10.01..001..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.111]


! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
```

```
    !* PART B *
    !TEST-024-B CHECKS THAT BUT[INSTR1] READS THE IR CORRECTLY
    !AS CLASS-D=SOP*DMO; I<14:06>H="000 101 111"; IR<15>H="0";
    !DM=IR<5:3>H="000", DMOH=1; AND TARGETS TO (557)
    5711:
    TEST024B:
            PO,      LOAD-ENUA(ZTARGET557),               !LOAD EXPECTED ADDRESS AFTER "BUT"
                     LOAD-ERROR(TEST024B),                !ERROR DIRECTORY KEY
                     DCS-CTR(C3.),                        !COMPARE ENUA:TNUA IN 3. MICROWORDS
            NEXT,    J/GOBUT024B                          !GO SETUP FOR "BUT"
 (5711)  DCS[1.00.1.0.0.0]  BM[1100..00.11..11.01..101..111...0.0.0..0..0...0.0000...0..0000.0...11.000...000.101.110]


    5056:  !(FREE)
    GOBUT024B:
            SETUP,   RETURN/SCOPE024,                     !RETURN TO SCOPE LOOP TEST WORD
            PO,      BUMP-VERIFY,                         !COUNT
            NEXT,    GOTO-PAGE(7),                        !BUT TABLE IS ON PAGE 7
                     J/BUTINSTR1                          !GO DO INSTR1 "BUT"
 (5056)  DCS[0.00.0.0.0.1]  BM[0101..00.00..01.01..111..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.000.110]


    5057:  !(FREE)
    SCOPE024:
            NEXT,    BUTD[SCOPE],                         !NO ERROR:  "TEST025A" [+1. WORD]
                     J/TEST025A                           !   ERROR:  "LOAD024A" [-4. WORDS]
 (5057)  DCS[0.00.0.1.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...111.000.111]






    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    !*** TEST 025 ***
    !TEST-025 USES A DATA PATTERN OF:  "0 000 110 011 000 011" (006303)

    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    !* PART A *
    !TEST-025-A CHECKS THAT BUT[INSTR1] READS THE IR CORRECTLY
    !AS CLASS-D=SOP*DMO; IR<14:06>H="000 110 011"; IR<15>H="0";
    !DM=IR<5:3>H="000", DMOH=1; AND TARGETS TO (543)
    5707:
    TEST025A:
            PO,      LOAD-ENUA(ZTARGET543),               !LOAD EXPECTED ADDRESS AFTER "BUT"
                     LOAD-ERROR(TEST025A),                !ERROR DIRECTORY KEY
                     DCS-CTR(C4.),                        !COMPARE ENUA:TNUA IN 4. MICROWORDS
            NEXT,    J/LOAD025A                           !GO LOAD PATTERN
 (5707)  DCS[1.00.1.0.0.0]  BM[1011..00.11..11.01..100..011...0.0.0..0..0...0.0000...0..0000.0...11.000...111.000.100]
```

```
    5704:
    LOAD025A:
            P2-U,    IR←EMIT,                                !LOAD IR WITH TEST PATTERN
                     EMIT/006303,                            !(006303)
            NEXT,    J/GOBUT025A                             !GO SETUP FOR "BUT"
 (5704)  DCS[0.00.0.0.0.0]  BM[0000..00.11..00.11..000..011...0.0.0..0..0...1.1010...0..0000.0...11.000...000.110.000]


    5060:  !(FREE)
    GOBUT025A:
            SETUP,   RETURN/SCOPE025,                        !RETURN TO SCOPE LOOP TEST WORD
            NEXT,    GOTO-PAGE(7),                           !BUT TABLE IS ON PAGE 7
                     J/BUTINSTR1                             !GO DO INSTR1 "BUT"
 (5060)  DCS[0.00.0.0.0.0]  BM[0101..00.00..01.10..001..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.000.110]


    5061:  !(FREE)
    SCOPE025:
            NEXT,    BUTD[SCOPE],                            !NO ERROR:  "TEST026A" [+1. WORD]
                     J/TEST026A                              !   ERROR:  "LOAD025A" [-2. WORDS]
 (5061)  DCS[0.00.0.1.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...111.000.101]






    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    !*** TEST 026 ***
    !TEST-026 USES A DATA PATTERN OF:  "1 000 101 100 000 011" (105403)

    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    !* PART A *
    !TEST-026-A CHECKS THAT BUT[INSTR1] READS THE IR CORRECTLY
    !AS CLASS-D=SOP*DMO; IR<14:06>H="000 101 100"; IR<15>H="1";
    !DM=IR<5:3>H="000", DMOH=1; AND TARGETS TO (574)
    5705:
    TEST026A:
            P0,      LOAD-ENUA(ZTARGET574),                  !LOAD EXPECTED ADDRESS AFTER "BUT"
                     LOAD-ERROR(TEST026A),                   !ERROR DIRECTORY KEY
                     DCS-CTR(C4.),                           !COMPARE ENUA:TNUA IN 4. MICROWORDS
                     BUMP-VERIFY,                            !COUNT
            NEXT,    J/LOAD026A                              !GO LOAD PATTERN
 (5705)  DCS[1.00.1.0.0.1]  BM[1011..00.11..11.01..111..100...0.0.0..0..0...0.0000...0..0000.0...11.000...111.000.010]


    5702:
    LOAD026A:
            P2-U,    IR←EMIT,                                !LOAD IR WITH TEST PATTERN
                     EMIT/105403,                            !(105403)
```

```
            NEXT,   J/GOBUT026A                                      !GO SETUP FOR "BUT"
    (5702)  DCS[0.00.0.0.0.0]  BM[1000..00.10..11.00..000..011...0.0.0..0..0...1.1010...0..0000.0...11.000...000.110.010]


    5062:  !(FREE)
    GOBUT026A:
            SETUP,  RETURN/SCOPE026,                                 !RETURN TO SCOPE LOOP TEST WORD
            P0,     BUMP-VERIFY,                                     !COUNT
            NEXT,   GOTO-PAGE(7),                                    !BUT TABLE IS ON PAGE 7
                    J/BUTINSTR1                                      !GO DO INSTR1 "BUT"
    (5062)  DCS[0.00.0.0.0.1]  BM[0101..00.00..01.10..011..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.000.110]


    5063:  !(FREE)
    SCOPE026:
            NEXT,   BUTD[SCOPE],                                     !NO ERROR:  "TEST027A" [+1. WORD]
                    J/TEST027A                                       !   ERROR:  "LOAD026A" [-2. WORDS]
    (5063)  DCS[0.00.0.1.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...111.000.011]






    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    !*** TEST 027 ***
    !TEST-027 USES A DATA PATTERN OF:  "1 000 110 001 000 010" (106102)

    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    !* PART A *
    !TEST-027-A CHECKS THAT BUT[INSTR1] READS THE IR CORRECTLY
    !AS CLASS-D=SOP*DM0; IR<14:06>H="000 110 001"; IR<15>H="1";
    !DM=IR<5:3>H="000", DM0H=1; AND TARGETS TO (561)
    5703:
    TEST027A:
            P0,     LOAD-ENUA(ZTARGET561),                           !LOAD EXPECTED ADDRESS AFTER "BUT"
                    LOAD-ERROR(TEST027A),                            !ERROR DIRECTORY KEY
                    DCS-CTR(C4.),                                    !COMPARE ENUA:TNUA IN 4. MICROWORDS
            NEXT,   J/LOAD027A                                       !GO LOAD PATTERN
    (5703)  DCS[1.00.1.0.0.0]  BM[1011..00.11..11.01..110..001...0.0.0..0..0...0.0000...0..0000.0...11.000...111.000.000]


    5700:
    LOAD027A:
            P2-U,   IR←EMIT,                                         !LOAD IR WITH TEST PATTERN
                    EMIT/106102,                                     !(106102)
            NEXT,   J/GOBUT027A                                      !GO SETUP FOR "BUT"
    (5700)  DCS[0.00.0.0.0.0]  BM[1000..00.11..00.01..000..010...0.0.0..0..0...1.1010...0..0000.0...11.000...000.110.100]


    5064:  !(FREE)
```

```
    GOBUT027A:
            SETUP,  RETURN/SCOPE027,                        !RETURN TO SCOPE LOOP TEST WORD
            NEXT,   GOTO-PAGE(7),                           !BUT TABLE IS ON PAGE 7
                    J/BUTINSTR1                             !GO DO INSTR1 "BUT"
 (5064)  DCS[0.00.0.0.0.0]  BM[0101..00.00..01.10..101..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.000.110]

    5065:  !(FREE)
    SCOPE027:
            P0,     BUMP-VERIFY,                            !COUNT
            NEXT,   BUTD[SCOPE],                            !NO ERROR:  "TEST030A" [+1. WORD]
                    J/TEST030A                              !   ERROR:  "LOAD027A" [-2. WORDS]
 (5065)  DCS[0.00.0.1.0.1]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...111.000.001]






    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    !*** TEST 030 ***
    !TEST-030 USES A DATA PATTERN OF:  "0 000 101 010 000 100" (005204)

    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    !* PART A *
    !TEST-030-A CHECKS THAT BUT[INSTR1] READS THE IR CORRECTLY
    !AS CLASS-D=SOP*DM0; IR<14:06>H="000 101 010"; IR<15>H="0";
    !DM=IR<5:3>H="000", DM0H=1; AND TARGETS TO (552)
    5701:
    TEST030A:
            P0,     LOAD-ENUA(ZTARGET552),                  !LOAD EXPECTED ADDRESS AFTER "BUT"
                    LOAD-ERROR(TEST030A),                   !ERROR DIRECTORY KEY
                    DCS-CTR(C4.),                           !COMPARE ENUA:TNUA IN 4. MICROWORDS
            NEXT,   J/LOAD030A                              !GO LOAD PATTERN
 (5701)  DCS[1.00.1.0.0.0]  BM[1011..00.11..11.01..101..010...0.0.0..0..0...0.0000...0..0000.0...11.000...110.111.110]


    5676:
    LOAD030A:
            P2-U,   IR←EMIT,                                !LOAD IR WITH TEST PATTERN
                    EMIT/005204,                            !(005204)
            NEXT,   J/GOBUT030A                             !GO SETUP FOR "BUT"
 (5676)  DCS[0.00.0.0.0.0]  BM[0000..00.10..10.10..000..100...0.0.0..0..0...1.1010...0..0000.0...11.000...000.110.110]


    5066:  !(FREE)
    GOBUT030A:
            SETUP,  RETURN/TEST030B,                        !RETURN TO START OF NEXT SUBTEST
            NEXT,   GOTO-PAGE(7),                           !BUT TABLE IS ON PAGE 7
                    J/BUTINSTR1                             !GO DO INSTR1 "BUT"
 (5066)  DCS[0.00.0.0.0.0]  BM[0101..00.11..10.01..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.000.110]
```

```
	!- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

	!* PART B *
	!TEST-030-B CHECKS THAT BUT[IR<11>#FLTPT<3:0>] READS THE "1" IN IR<11>H CORRECTLY,
	!AND THE FLTPT DECODE ROM GETS ADDRESS (240), WHICH IS A MULF/MODE-0 INSTR,
	!DATA SHOULD BE (04)
	5712:
	TEST030B:
		PO,	LOAD-ENUA(ZTARGET424),			!LOAD EXPECTED ADDRESS AFTER "BUT"
			LOAD-ERROR(TEST030B),			!ERROR DIRECTORY KEY
			DCS-CTR(C3.),				!COMPARE ENUA:TNUA IN 3. MICROWORDS
		NEXT,	J/GOBUT030B				!
 (5712)	DCS[1.00.1.0.0.0]  BM[1100..00.11..11.00..010..100...0.0.0..0..0...0.0000...0..0000.0...11.000...000.110.111]


	5067:	!(FREE)
	GOBUT030B:
		SETUP,	RETURN/TEST030C,			!RETURN TO START OF NEXT SUBTEST
		NEXT,	GOTO-PAGE(7),				!BUT TABLE IS ON PAGE 7
			J/BUTIR11FLTPT3-0			!GO DO "BUT" ON IR<11>H#FLTPT<3:0>H
 (5067)	DCS[0.00.0.0.0.0]  BM[0101..00.11..10.01..011..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.000.010]


	!- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

	!* PART C *
	!TEST-030-C CHECKS THAT BUTR[IR<11>B] READS THE "1" IN IR<11>H CORRECTLY
	5713:
	TEST030C:
		PO,	LOAD-ENUA(ZTARGET403),			!LOAD EXPECTED ADDRESS AFTER "BUT"
			LOAD-ERROR(TEST030C),			!ERROR DIRECTORY KEY
			DCS-CTR(C3.),				!COMPARE ENUA:TNUA IN 3. MICROWORDS
		NEXT,	J/GOBUT030C				!GO SETUP FOR "BUT"
 (5713)	DCS[1.00.1.0.0.0]  BM[1100..00.11..11.00..000..011...0.0.0..0..0...0.0000...0..0000.0...11.000...000.111.000]


	5070:	!(FREE)
	GOBUT030C:
		SETUP,	RETURN/TEST030D,			!RETURN TO START OF NEXT SUBTEST
		NEXT,	GOTO-PAGE(7),				!BUT TABLE IS ON PAGE 7
			J/BUTIR11B				!GO DO "BUT" ON IR<11>H
 (5070)	DCS[0.00.0.0.0.0]  BM[0101..00.11..10.11..100..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.010]




	!- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
```

```
        !* PART D *
        !TEST-030-D CHECKS THAT BUT[INSTRS] READS THE IR CORRECTLY
        !AS ROM ADDRESS=(452) ON THE INSTRS E78 ROM, AND RECEIVES THE DIAGNOSTIC VALUE
        !OF (05), TARGETING TO (405) AFTER THE DECODE
        5734:
        TEST030D:
                PO,     LOAD-ENUA(ZTARGET405),                  !LOAD EXPECTED ADDRESS AFTER "BUT"
                        LOAD-ERROR(TEST030D),                   !ERROR DIRECTORY KEY
                        DCS-CTR(C3.),                           !COMPARE ENUA:TNUA IN 3. MICROWORDS
                NEXT,   J/GOBUT030D                             !GO SETUP FOR "BUT"
   (5734)  DCS[1.00.1.0.0.0]  BM[1100..00.11..11.00..000..101...0.0.0..0..0...0.0000...0..0000.0...11.000...000.111.001]


        5071:  !(FREE)
        GOBUT030D:
                SETUP,  RETURN/SCOPE030,                        !RETURN TO SCOPE LOOP TEST WORD
                NEXT,   GOTO-PAGE(7),                           !BUT TABLE IS ON PAGE 7
                        J/BUTINSTRS                             !GO DO "BUT" ON INSTRS<4:0>H
   (5071)  DCS[0.00.0.0.0.0]  BM[0101..00.00..01.11..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.000.001]


        5072:  !(FREE)
        SCOPE030:
                NEXT,   BUTD[SCOPE],                            !NO ERROR:  "TEST031A" [+1. WORD]
                        J/TEST031A                              !   ERROR:  "LOAD030A" [-8. WORDS]
   (5072)  DCS[0.00.0.1.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...110.111.111]






        ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

        !*** TEST 031 ***
        !TEST-031 USES A DATA PATTERN OF:   "0 001 000 010 100 010" (040212)

        ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

        !* PART A *
        !TEST-031-A CHECKS THAT BUT[DMO#SMO#BYTE]
        !DM=IR<5:3>H="100", DMOH=0; SM=IR<11:9>H="000", SMOH=1; BYTE H=0
        5677:
        TEST031A:
                PO,     LOAD-ENUA(ZTARGET402),                  !LOAD EXPECTED ADDRESS AFTER "BUT"
                        LOAD-ERROR(TEST031A),                   !ERROR DIRECTORY KEY
                        DCS-CTR(C4.),                           !COMPARE ENUA:TNUA IN 4. MICROWORDS
                NEXT,   J/LOAD031A                              !GO LOAD PATTERN
   (5677)  DCS[1.00.1.0.0.0]  BM[1011..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...110.111.010]


        5672:
        LOAD031A:
```

```
          P0,     BUMP-VERIFY,                              !COUNT
          P2-U,   IR←EMIT,                                  !LOAD IR WITH TEST PATTERN
                  EMIT/010242,                              !(010242)
          NEXT,   J/GOBUT031A                               !GO SETUP FOR "BUT"
 (5672) DCS[0.00.0.0.0.1] BM[0001..00.00..00.10..100..010...0.0.0..0..0...1.1010...0..0000.0...11.000...000.111.011]


    5073: !(FREE)
    GOBUT031A:
          SETUP,  RETURN/TEST031B,                          !RETURN TO START OF NEXT SUBTEST
          NEXT,   GOTO-PAGE(7),                             !BUT TABLE IS ON PAGE 7
                  J/BUTDMSMBYTE                             !GO DO "BUT"
 (5073) DCS[0.00.0.0.0.0] BM[0101..00.11..01.11..101..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.001.011]


    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    !* PART B *
    !TEST-031-B CHECKS THAT BUT[INSTR1] READS THE IR CORRECTLY
    !AS CLASS-C=MOV*SMD*-DMD; IR<14:9>H="001 000"; IR<15>H="0";
    !DM=IR<5:3>H="100"; AND TARGETS TO (604)
    5675:
    TEST031B:
          P0,     LOAD-ENUA(ZTARGET604),                    !LOAD EXPECTED ADDRESS AFTER "BUT"
                  LOAD-ERROR(TEST031B),                     !ERROR DIRECTORY KEY
                  DCS-CTR(C3.),                             !COMPARE ENUA:TNUA IN 3. MICROWORDS
          NEXT,   J/GOBUT031B                               !GO SETUP FOR "BUT"
 (5675) DCS[1.00.1.0.0.0] BM[1100..00.11..11.10..000..100...0.0.0..0..0...0.0000...0..0000.0...11.000...000.111.100]


    5074: !(FREE)
    GOBUT031B:
          SETUP,  RETURN/SCOPE031,                          !RETURN TO SCOPE LOOP TEST WORD
          NEXT,   GOTO-PAGE(7),                             !BUT TABLE IS ON PAGE 7
                  J/BUTINSTR1                               !GO DO INSTR1 "BUT"
 (5074) DCS[0.00.0.0.0.0] BM[0101..00.00..01.11..101..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.000.110]


    5075: !(FREE)
    SCOPE031:
          NEXT,   BUTD[SCOPE],                              !NO ERROR:  "TEST032A" [+1. WORDS]
                  J/TEST032A                                !   ERROR:  "LOAD031A" [-4. WORDS]
 (5075) DCS[0.00.0.1.0.0] BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...110.111.011]






    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    !*** TEST 032 ***
```

```
!TEST-032 USES A DATA PATTERN OF: "1 001 000 001 010 101" (110125)

! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

!* PART A *
!TEST-032-A CHECKS THAT BUT[MOV-DR7#IR<5:3>] READS THE (-FLTPT*MOV+FLTPT*DR7) AND
!ALTERNATING PATTERN "010" IN IR<5:3>H CORRECTLY
5673:
TEST032A:
        P0,     LOAD-ENUA(ZTARGET412),                   !LOAD EXPECTED ADDRESS AFTER "BUT"
                LOAD-ERROR(TEST032A),                    !ERROR DIRECTORY KEY
                DCS-CTR(C4.),                            !COMPARE ENUA:TNUA IN 4. MICROWORDS
                BUMP-VERIFY,                             !COUNT
        NEXT,   J/LOAD032A                               !GO LOAD PATTERN
(5673)  DCS[1.00.1.0.0.1]  BM[1011..00.11..11.00..001..010...0.0.0..0..0...0.0000...0..0000.0...11.000...110.110.110]


5666:
LOAD032A:
        P2-U,   IR←EMIT,                                 !LOAD IR WITH TEST PATTERN
                EMIT/110125,                             !(110125)
        NEXT,   J/GOBUT032A                              !GO SETUP FOR "BUT"
(5666)  DCS[0.00.0.0.0.0]  BM[1001..00.00..00.01..010..101...0.0.0..0..0...1.1010...0..0000.0...11.000...000.111.110]


5076:  !(FREE)
GOBUT032A:
        SETUP,  RETURN/TEST032B,                         !RETURN TO START OF NEXT SUBTEST
        NEXT,   GOTO-PAGE(7),                            !BUT TABLE IS ON PAGE 7
                J/BUTMOVDR7IR5-3                         !GO DO "BUT"
(5076)  DCS[0.00.0.0.0.0]  BM[0101..00.11..01.11..001..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.000.101]


! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

!* PART B *
!TEST-032-B CHECKS THAT BUT[INSTR1] READS THE IR CORRECTLY
!AS CLASS-C=MOV*SMO*-DMO; IR<14:9>H="001 000"; IR<15>H="1";
!DM=IR<5:3>H="010"; AND TARGETS TO (612)
5671:
TEST032B:
        P0,     LOAD-ENUA(ZTARGET612),                   !LOAD EXPECTED ADDRESS AFTER "BUT"
                LOAD-ERROR(TEST032B),                    !ERROR DIRECTORY KEY
                DCS-CTR(C3.),                            !COMPARE ENUA:TNUA IN 3. MICROWORDS
        NEXT,   J/GOBUT032B                              !GO SETUP FOR "BUT"
(5671)  DCS[1.00.1.0.0.0]  BM[1100..00.11..11.10..001..010...0.0.0..0..0...0.0000...0..0000.0...11.000...000.111.111]


5077:  !(FREE)
GOBUT032B:
        SETUP,  RETURN/SCOPE032,                         !RETURN TO SCOPE LOOP TEST WORD
        P0,     BUMP-VERIFY,                             !COUNT
        NEXT,   GOTO-PAGE(7),                            !BUT TABLE IS ON PAGE 7
```

```
                J/BUTINSTR1                                  !GO DO INSTR1 "BUT"
  (5077) DCS[0.00.0.0.0.1]  BM[0101..00.00..10.00..000..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.000.110]


    5100:  !(FREE)
    SCOPE032:
          NEXT,  BUTD[SCOPE],                                !NO ERROR:  "TEST033A" [+1. WORDS]
                 J/TEST033A                                  !   ERROR:  "LOAD032A" [-4. WORDS]
  (5100) DCS[0.00.0.1.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...110.110.111]






    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    !*** TEST 033 ***
    !TEST-033 USES A DATA PATTERN OF:  "1 000 110 010 111 100" (106274)

    !  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -

    !* PART A *
    !TEST-033-A CHECKS THAT BUT[INSTR1] READS THE IR CORRECTLY
    !AS CLASS-B=SOP*-DMO; IR<14:08>H="000 110 0";
    !DM=IR<5:3>H="111", DMOH=0; AND TARGETS TO (517)
    5667:
    TEST033A:
          PO,    LOAD-ENUA(ZTARGET517),                      !LOAD EXPECTED ADDRESS AFTER "BUT"
                 LOAD-ERROR(TEST033A),                       !ERROR DIRECTORY KEY
                 DCS-CTR(C4.),                               !COMPARE ENUA:TNUA IN 4. MICROWORDS
                 BUMP-VERIFY,                                !COUNT
          NEXT,  J/LOAD033A                                  !GO LOAD PATTERN
  (5667) DCS[1.00.1.0.0.1]  BM[1011..00.11..11.01..001..111...0.0.0..0..0...0.0000...0..0000.0...11.000...110.110.100]


    5664:
    LOAD033A:
          P2-U,  IR←EMIT,                                    !LOAD IR WITH TEST PATTERN
                 EMIT/106274,                                !(106274)
          NEXT,  J/GOBUT033A                                 !GO SETUP FOR "BUT"
  (5664) DCS[0.00.0.0.0.0]  BM[1000..00.11..00.10..111..100...0.0.0..0..0...1.1010...0..0000.0...11.000...001.000.001]


    5101:  !(FREE)
    GOBUT033A:
          SETUP, RETURN/SCOPE033,                            !RETURN TO SCOPE LOOP TEST WORD
          PO,    BUMP-VERIFY,                                !COUNT
          NEXT,  GOTO-PAGE(7),                               !BUT TABLE IS ON PAGE 7
                 J/BUTINSTR1                                 !GO DO INSTR1 "BUT"
  (5101) DCS[0.00.0.0.0.1]  BM[0101..00.00..10.00..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.000.110]
```

```
     5102:  !(FREE)
     SCOPE033:
             NEXT,    BUTD[SCOPE],                               !NO ERROR:  "TEST034A" [+1. WORD]
                      J/TEST034A                                 !   ERROR:  "LOAD033A" [-2. WORDS]
 (5102)  DCS[0.00.0.1.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...110.110.101]




     ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

     !*** TEST 034 ***
     !TEST-034 USES A DATA PATTERN OF:  "0 000 101 001 001 010" (005112)

     !  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -

     !* PART A *
     !TEST-034-A CHECKS THAT BUT[INSTR1] READS THE IR CORRECTLY
     !AS CLASS-B=SOP*-DMO; IR<14:09>H="000 101";
     !DM=IR<5:3>H="001", DMOH=0; AND TARGETS TO (511)
     5665:
     TEST034A:
             P0,      LOAD-ENUA(ZTARGET511),                     !LOAD EXPECTED ADDRESS AFTER "BUT"
                      LOAD-ERROR(TEST034A),                      !ERROR DIRECTORY KEY
                      DCS-CTR(C4.),                              !COMPARE ENUA:TNUA IN 4. MICROWORDS
             NEXT,    J/LOAD034A                                 !GO LOAD PATTERN
 (5665)  DCS[1.00.1.0.0.0]  BM[1011..00.11..11.01..001..001...0.0.0..0..0...0.0000...0..0000.0...11.000...110.110.010]


     5662:
     LOAD034A:
             P0,      BUMP-VERIFY,                               !COUNT
             P2-U,    IR←EMIT,                                   !LOAD IR WITH TEST PATTERN
                      EMIT/005112,                               !(005112)
             NEXT,    J/GOBUT034A                                !GO SETUP FOR "BUT"
 (5662)  DCS[0.00.0.0.0.1]  BM[0000..00.10..10.01..001..010...0.0.0..0..0...1.1010...0..0000.0...11.000...001.000.011]


     5103:  !(FREE)
     GOBUT034A:
             SETUP,   RETURN/SCOPE034,                           !RETURN TO SCOPE LOOP TEST WORD
             NEXT,    GOTO-PAGE(7),                              !BUT TABLE IS ON PAGE 7
                      J/BUTINSTR1                                !GO DO INSTR1 "BUT"
 (5103)  DCS[0.00.0.0.0.0]  BM[0101..00.00..10.00..100..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.000.110]


     5104:  !(FREE)
     SCOPE034:
             NEXT,    BUTD[SCOPE],                               !NO ERROR:  "TEST035A" [+1. WORD]
                      J/TEST035A                                 !   ERROR:  "LOAD034A" [-2. WORDS]
 (5104)  DCS[0.00.0.1.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...110.110.011]
```

```
!- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

!*** TEST 035 ***
!TEST-035 USES A DATA PATTERN OF:  "0 011 000 111 000 001" (030701)

! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

!* PART A *
!TEST-035-A CHECKS THAT BUT[INSTR1] READS THE IR CORRECTLY
!AS CLASS-A=DOP*SMO*DMO; IR<15:12>H="0011";
!SM=IR<11:9>H="000", SMOH=1; DM=IR<5:3>H="000", DMOH=1; AND TARGETS TO (443)
5663:
TEST035A:
        PO,     LOAD-ENUA(ZTARGET443),                  !LOAD EXPECTED ADDRESS AFTER "BUT"
                LOAD-ERROR(TEST035A),                   !ERROR DIRECTORY KEY
                DCS-CTR(C4.),                           !COMPARE ENUA:TNUA IN 4. MICROWORDS
        NEXT,   J/LOAD035A                              !GO LOAD PATTERN
(5663)  DCS[1.00.1.0.0.0]  BM[1011..00.11..11.00..100..011...0.0.0..0..0...0.0000...0..0000.0...11.000...110.110.000]


5660:
LOAD035A:
        P2-U,   IR←EMIT,                                !LOAD IR WITH TEST PATTERN
                EMIT/030701,                            !(030701)
        NEXT,   J/GOBUT035A                             !GO SETUP FOR "BUT"
(5660)  DCS[0.00.0.0.0.0]  BM[0011..00.00..01.11..000..001...0.0.0..0..0...1.1010...0..0000.0...11.000...001.000.101]


5105:  !(FREE)
GOBUT035A:
        SETUP,  RETURN/SCOPE035,                        !RETURN TO SCOPE LOOP TEST WORD
        PO,     BUMP-VERIFY,                            !COUNT
        NEXT,   GOTO-PAGE(7),                           !BUT TABLE IS ON PAGE 7
                J/BUTINSTR1                             !GO DO INSTR1 "BUT"
(5105)  DCS[0.00.0.0.0.1]  BM[0101..00.00..10.00..110..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.000.110]


5106:  !(FREE)
SCOPE035:
        NEXT,   BUTD[SCOPE],                            !NO ERROR:  "TEST036A" [+1. WORD]
                J/TEST036A                              !   ERROR:  "LOAD035A" [-2. WORDS]
(5106)  DCS[0.00.0.1.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...110.110.001]
```

```

! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

!*** TEST 036 ***
!TEST-036 USES A DATA PATTERN OF:  "1 101 000 101 000 110" (150506)

! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

!* PART A *
!TEST-036-A CHECKS THAT BUT[INSTR1] READS THE IR CORRECTLY
!AS CLASS-A=DOP*SMD*DMD; IR<15:12>H="1101";
!SM=IR<11:9>H="000", SMDH=1; DM=IR<5:3>H="000", DMDH=1; AND TARGETS TO (455)
5661:
TEST036A:
        PO,     LOAD-ENUA(ZTARGET455),                  !LOAD EXPECTED ADDRESS AFTER "BUT"
                LOAD-ERROR(TEST036A),                   !ERROR DIRECTORY KEY
                DCS-CTR(C4.),                           !COMPARE ENUA:TNUA IN 4. MICROWORDS
        NEXT,   J/LOAD036A                              !GO LOAD PATTERN
(5661)  DCS[1.00.1.0.0.0]  BM[1011..00.11..11.00..101..101...0.0.0..0..0...0.0000...0..0000.0...11.000...110.101.110]


5656:
LOAD036A:
        PO,     BUMP-VERIFY,                            !COUNT
        P2-U,   IR←EMIT,                                !LOAD IR WITH TEST PATTERN
                EMIT/150506,                            !(150506)
        NEXT,   J/GOBUT036A                             !GO SETUP FOR "BUT"
(5656)  DCS[0.00.0.0.0.1]  BM[1101..00.00..01.01..000..110...0.0.0..0..0...1.1010...0..0000.0...11.000...001.000.111]


5107:  !(FREE)
GOBUT036A:
        SETUP,  RETURN/SCOPE036,                        !RETURN TO SCOPE LOOP TEST WORD
        NEXT,   GOTO-PAGE(7),                           !BUT TABLE IS ON PAGE 7
                J/BUTINSTR1                             !GO DO INSTR1 "BUT"
(5107)  DCS[0.00.0.0.0.0]  BM[0101..00.00..10.01..000..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.000.110]



5110:  !(FREE)
SCOPE036:
        NEXT,   BUTD[SCOPE],                            !NO ERROR:  "TEST037A" [+1. WORD]
                J/TEST037A                              !   ERROR:  "LOAD036A" [-2. WORDS]
(5110)  DCS[0.00.0.1.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...110.101.111]






! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

!*** TEST 037 ***
```

```
!TEST-037 USES A DATA PATTERN OF:  "0 110 000 010 000 101" (060205)

! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

!* PART A *
!TEST-037-A CHECKS THAT BUT[INSTR1] READS THE IR CORRECTLY
!AS CLASS-A=DOP*SMO*DMO; IR<15:12>H="0110";
!SM=IR<11:9>H="000", SMOH=1; DM=IR<5:3>H="000", DMO=1; AND TARGETS TO (446)
5657:
TEST037A:
        PO,     LOAD-ENUA(ZTARGET446),                 !LOAD EXPECTED ADDRESS AFTER "BUT"
                LOAD-ERROR(TEST037A),                  !ERROR DIRECTORY KEY
                DCS-CTR(C4.),                          !COMPARE ENUA:TNUA IN 4. MICROWORDS
        NEXT,   J/LOAD037A                             !GO LOAD PATTERN
(5657) DCS[1.00.1.0.0.0] BM[1011..00.11..11.00..100..110...0.0.0..0..0...0.0000...0..0000.0...11.000...110.101.100]


5654:
LOAD037A:
        P2-U,   IR←EMIT,                               !LOAD IR WITH TEST PATTERN
                EMIT/060205,                           !(060205)
        NEXT,   J/GOBUT037A                            !GO SETUP FOR "BUT"
(5654) DCS[0.00.0.0.0.0] BM[0110..00.00..00.10..000..101...0.0.0..0..0...1.1010...0..0000.0...11.000...001.001.001]


5111: !(FREE)
GOBUT037A:
        SETUP,  RETURN/SCOPE037,                       !RETURN TO SCOPE LOOP TEST WORD
        PO,     BUMP-VERIFY,                           !COUNT
        NEXT,   GOTO-PAGE(7),                          !BUT TABLE IS ON PAGE 7
                J/BUTINSTR1                            !GO DO INSTR1 "BUT"
(5111) DCS[0.00.0.0.0.1] BM[0101..00.00..10.01..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.000.110]


5112: !(FREE)
SCOPE037:
        NEXT,   BUTD[SCOPE],                           !NO ERROR:  "TEST040A" [+1. WORD]
                J/TEST040A                             !   ERROR:  "LOAD037A" [-2. WORDS]
(5112) DCS[0.00.0.1.0.0] BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...110.101.101]






! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

!*** TEST 040 ***
!TEST-040 USES A DATA PATTERN OF:  "0 101 000 111 111 111 " (050777)

! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

!* PART A *
```

```
        !TEST-040-A CHECKS THAT BUT [IR<15:12>] READS THE
        !ALTERNATING PATTERN "0101" IN IR<15:12>H CORRECTLY
        5655:
        TEST040A:
                P0,     LOAD-ENUA(ZTARGET405),                  !LOAD EXPECTED ADDRESS AFTER "BUT"
                        LOAD-ERROR(TEST040A),                   !ERROR DIRECTORY KEY
                        DCS-CTR(C4.),                           !COMPARE ENUA:TNUA IN 4. MICROWORDS
                NEXT,   J/LOAD040A                              !GO LOAD PATTERN
 (5655) DCS[1.00.1.0.0.0] BM[1011..00.11..11.00..000..101...0.0.0..0..0...0.0000...0..0000.0...11.000...110.101.000]


        5650:
        LOAD040A:
                P2-U,   IR←EMIT,                                !LOAD IR WITH TEST PATTERN
                        EMIT/050777,                            !(050777)
                NEXT,   J/GOBUT040A                             !GO SETUP FOR "BUT"
 (5650) DCS[0.00.0.0.0.0] BM[0101..00.00..01.11..111..111...0.0.0..0..0...1.1010...0..0000.0...11.000...001.001.011]


        5113:  !(FREE)
        GOBUT040A:
                SETUP,  RETURN/TEST040B,                        !RETURN TO START OF NEXT SUBTEST
                NEXT,   GOTO-PAGE(7),                           !BUT TABLE IS ON PAGE 7
                        J/BUTIR15-12                            !GO DO "BUT"
 (5113) DCS[0.00.0.0.0.0] BM[0101..00.11..01.01..011..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.000.000]


        ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

        !* PART B *
        !TEST-040-B CHECKS THAT BUT[INSTR1] READS THE IR CORRECTLY
        !AS CLASS-B=DOP*-MOV*SMO*-DMO; DM=IR<5:3>H="111";
        !DOP=IR<14:12>H="101"; TARGETS TO (517)
        5653:
        TEST040B:
                P0,     LOAD-ENUA(ZTARGET517),                  !LOAD EXPECTED ADDRESS AFTER "BUT"
                        LOAD-ERROR(TEST040B),                   !ERROR DIRECTORY KEY
                        DCS-CTR(C3.),                           !COMPARE ENUA:TNUA IN 3. MICROWORDS
                        BUMP-VERIFY,                            !COUNT
                NEXT,   J/GOBUT040B                             !GO SETUP FOR "BUT"
 (5653) DCS[1.00.1.0.0.1] BM[1100..00.11..11.01..001..111...0.0.0..0..0...0.0000...0..0000.0...11.000...001.001.100]


        5114:  !(FREE)
        GOBUT040B:
                SETUP,  RETURN/SCOPE040,                        !RETURN TO SCOPE LOOP TEST WORD
                NEXT,   GOTO-PAGE(7),                           !BUT TABLE IS ON PAGE 7
                        J/BUTINSTR1                             !GO DO INSTR1 "BUT"
 (5114) DCS[0.00.0.0.0.0] BM[0101..00.00..10.01..101..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.000.110]


        5115:  !(FREE)
```

```
SCOPE040:
        NEXT,   BUTD[SCOPE],                              !NO ERROR:  "TEST041A" [+1. WORDS]
                J/TEST041A                                !   ERROR:  "LOAD040A" [-4. WORDS]
(5115)  DCS[0.00.0.1.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...110.101.001]






!- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

!*** TEST 041 ***
!TEST-041 USES A DATA PATTERN OF:  "1 010 000 111 111 111 " (120777)

! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

!* PART A *
!TEST-041-A CHECKS THAT BUT[IR<15:12>] READS THE
!ALTERNATING PATTERN "1010" IN IR<15:12>H CORRECTLY
5651:
TEST041A:
        P0,     LOAD-ENUA(ZTARGET412),                    !LOAD EXPECTED ADDRESS AFTER "BUT"
                LOAD-ERROR(TEST041A),                     !ERROR DIRECTORY KEY
                DCS-CTR(C4.),                             !COMPARE ENUA:TNUA IN 4. MICROWORDS
        NEXT,   J/LOAD041A                                !GO LOAD PATTERN
(5651)  DCS[1.00.1.0.0.0]  BM[1011..00.11..11.00..001..010...0.0.0..0..0...0.0000...0..0000.0...11.000...110.100.100]


5644:
LOAD041A:
        P0,     BUMP-VERIFY,                              !COUNT
        P2-U,   IR←EMIT,                                  !LOAD IR WITH TEST PATTERN
                EMIT/120777,                              !(120777)
        NEXT,   J/GOBUT041A                               !GO SETUP FOR "BUT"
(5644)  DCS[0.00.0.0.0.1]  BM[1010..00.00..01.11..111..111...0.0.0..0..0...1.1010...0..0000.0...11.000...001.001.110]


5116:  !(FREE)
GOBUT041A:
        SETUP,  RETURN/TEST041B,                          !RETURN TO START OF NEXT SUBTEST
        NEXT,   GOTO-PAGE(7),                             !BUT TABLE IS ON PAGE 7
                J/BUTIR15-12                              !GO DO "BUT"
(5116)  DCS[0.00.0.0.0.0]  BM[0101..00.11..01.00..111..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.000.000]


! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

!* PART B *
!TEST041-B CHECKS THAT BUT[INSTR1] READS THE IR CORRECTLY
!AS CLASS-B=DOP*-MOV*SMO*-DMO; DM=IR<5:3>H="111";
!DOP=IR<14:12>H="010"; TARGETS TO (517)
5647:
```

```
TEST041B:
        P0,     LOAD-ENUA(ZTARGET517),                  !LOAD EXPECTED ADDRESS AFTER "BUT"
                LOAD-ERROR(TEST041B),                   !ERROR DIRECTORY KEY
                DCS-CTR(C3.),                           !COMPARE ENUA:TNUA IN 3. MICROWORDS
                BUMP-VERIFY,                            !COUNT
        NEXT,   J/GOBUT041B                             !GO SETUP FOR "BUT"
(5647)  DCS[1.00.1.0.0.1]  BM[1100..00.11..11.01..001..111...0.0.0..0..0...0.0000...0..0000.0...11.000...001.001.111]


5117:   !(FREE)
GOBUT041B:
        SETUP,  RETURN/SCOPE041,                        !RETURN TO SCOPE LOOP TEST WORD
        NEXT,   GOTO-PAGE(7),                           !BUT TABLE IS ON PAGE 7
                J/BUTINSTR1                             !GO DO INSTR1 "BUT"
(5117)  DCS[0.00.0.0.0.0]  BM[0101..00.00..10.10..000..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.000.110]


5120:   !(FREE)
SCOPE041:
        NEXT,   BUTD[SCOPE],                            !NO ERROR:  "TEST042A" [+1. WORDS]
                J/TEST042A                              !   ERROR:  "LOAD041A" [-4. WORDS]
(5120)  DCS[0.00.0.1.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...110.100.101]






! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

!*** TEST 042 ***
!TEST-042 USES A DATA PATTERN OF:  "1 100 100 000 010 000" (144020)

! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

!* PART A *
!TEST-042-A CHECKS THAT BUT[DMO#SMO#BYTE]
!DM=IR<5:3>H="010", DMOH=0; SM=IR<11:9>H="100", SMOH=0; BYTE H=1
5645:
TEST042A:
        P0,     LOAD-ENUA(ZTARGET401),                  !LOAD EXPECTED ADDRESS AFTER "BUT"
                LOAD-ERROR(TEST042A),                   !ERROR DIRECTORY KEY
                DCS-CTR(C4.),                           !COMPARE ENUA:TNUA IN 4. MICROWORDS
        NEXT,   J/LOAD042A                              !GO LOAD PATTERN
(5645)  DCS[1.00.1.0.0.0]  BM[1011..00.11..11.00..000..001...0.0.0..0..0...0.0000...0..0000.0...11.000...110.100.000]


5640:
LOAD042A:
        P2-U,   IR←EMIT,                                !LOAD IR WITH TEST PATTERN
                EMIT/144020,                            !(144020)
        NEXT,   J/GOBUT042A                             !GO SETUP FOR "BUT"
(5640)  DCS[0.00.0.0.0.0]  BM[1100..00.10..00.00..010..000...0.0.0..0..0...1.1010...0..0000.0...11.000...001.010.001]
```

```
5121:  !(FREE)
GOBUTO42A:
        SETUP,  RETURN/TESTO42B,                        !RETURN TO START OF NEXT SUBTEST
        NEXT,   GOTO-PAGE(7),                           !BUT TABLE IS ON PAGE 7
                J/BUTDMSMBYTE                           !GO DO "BUT"
(5121)  DCS[0.00.0.0.0.0]  BM[0101..00.11..01.00..011..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.001.011]


!  - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

!* PART B *
!TEST-042-B CHECKS THAT BUT[INSTR1] READS THE IR CORRECTLY
!AS CLASS-G=DOP*-SMO; DOP=IR<14:12>H="100";
!SM=IR<11:9>H="100"; TARGETS TO (714)
5643:
TESTO42B:
        PO,     LOAD-ENUA(ZTARGET714),                  !LOAD EXPECTED ADDRESS AFTER "BUT"
                LOAD-ERROR(TESTO42B),                   !ERROR DIRECTORY KEY
                DCS-CTR(C3.),                           !COMPARE ENUA:TNUA IN 3. MICROWORDS
        NEXT,   J/GOBUTO42B                             !GO SETUP FOR "BUT"
(5643)  DCS[1.00.1.0.0.0]  BM[1100..00.11..11.11..001..100...0.0.0..0..0...0.0000...0..0000.0...11.000...001.010.010]


5122:  !(FREE)
GOBUTO42B:
        SETUP,  RETURN/SCOPEO42,                        !RETURN TO SCOPE LOOP TEST WORD
        PO,     BUMP-VERIFY,                            !COUNT
        NEXT,   GOTO-PAGE(7),                           !BUT TABLE IS ON PAGE 7
                J/BUTINSTR1                             !GO DO INSTR1 "BUT"
(5122)  DCS[0.00.0.0.0.1]  BM[0101..00.00..10.10..011..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.000.110]


5123:  !(FREE)
SCOPEO42:
        NEXT,   BUTD[SCOPE],                            !NO ERROR:  "TESTO43A" [+1. WORDS]
                J/TESTO43A                              !   ERROR:  "LOADO42A" [-4. WORDS]
(5123)  DCS[0.00.0.1.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...110.100.001]






!  - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

!*** TEST 043 ***
!TEST-043 USES A DATA PATTERN OF:  "1 110 001 111 000 111" (161707)

!  - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

```

```
        !* PART A *
        !TEST-043-A CHECKS THAT BUT[DMO#SMO#BYTE]
        !DM=IR<5:3>H="000", DMOH=1; SM=IR<11:9>H="001", SMOH=0; BYTE H=0
        5641:
        TEST043A:
                PO,     LOAD-ENUA(ZTARGET404),                  !LOAD EXPECTED ADDRESS AFTER "BUT"
                        LOAD-ERROR(TEST043A),                   !ERROR DIRECTORY KEY
                        DCS-CTR(C4.),                           !COMPARE ENUA:TNUA IN 4. MICROWORDS
                NEXT,   J/LOAD043A                              !GO LOAD PATTERN
  (5641)  DCS[1.00.1.0.0.0]  BM[1011..00.11..11.00..000..100...0.0.0..0..0...0.0000...0..0000.0...11.000...110.011.100]


        5634:
        LOAD043A:
                PO,     BUMP-VERIFY,                            !COUNT
                P2-U,   IR←EMIT,                                !LOAD IR WITH TEST PATTERN
                        EMIT/161707,                            !(161707)
                NEXT,   J/GOBUT043A                             !GO SETUP FOR "BUT"
  (5634)  DCS[0.00.0.0.0.1]  BM[1110..00.00..11.11..000..111...0.0.0..0..0...1.1010...0..0000.0...11.000...001.010.100]


        5124:  !(FREE)
        GOBUT043A:
                SETUP,  RETURN/TEST043B,                        !RETURN TO START OF NEXT SUBTEST
                NEXT,   GOTO-PAGE(7),                           !BUT TABLE IS ON PAGE 7
                        J/BUTDMSMBYTE                           !GO DO "BUT"
  (5124)  DCS[0.00.0.0.0.0]  BM[0101..00.11..00.11..111..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.001.011]


        !  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -

        !* PART B *
        !TEST-043-B CHECKS THAT BUT[INSTR1] READS THE IR CORRECTLY
        !AS CLASS-G=DOP*-SMO; DOP=IR<14:12>H="110";
        !SM=IR<11:9>H="001"; TARGETS TO (711)
        5637:
        TEST043B:
                PO,     LOAD-ENUA(ZTARGET711),                  !LOAD EXPECTED ADDRESS AFTER "BUT"
                        LOAD-ERROR(TEST043B),                   !ERROR DIRECTORY KEY
                        DCS-CTR(C3.),                           !COMPARE ENUA:TNUA IN 3. MICROWORDS
                NEXT,   J/GOBUT043B                             !GO SETUP FOR "BUT"
  (5637)  DCS[1.00.1.0.0.0]  BM[1100..00.11..11.11..001..001...0.0.0..0..0...0.0000...0..0000.0...11.000...001.010.101]


        5125:  !(FREE)
        GOBUT043B:
                SETUP,  RETURN/SCOPE043,                        !RETURN TO SCOPE LOOP TEST WORD
                NEXT,   GOTO-PAGE(7),                           !BUT TABLE IS ON PAGE 7
                        J/BUTINSTR1                             !GO DO INSTR1 "BUT"
  (5125)  DCS[0.00.0.0.0.0]  BM[0101..00.00..10.10..110..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.000.110]
```

```
	5126:	!(FREE)
	SCOPE043:
		P0,	BUMP-VERIFY,				!COUNT
		NEXT,	BUTD[SCOPE],				!NO ERROR:  "TEST044A" [+1. WORDS]
			J/TEST044A				!    ERROR:  "LOAD043A" [-4. WORDS]
(5126)	DCS[0.00.0.1.0.1]	BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...110.011.101]







	! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

	!*** TEST 044 ***
	!TEST-044 USES A DATA PATTERN OF:  "0 111 110 010 101 000" (076250)

	! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

	!* PART A *
	!TEST-044-A CHECKS THAT BUT[INSTR1] READS THE IR CORRECTLY
	!AS CLASS-A=XFC; IR<15:9>H="0 111 110"; AND TARGETS TO (447)
	5635:
	TEST044A:
		P0,	LOAD-ENUA(ZTARGET447),			!LOAD EXPECTED ADDRESS AFTER "BUT"
			LOAD-ERROR(TEST044A),			!ERROR DIRECTORY KEY
			DCS-CTR(C4.),				!COMPARE ENUA:TNUA IN 4. MICROWORDS
		NEXT,	J/LOAD044A				!GO LOAD PATTERN
(5635)	DCS[1.00.1.0.0.0]	BM[1011..00.11..11.00..100..111...0.0.0..0..0...0.0000...0..0000.0...11.000...110.011.010]


	5632:
	LOAD044A:
		P2-U,	IR←EMIT,				!LOAD IR WITH TEST PATTERN
			EMIT/076250,				!(076250)
		NEXT,	J/GOBUT044A				!GO SETUP FOR "BUT"
(5632)	DCS[0.00.0.0.0.0]	BM[0111..00.11..00.10..101..000...0.0.0..0..0...1.1010...0..0000.0...11.000...001.010.111]


	5127:	!(FREE)
	GOBUT044A:
		SETUP,	RETURN/SCOPE044,			!RETURN TO SCOPE LOOP TEST WORD
		NEXT,	GOTO-PAGE(7),				!BUT TABLE IS ON PAGE 7
			J/BUTINSTR1				!GO DO INSTR1 "BUT"
(5127)	DCS[0.00.0.0.0.0]	BM[0101..00.00..10.11..000..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.000.110]


	5130:	!(FREE)
	SCOPE044:
		P0,	BUMP-VERIFY,				!COUNT
		NEXT,	BUTD[SCOPE],				!NO ERROR:  "TEST045A" [+1. WORD]
			J/TEST045A				!    ERROR:  "LOAD044A" [-2. WORDS]
```

```
(5130) DCS[0.00.0.1.0.1] BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...110.011.011]







    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    !*** TEST 045 ***
    !TEST-045 USES A DATA PATTERN OF:  "0 000 100 011 000 000" (004300)

    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    !* PART A *
    !TEST-045-A CHECKS THAT BUT[DM#SM#BYTE] READS THE IR CORRECTLY AS:
    !DM H="000", DMOH=1;  SM H="100", SMOH=0;  BYTE H=1  (IR=SWAB, SORT OF)
    !CHECKS THAT SWAB INSTR ASSERTS BYTE H
    5633:
    TEST045A:
            P0,     LOAD-ENUA(ZTARGET405),                  !LOAD EXPECTED ADDRESS AFTER "BUT"
                    LOAD-ERROR(TEST045A),                   !ERROR DIRECTORY KEY
                    DCS-CTR(C4.),                           !COMPARE ENUA:TNUA IN 4. MICROWORDS
            NEXT,   J/LOAD045A                              !GO LOAD PATTERN
(5633) DCS[1.00.1.0.0.0] BM[1011..00.11..11.00..000..101...0.0.0..0..0...0.0000...0..0000.0...11.000...110.011.000]


    5630:
    LOAD045A:
            P2-U,   IR←EMIT,                                !LOAD IR WITH TEST PATTERN
                    EMIT/004300,                            !(004300)
            NEXT,   J/GOBUT045A                             !GO SETUP FOR "BUT"
(5630) DCS[0.00.0.0.0.0] BM[0000..00.10..00.11..000..000...0.0.0..0..0...1.1010...0..0000.0...11.000...001.011.001]


    5131:  !(FREE)
    GOBUT045A:
            SETUP,  RETURN/SCOPE045,                        !RETURN TO SCOPE LOOP TEST WORD
            NEXT,   GOTO-PAGE(7),                           !BUT TABLE IS ON PAGE 7
                    J/BUTDMSMBYTE                           !GO DO BUT ON DM#SM#BYTE
(5131) DCS[0.00.0.0.0.0] BM[0101..00.00..10.11..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.001.011]


    5132:  !(FREE)
    SCOPE045:
            NEXT,   BUTD[SCOPE],                            !NO ERROR:  "TEST046A"  [+1. WORD]
                    J/TEST046A                              !   ERROR:  "LOAD045A" [-2. WORDS]
(5132) DCS[0.00.0.1.0.0] BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...110.011.001]
```

```

    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    !*** TEST 046 ***
    !TEST-046 USES A DATA PATTERN OF:  "0 000 000 010 000 000" (000200)

    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    !* PART A *
    !TEST-046-A CHECKS THAT BUT[INSTRS] READS THE IR CORRECTLY
    !AS ROM ADDRESS=(426) ON THE INSTRS E88 ROM, AND RECEIVES THE VALUE
    !OF (06), TARGETING TO (426) AFTER THE DECODE
    5631:
    TEST046A:
            PO,     LOAD-ENUA(ZTARGET426),                  !LOAD EXPECTED ADDRESS AFTER "BUT"
                    LOAD-ERROR(TEST046A),                   !ERROR DIRECTORY KEY
                    DCS-CTR(C4.),                           !COMPARE ENUA:TNUA IN 4. MICROWORDS
            NEXT,   J/LOAD046A                              !GO LOAD PATTERN
 (5631)  DCS[1.00.1.0.0.0]  BM[1011..00.11..11.00..010..110...0.0.0..0..0...0.0000...0..0000.0...11.000...101.110.000]


    5560:
    LOAD046A:
            P2-U,   IR←EMIT,                                !LOAD IR WITH TEST PATTERN
                    EMIT/000200,                            !(000200)
            NEXT,   J/GOBUT046A                             !GO SETUP FOR "BUT"
 (5560)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.10..000..000...0.0.0..0..0...1.1010...0..0000.0...11.000...001.011.011]


    5133:  !(FREE)
    GOBUT046A:
            SETUP,  RETURN/TEST046B,                        !RETURN TO START OF NEXT SUBTEST
            NEXT,   GOTO-PAGE(7),                           !BUT TABLE IS ON PAGE 7
                    J/BUTINSTRS                             !GO DO INSTRS "BUT"
 (5133)  DCS[0.00.0.0.0.0]  BM[0101..00.11..11.11..000..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.000.001]




    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    !* PART B *
    !TEST-046-B CHECKS THAT BUT[IR<11>#FLTPT<3:0>] READS THE "0" IN IR<11>H CORRECTLY,
    !AND THE FLTPT DECODE ROM GETS ADDRESS (040), WHICH IS A STST INSTR,
    !DATA SHOULD BE (01)
    5770:
    TEST046B:
            PO,     LOAD-ENUA(ZTARGET401),                  !LOAD EXPECTED ADDRESS AFTER "BUT"
                    LOAD-ERROR(TEST046B),                   !ERROR DIRECTORY KEY
                    DCS-CTR(C3.),                           !COMPARE ENUA:TNUA IN 3. MICROWORDS
            NEXT,   J/GOBUT046B                             !
 (5770)  DCS[1.00.1.0.0.0]  BM[1100..00.11..11.00..000..001...0.0.0..0..0...0.0000...0..0000.0...11.000...001.011.100]

```

```
	5134:	!(FREE)
	GOBUT046B:
		SETUP,	RETURN/SCOPE046,				!RETURN TO SCOPE LOOP TEST WORD
		NEXT,	GOTO-PAGE(7),					!BUT TABLE IS ON PAGE 7
			J/BUTIR11FLTPT3-0				!GO DO "BUT" ON IR<11>H#FLTPT<3:0>H
 (5134)	DCS[0.00.0.0.0.0]  BM[0101..00.00..10.11..101..111...0.0.0...0...0...0.0000...0..0000.0...11.100...011.000.010]




	5135:	!(FREE)
	SCOPE046:
		NEXT,	BUTD[SCOPE],					!NO ERROR:  "TEST047A" [+1. WORD]
			J/TEST047A					!   ERROR:  "LOAD046A" [-4. WORDS]
 (5135)	DCS[0.00.0.1.0.0]  BM[0000..00.00..00.00..000..000...0.0.0...0...0...0.0000...0..0000.0...11.000...101.110.001]






	! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

	!*** TEST 047 ***
	!TEST-047 USES A DATA PATTERN OF:  "1 010 010 101 110 110" (122566)

	! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

	!* PART A *
	!TEST-047-A CHECKS THAT BUT[INSTRS] READS THE IR CORRECTLY
	!AS ROM ADDRESS=(325) ON THE INSTRS E78 ROM, AND RECEIVES THE DIAGNOSTIC VALUE
	!OF (12), TARGETING TO (412) AFTER THE DECODE
	5561:
	TEST047A:
		P0,	LOAD-ENUA(ZTARGET412),				!LOAD EXPECTED ADDRESS AFTER "BUT"
			LOAD-ERROR(TEST047A),				!ERROR DIRECTORY KEY
			DCS-CTR(C4.),					!COMPARE ENUA:TNUA IN 4. MICROWORDS
			BUMP-VERIFY,					!COUNT
		NEXT,	J/LOAD047A					!GO LOAD PATTERN
 (5561)	DCS[1.00.1.0.0.1]  BM[1011..00.11..11.00..001..010...0.0.0...0...0...0.0000...0..0000.0...11.000...101.101.000]


	5550:
	LOAD047A:
		P2-U,	IR←EMIT,					!LOAD IR WITH TEST PATTERN
			EMIT/122566,					!(122566)
		NEXT,	J/GOBUT047A					!GO SETUP FOR "BUT"
 (5550)	DCS[0.00.0.0.0.0]  BM[1010..00.01..01.01..110..110...0.0.0...0...0...1.1010...0..0000.0...11.000...001.011.110]


	5136:	!(FREE)
	GOBUT047A:
```

```
          SETUP,  RETURN/TEST047B,                     !RETURN TO START OF NEXT SUBTEST
          NEXT,   GOTO-PAGE(7),                        !BUT TABLE IS ON PAGE 7
                  J/BUTINSTRS                          !GO DO INSTRS "BUT"
 (5136)  DCS[0.00.0.0.0.0]  BM[0101..00.11..01.11..000..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.000.001]




   ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

   !* PART B *
   !TEST-047-B CHECKS THAT BUT[IR<11>#FLTPT<3:0>] READS THE "0" IN IR<11>H CORRECTLY,
   !AND THE FLTPT DECODE ROM GETS ADDRESS (534), WHICH IS A LOAD/MODE-6 INSTR,
   !DATA SHOULD BE (13)
   5670:
   TEST047B:
          PO,     LOAD-ENUA(ZTARGET413),               !LOAD EXPECTED ADDRESS AFTER "BUT"
                  LOAD-ERROR(TEST047B),                !ERROR DIRECTORY KEY
                  DCS-CTR(C3.),                        !COMPARE ENUA:TNUA IN 3. MICROWORDS
          NEXT,   J/GOBUT047B                          !
 (5670)  DCS[1.00.1.0.0.0]  BM[1100..00.11..11.00..001..011...0.0.0..0..0...0.0000...0..0000.0...11.000...001.011.111]


   5137:  !(FREE)
   GOBUT047B:
          PO,     BUMP-VERIFY,                         !COUNT
          SETUP,  RETURN/TEST047C,                     !RETURN TO START OF NEXT SUBTEST
          NEXT,   GOTO-PAGE(7),                        !BUT TABLE IS ON PAGE 7
                  J/BUTIR11FLTPT3-0                    !GO DO "BUT" ON IR<11>H#FLTPT<3:0>H
 (5137)  DCS[0.00.0.0.0.1]  BM[0101..00.11..10.11..000..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.000.010]


   ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

   !* PART C *
   !TEST-047-C CHECKS THAT BUT[MOV-DR7#IR<5:3>] READS THE -(-FLTPT*MOV+FLTPT*DR7), IR<5:3>="110"
   5730:
   TEST047C:
          PO,     LOAD-ENUA(ZTARGET406),               !LOAD EXPECTED ADDRESS AFTER "BUT"
                  LOAD-ERROR(TEST047C),                !ERROR DIRECTORY KEY
                  DCS-CTR(C3.),                        !COMPARE ENUA:TNUA IN 3. MICROWORDS
          NEXT,   J/GOBUT047C                          !GO SETUP FOR "BUT"
 (5730)  DCS[1.00.1.0.0.0]  BM[1100..00.11..11.00..000..110...0.0.0..0..0...0.0000...0..0000.0...11.000...001.100.000]


   5140:  !(FREE)
   GOBUT047C:
          SETUP,  RETURN/SCOPE047,                     !RETURN TO SCOPE LOOP TEST WORD
          NEXT,   GOTO-PAGE(7),                        !BUT TABLE IS ON PAGE 7
                  J/BUTMOVDR7IR5-3                     !GO DO "BUT" ON (MOV/DR7)#IR<5:3>H
 (5140)  DCS[0.00.0.0.0.0]  BM[0101..00.00..11.00..001..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.000.101]
```

```
5141:  !(FREE)
SCOPE047:
        NEXT,    BUTD[SCOPE],                               !NO ERROR:  "TESTO50A" [+1. WORD]
                 J/TESTO50A                                 !    ERROR:  "LOAD047A" [-6. WORDS]
(5141)  DCS[0.00.0.1.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...101.101.001]




!- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

!*** TEST 050 ***
!TEST-050-A USES A DATA PATTERN OF:  "1 111 010 101 000 000" (172500)
!TEST-050-B USES A DATA PATTERN OF:  "1 111 101 010 000 000" (175200)

!- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

!* PART A *
!TEST-050-A CHECKS THAT BUT[INSTRS] READS THE IR CORRECTLY
!AS ROM ADDRESS=(725) ON THE INSTRS E78 ROM, AND RECEIVES THE DIAGNOSTIC VALUE
!OF (05), TARGETING TO (405) AFTER THE DECODE
5551:
TESTO50A:
        PO,      LOAD-ENUA(ZTARGET405),                     !LOAD EXPECTED ADDRESS AFTER "BUT"
                 LOAD-ERROR(TESTO50A),                      !ERROR DIRECTORY KEY
                 DCS-CTR(C4.),                              !COMPARE ENUA:TNUA IN 4. MICROWORDS
                 BUMP-VERIFY,                               !COUNT
        NEXT,    J/LOAD050A                                 !GO LOAD PATTERN
(5551)  DCS[1.00.1.0.0.1]  BM[1011..00.11..11.00..000..101...0.0.0..0..0...0.0000...0..0000.0...11.000...101.101.010]


5552:
LOAD050A:
        P2-U,    IR←EMIT,                                   !LOAD IR WITH TEST PATTERN
                 EMIT/172500,                               !(172500)
        NEXT,    J/GOBUTO50A                                !GO SETUP FOR "BUT"
(5552)  DCS[0.00.0.0.0.0]  BM[1111..00.01..01.01..000..000...0.0.0..0..0...1.1010...0..0000.0...11.000...001.100.010]


5142:  !(FREE)
GOBUTO50A:
        SETUP,   RETURN/TESTO50B,                           !RETURN TO START OF NEXT SUBTEST
        NEXT,    GOTO-PAGE(7),                              !BUT TABLE IS ON PAGE 7
                 J/BUTINSTRS                                !GO DO INSTRS "BUT"
(5142)  DCS[0.00.0.0.0.0]  BM[0101..00.11..10.10..110..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.000.001]
```

```

 ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

 !* PART B *
 !TEST-050-B CHECKS THAT BUT[INSTR-5] READS THE IR CORRECTLY
 !AS ROM ADDR=(752) ON THE INSTRS E78 ROM, AND RECEIVES THE DIAGNOSTIC VALUE
 !OF (12), TARGETING TO (412) AFTER THE DECODE
 5726:
 TEST050B:
         P0,      LOAD-ENUA(ZTARGET412),                   !LOAD EXPECTED ADDRESS AFTER "BUT"
                  LOAD-ERROR(TEST050B),                    !ERROR DIRECTORY KEY
                  DCS-CTR(C4.),                            !COMPARE ENUA:TNUA IN 4. MICROWORDS
         NEXT,    J/LOAD050B                               !
(5726) DCS[1.00.1.0.0.0] BM[1011..00.11..11.00..001..010...0.0.0..0..0...0.0000...0..0000.0...11.000...001.100.011]


 5143: !(FREE)
 LOAD050B:
         P2-U,    IR←EMIT,                                 !LOAD IR WITH TEST PATTERN
                  EMIT/175200,                             !(175200)
         NEXT,    J/GOBUT050B                              !GO SETUP FOR "BUT"
(5143) DCS[0.00.0.0.0.0] BM[1111..00.10..10.10..000..000...0.0.0..0..0...1.1010...0..0000.0...11.000...001.100.100]

 5144: !(FREE)
 GOBUT050B:
         SETUP,   RETURN/SCOPE050,                         !RETURN TO SCOPE LOOP TEST WORD
         NEXT,    GOTO-PAGE(7),                            !BUT TABLE IS ON PAGE 7
                  J/BUTINSTRS                              !DO INSTRS BUT
(5144) DCS[0.00.0.0.0.0] BM[0101..00.00..11.00..101..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.000.001]


 5145: !(FREE)
 SCOPE050:
         P0,      BUSDIN←EMIT-[I],                         !RESET PROC UCON
                  EN-CLK-IR[15-00],                        !
         NEXT,    BUTD[SCOPE],                             !NO ERROR:  "TEST101A"  [+1. WORD]
                  J/TEST101A                               !   ERROR:  "LOAD050A"  [-5. WORDS]
(5145) DCS[0.00.0.1.0.0] BM[0000..00.00..00.01..000..100...0.0.0..0..0...1.1001...0..0000.0...11.000...101.101.011]



 !.PAGE=========================================================================================

 .TOC   *   TEST101:  D -> DBUF -> IR PATH


 !*****************************************************************************
 !*
 !*     TESTS:  101 - 104                          UWORDS:  057 + 067
 !*
 !*     FUNCTIONS:
 !*
 !*     THESE TESTS VERIFY THE "EMIT -> CSP -> BBUS -> D -> DBUF -> IR" DATAPATH.
```

```
!*
!*      TEST 101 FIRST VERIFIES THE "D -> DBUF -> IR" DATA PATH, INSURING THAT THE
!*      DBUF LATCH CAN BE WRITTEN WITH ZEROES, AND ENABLED ONTO BUSDIN, TO BE PUT
!*      INTO THE IR AND VERIFIED (VIA INSTRS DECODE, AS A HALT INSTRUCTION).
!*
!*      TESTS 102-104 THEN GO ON TO FURTHER TEST THE FULL DATAPATH FROM EMIT TO
!*      IR, VIA THE EXTENDED ROUTE.  THESE TESTS THEN VERIFY THE CSP WRITE, ADDRESSING AND
!*      DATAPATHS LOGIC.
!*
!****************************************************************************************

5553:
TESTI01A:
        P0,     LOAD-ENUA(ZTARGET434),                  !INSTRS EBB OUTPUT FOR IR=(000000)
                LOAD-ERROR(TEST101A),                   !ERROR DIRECTORY KEY
                DCS-CTR(C7.),                           !COMPARE AT TARGET
        NEXT,   J/LOADD101A                             !
(5553)  DCS[1.00.1.0.0.0]  BM[1000..00.11..11.00..011..100...0.0.0..0..0...0.0000...0..0000.0...11.000...101.010.000]

5520:
LOADD101A:
        P2-T,   D←ZERO,                                 !PUT (000000) IN D
        NEXT,   J/GOTEST101A                            !
(5520)  DCS[0.00.0.0.0.0]  BM[0011..00.00..00.00..000..000...0.1.0..0..0...0.0000...0..0000.0...11.000...001.100.111]

5147:   !(FREE)
GOTEST101A:
        SETUP,  RETURN/SCOPE101,                        !GOT TO SUBR THAT:
        NEXT,   CALL[DINTOIR-5]                         !D -> DBUF -> IR, THEN BUT(INSTRS)
(5147)  DCS[0.00.0.0.0.0]  BM[0101..00.00..11.01..000..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.111.011]



5150:   !(FREE)
SCOPE101:
        NEXT,   BUTD[SCOPE],                            !NO ERROR:  "TEST102A"  (+1. WORDS)
                J/TEST102A                              !   ERROR:  "LOADCSP101A"  (-3. WORDS)
(5150)  DCS[0.00.0.1.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...101.010.001]


!- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -


.TOC    *   TEST102-104:  TESTING CSP ADDRESS/READ/WRITE FUNCTIONS

!THE FOLLOWING SET OF FOUR TESTS VERIFIES THAT THE CSP, AND THE CSP ADDRESS FIELD "CSPADDR"
!HAS NO STUCK ZERO BITS, AND THAT THE EMIT -> CSP -> D -> DBUF -> IR DATAPATH
!IS FULLY FUNCTIONAL.
!
!       AFTER TEST 104B COMPLETES, THE CSP WILL LOOK AS FOLLOWS:
!
!       "BAS-CON"       "CSP-ADR"       CSP                 INSTRS
!       U<41:40>H       U<23:20>H       LOCT     -DATA-     TARGET
```

```
!      ---------         ---------        ----    ------  ------
!                          1111            00     000000  E78/434
!                          1110            01     000152  E78/425
!                          1101            02     000125  E78/432
!                          1100            03     ------
!                          1011            04     125200  E88/412
!                          1010            05     ------
!                          1001            06     ------
!                          1000            07     152500  E88/405
!                          0111            10     125200  E88/405
!                          0110            11     ------
!                          0101            12     ------
!                          0100            13     125200  E88/412
!         11               0011            14     ------
!         10               0010            15     000125  E78/432
!         01               0001            16     000152  E78/425
!         00               0000            17     000000  E78/434
!



! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -


!TEST 102A VERIFIES THAT CSPD(02) WAS WRITTEN WITH THE UNIQUE INSTRS PATTERN:
!  (000125), E78 TARGET (432).  LOOKING FOR CSP ADDRESS BIT(01) STUCK ONE/ZERO,
!  OR ERRORS IN DATAPATH FROM EMIT -> CSP -> ALU-B -> D -> DBUF -> IR.
5521:
TEST102A:
        P0,     LOAD-ENUA(ZTARGET432),                  !INSTRS E78 OUTPUT
                LOAD-ERROR(TEST102A),                   !ERROR DIRECTORY KEY
                DCS-CTR(C12.),                          !COMPARE AT TARGET
        NEXT,   J/LOAD01-102A                           !
(5521)  DCS[1.00.1.0.0.0]  BM[0011..00.11..11.00..011..010...0.0.0..0..0...0.0000...0..0000.0...11.000...101.011.000]

5530:
LOAD01-102A:
        P3,     CSPD[01]←EMIT, EMIT/000152,             !INSTRS DATA PATTERN:
        NEXT,   J/LOAD02-102A                           !  (000152)=E78(425)
(5530)  DCS[0.00.0.0.0.0]  BM[0000..10.00..00.01..101..010...0.0.0..0..0...0.1110...1..0000.0...11.000...001.101.001]

5151:  !(FREE)
LOAD02-102A:
        P3,     CSPD[02]←EMIT, EMIT/000125,             !INSTRS DATA PATTERN:
        NEXT,   J/LOAD04-102A                           !  (000125)=E78(432)
(5151)  DCS[0.00.0.0.0.0]  BM[0000..10.00..00.01..010..101...0.0.0..0..0...0.1101...1..0000.0...11.000...001.101.010]

5152:  !(FREE)
LOAD04-102A:
        P3,     CSPD[04]←EMIT, EMIT/125200,             !INSTRS DATA PATTERN:
        NEXT,   J/LOAD10-102A                           !  (125200)=E88(412)
(5152)  DCS[0.00.0.0.0.0]  BM[1010..10.10..10.10..000..000...0.0.0..0..0...0.1011...1..0000.0...11.000...001.101.011]

5153:  !(FREE)
LOAD10-102A:
```

```
                P3,     CSPD[10]+EMIT, EMIT/152500,              !INSTRS DATA PATTERN:
                NEXT,   J/LOAD00-102A                            !  (152500)=E88(405)
     (5153)  DCS[0.00.0.0.0.0]  BM[1101..10.01..01.01..000..000...0.0.0..0..0...0.0111...1..0000.0...11.000...001.101.100]

        5154:  !(FREE)
        LOAD00-102A:
                P3,     CSPD[00]+EMIT, EMIT/000000,              !INSTRS DATA PATTERN:
                                                                 !  (000000)=E78(434)
                NEXT,   J/LOAD0102A                              !IF THIS DATA USED, CSP ADDRESSING ERROR
     (5154)  DCS[0.00.0.0.0.0]  BM[0000..10.00..00.00..000..000...0.0.0..0..0...0.1111...1..0000.0...11.000...001.101.101]

        5155:  !(FREE)
        LOAD0102A:
                P2-T,   D+CSPD(D02), BSEL/B17,                   !GET CSP LOC VIA CSPADDR, BASCON FIELD "00"
                NEXT,   J/GOTEST102A                             !
     (5155)  DCS[0.00.0.0.0.0]  BM[1010..10.00..00.00..000..000...0.1.0..0..0...0.1101...0..0000.0...11.000...001.101.110]

        5156:  !(FREE)
        GOTEST102A:
                SETUP,  RETURN/TEST102B,                         !GO TO SUBR WHICH:
                NEXT,   CALL[DINTOIR-5]                          ! D -> DBUF -> IR, THEN BUT(INSTRS)
     (5156)  DCS[0.00.0.0.0.0]  BM[0101..00.10..11.11..100..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.111.011]





        ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

        !TEST 102B VERIFIES THAT CSPD(10) WAS WRITTEN WITH THE UNIQUE INSTRS PATTERN:
        !  (152500), E88 TARGET (405).  LOOKING FOR CSP ADDRESS BIT<03> STUCK ONE/ZERO,
        !  OR ERRORS IN DATAPATH FROM EMIT -> CSP -> ALU-B -> D -> DBUF -> IR.
        5574:
        TEST102B:
                P0,     LOAD-ENUA(ZTARGET405),                   !INSTRS E88 OUTPUT
                        LOAD-ERROR(TEST102B),                    !ERROR DIRECTORY KEY
                        DCS-CTR(C7.),                            !COMPARE AT TARGET
                NEXT,   J/LOAD0102B                              !
     (5574)  DCS[1.00.1.0.0.0]  BM[1000..00.11..11.00..000..101...0.0.0..0..0...0.0000...0..0000.0...11.000...001.101.111]

        5157:  !(FREE)
        LOAD0102B:
                P2-T,   D+CSPD(D10), BSEL/B17,                   !GET CSP LOC VIA CSPADDR, BASCON FIELD "00"
                NEXT,   J/GOTEST102B                             !
     (5157)  DCS[0.00.0.0.0.0]  BM[1010..10.00..00.00..000..000...0.1.0..0..0...0.0111...0..0000.0...11.000...001.110.000]

        5160:  !(FREE)
        GOTEST102B:
                SETUP,  RETURN/TEST102C,                         !GO TO SUBR WHICH:
                NEXT,   CALL[DINTOIR-5]                          ! D -> DBUF -> IR, THEN BUT(INSTRS)
     (5160)  DCS[0.00.0.0.0.0]  BM[0101..00.10..11.10..100..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.111.011]
```

```
	!  - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

	!TEST 102C VERIFIES THAT CSPD(D4) WAS WRITTEN WITH THE UNIQUE INSTRS PATTERN:
	!  (125200), E88 TARGET (412).  LOOKING FOR CSP ADDRESS BIT<D2> STUCK ONE/ZERO,
	!  OR ERRORS IN DATAPATH FROM EMIT -> CSP -> ALU-B -> D -> DBUF -> IR.
	5564:
	TEST102C:
		P0,	LOAD-ENUA(ZTARGET412),			!INSTRS E88 OUTPUT
			LOAD-ERROR(TEST102C),			!ERROR DIRECTORY KEY
			DCS-CTR(C7.),				!COMPARE AT TARGET
			BUMP-VERIFY,				!COUNT
		NEXT,	J/LOADD102C				!
  (5564)  DCS[1.00.1.0.0.1]  BM[1000..00.11..11.00..001..010...0.0.0..0..0...0.0000...0..0000.0...11.000...001.110.001]

	5161:  !(FREE)
	LOADD102C:
		P2-T,	D+CSPD(DD4), BSEL/B17,			!GET CSP LOC VIA CSPADDR, BASCON FIELD "00"
		NEXT,	J/GOTEST102C				!
  (5161)  DCS[0.00.0.0.0.0]  BM[1010..10.00..00.00..000..000...0.1.0..0..0...0.1011...0..0000.0...11.000...001.110.010]

	5162:  !(FREE)
	GOTEST102C:
		SETUP,	RETURN/TEST102D,			!GO TO SUBR WHICH:
		NEXT,	CALL[DINTOIR-5]				! D -> DBUF -> IR, THEN BUT(INSTRS)
  (5162)  DCS[0.00.0.0.0.0]  BM[0101..00.10..11.01..100..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.111.011]





	!  - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

	!TEST 102D VERIFIES THAT CSPD(D1) WAS WRITTEN WITH THE UNIQUE INSTRS PATTERN:
	!  (000152), E78 TARGET (425).  LOOKING FOR CSP ADDRESS BIT<D0> STUCK ONE/ZERO,
	!  OR ERRORS IN DATAPATH FROM EMIT -> CSP -> ALU-B -> D -> DBUF -> IR.
	5554:
	TEST102D:
		P0,	LOAD-ENUA(ZTARGET425),			!INSTRS E88 OUTPUT
			LOAD-ERROR(TEST102D),			!ERROR DIRECTORY KEY
			DCS-CTR(C7.),				!COMPARE AT TARGET
		NEXT,	J/LOADD102D				!
  (5554)  DCS[1.00.1.0.0.0]  BM[1000..00.11..11.00..010..101...0.0.0..0..0...0.0000...0..0000.0...11.000...001.110.011]

	5163:  !(FREE)
	LOADD102D:
		P2-T,	D+CSPD(DD1), BSEL/B17,			!GET CSP LOC VIA CSPADDR, BASCON FIELD "00"
		NEXT,	J/GOTEST102D				!
  (5163)  DCS[0.00.0.0.0.0]  BM[1010..10.00..00.00..000..000...0.1.0..0..0...0.1110...0..0000.0...11.000...001.110.100]
```

```
        5164:  !(FREE)
        GOTEST102D:
                SETUP,   RETURN/SCOPE102,                               !GO TO SUBR WHICH:
                NEXT,    CALL[DINTOIR-5]                                ! D -> DBUF -> IR, THEN BUT(INSTRS)
     (5164)  DCS[0.00.0.0.0.0]  BM[0101..00.00..11.10..101..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.111.011]




        5165:  !(FREE)
        SCOPE102:
                NEXT,    BUTD[SCOPE],                                   !NO ERROR:  "TEST103A" (+1. WORDS)
                         J/TEST103A                                     !   ERROR:  "LOAD01-102A"  (-16. WORDS)
     (5165)  DCS[0.00.0.1.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...101.011.001]


        ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -


        !THE FOLLOWING SET OF FOUR TESTS VERIFIES THAT THE CSP, AND THE CSP ADDRESS FIELD "CSPADDR"
        !HAS NO STUCK ONE BITS, AND THAT THE EMIT -> CSP -> D -> DBUF -> IR DATAPATH
        !IS FULLY FUNCTIONAL.


        !  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -


        !TEST 103A VERIFIES THAT CSPD(13) WAS WRITTEN WITH THE UNIQUE INSTRS PATTERN:
        !   (125200), E88 TARGET (412).  LOOKING FOR CSP ADDRESS BIT<02> STUCK ONE/ZERO,
        !   OR ERRORS IN DATAPATH FROM EMIT -> CSP -> ALU-B -> D -> DBUF -> IR.
        5531:
        TEST103A:
                P0,      LOAD-ENUA(ZTARGET412),                         !INSTRS E88 OUTPUT
                         LOAD-ERROR(TEST103A),                          !ERROR DIRECTORY KEY
                         DCS-CTR(C12.),                                 !COMPARE AT TARGET
                NEXT,    J/LOAD16-103A                                  !
     (5531)  DCS[1.00.1.0.0.0]  BM[0011..00.11..11.00..001..010...0.0.0..0..0...0.0000...0..0000.0...11.000...101.100.110]

        5546:
        LOAD16-103A:
                P0,      BUMP-VERIFY,                                   !COUNT
                P3,      CSPD[16]←EMIT, EMIT/000152,                    !INSTRS DATA PATTERN:
                NEXT,    J/LOAD15-103A                                  !  (000152)=E78(425)
     (5546)  DCS[0.00.0.0.0.1]  BM[0000..10.00..00.01..101..010...0.0.0..0..0...0.0001...1..0000.0...11.000...001.110.110]

        5166:  !(FREE)
        LOAD15-103A:
                P3,      CSPD[15]←EMIT, EMIT/000125,                    !INSTRS DATA PATTERN:
                NEXT,    J/LOAD13-103A                                  !  (000125)=E78(432)
     (5166)  DCS[0.00.0.0.0.0]  BM[0000..10.00..00.01..010..101...0.0.0..0..0...0.0010...1..0000.0...11.000...001.110.111]

        5167:  !(FREE)
        LOAD13-103A:
```

```
           P3,      CSPD[13]+EMIT, EMIT/125200,                    !INSTRS DATA PATTERN:
           NEXT,    J/LOAD07-103A                                  !  (125200)=E88(412)
 (5167)  DCS[0.00.0.0.0.0]  BM[1010..10.10..10.10..000..000...0.0.0..0..0...0.0100...1..0000.0...11.000...001.111.000]

    5170:  !(FREE)
    LOAD07-103A:
           P3,      CSPD[07]+EMIT, EMIT/152500,                    !INSTRS DATA PATTERN:
           NEXT,    J/LOAD17-103A                                  !  (152500)=E88(405)
 (5170)  DCS[0.00.0.0.0.0]  BM[1101..10.01..01.01..000..000...0.0.0..0..0...0.1000...1..0000.0...11.000...001.111.001]

    5171:  !(FREE)
    LOAD17-103A:
           P3,      CSPD[17]+EMIT, EMIT/000000,                    !INSTRS DATA PATTERN:
                                                                   !  (000000)=E78(434)
           NEXT,    J/LOADD103A                                    !IF THIS DATA USED, CSP ADDRESSING ERROR
 (5171)  DCS[0.00.0.0.0.0]  BM[0000..10.00..00.00..000..000...0.0.0..0..0...0.0000...1..0000.0...11.000...001.111.010]

    5172:  !(FREE)
    LOADD103A:
           P2-T,    D+CSPD(D13), BSEL/B17,                         !GET CSP LOC VIA CSPADDR, BASCON FIELD "00"
           NEXT,    J/GOTEST103A                                   !
 (5172)  DCS[0.00.0.0.0.0]  BM[1010..10.00..00.00..000..000...0.1.0..0..0...0.0100...0..0000.0...11.000...001.111.011]

    5173:  !(FREE)
    GOTEST103A:
           SETUP,   RETURN/TEST103B,                               !GO TO SUBR WHICH:
           NEXT,    CALL[DINTOIR-5]                                ! D -> DBUF -> IR, THEN BUT(INSTRS)
 (5173)  DCS[0.00.0.0.0.0]  BM[0101..00.10..11.11..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.111.011]





    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    !TEST 103B VERIFIES THAT CSPD(15) WAS WRITTEN WITH THE UNIQUE INSTRS PATTERN:
    !  (000125), E78 TARGET (432).  LOOKING FOR CSP ADDRESS BIT<01> STUCK ONE/ZERO,
    !  OR ERRORS IN DATAPATH FROM EMIT -> CSP -> ALU-B -> D -> DBUF -> IR.
    5572:
    TEST103B:
           P0,      LOAD-ENUA(ZTARGET432),                         !INSTRS E78 OUTPUT
                    LOAD-ERROR(TEST103B),                          !ERROR DIRECTORY KEY
                    DCS-CTR(C7.),                                  !COMPARE AT TARGET
           NEXT,    J/LOADD103B                                    !
 (5572)  DCS[1.00.1.0.0.0]  BM[1000..00.11..11.00..011..010...0.0.0..0..0...0.0000...0..0000.0...11.000...001.111.100]

    5174:  !(FREE)
    LOADD103B:
           P2-T,    D+CSPD(D15), BSEL/B17,                         !GET CSP LOC VIA CSPADDR, BASCON FIELD "00"
           NEXT,    J/GOTEST103B                                   !
 (5174)  DCS[0.00.0.0.0.0]  BM[1010..10.00..00.00..000..000...0.1.0..0..0...0.0010...0..0000.0...11.000...001.111.101]

    5175:  !(FREE)
```

```
    GOTEST103B:
            SETUP,  RETURN/TEST103C,                          !GO TO SUBR WHICH:
            NEXT,   CALL[DINTOIR-5]                           ! D -> DBUF -> IR, THEN BUT(INSTRS)
 (5175)  DCS[0.00.0.0.0.0]  BM[0101..00.10..11.11..110..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.111.011]





    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    !TEST 103C VERIFIES THAT CSPD(16) WAS WRITTEN WITH THE UNIQUE INSTRS PATTERN:
    !  (000152), E78 TARGET (425).  LOOKING FOR CSP ADDRESS BIT<00> STUCK ONE/ZERO,
    !  OR ERRORS IN DATAPATH FROM EMIT -> CSP -> ALU-B -> D -> DBUF -> IR.
    5576:
    TEST103C:
            P0,     LOAD-ENUA(ZTARGET425),                    !INSTRS E78 OUTPUT
                    LOAD-ERROR(TEST103C),                     !ERROR DIRECTORY KEY
                    DCS-CTR(C7.),                             !COMPARE AT TARGET
                    BUMP-VERIFY,                              !COUNT
            NEXT,   J/LOADD103C                               !
 (5576)  DCS[1.00.1.0.0.1]  BM[1000..00.11..11.00..010..101...0.0.0..0..0...0.0000...0..0000.0...11.000...001.111.110]

    5176:  !(FREE)
    LOADD103C:
            P2-T,   D+CSPD(D16), BSEL/B17,                    !GET CSP LOC VIA CSPADDR, BASCON FIELD "00"
            NEXT,   J/GOTEST103C                              !
 (5176)  DCS[0.00.0.0.0.0]  BM[1010..10.00..00.00..000..000...0.1.0..0..0...0.0001...0..0000.0...11.000...001.111.111]

    5177:  !(FREE)
    GOTEST103C:
            SETUP,  RETURN/TEST103D,                          !GO TO SUBR WHICH:
            NEXT,   CALL[DINTOIR-5]                           ! D -> DBUF -> IR, THEN BUT(INSTRS)
 (5177)  DCS[0.00.0.0.0.0]  BM[0101..00.11..01.11..100..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.111.011]





    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    !TEST 103D VERIFIES THAT CSPD(07) WAS WRITTEN WITH THE UNIQUE INSTRS PATTERN:
    !  (152500), E88 TARGET (405).  LOOKING FOR CSP ADDRESS BIT<03> STUCK ONE/ZERO,
    !  OR ERRORS IN DATAPATH FROM EMIT -> CSP -> ALU-B -> D -> DBUF -> IR.
    5674:
    TEST103D:
            P0,     LOAD-ENUA(ZTARGET405),                    !INSTRS E88 OUTPUT
                    LOAD-ERROR(TEST103D),                     !ERROR DIRECTORY KEY
                    DCS-CTR(C7.),                             !COMPARE AT TARGET
            NEXT,   J/LOADD103D                               !
 (5674)  DCS[1.00.1.0.0.0]  BM[1000..00.11..11.00..000..101...0.0.0..0..0...0.0000...0..0000.0...11.000...010.000.000]
```

```
	5200:	!(FREE)
	LOADD103D:
		P2-T,	D+CSPD(D07), BSEL/B17,			!GET CSP LOC VIA CSPADDR, BASCON FIELD "00"
		NEXT,	J/GOTEST103D				!
(5200)	DCS[0.00.0.0.0.0]	BM[1010..10.00..00.00..000..000...0.1.0..0..0...0.1000...0..0000.0...11.000...010.000.001]

	5201:	!(FREE)
	GOTEST103D:
		SETUP,	RETURN/SCOPE103,			!GO TO SUBR WHICH:
		NEXT,	CALL[DINTOIR-5]				! D -> DBUF -> IR, THEN BUT(INSTRS)
(5201)	DCS[0.00.0.0.0.0]	BM[0101..00.01..00.00..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.111.011]




	5202:	!(FREE)
	SCOPE103:
		NEXT,	BUTD[SCOPE],				!NO ERROR:  "TEST104A" (+1. WORDS)
			J/TEST104A				!   ERROR:  "LOAD16-103A"  (-16. WORDS)
(5202)	DCS[0.00.0.1.0.0]	BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...101.100.111]


	! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

	!THE FOLLOWING SET OF TWO TESTS VERIFIES THAT THE CSP, AND THE CSP ADDRESS FIELD "BASCON"
	!HAS NO STUCK ZERO/ONE BITS, AND THAT THE EMIT -> CSP -> D -> DBUF -> IR DATAPATH
	!IS FULLY FUNCTIONAL.


	!  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -


	!TEST 104A VERIFIES THAT CSPB(16) WAS WRITTEN WITH THE UNIQUE INSTRS PATTERN:
	!  (000152), E78 TARGET (425).  LOOKING FOR CSP ADDRESS BIT<00> STUCK ONE/ZERO,
	!  OR ERRORS IN DATAPATH FROM EMIT -> CSP -> ALU-B -> D -> DBUF -> IR.
	!THIS TEST USES THE "BASCON" ADDRESS MODE FOR THE CSP.
	5547:
	TEST104A:
		P0,	LOAD-ENUA(ZTARGET425),			!INSTRS E78 OUTPUT
			LOAD-ERROR(TEST104A),			!ERROR DIRECTORY KEY
			DCS-CTR(C7.),				!COMPARE AT TARGET
		NEXT,	J/LOADD104A				!
(5547)	DCS[1.00.1.0.0.0]	BM[1000..00.11..11.00..010..101...0.0.0..0..0...0.0000...0..0000.0...11.000...101.100.000]

	5540:
	LOADD104A:
		P2-T,	D+CSPB(B16), CSPADDR/D17,		!GET CSP LOC VIA BASCON, CSPADDR FIELD "0000"
		NEXT,	J/GOTEST104A				!
(5540)	DCS[0.00.0.0.0.0]	BM[1010..11.01..00.00..000..000...0.1.0..0..0...0.0000...0..0000.0...11.000...010.000.011]

	5203:	!(FREE)
	GOTEST104A:
		SETUP,	RETURN/TEST104B,			!GO TO SUBR WHICH:
```

```
          NEXT,   CALL[DINTOIR-5]                          ! D -> DBUF -> IR, THEN BUT(INSTR5)
  (5203)  DCS[0.00.0.0.0.0]  BM[0101..00.11..01.00..110..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.111.011]





    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    !TEST 104B VERIFIES THAT CSPB(15) WAS WRITTEN WITH THE UNIQUE INSTR5 PATTERN:
    !  (000125), E78 TARGET (432).  LOOKING FOR CSP ADDRESS BIT(01) STUCK ONE/ZERO,
    !  OR ERRORS IN DATAPATH FROM EMIT -> CSP -> ALU-B -> D -> DBUF -> IR.
    !THIS TEST USES THE "BASCON" ADDRESS MODE FOR THE CSP.
    5646:
    TEST104B:
          PO,      LOAD-ENUA(ZTARGET432),                  !INSTR5 E78 OUTPUT
                   LOAD-ERROR(TEST104B),                   !ERROR DIRECTORY KEY
                   DCS-CTR(C7.),                           !COMPARE AT TARGET
          NEXT,    J/LOADD104B                             !
  (5646)  DCS[1.00.1.0.0.0]  BM[1000..00.11..11.00..011..010...0.0.0..0..0...0.0000...0..0000.0...11.000...010.000.100]

    5204:  !(FREE)
    LOADD104B:
          P2-T,    D←CSPB(B15), CSPADDR/D17,               !GET CSP LOC VIA BASCON, CSPADDR FIELD "0000"
          NEXT,    J/GOTEST104B                            !
  (5204)  DCS[0.00.0.0.0.0]  BM[1010..11.10..00.00..000..000...0.1.0..0..0...0.0000...0..0000.0...11.000...010.000.101]

    5205:  !(FREE)
    GOTEST104B:
          SETUP,   RETURN/SCOPE104,                        !GO TO SUBR WHICH:
          NEXT,    CALL[DINTOIR-5]                         ! D -> DBUF -> IR, THEN BUT(INSTR5)
  (5205)  DCS[0.00.0.0.0.0]  BM[0101..00.01..00.00..110..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.111.011]




    5206:  !(FREE)
    SCOPE104:
          PO,      BUSDIN←EMIT-[I],                        !RESET PROC UCON
                   EN-CLK-IR[15-00],                       !
          NEXT,    BUTD[SCOPE],                            !NO ERROR:  "TEST105A"  (+1. WORDS)
                   J/TEST105A                              !    ERROR:  "LOADD104A"  (-5. WORDS)
  (5206)  DCS[0.00.0.1.0.0]  BM[0000..00.00..00.01..000..100...0.0.0..0..0...1.1001...0..0000.0...11.000...101.100.001]



    !.PAGE=================================================================================================

    .TOC   *   TEST105: SR CAN LOAD/STORE AS A REGISTER

    !******************************************************************************************
    !*
```

```
!*      TESTS:  105                                         UWORDS:  023 + 032
!*
!*      FUNCTIONS:
!*
!*      THE FOLLOWING TESTS VERIFY THE VALIDITY OF THE SR AS A TEMPORARY REGISTER,
!*      (IE, IT CAN BE LOADED/READ) IN ALL BIT POSITIONS, AND THAT THE ALU-A SIDE CAN
!*      PASS DATA INTO D.
!*
!*********************************************************************************************


!TEST 105A VERIFIES THAT THE SR CAN BE LOADED/READ WITH THE INSTRS PATTERN:
!  (000125), E78 TARGET (432), AND TO VERIFY THE:
!  DATAPATH FROM SR -> ALU-A -> D -> DBUF -> IR.
5541:
TEST105A:
        P0,     LOAD-ENUA(ZTARGET432),                      !INSTRS E78 OUTPUT
                LOAD-ERROR(TEST105A),                       !ERROR DIRECTORY KEY
                DCS-CTR(C8.),                               !COMPARE AT TARGET
                BUMP-VERIFY,                                !COUNT
        NEXT,   J/LOADSR105A                                !
(5541)  DCS[1.00.1.0.0.1]  BM[0111..00.11..11.00..011..010...0.0.0..0..0...0.0000...0..0000.0...11.000...101.100.010]

 5542:
LOADSR105A:
        P2,     RES+CSPD(D02),                              !BITS<13:11>=00/0, WHICH IS:  SR/LOAD, GUARD/DISABLED
        P3-T,   SR+CSPD(D02), BSEL/B17,                     !DATA IS (000125) = INSTRS E78 (432)
        NEXT,   J/GOTEST105A                                !
(5542)  DCS[0.00.0.0.0.0]  BM[1010..10.00..00.00..000..000...1.0.1..0..0...0.1101...0..1000.1...11.000...010.000.111]

 5207:  !(FREE)
GOTEST105A:
        P0,     BUMP-VERIFY,                                !COUNT
        SETUP,  RETURN/TEST105A1,                           !GO TO SUBR WHICH:
        NEXT,   CALL[SRINTOIR-5]                            ! SR -> D -> DBUF -> IR, THEN BUT(INSTRS)
(5207)  DCS[0.00.0.0.0.1]  BM[0101..00.11..00.01..000..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.111.010]





! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

!TEST 105A1 VERIFIES THAT THE BUT(SR3-0) SEES THE "0101" IN THE SR.
5610:
TEST105A1:
        P0,     LOAD-ENUA(ZTARGET405),                      !BIT<3:0> = "0101"
                LOAD-ERROR(TEST105A1),                      !ERROR DIRECTORY KEY
                DCS-CTR(C3.),                               !COMPARE AT TARGET
        NEXT,   J/GOBUT105A1                                !
(5610)  DCS[1.00.1.0.0.0]  BM[1100..00.11..11.00..000..101...0.0.0..0..0...0.0000...0..0000.0...11.000...010.001.000]

 5210:  !(FREE)
```

```
    GOBUT105A1:
            PO,     BUMP-VERIFY,                    !COUNT
            SETUP,  RETURN/TEST105B,                !RETURN TO START OF NEXT SUBTEST
            NEXT,   GOTO-PAGE(7),                   !BUT TABLE
                    J/BUTSR3-0                      !SR<3:0> IN BIT<3:0>
 (5210)  DCS[0.00.0.0.0.1]  BM[0101..00.11..01.01..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.111.110]





    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    !TEST 105B VERIFIES THAT THE SR CAN BE LOADED/READ WITH THE INSTRS PATTERN:
    !  (000152), E78 TARGET (425), AND TO VERIFY THE:
    !  DATAPATH FROM SR -> ALU-A -> D -> DBUF -> IR.
    5652:
    TEST105B:
            PO,     LOAD-ENUA(ZTARGET425),          !INSTRS E78 OUTPUT
                    LOAD-ERROR(TEST105B),           !ERROR DIRECTORY KEY
                    DCS-CTR(C8.),                   !COMPARE AT TARGET
            NEXT,   J/LOADSR105B                    !
 (5652)  DCS[1.00.1.0.0.0]  BM[0111..00.11..11.00..010..101...0.0.0..0..0...0.0000...0..0000.0...11.000...010.001.001]

    5211:  !(FREE)
    LOADSR105B:
            P2-T,   SR+CSPD(D01), BSEL/B17,         !DATA IS (000152) = INSTRS E78 (425)
            NEXT,   J/GOTEST105B                    !
 (5211)  DCS[0.00.0.0.0.0]  BM[1010..10.00..00.00..000..000...0.0.1..0..0...0.1110...0..0000.0...11.000...010.001.010]

    5212:  !(FREE)
    GOTEST105B:
            SETUP,  RETURN/TEST105B1,               !GO TO SUBR WHICH:
            NEXT,   CALL[SRINTOIR-5]                ! SR -> D -> DBUF -> IR, THEN BUT(INSTRS)
 (5212)  DCS[0.00.0.0.0.0]  BM[0101..00.11..00.00..000..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.111.010]





    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    !TEST 105B1 VERIFIES THAT THE BUT(SR3-0) SEES THE "1010" IN THE SR.
    5600:
    TEST105B1:
            PO,     LOAD-ENUA(ZTARGET412),          !BIT<3:0> = "1010"
                    LOAD-ERROR(TEST105B1),          !ERROR DIRECTORY KEY
                    DCS-CTR(C3.),                   !COMPARE AT TARGET
                    BUMP-VERIFY,                    !COUNT
            NEXT,   J/GOBUT105B1                    !
 (5600)  DCS[1.00.1.0.0.1]  BM[1100..00.11..11.00..001..010...0.0.0..0..0...0.0000...0..0000.0...11.000...010.001.011]
```

```
    5213:  !(FREE)
    GOBUT105B1:
            SETUP,   RETURN/TEST105C,                     !RETURN TO START OF NEXT SUBTEST
            NEXT,    GOTO-PAGE(7),                        !BUT TABLE
                     J/BUTSR3-0                           !SR<3:0> IN BIT<3:0>
 (5213)  DCS[0.00.0.0.0.0]  BM[0101..00.11..01.00..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.111.110]





    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    !TEST 105C VERIFIES THAT THE SR CAN BE LOADED/READ WITH THE INSTRS PATTERN:
    !  (125200), E88 TARGET (412), AND TO VERIFY THE:
    !  DATAPATH FROM SR -> ALU-A -> D -> DBUF -> IR.
    5642:
    TEST105C:
            PO,      LOAD-ENUA(ZTARGET412),               !INSTRS E88 OUTPUT
                     LOAD-ERROR(TEST105C),                !ERROR DIRECTORY KEY
                     DCS-CTR(C8.),                        !COMPARE AT TARGET
            NEXT,    J/LOADSR105C                         !
 (5642)  DCS[1.00.1.0.0.0]  BM[0111..00.11..11.00..001..010...0.0.0..0..0...0.0000...0..0000.0...11.000...010.001.100]

    5214:  !(FREE)
    LOADSR105C:
            P2-T,    SR+CSPD(D04), BSEL/B17,              !DATA IS (125200) = INSTRS E88 (412)
            NEXT,    J/GOTEST105C                         !
 (5214)  DCS[0.00.0.0.0.0]  BM[1010..10.00..00.00..000..000...0.0.1..0..0...0.1011...0..0000.0...11.000...010.001.101]

    5215:  !(FREE)
    GOTEST105C:
            SETUP,   RETURN/TEST105D,                     !GO TO SUBR WHICH:
            NEXT,    CALL[SRINTOIR-5]                     ! SR -> D -> DBUF -> IR, THEN BUT(INSTRS)
 (5215)  DCS[0.00.0.0.0.0]  BM[0101..00.11..00.11..110..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.111.010]





    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    !TEST 105D VERIFIES THAT THE SR CAN BE LOADED/READ WITH THE INSTRS PATTERN:
    !  (152500), E88 TARGET (405), AND TO VERIFY THE:
    !  DATAPATH FROM SR -> ALU-A -> D -> DBUF -> IR.
    5636:
    TEST105D:
            PO,      LOAD-ENUA(ZTARGET405),               !INSTRS E88 OUTPUT
                     LOAD-ERROR(TEST105D),                !ERROR DIRECTORY KEY
                     DCS-CTR(C8.),                        !COMPARE AT TARGET
            NEXT,    J/LOADSR105D                         !
```

```
(5636) DCS[1.00.1.0.0.0]  BM[0111..00.11..11.00..000..101...0.0.0..0..0...0.0000...0..0000.0...11.000...010.001.110]

    5216:  !(FREE)
    LOADSR105D:
            P0,      BUMP-VERIFY,                              !COUNT
            P2-T,    SR←CSPD(D10), BSEL/B17,                   !DATA IS (152500) = INSTRS E88 (405)
            NEXT,    J/GOTEST105D                              !
(5216) DCS[0.00.0.0.0.1]  BM[1010..10.00..00.00..000..000...0.0.1..0..0...0.0111...0..0000.0...11.000...010.001.111]

    5217:  !(FREE)
    GOTEST105D:
            SETUP,   RETURN/TEST105E,                          !GO TO SUBR WHICH:
            NEXT,    CALL[SRINTOIR-5]                          ! SR -> D -> DBUF -> IR, THEN BUT(INSTRS)
(5217) DCS[0.00.0.0.0.0]  BM[0101..00.11..00.10..000..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.111.010]





    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    !TEST 105E VERIFIES THE DATAPATH FROM:
    !  EMIT -> CSP -> ALU-B -> SR -> ALU-A -> D -> DBUF -> IR,
    !  IS A VALID "1101" IN BITS<15:12>.  SR VALUE = (152500) FROM PREVIOUS TEST.
    5620:
    TEST105E:
            P0,      LOAD-ENUA(ZTARGET415),                    !BIT<15:12> = "1101"
                     LOAD-ERROR(TEST105E),                     !ERROR DIRECTORY KEY
                     DCS-CTR(C3.),                             !COMPARE AT TARGET
            NEXT,    J/GOTEST105E                              !
(5620) DCS[1.00.1.0.0.0]  BM[1100..00.11..11.00..001..101...0.0.0..0..0...0.0000...0..0000.0...11.000...010.010.000]

    5220:  !(FREE)
    GOTEST105E:
            SETUP,   RETURN/SCOPE105,                          !RETURN TO SCOPE LOOP TEST WORD
            NEXT,    GOTO-PAGE(7),                             !BUT TABLE
                     J/BUTIR15-12                              !BIT<15:12> TEST
(5220) DCS[0.00.0.0.0.0]  BM[0101..00.01..00.10..001..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.000.000]



    5221:  !(FREE)
    SCOPE105:
            P0,      BUSDIN←EMIT-[I],                          !RESET PROC UCON
                     EN-CLK-IR[15-00],                         !
            NEXT,    BUTD[SCOPE],                              !NO ERROR:  "SETUPCSP17A"  (+1. WORDS)
                     J/SETUPCSP17A                             !   ERROR:  "LOADSR105A"  (-17. WORDS)
(5221) DCS[0.00.0.1.0.0]  BM[0000..00.00..00.01..000..100...0.0.0..0..0...1.1001...0..0000.0...11.000...101.100.011]
```

```



!.PAGE=========================================================================================================

.TOC  *  TEST114-121:  ALU LOGIC TESTS / D[C] TESTS

!**************************************************************************************
!*
!*     TESTS:  114 - 121                                UWORDS:  250 + 300
!*
!*     FUNCTIONS:
!*
!*     THESE TESTS TEST THE ALU LOGIC FUNCTIONS.
!*
!**************************************************************************************



!
!      SUMMARY OF ALU LOGIC / D[C] TESTS:
!
!      TEST          ALU             OPERANDS               D[C]
!      NUMB          FUNCTION         A/B=D                 FUNCTION
!      ----          ---------       --------               --------
!
!      114A          ZERO             1/1=0                 CIN=PS[C]=0
!
!      115A          NOT-A            1/1=0                 CIN=1
!      115B          NOT-A            0/1=1                 PS[C]=0
!      115C          NOT-A            0/0=1
!      115D          NOT-A            1/0=0
!
!      116A          NOT-A-AND-B      0/1=1                 ALU15=1, D[C]=1
!      116B          ZERO             1/0=0
!      116C          NOT-A-AND-B      0/0=0                 ALU15=0, D[C]=0
!      116D          ZERO             0/1=0
!
!      117A          A-AND-NOT-B      1/0=1                 CIN=D[C]=0
!      117B          A-AND-NOT-B      1/1=0                 (ALU15=1)
!      117C          A-AND-NOT-B      0/0=0                 CIN=D[C]=1
!
!      120A          A-AND-B          0/1=0
!      120B          A-AND-B          1/1=1                 CIN=0
!
!      121A          A-XOR-B          0/0=0                 ALU00=1
!      121B          A-XOR-B          1/0=1                 ALU00=0
!      121C          A-XOR-B          0/1=1                 ALU07=1
!      121D          A-XOR-B          1/1=0                 ALU07=0
!
!      122A          A-IOR-B          0/0=0                 CIN=1
!      122A3         BUT(D<14-00>=ZERO#D15) W/ D=(000000)
!      122A4         BUT(D<14-00>=ZERO#D15) W/ D=(125252)
!
```

```
    !

    !FOR THE ALU LOGIC TESTS FOLLOWING, THE REQUIRED CONSTANTS
    !IN THE CSP ARE:
    5543:
    SETUPCSP17A:
            P3,       CSPD[15]←EMIT, EMIT/000077,          !MASK FOR BITS<05:00>
            NEXT,     GOTO-PAGE(7),                         !XFR
                      J/SETUPCSP16A                         !
 (5543)  DCS[0.00.0.0.0.0]  BM[0000..10.00..00.00..111..111...0.0.0..0..0...0.0010...1..0000.0...11.100...000.000.010]

    7002:  !(FREE)
    SETUPCSP16A:
            P3,       CSPD[16]←EMIT, EMIT/170000,          !BITS<15:12> SET
            NEXT,     J/SETUPCSP15A                         !
 (7002)  DCS[0.00.0.0.0.0]  BM[1111..10.00..00.00..000..000...0.0.0..0..0...0.0001...1..0000.0...11.000...000.001.000]

    7010:  !(FREE)
    SETUPCSP15A:
            P3,       CSPD[17]←EMIT, EMIT/007700,          !MASK FOR BITS<11:06>
            NEXT,     J/SETUPCSP14A                         !
 (7010)  DCS[0.00.0.0.0.0]  BM[0000..10.11..11.11..000..000...0.0.0..0..0...0.0000...1..0000.0...11.000...000.001.001]

    7011:  !(FREE)
    SETUPCSP14A:
            P3,       CSPD[14]←EMIT, EMIT/000100,          !BIT<06> SET
            NEXT,     J/SETUPCSP12A                         !
 (7011)  DCS[0.00.0.0.0.0]  BM[0000..10.00..00.01..000..000...0.0.0..0..0...0.0011...1..0000.0...11.000...000.001.010]

    7012:  !(FREE)
    SETUPCSP12A:
            P3,       CSPD[11]←EMIT, EMIT/125252,          !PATTERN: "1010 1010 1010 1010"
            NEXT,     J/SETUPCSP05A                         !
 (7012)  DCS[0.00.0.0.0.0]  BM[1010..10.10..10.10..101..010...0.0.0..0..0...0.0110...1..0000.0...11.000...000.001.011]

    7013:  !(FREE)
    SETUPCSP05A:
            P3,       CSPD[10]←EMIT, EMIT/052525,          !PATTERN: "0101 0101 0101 0101"
            NEXT,     J/SETUPCSP07A                         !
 (7013)  DCS[0.00.0.0.0.0]  BM[0101..10.01..01.01..010..101...0.0.0..0..0...0.0111...1..0000.0...11.000...000.001.100]

    7014:  !(FREE)
    SETUPCSP07A:
            P3,       CSPD[12]←EMIT, EMIT/177777,          !PATTERN: "1111 1111 1111 1111 "
            NEXT,     J/SETUPCSP00A                         !
 (7014)  DCS[0.00.0.0.0.0]  BM[1111..10.11..11.11..111..111...0.0.0..0..0...0.0101...1..0000.0...11.000...000.001.101]

    7015:  !(FREE)
    SETUPCSP00A:
            P3,       CSPD[13]←EMIT, EMIT/000000,          !PATTERN: "0000 0000 0000 0000"
            NEXT,     GOTO-PAGE(0),                         !SAME AS (4)
                      J/TEST114A                            !
```

```
(7015) DCS[0.00.0.0.0.0]  BM[0000..10.00..00.00..000..000...0.0.0..0..0...0.0100...1..0000.0...11.100...110.000.111]




 !- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

 !VERIFY THAT WITH: ALU=(ZERO), A=(177777), B=(177777), THEN D=(000000), AND D[C]=CIN=PS[C]=(0)
 4607:
 TEST114A:
        P0,      LOAD-ENUA(ZTARGET434),                !INSTRS FOR IR=(000000)
                 LOAD-ERROR(TEST114A),                 !ERROR DIRECTORY KEY
                 DCS-CTR(C8.),                         !COMPARE AT TARGET
        NEXT,    J/GETONES114A                         !
(4607) DCS[1.00.1.0.0.0]  BM[0111..00.11..11.00..011..100...0.0.0..0..0...0.0000...0..0000.0...11.000...110.000.000]

 4600:
 GETONES114A:
        P2-T,    D+CSPD(C177777), D[C]+ALU15,          !ALL ONES STORED HERE
        P3,      A#BSPHI[C177777]+D,                   !WRITE INTO ASP,BSP
        NEXT,    J/ALU114A
(4600) DCS[0.00.0.0.0.0]  BM[1010..10.11..00.01..101..100...0.1.0..0..0...0.0101...0..1111.0...11.000...000.000.011]

 4003:  !(FREE)
 ALU114A:
        P2-T,    D+ZERO, D[C]+CINMUX,                  !ALU=(ZERO), D[C]=CIN=PS[C]=(0)
                 BUS-A+ASPHI(C177777),                 !A=(177777)
                 BUS-B+CSPD(C177777),                  !B=(177777)
        NEXT,    J/GETZEROES114A                       !D=(000000)
(4003) DCS[0.00.0.0.0.0]  BM[0011..10.00..11.01..101..000...0.1.0..0..0...0.0101...0..0000.0...11.000...000.000.100]

 4004:  !(FREE)
 GETZEROES114A:
        P3,      A#BSPHI[C000000]+D,                   !ALL ZEROS STORED HERE IN ASP, BSP
        NEXT,    J/GOBUT114A                           !
(4004) DCS[0.00.0.0.0.0]  BM[0000..00.11..00.01..100..000...0.0.0..0..0...0.0000...0..1111.0...11.000...000.000.101]

 4005:  !(FREE)
 GOBUT114A:
        SETUP,   RETURN/TEST114A2,                     !EXEC SUBR WHICH:
                                                       !(1) D -> IR
        NEXT,    CALL[DZERO]                           !(2) BUT(INSTRS) INTO ZTARGET---
(4005) DCS[0.00.0.0.0.0]  BM[0100..00.11..00.00..011..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.100.010]

 !CHECK THAT D[C] GOT A (0) FROM "CINMUX=PS[C]", ABOVE
 4603:
 TEST114A2:
        P0,      LOAD-ENUA(ZTARGET402),                !BIT <00> = D[C] = (0)
                 LOAD-ERROR(TEST114A2),                !ERROR DIRECTORY KEY
                 DCS-CTR(C3.),                         !COMPARE AT TARGET
        NEXT,    J/GOBUT114A2                          !
(4603) DCS[1.00.1.0.0.0]  BM[1100..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...000.000.110]
```

```
     4006:  !(FREE)
     GOBUT114A2:
             SETUP,   RETURN/SCOPE114A,                         !RETURN TO SCOPE LOOP TEST WORD
             NEXT,    GOTO-PAGE(7),                             !BUT TABLE
                      J/BUTD[C]A                                !D[C]H IN BIT<00>
(4006)  DCS[0.00.0.0.0.0]  BM[0100..00.00..00.00..111..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.100]


     4007:  !(FREE)
     SCOPE114A:
             P2-T,    D+CSPD(C052525), SAVE-D[C],               !STORE A CONSTANT
             P3,      A#BSPHI[C052525]+D,                       !
             NEXT,    BUTD[SCOPE],                              !NO ERROR:  "TEST115A1"    (+1. WORDS)
                      J/TEST115A1                               !   ERROR:  "GETONES114A"  (-6.WORDS)
(4007)  DCS[0.00.0.1.0.0]  BM[1010..10.11..00.01..111..111...0.1.0..0..0...0.0111...0..1111.0...11.000...110.000.001]





     ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

     !THIS NEXT SET OF 12. TESTS EXERCISES THE "NOT-A" ALU FUNCTION

     ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

     !TESTS 115A 1-3 VERIFIES THAT WITH:
     !ALU=(NOT-A), A=(052525), B=(177777), THEN D=(125252), AND D[C]=CINMUX=(1)
     4601:
     TEST115A1:
             P0,      LOAD-ENUA(ZTARGET412),                    !BIT<15:12> = "1010"
                      LOAD-ERROR(TEST115A1),                    !ERROR DIRECTORY KEY
                      DCS-CTR(C7.),                             !COMPARE AT TARGET
             NEXT,    J/ALU115A1                                !
(4601)  DCS[1.00.1.0.0.0]  BM[1000..00.11..11.00..001..010...0.0.0..0..0...0.0000...0..0000.0...11.000...110.001.000]

     4610:
     ALU115A1:
             P0,      BUMP-VERIFY,                              !COUNT
             P2-T,    D+NOT-A, D[C]+CINMUX,                     !ALU=(NOT-A) D[C]=CINMUX=(1)
                      BUS-A+ASPHI(C052525),                     !A=(052525)
                      BUS-B+CSPD(C177777),                      !B=(177777)
             NEXT,    J/GETALTN115A1                            !D=(125252)
(4610)  DCS[0.00.0.0.0.1]  BM[0000..10.00..11.01..111..000...0.1.0..0..0...0.0101...0..0000.0...11.000...000.001.000]

     4010:  !(FREE)
     GETALTN115A1:
             P3,      A#BSPHI[C125252]+D,                       !STORE CONSTANT (125252), HOPEFULLY
             NEXT,    J/GOBUT115A1                              !
(4010)  DCS[0.00.0.0.0.0]  BM[0000..00.11..00.01..110..000...0.0.0..0..0...0.0000...0..1111.0...11.000...000.001.001]

     4011:  !(FREE)
     GOBUT115A1:
```

```
          SETUP,  RETURN/TEST115A4,                       !EXEC SUBR WHICH:
                                                          !(1) D<15:12> -> IR<15:12>
          NEXT,   CALL[D15-12]                            !(2) BUT(IR15-12) INTO ZTARGET---
   (4011) DCS[0.00.0.0.0.0]  BM[0100..00.11..00.00..100..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.011.100]


     !CHECK THAT D[C] GOT A (1) FROM "CINMUX=(1)", ABOVE
     4604:
     TEST115A4:
          PO,     LOAD-ENUA(ZTARGET403),                  !BIT <00> = D[C] = (1)
                  LOAD-ERROR(TEST115A4),                  !ERROR DIRECTORY KEY
                  DCS-CTR(C3.),                           !COMPARE AT TARGET
                  BUMP-VERIFY,                            !COUNT
          NEXT,   J/GOBUT115A4                            !
   (4604) DCS[1.00.1.0.0.1]  BM[1100..00.11..11.00..000..011...0.0.0..0..0...0.0000...0..0000.0...11.000...000.001.010]

     4012:  !(FREE)
     GOBUT115A4:
          SETUP,  RETURN/TEST115A2,                       !RETURN TO START OF NEXT SUBTEST
          NEXT,   GOTO-PAGE(7),                           !BUT TABLE
                  J/BUTD[C]A                              !D[C]H IN BIT<00>
   (4012) DCS[0.00.0.0.0.0]  BM[0100..00.11..00.01..110..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.100]


     !CHECK BIT<11:06> = "1010 10"
     4616:
     TEST115A2:
          PO,     LOAD-ENUA(ZTARGET412),                  !INSTR5-E78 OUTPUT FOR BIT <11:06>="101 010"
                  LOAD-ERROR(TEST115A2),                  !ERROR DIRECTORY KEY
                  DCS-CTR(C6.),                           !COMPARE AT TARGET
                  BUMP-VERIFY,                            !COUNT
          NEXT,   J/GOBUT115A2                            !
   (4616) DCS[1.00.1.0.0.1]  BM[1001..00.11..11.00..001..010...0.0.0..0..0...0.0000...0..0000.0...11.000...000.001.011]

     4013:  !(FREE)
     GOBUT115A2:
          SETUP,  RETURN/TEST115A3,                       !EXEC SUBR WHICH:
                                                          !(1) D<11:06> -> IR<11:06>
          NEXT,   CALL[D11-06]                            !(2) BUT(INSTR5) INTO ZTARGET---
   (4013) DCS[0.00.0.0.0.0]  BM[0100..00.11..00.01..101..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.011.110]



     !CHECK BIT<05:00> = "10 1010"
     4615:
     TEST115A3:

          PO,     LOAD-ENUA(ZTARGET425),                  !INSTR5-E88 OUTPUT FOR BIT <05:00> = "101 010"
                  LOAD-ERROR(TEST115A3),                  !ERROR DIRECTORY KEY
                  DCS-CTR(C6.),                           !COMPARE AT TARGET
          NEXT,   J/GOBUT115A3                            !
```

```
(4615) DCS[1.00.1.0.0.0] BM[1001..00.11..11.00..010..101...0.0.0..0..0...0.0000...0..0000.0...11.000...000.001.100]

   4014:  !(FREE)
   GOBUT115A3:
           SETUP,   RETURN/TEST115B1,                      !EXEC SUBR WHICH:
                                                           !(1) D<05:00> -> IR<05:00>
           NEXT,    CALL[D05-00]                           !(2) BUT(INSTRS) INTO ZTARGET---
(4014) DCS[0.00.0.0.0.0] BM[0100..00.11..00.01..100..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.100.000]




   ! - - - - - - - - - - - - - - - - - - - - - - - - - - - -

   !TESTS 115B 1-3 VERIFIES THAT WITH:
   !ALU=(NOT-A), A=(125252), B=(177777), THEN D=(052525), AND D[C]+PS[C]=(0)
   4614:
   TEST115B1:
           P0,      LOAD-ENUA(ZTARGET405),                 !BIT <15:12> = "0101"
                    LOAD-ERROR(TEST115B1),                 !ERROR DIRECTORY KEY
                    DCS-CTR(C6.),                          !COMPARE AT TARGET
           NEXT,    J/ALU115B1                             !
(4614) DCS[1.00.1.0.0.0] BM[1001..00.11..11.00..000..101...0.0.0..0..0...0.0000...0..0000.0...11.000...000.001.101]

   4015:  !(FREE)
   ALU115B1:
           P0,      BUMP-VERIFY,                           !COUNT
           P2-T,    D+NOT-A, D[C]+PS[C],                   !ALU=(NOT-A), D[C]=PS[C]=(0)
                    BUS-A+ASPHI(C125252),                  !A=(125252)
                    BUS-B+CSPD(C177777),                   !B=(177777)
           NEXT,    J/GOBUT115B1                           !D=(052525)
(4015) DCS[0.00.0.0.0.1] BM[0000..10.00..11.01..110..001...0.1.0..0..0...0.0101...0..0000.0...11.000...000.001.110]

   4016:  !(FREE)
   GOBUT115B1:
           SETUP,   RETURN/TEST115B4,                      !EXEC SUBR WHICH:
                                                           !(1) D<15:12> -> IR<15:12>
           NEXT,    CALL[D15-12]                           !(2) BUT(IR15-12) INTO ZTARGET---
(4016) DCS[0.00.0.0.0.0] BM[0100..00.11..00.00..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.011.100]


   !CHECK THAT D[C] GOT A (0) FROM "PS[C]", ABOVE
   4602:
   TEST115B4:
           P0,      LOAD-ENUA(ZTARGET402),                 !BIT <00> = D[C] = (0)
                    LOAD-ERROR(TEST115B4),                 !ERROR DIRECTORY KEY
                    DCS-CTR(C3.),                          !COMPARE AT TARGET
                    BUMP-VERIFY,                           !COUNT
           NEXT,    J/GOBUT115B4                           !
(4602) DCS[1.00.1.0.0.1] BM[1100..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...000.001.111]

   4017:  !(FREE)
```

```
    GOBUT115B4:
            SETUP,  RETURN/TEST115B2,                   !RETURN TO START OF NEXT SUBTEST
            NEXT,   GOTO-PAGE(7),                       !BUT TABLE
                    J/BUTD[C]A                          !D[C]H IN BIT<00>
 (4017)  DCS[0.00.0.0.0.0]  BM[0100..00.11..00.01..011..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.100]


    !CHECK BIT<11:06> = "0101 01"
    4613:
    TEST115B2:
            PO,     LOAD-ENUA(ZTARGET405),              !INSTRS-E78 OUTPUT FOR BIT <11:06> = "010 101"
                    LOAD-ERROR(TEST115B2),              !ERROR DIRECTORY KEY
                    DCS-CTR(C6.),                       !COMPARE AT TARGET
                    BUMP-VERIFY,                        !COUNT
            NEXT,   J/GOBUT115B2                        !
 (4613)  DCS[1.00.1.0.0.1]  BM[1001..00.11..11.00..000..101...0.0.0..0..0...0.0000...0..0000.0...11.000...000.010.000]

    4020:  !(FREE)
    GOBUT115B2:
            SETUP,  RETURN/TEST115B3,                   !EXEC SUBR WHICH:
                                                        !(1) D<11:06> -> IR<11:06>
            NEXT,   CALL[D11-06]                        !(2) BUT(INSTRS) INTO ZTARGET---
 (4020)  DCS[0.00.0.0.0.0]  BM[0100..00.11..00.01..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.011.110]



    !CHECK BIT<05:00> = "01 0101"
    4612:
    TEST115B3:

            PO,     LOAD-ENUA(ZTARGET432),              !INSTRS-E88 OUTPUT FOR BIT<05:00> = "010 101"
                    LOAD-ERROR(TEST115B3),              !ERROR DIRECTORY KEY
                    DCS-CTR(C6.),                       !COMPARE AT TARGET
            NEXT,   J/GOBUT115B3                        !
 (4612)  DCS[1.00.1.0.0.0]  BM[1001..00.11..11.00..011..010...0.0.0..0..0...0.0000...0..0000.0...11.000...000.010.001]

    4021:  !(FREE)
    GOBUT115B3:
            SETUP,  RETURN/SCOPE115B,                   !EXEC SUBR WHICH:
                                                        !(1) D<05:00> -> IR<05:00>
            NEXT,   CALL[D05-00]                        !(2) BUT(INSTRS) INTO ZTARGET---
 (4021)  DCS[0.00.0.0.0.0]  BM[0100..00.00..00.10..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.100.000]


    4022:  !(FREE)
    SCOPE115B:
            NEXT,   BUTD[SCOPE],                        !NO ERROR:  "TEST115C1"   (+1. WORDS)
                    J/TEST115C1                         !    ERROR:  "ALU115A1" (-17.WORDS)
 (4022)  DCS[0.00.0.1.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...110.001.001]
```

```


    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    !TESTS 115C 1-3 VERIFIES THAT WITH:
    !ALU=(NOT-A), A=(052525), B=(000000), THEN D=(125252)
    4611:
    TEST115C1:
            P0,     LOAD-ENUA(ZTARGET412),                  !BIT <15:12> = "1010"
                    LOAD-ERROR(TEST115C1),                  !ERROR DIRECTORY KEY
                    DCS-CTR(C6.),                           !COMPARE AT TARGET
            NEXT,   J/ALU115C1                              !
 (4611)  DCS[1.00.1.0.0.0]  BM[1001..00.11..11.00..001..010...0.0.0..0..0...0.0000...0..0000.0...11.000...110.010.010]

    4622:
    ALU115C1:
            P0,     BUMP-VERIFY,                            !COUNT
            P2-T,   D←NOT-A, SAVE-D[C],                     !ALU=(NOT-A)
                    BUS-A←ASPHI(C052525),                   !A=(052525)
                    BUS-B←CSPD(C000000),                    !B=(000000)
            NEXT,   J/GOBUT115C1                            !D=(125252)
 (4622)  DCS[0.00.0.0.0.1]  BM[0000..10.00..11.01..111..111...0.1.0..0..0...0.0100...0..0000.0...11.000...000.010.011]

    4023:  !(FREE)
    GOBUT115C1:
            SETUP,  RETURN/TEST115C2,                       !EXEC SUBR WHICH:
                                                            !(1) D<15:12> -> IR<15:12>
            NEXT,   CALL[D15-12]                            !(2) BUT(IR15-12) INTO ZTARGET---
 (4023)  DCS[0.00.0.0.0.0]  BM[0100..00.11..00.01..111..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.011.100]

    !CHECK BIT<11:06> = "1010 10"
    4617:
    TEST115C2:
            P0,     LOAD-ENUA(ZTARGET412),                  !INSTR5-E78 OUTPUT FOR BIT <11:06> = "101 010"
                    LOAD-ERROR(TEST115C2),                  !ERROR DIRECTORY KEY
                    DCS-CTR(C6.),                           !COMPARE AT TARGET
                    BUMP-VERIFY,                            !COUNT
            NEXT,   J/GOBUT115C2                            !
 (4617)  DCS[1.00.1.0.0.1]  BM[1001..00.11..11.00..001..010...0.0.0..0..0...0.0000...0..0000.0...11.000...000.010.100]

    4024:  !(FREE)
    GOBUT115C2:
            SETUP,  RETURN/TEST115C3,                       !EXEC SUBR WHICH:
                                                            !(1) D<11:06> -> IR<11:06>
            NEXT,   CALL[D11-06]                            !(2) BUT(INSTR5) INTO ZTARGET---
 (4024)  DCS[0.00.0.0.0.0]  BM[0100..00.11..00.10..111..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.011.110]



    !CHECK BIT<05:00> = "10 1010"
    4627:
    TEST115C3:
```

```
          PO,     LOAD-ENUA(ZTARGET425),                    !INSTR5-E88 OUTPUT FOR BIT<05:00> = "101 010"
                  LOAD-ERROR(TEST115C3),                    !ERROR DIRECTORY KEY
                  DCS-CTR(C6.),                             !COMPARE AT TARGET
          NEXT,   J/GOBUT115C3                              !
  (4627)  DCS[1.00.1.0.0.0]  BM[1001..00.11..11.00..010..101...0.0.0..0..0...0.0000...0..0000.0...11.000...000.010.101]

     4025:  !(FREE)
     GOBUT115C3:
          SETUP,  RETURN/TEST115D1,                         !EXEC SUBR WHICH:
                                                            !(1) D<05:00> -> IR<05:00>
          NEXT,   CALL[D05-00]                              !(2) BUT(INSTR5) INTO ZTARGET---
  (4025)  DCS[0.00.0.0.0.0]  BM[0100..00.11..00.10..110..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.100.000]




     ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

     !TESTS 115D 1-3 VERIFIES THAT WITH:
     !ALU=(NOT-A, A=(125252), B=(000000), THEN D=(052525)
     4626:
     TEST115D1:
          PO,     LOAD-ENUA(ZTARGET405),                    !BIT<15:12> = "0101"
                  LOAD-ERROR(TEST115D1),                    !ERROR DIRECTORY KEY
                  DCS-CTR(C6.),                             !COMPARE AT TARGET
          NEXT,   J/ALU115D1                                !
  (4626)  DCS[1.00.1.0.0.0]  BM[1001..00.11..11.00..000..101...0.0.0..0..0...0.0000...0..0000.0...11.000...000.010.110]

     4026:  !(FREE)
     ALU115D1:
          PO,     BUMP-VERIFY,                              !COUNT
          P2-T,   D+NOT-A, SAVE-D[C],                       !ALU=(NOT-A), D[C]+0
                  BUS-A+ASPHI(C125252),                     !A=(125252)
                  BUS-B+CSPD(C000000),                      !B=(000000)
          NEXT,   J/GOBUT115D1                              !D=(052525)
  (4026)  DCS[0.00.0.0.0.1]  BM[0000..10.00..11.01..110..111...0.1.0..0..0...0.0100...0..0000.0...11.000...000.010.111]

     4027:  !(FREE)
     GOBUT115D1:
          SETUP,  RETURN/TEST115D2,                         !EXEC SUBR WHICH:
                                                            !(1) D<15:12> -> IR<15:12>
          NEXT,   CALL[D15-12]                              !(2) BUT(IR15-12) INTO ZTARGET---
  (4027)  DCS[0.00.0.0.0.0]  BM[0100..00.11..00.10..101..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.011.100]

     !CHECK BIT<11:06> = "0101 01"
     4625:
     TEST115D2:
          PO,     LOAD-ENUA(ZTARGET405),                    !INSTR5-E78 OUTPUT FOR BIT<11:06> = "010 101"
                  LOAD-ERROR(TEST115D2),                    !ERROR DIRECTORY KEY
                  DCS-CTR(C6.),                             !COMPARE AT TARGET
                  BUMP-VERIFY,                              !COUNT
```

```
                NEXT,   J/GOBUT115D2                            !
        (4625)  DCS[1.00.1.0.0.1]  BM[1001..00.11..11.00..000..101...0.0.0..0..0...0.0000...0..0000.0...11.000...000.011.000]

        4030:  !(FREE)
        GOBUT115D2:
                SETUP,  RETURN/TEST115D3,                       !EXEC SUBR WHICH:
                                                                !(1) D<11:06> -> IR<11:06>
                NEXT,   CALL[D11-06]                            !(2) BUT(INSTRS) INTO ZTARGET---
        (4030)  DCS[0.00.0.0.0.0]  BM[0100..00.11..00.10..100..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.011.110]



        !CHECK BIT<05:00> = "01 0101"
        4624:
        TEST115D3:

                PO,     LOAD-ENUA(ZTARGET432),                  !INSTRS-E88 OUTPUT FOR BIT<05:00> = "010 101"
                        LOAD-ERROR(TEST115D3),                  !ERROR DIRECTORY KEY
                        DCS-CTR(C6.),                           !COMAPRE AT TARGET
                NEXT,   J/GOBUT115D3                            !
        (4624)  DCS[1.00.1.0.0.0]  BM[1001..00.11..11.00..011..010...0.0.0..0..0...0.0000...0..0000.0...11.000...000.011.001]

        4031:  !(FREE)
        GOBUT115D3:
                SETUP,  RETURN/SCOPE115D,                       !EXEC SUBR WHICH:
                                                                !(1) D<05:00> -> IR<05:00>
                NEXT,   CALL[D05-00]                            !(2) BUT(INSTRS) INTO ZTARGET---
        (4031)  DCS[0.00.0.0.0.0]  BM[0100..00.00..00.11..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.100.000]

        4032:  !(FREE)
        SCOPE115D:
                PO,     BUMP-VERIFY,                            !COUNT
                NEXT,   BUTD[SCOPE],                            !NO ERROR: "TEST116A1" (+1. WORDS)
                        J/TEST116A1                             !   ERROR: "ALU115C1"  (-13. WORDS)
        (4032)  DCS[0.00.0.1.0.1]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...110.010.011]




        ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

        !THIS NEXT SET OF 12. TESTS EXERCISES THE ALU FUNCTIONS
        !"ZERO" AND "NOT-A-AND-B", AND THE D[C] INPUTS "ALU15" AND "D[C]"

        ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

        !TESTS 116A 1-5 VERIFIES THAT WITH:
        !ALU=(NOT-A-AND-B), A=(000000), B=(125252), THEN D=(125252)
        4623:
        TEST116A1:
                PO,     LOAD-ENUA(ZTARGET412),                  !BIT<15:12> = "1010"
                        LOAD-ERROR(TEST116A1),                  !ERROR DIRECTORY KEY
```

```
                DCS-CTR(C6.),                            !COMPARE AT TARGET
           NEXT, J/ALU116A1                              !
   (4623) DCS[1.00.1.0.0.0] BM[1001..00.11..11.00..001..010...0.0.0..0..0...0.0000...0..0000.0...11.000...110.011.100]

   4634:
   ALU116A1:
           P0,   BUMP-VERIFY,                            !COUNT
           P2-T, D+NOT-A-AND-B, D[C]+ALU15,              !ALU=(NOT-A-AND-B), D[C]=(1)
                 BUS-A+ASPHI(C000000),                   !A=(000000)
                 BUS-B+CSPD(C125252),                    !B=(125252)
           NEXT, J/GOBUT116A1                            !D=(125252)
   (4634) DCS[0.00.0.0.0.1] BM[0010..10.00..11.01..100..100...0.1.0..0..0...0.0110...0..0000.0...11.000...000.011.011]

   4033: !(FREE)
   GOBUT116A1:
           SETUP, RETURN/TEST116A2,                      !EXEC SUBR WHICH:
                                                         !(1) D<15:12> -> IR<15:12>
           NEXT,  CALL[D15-12]                           !(2) BUT (IR15-12) INTO ZTARGET---
   (4033) DCS[0.00.0.0.0.0] BM[0100..00.11..00.10..001..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.011.100]

   !CHECK THAT D[C] GOT A (1) FROM "ALU15," ABOVE
   4621:
   TEST116A2:
           P0,   LOAD-ENVA(ZTARGET403),                  !BIT <00> = D[C] = (1)
                 LOAD-ERROR(TEST116A2),                  !ERROR DIRECTORY KEY
                 DCS-CTR(C3.),                           !COMPARE AT TARGET
                 BUMP-VERIFY,                            !COUNT
           NEXT, J/GOBUT116A2                            !
   (4621) DCS[1.00.1.0.0.1] BM[1100..00.11..11.00..000..011...0.0.0..0..0...0.0000...0..0000.0...11.000...000.011.100]
   4034: !(FREE)
   GOBUT116A2:
           SETUP, RETURN/TEST116A3,                      !RETURN TO START OF NEXT SUBTEST
           NEXT,  GOTO-PAGE(7),                          !BUT TABLE
                  J/BUTD[C]A                             !D[C]H IN BIT <00>
   (4034) DCS[0.00.0.0.0.0] BM[0100..00.11..00.10..000..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.100]

   !CHECK BIT<11:06> = "1010 10"
   4620:
   TEST116A3:
           P0,   LOAD-ENVA(ZTARGET412),                  !INSTR5-E78 OUTPUT FOR BIT <11:06> = "101 010"
                 LOAD-ERROR(TEST116A3),                  !ERROR DIRECTORY KEY
                 DCS-CTR(C6.),                           !COMPARE AT TARGET
                 BUMP-VERIFY,                            !COUNT
           NEXT, J/GOBUT116A3                            !
   (4620) DCS[1.00.1.0.0.1] BM[1001..00.11..11.00..001..010...0.0.0..0..0...0.0000...0..0000.0...11.000...000.011.101]

   4035: !(FREE)
   GOBUT116A3:
           SETUP, RETURN/TEST116A4,                      !EXEC SUBR WHICH:
                                                         !(1) D<11:06> -> IR<11:06>
           NEXT,  CALL[D11-06]                           !(2) BUT(INSTR5) INTO ZTARGET---
```

```
(4035)  DCS[0.00.0.0.0.0]  BM[0100..00.11..00.11..111..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.011.110]



        !CHECK BIT<05:00> = "10 1010"
        4637:
        TEST116A4:

                PO,     LOAD-ENUA(ZTARGET425),                  !INSTRS-E88 OUTPUT FOR BIT <05:00> ="101 010"
                        LOAD-ERROR(TEST116A4),                  !ERROR DIRECTORY KEY
                        DCS-CTR(C6.),                           !COMPARE AT TARGET
                NEXT,   J/GOBUT116A4                            !
(4637)  DCS[1.00.1.0.0.0]  BM[1001..00.11..11.00..010..101...0.0.0..0..0...0.0000...0..0000.0...11.000...000.011.110]

        4036:   !(FREE)
        GOBUT116A4:
                SETUP,  RETURN/TEST116A5,                       !EXEC SUBR WHICH:
                                                                !(1) D<05:00> -> IR<05:00>
                NEXT,   CALL[D05-00]                            !(2) BUT(INSTRS) INTO ZTARGET---
(4036)  DCS[0.00.0.0.0.0]  BM[0100..00.11..00.11..110..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.100.000]



        !CHECK THAT D[C] WAS PROPOGATED UNCHANGED AS A (1), VIA D[C]+D[C]
        4636:
        TEST116A5:
                PO,     LOAD-ENUA(ZTARGET403),                  !BIT<01> = D[C] = (1)
                        LOAD-ERROR(TEST116A5),                  !ERROR DIRECTORY KEY
                        DCS-CTR(C3.),                           !COMPARE AT TARGET
                NEXT,   J/GOBUT116A5                            !
(4636)  DCS[1.00.1.0.0.0]  BM[1100..00.11..11.00..000..011...0.0.0..0..0...0.0000...0..0000.0...11.000...000.011.111]

        4037:   !(FREE)
        GOBUT116A5:
                SETUP,  RETURN/TEST116B,                        !RETURN TO START OF NEXT SUBTEST
                NEXT,   GOTO-PAGE(7),                           !BUT TABLE
                        J/BUTD[C]B                              !D[C]H IN BIT <01>
(4037)  DCS[0.00.0.0.0.0]  BM[0100..00.11..00.00..110..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.101.000]





        ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

        !TEST 116B VERIFIES THAT WITH:
        !ALU=(ZERO), A=(125252), B=(052525), THEN D=(000000)
        4606:
        TEST116B:
                PO,     LOAD-ENUA(ZTARGET434),                  !INSTRS FOR IR=(000000)
                        LOAD-ERROR(TEST116B),                   !ERROR DIRECTORY KEY
                        DCS-CTR(C6.),                           !COMPARE AT TARGET
```

```
            NEXT,    J/ALU116B                         !
    (4606)  DCS[1.00.1.0.0.0]  BM[1001..00.11..11.00..011..100...0.0.0..0..0...0.0000...0..0000.0...11.000...000.100.000]

    4040:  !(FREE)
    ALU116B:
            P2-T,    D+ZERO, SAVE-D[C],                !ALU=(ZERO), D[C]=D[C]=(1)
                     BUS-A+ASPHI(C125252),             !A=(125252)
                     BUS-B+CSPD(C052525),              !B=(052525)
            NEXT,    J/GOBUT116B                       !D=(000000)
    (4040)  DCS[0.00.0.0.0.0]  BM[0011..10.00..11.01..110..111...0.1.0..0..0...0.0111...0..0000.0...11.000...000.100.001]

    4041:  !(FREE)
    GOBUT116B:
            SETUP,   RETURN/SCOPE116C,                 !EXEC SUBR WHICH:
                                                       !(1) D-> IR
            NEXT,    CALL[DZERO]                       !(2) BUT(INSTRS) INTO ZTARGET---
    (4041)  DCS[0.00.0.0.0.0]  BM[0100..00.00..01.00..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.100.010]



    4042:  !(FREE)
    SCOPE116C:
            NEXT,    BUTD[SCOPE],                      !NO ERROR:  "TEST116C1"   (+1. WORDS)
                     J/TEST116C1                       !   ERROR:  "ALU116A1"  (-13. WORDS)
    (4042)  DCS[0.00.0.1.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...110.011.101]



    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    !TEST 116C 1-5 VERIFIES THAT WITH:
    !ALU=(NOT-A-AND-B), A=(000000), B=(052525), THEN D=(052525)
    4635:
    TEST116C1:
            P0,      LOAD-ENVA(ZTARGET405),            !BIT<15:12> = "0101"
                     LOAD-ERROR(TEST116C1),            !ERROR DIRECTORY KEY
                     DCS-CTR(C6.),                     !COMPARE AT TARGET
            NEXT,    J/ALU116C1                        !
    (4635)  DCS[1.00.1.0.0.0]  BM[1001..00.11..11.00..000..101...0.0.0..0..0...0.0000...0..0000.0...11.000...110.100.110]

    4646:
    ALU116C1:
            P0,      BUMP-VERIFY,                      !COUNT
            P2-T,    D+NOT-A-AND-B, D[C]+ALU15,        !ALU=(NOT-A-AND-B), D[C]=(0)
                     BUS-A+ASPHI(C000000),             !A=(000000)
                     BUS-B+CSPD(C052525),              !B=(052525)
            NEXT,    J/GOBUT116C1                      !D=(052525)
    (4646)  DCS[0.00.0.0.0.1]  BM[0010..10.00..11.01..100..100...0.1.0..0..0...0.0111...0..0000.0...11.000...000.100.011]

    4043:  !(FREE)
    GOBUT116C1:
            SETUP,   RETURN/TEST116C2,                 !EXEC SUBR WHICH:
                                                       !(1) D<15:12> -> IR<15:12>
```

```
        NEXT,   CALL[D15-12]                            !(2) BUT(IR15-12) INTO ZTARGET---
(4043)  DCS[0.00.0.0.0.0]  BM[0100..00.11..00.11..011..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.011.100]

   !CHECK THAT D[C] GOT A (0) FROM "ALU15", ABOVE
   4633:
   TEST116C2:
        PO,     LOAD-ENUA(ZTARGET402),                  !BIT <00> = D[C] = (0)
                LOAD-ERROR(TEST116C2),                  !ERROR DIRECTORY KEY
                DCS-CTR(C3.),                           !COMPARE AT TARGET
                BUMP-VERIFY,                            !COUNT
        NEXT,   J/GOBUT116C2                            !
(4633)  DCS[1.00.1.0.0.1]  BM[1100..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...000.100.100]

   4044:  !(FREE)
   GOBUT116C2:
        SETUP,  RETURN/TEST116C3,                       !RETURN TO START OF NEXT SUBTEST
        NEXT,   GOTO-PAGE(7),                           !BUT TABLE
                J/BUTD[C]A                              !D[C]H IN BIT<00>
(4044)  DCS[0.00.0.0.0.0]  BM[0100..00.11..00.11..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.100]

   !CHECK BIT<11:06> = "0101 01"
   4632:
   TEST116C3:
        PO,     LOAD-ENUA(ZTARGET405),                  !INSTRS-E78 OUTPUT FOR BIT<11:06>="010 101"
                LOAD-ERROR(TEST116C3),                  !ERROR DIRECTORY KEY
                DCS-CTR(C6.),                           !COMPARE AT TARGET
                BUMP-VERIFY,                            !COUNT
        NEXT,   J/GOBUT116C3                            !
(4632)  DCS[1.00.1.0.0.1]  BM[1001..00.11..11.00..000..101...0.0.0..0..0...0.0000...0..0000.0...11.000...000.100.101]

   4045:  !(FREE)
   GOBUT116C3:
        SETUP,  RETURN/TEST116C4,                       !EXEC SUBR WHICH:
                                                        !(1) D<11:06>-> IR<11:06>
        NEXT,   CALL[D11-06]                            !(2) BUT(INSTRS) INTO ZTARGET---
(4045)  DCS[0.00.0.0.0.0]  BM[0100..00.11..00.11..001..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.011.110]



   !CHECK BIT <05:00> = "01 0101"
   4631:
   TEST116C4:

        PO,     LOAD-ENUA(ZTARGET432),                  !INSTRS-E88 OUTPUT FOR BIT <05:00> = "010 101"
                LOAD-ERROR(TEST116C4),                  !ERROR DIRECTORY KEY
        NEXT,   J/GOBUT116C4                            !
(4631)  DCS[1.00.0.0.0.0]  BM[0000..00.11..11.00..011..010...0.0.0..0..0...0.0000...0..0000.0...11.000...000.100.110]

   4046:  !(FREE)
   GOBUT116C4:
        SETUP,  RETURN/TEST116C5,                       !EXEC SUBR WHICH:
```

```
                                                             !(1) D<05:00> -> IR<05:00>
            NEXT,   CALL[D05-00]                             !(2) BUT(INSTRS) INTO ZTARGET---
 (4046)  DCS[0.00.0.0.0.0]  BM[0100..00.11..00.11..000..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.100.000]


   !CHECK THAT D[C] WAS PROPOGATED UNCHANGED AS A (0), VIA D[C]+D[C]
   4630:
   TEST116C5:
            P0,     LOAD-ENUA(ZTARGET401),                   !BIT<01> = D[C] = (0)
                    LOAD-ERROR(TEST116C5),                   !ERROR DIRECTORY KEY
                    DCS-CTR(C3.),                            !COMPARE AT TARGET
            NEXT,   J/GOBUT116C5                             !
 (4630)  DCS[1.00.1.0.0.0]  BM[1100..00.11..11.00..000..001...0.0.0..0..0...0.0000...0..0000.0...11.000...000.100.111]

   4047:  !(FREE)
   GOBUT116C5:

            SETUP,  RETURN/TEST116D,                         !RETURN TO START OF NEXT SUBTEST
            NEXT,   GOTO-PAGE(7),                            !BUT TABLE
                    J/BUTD[C]B                               !D[C]H IN BIT <01>
 (4047)  DCS[0.00.0.0.0.0]  BM[0100..00.11..01.00..101..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.101.000]






   ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

   !TEST 116D VERIFIES THAT WITH:
   !ALU=(ZERO), A=(052525), B=(125252), THEN D=(000000)
   4645:
   TEST116D:
            P0,     LOAD-ENUA(ZTARGET434),                   !INSTRS FOR IR=(000000)
                    LOAD-ERROR(TEST116D),                    !ERROR DIRECTORY KEY
                    DCS-CTR(C6.),                            !COMPARE AT TARGET
            NEXT,   J/ALU116D                                !
 (4645)  DCS[1.00.1.0.0.0]  BM[1001..00.11..11.00..011..100...0.0.0..0..0...0.0000...0..0000.0...11.000...000.101.000]

   4050:  !(FREE)
   ALU116D:
            P2-T,   D+ZERO, SAVE-D[C],                       !ALU=(ZERO), D[C]=D[C]=(0)
                    BUS-A+ASPHI(C052525),                    !A=(052525)
                    BUS-B+CSPD(C125252),                     !B=(125252)
            NEXT,   J/GOBUT116D                              !D=(000000)
 (4050)  DCS[0.00.0.0.0.0]  BM[0011..10.00..11.01..111..111...0.1.0..0..0...0.0110...0..0000.0...11.000...000.101.001]

   4051:  !(FREE)
   GOBUT116D:
            SETUP,  RETURN/SCOPE116D,                        !EXEC SUBR WHICH:
                                                             !(1) D  -> IR
```

```
                NEXT,   CALL[DZERO]                                   !(2) BUT(INSTRS) INTO ZTARGET---
        (4051)  DCS[0.00.0.0.0.0]  BM[0100..00.00..01.01..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.100.010]



        4052:  !(FREE)
        SCOPE116D:
                NEXT,   BUTD[SCOPE],                                  !NO ERROR: "TEST117A1" (+1. WORDS)
                        J/TEST117A1                                   !   ERROR: "ALU116C1"  (-13. WORDS)
        (4052)  DCS[0.00.0.1.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...110.100.111]





        ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

        !THIS NEXT SET OF 9. TESTS EXERCIZES THE ALU FUNCTION
        !"A-AND-NOT-B", AND THE CARRYOUT OF "CINMUX=D[C]" INTO D[C]




        ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

        !TESTS 117A 1-4 VERIFIES THAT WITH:
        !ALU=(A-AND-NOT-B), A=(177777), B=(125252), THEN D=(052525)
        4647:
        TEST117A1:
                P0,     LOAD-ENUA(ZTARGET405),                        !BIT<15:12> = "0101"
                        LOAD-ERROR(TEST117A1),                        !ERROR DIRECTORY KEY
                        DCS-CTR(C6.),                                 !COMPARE AT TARGET
                NEXT,   J/ALU117A1                                    !
        (4647)  DCS[1.00.1.0.0.0]  BM[1001..00.11..11.00..000..101...0.0.0..0..0...0.0000...0..0000.0...11.000...110.110.110]

        4666:
        ALU117A1:
                P0,     BUMP-VERIFY,                                  !COUNT
                P2-T,   D+A-AND-NOT-B, D[C]+CINMUX,                   !ALU=(A-AND-NOT-B), D[C]=CIN=D[C]=(0)
                        BUS-A+ASPHI(C177777),                         !A=(177777)
                        BUS-B+CSPD(C125252),                          !B=(125252)
                NEXT,   J/GOBUT117A1                                  !D=(052525)
        (4666)  DCS[0.00.0.0.0.1]  BM[0111..10.00..11.01..101..000...0.1.0..0..0...0.0110...0..0000.0...11.000...000.101.011]

        4053:  !(FREE)
        GOBUT117A1:
                SETUP,  RETURN/TEST117A2,                             !EXEC SUBR WHICH:
                                                                      !(1) D<15:12> -> IR<15:12>
                NEXT,   CALL[D15-12]                                  !(2) BUT(IR15-12) INTO ZTARGET---
        (4053)  DCS[0.00.0.0.0.0]  BM[0100..00.11..01.00..100..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.011.100]

        !CHECK BIT<11:06> = "0101 01"
```

```
    4644:
    TEST117A2:
            PO,      LOAD-ENUA(ZTARGET405),             !INSTRS-E78 OUTPUT FOR BIT<11:06>="010 101"
                     LOAD-ERROR(TEST117A2),             !ERROR DIRECTORY KEY
                     DCS-CTR(C6.),                      !COMPARE AT TARGET
                     BUMP-VERIFY,                       !COUNT
            NEXT,    J/GOBUT117A2                       !
 (4644) DCS[1.00.1.0.0.1] BM[1001..00.11..11.00..000..101...0.0.0..0..0...0.0000...0..0000.0...11.000...000.101.100]

    4054: !(FREE)
    GOBUT117A2:
            SETUP,   RETURN/TEST117A3,                  !EXEC SUBR WHICH:
                                                        !(1) D<11:06> -> IR<11:06>
            NEXT,    CALL[D11-06]                       !(2) BUT(INSTRS) INTO ZTARGET---
 (4054) DCS[0.00.0.0.0.0] BM[0100..00.11..01.00..011..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.011.110]



    !CHECK BIT<05:00> = "01 0101"
    4643:
    TEST117A3:

            PO,      LOAD-ENUA(ZTARGET432),             !INSTRS-E88 OUTPUT FOR BIT <05:00>="010 101"
                     LOAD-ERROR(TEST117A3),             !ERROR DIRECTORY KEY
                     DCS-CTR(C6.),                      !COMPARE AT TARGET
            NEXT,    J/GOBUT117A3                       !
 (4643) DCS[1.00.1.0.0.0] BM[1001..00.11..11.00..011..010...0.0.0..0..0...0.0000...0..0000.0...11.000...000.101.101]

    4055: !(FREE)
    GOBUT117A3:
            SETUP,   RETURN/TEST117A4,                  !EXEC SUBR WHICH:
                                                        !(1) D<05:00> -> IR<05:00>
            NEXT,    CALL[D05-00]                       !(2) BUT(INSTRS) INTO ZTARGET---
 (4055) DCS[0.00.0.0.0.0] BM[0100..00.11..01.00..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.100.000]

    !CHECK THAT D[C] GOT A (0) FROM CINMUX, ABOVE
    4642:
    TEST117A4:
            PO,      LOAD-ENUA(ZTARGET413),             !BIT<02> = D[C] = (0)
                     LOAD-ERROR(TEST117A4),             !ERROR DIRECTORY KEY
                     DCS-CTR(C3.),                      !COMPARE AT TARGET
                     BUMP-VERIFY,                       !COUNT
            NEXT,    J/GOBUT117A4                       !
 (4642) DCS[1.00.1.0.0.1] BM[1100..00.11..11.00..001..011...0.0.0..0..0...0.0000...0..0000.0...11.000...000.101.110]

    4056: !(FREE)
    GOBUT117A4:
            SETUP,   RETURN/TEST117B1,                  !RETURN TO START OF NEXT SUBTEST
            NEXT,    GOTO-PAGE(7),                      !BUT TABLE
                     J/BUTD[C]C                         !D[C]H IN BIT<02>
 (4056) DCS[0.00.0.0.0.0] BM[0100..00.11..01.00..001..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.001.000]
```

```
    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    !TESTS 117B 1-3 VERIFIES THAT WITH:
    !ALU=(A-AND-NOT-B), A=(177777), B=(052525), THEN D=(125252)
    4641:
    TEST117B1:
            P0,     LOAD-ENVA(ZTARGET412),                        !BIT<15:12> = "1010"
                    LOAD-ERROR(TEST117B1),                        !ERROR DIRECTORY KEY
                    DCS-CTR(C6.),                                 !COMPARE AT TARGET
            NEXT,   J/ALU117B1                                    !
(4641) DCS[1.00.1.0.0.0] BM[1001..00.11..11.00..001..010...0.0.0..0..0...0.0000...0..0000.0...11.000...000.101.111]

    4057:  !(FREE)
    ALU117B1:
            P0,     BUMP-VERIFY,                                  !COUNT
            P2-T,   D+A-AND-NOT-B, D[C]+ALU15,                    !ALU=(A-AND-NOT-B), D[C]=ALU15=(1)
                    BUS-A+ASPHI(C177777),                         !A=(177777)
                    BUS-B+CSPD(C052525),                          !B=(052525)
            NEXT,   J/GOBUT117B1                                  !D=(125252)
(4057) DCS[0.00.0.0.0.1] BM[0111..10.00..11.01..101..100...0.1.0..0..0...0.0111...0..0000.0...11.000...000.110.000]

    4060:  !(FREE)
    GOBUT117B1:
            SETUP,  RETURN/TEST117B2,                             !EXEC SUBR WHICH:
                                                                  !(1) D<15:12> -> IR<15:12>
            NEXT,   CALL[D15-12]                                  !(2) BUT(IR15-12) INTO ZTARGET---
(4060) DCS[0.00.0.0.0.0] BM[0100..00.11..01.00..000..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.011.100]

    !CHECK BIT <11:06> = "1010 10"
    4640:
    TEST117B2:
            P0,     LOAD-ENVA(ZTARGET412),                        !INSTR5-E78 OUTPUT FOR BIT <11:06>="101 010"
                    LOAD-ERROR(TEST117B2),                        !ERROR DIRECTORY KEY
                    DCS-CTR(C6.),                                 !COMPARE AT TARGET
                    BUMP-VERIFY,                                  !COUNT
            NEXT,   J/GOBUT117B2                                  !
(4640) DCS[1.00.1.0.0.1] BM[1001..00.11..11.00..001..010...0.0.0..0..0...0.0000...0..0000.0...11.000...000.110.001]

    4061:  !(FREE)
    GOBUT117B2:
            SETUP,  RETURN/TEST117B3,                             !EXEC SUBR WHICH:
                                                                  !(1) D<11:06> -> IR<11:06>
            NEXT,   CALL[D11-06]                                  !(2) BUT(INSTR5) INTO ZTARGET---
(4061) DCS[0.00.0.0.0.0] BM[0100..00.11..01.01..111..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.011.110]



    !CHECK BIT<05:00> = "10 1010"
```

```
        4657:
        TEST117B3:

                PO,     LOAD-ENUA(ZTARGET425),                  !INSTRS-E88 OUTPUT FOR BIT <05:00> = "101 010"
                        LOAD-ERROR(TEST117B3),                  !ERROR DIRECTORY KEY
                        DCS-CTR(C6.),                           !COMPARE AT TARGET
                NEXT,   J/GOBUT117B3                            !
   (4657) DCS[1.00.1.0.0.0]  BM[1001..00.11..11.00..010..101...0.0.0..0..0...0.0000...0..0000.0...11.000...000.110.010]

        4062:  !(FREE)
        GOBUT117B3:
                SETUP,  RETURN/TEST117C1,                       !EXEC SUBR WHICH:
                                                                !(1) D<05:00> -> IR<05:00>
                NEXT,   CALL[D05-00]                            !(2) BUT (INSTRS) INTO ZTARGET---
   (4062) DCS[0.00.0.0.0.0]  BM[0100..00.11..01.01..110..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.100.000]








        ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

        !TESTS 117C 1-2 VERIFIES THAT WITH:
        !ALU=(A-AND-NOT-B), A=(000000), B=(000000), THEN D=(000000)
        4656:
        TEST117C1:
                PO,     LOAD-ENUA(ZTARGET434),                  !INSTRS FOR IR=(000000)
                        LOAD-ERROR(TEST117C1),                  !ERROR DIRECTORY KEY
                        DCS-CTR(C6.),                           !COMPARE AT TARGET
                NEXT,   J/ALU117C1                              !
   (4656) DCS[1.00.1.0.0.0]  BM[1001..00.11..11.00..011..100...0.0.0..0..0...0.0000...0..0000.0...11.000...000.110.011]

        4063:  !(FREE)
        ALU117C1:
                P2-T,   D+A-AND-NOT-B, D[C]+CINMUX,             !ALU=(A-AND-NOT-B), D[C]=CINMUX=D[C]=(1)
                        BUS-A+ASPHI(C000000),                   !A=(000000)
                        BUS-B+CSPD(C000000),                    !B=(000000)
                NEXT,   J/GOBUT117C1                            !
   (4063) DCS[0.00.0.0.0.0]  BM[0111..10.00..11.01..100..000...0.1.0..0..0...0.0100...0..0000.0...11.000...000.110.100]

        4064:  !(FREE)
        GOBUT117C1:
                SETUP,  RETURN/TEST117C2,                       !EXEC SUBR WHICH:
                                                                !(19 D  -> IR
                NEXT,   CALL[DZERO]                             !(2) BUT(INSTRS) INTO ZTARGET---
   (4064) DCS[0.00.0.0.0.0]  BM[0100..00.11..01.11..111..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.100.010]


        !CHECK THAT D[C] GOT A (1) FROM CINMUX, ABOVE
        4677:
```

```
    TEST117C2:
            P0,      LOAD-ENUA(ZTARGET417),                     !BIT<02> = D[C] = (1)
                     LOAD-ERROR(TEST117C2),                     !ERROR DIRECTORY KEY
                     DCS-CTR(C3.),                              !COMPARE AT TARGET
            NEXT,    J/GOBUT117C2                               !
(4677)  DCS[1.00.1.0.0.0]  BM[1100..00.11..11.00..001..111...0.0.0..0..0...0.0000...0..0000.0...11.000...000.110.101]

    4065:  !(FREE)
    GOBUT117C2:
            SETUP,   RETURN/SCOPE117C,                          !RETURN TO SCOPE LOOP TEST WORD
            NEXT,    GOTO-PAGE(7),                              !BUT TABLE
                     J/BUTD[C]C                                 !BIT<02> = D[C]H
(4065)  DCS[0.00.0.0.0.0]  BM[0100..00.00..01.10..110..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.001.000]



    4066:  !(FREE)
    SCOPE117C:
            NEXT,    BUTD[SCOPE],                               !NO ERROR: "TEST120A1" (+1. WORDS)
                     J/TEST120A1                                ! ERROR: "ALU117A1" (-20. WORDS)
(4066)  DCS[0.00.0.1.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...110.110.111]


    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    !THIS NEXT SET OF 7. TESTS EXERCIZES THE ALU FUNCTION
    !"A-AND-B", AND THE CARRYOUT OF "CINMUX =(0) INTO D[C]

    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    !TESTS 120A 1-3 VERIFIES THAT WITH:
    !ALU=(A-AND-B), A=(125252), B=(177777), THEN D=(125252)
    4667:
    TEST120A1:
            P0,      LOAD-ENUA(ZTARGET412),                     !BIT<15:12> = "1010"
                     LOAD-ERROR(TEST120A1),                     !ERROR DIRECTORY KEY
                     DCS-CTR(C6.),                              !COMPARE AT TARGET
            NEXT,    J/ALU120A1                                 !
(4667)  DCS[1.00.1.0.0.0]  BM[1001..00.11..11.00..001..010...0.0.0..0..0...0.0000...0..0000.0...11.000...110.110.100]

    4664:
    ALU120A1:
            P0,      BUMP-VERIFY,                               !COUNT
            P2-T,    D←A-AND-B, D[C]←ALU15,                     !ALU=(A-AND-B), D[C]=(1)
                     BUS-A←ASPHI(C125252),                      !A=(125252)
                     BUS-B←CSPD(C177777),                       !B=(177777)
            NEXT,    J/GOBUT120A1                               !D=(125252)
(4664)  DCS[0.00.0.0.0.1]  BM[1011..10.00..11.01..110..100...0.1.0..0..0...0.0101...0..0000.0...11.000...000.110.111]

    4067:  !(FREE)
    GOBUT120A1:
            SETUP,   RETURN/TEST120A2,                          !EXEC SUBR WHICH:
                                                                !(1) D<15:12>  -> IR<15:12>
```

```
              NEXT,   CALL[D15-12]                           !(2) BUT(IR15-12) INTO ZTARGET---
     (4067)  DCS[0.00.0.0.0.0.0]  BM[0100..00.11..01.01..101..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.011.100]

       !CHECK BIT <11:06> = "1010 10"
       4655:
       TEST120A2:
              PO,     LOAD-ENUA(ZTARGET412),                 !INSTR5-E78 OUTPUT FOR BIT <11:06> = "101 010"
                      LOAD-ERROR(TEST120A2),                 !ERROR DIRECTORY KEY
                      DCS-CTR(C6.),                          !COMPARE AT TARGET
                      BUMP-VERIFY,                           !COUNT
              NEXT,   J/GOBUT120A2                           !
     (4655)  DCS[1.00.1.0.0.1]  BM[1001..00.11..11.00..001..010...0.0.0..0..0...0.0000...0..0000.0...11.000...000.111.000]

       4070:  !(FREE)
       GOBUT120A2:
              SETUP,  RETURN/TEST120A3,                      !EXEC SUBR WHICH:
                                                             !(1) D<11:06> -> IR<11:06>
              NEXT,   CALL[D11-06]                           !(2) BUT(INSTR5) INTO ZTARGET---
     (4070)  DCS[0.00.0.0.0.0.0]  BM[0100..00.11..01.01..100..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.011.110]



       !CHECK BIT<05:00> = "10 1010"
       4654:
       TEST120A3:

              PO,     LOAD-ENUA(ZTARGET425),                 !INSTR5-E88 OUTPUT FOR BIT<05:00>="101 010"
                      LOAD-ERROR(TEST120A3),                 !ERROR DIRECTORY KEY
                      DCS-CTR(C6.),                          !COMPARE AT TARGET
              NEXT,   J/GOBUT120A3                           !
     (4654)  DCS[1.00.1.0.0.0]  BM[1001..00.11..11.00..010..101...0.0.0..0..0...0.0000...0..0000.0...11.000...000.111.001]

       4071:  !(FREE)
       GOBUT120A3:
              SETUP,  RETURN/TEST120B1,                      !EXEC SUBR WHICH:
                                                             !(1) D<05:00> -> IR<05:00>
              NEXT,   CALL[D05-00]                           !(2) BUT(INSTR5) INTO ZTARGET---
     (4071)  DCS[0.00.0.0.0.0.0]  BM[0100..00.11..01.01..011..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.100.000]




       ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

       !TESTS 120B 1-4 VERIFIES THAT WITH:
       !ALU=(A-AND-B), A=(052525), B=(177777), THEN D=(052525)
       4653:
       TEST120B1:
              PO,     LOAD-ENUA(ZTARGET405),                 !BIT<15:12> = "0101"
                      LOAD-ERROR(TEST120B1),                 !ERROR DIRECTORY KEY
                      DCS-CTR(C6.),                          !COMPARE AT TARGET
```

```
              NEXT,   J/ALU120B1                                   !
     (4653)  DCS[1.00.1.0.0.0]  BM[1001..00.11..11.00..000..101...0.0.0..0..0...0.0000...0..0000.0...11.000...000.111.010]

        4072:  !(FREE)
        ALU120B1:

              P2-T,   D←A-AND-B, D[C]←CINMUX,                      !ALU=(A-AND-B), D[C]=CIN=(0)
                      BUS-A←ASPHI(C052525),                        !A=(052525)
                      BUS-B←CSPD(C177777),                         !B=(177777)
              NEXT,   J/GOBUT120B1                                 !D=(052525)
     (4072)  DCS[0.00.0.0.0.0]  BM[1011..10.00..11.01..111..000...0.1.0..0..0...0.0101...0..0000.0...11.000...000.111.011]

        4073:  !(FREE)
        GOBUT120B1:
              SETUP,  RETURN/TEST120B2,                            !EXEC SUBR WHICH:
                                                                   !(1) D<15:12> -> IR<15:12>
              NEXT,   CALL[D15-12]                                 !(2) BUT(IR15-12) INTO ZTARGET---
     (4073)  DCS[0.00.0.0.0.0]  BM[0100..00.11..01.01..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.011.100]

        !CHECK BIT<11:06> = "0101 01"
        4652:
        TEST120B2:
              P0,     LOAD-ENUA(ZTARGET405),                       !INSTR5-E78 OUTPUT FOR BIT<11:06>="010 101"
                      LOAD-ERROR(TEST120B2),                       !ERROR DIRECTORY KEY
                      DCS-CTR(C6.),                                !COMPARE AT TARGET
                      BUMP-VERIFY,                                 !COUNT
              NEXT,   J/GOBUT120B2                                 !
     (4652)  DCS[1.00.1.0.0.1]  BM[1001..00.11..11.00..000..101...0.0.0..0..0...0.0000...0..0000.0...11.000...000.111.100]

        4074:  !(FREE)
        GOBUT120B2:
              SETUP,  RETURN/TEST120B3,                            !EXEC SUBR WHICH:
                                                                   !(1) D<11:06> -> IR<11:06>
              NEXT,   CALL[D11-06]                                 !(2) BUT(INSTR5) INTO ZTARGET---
     (4074)  DCS[0.00.0.0.0.0]  BM[0100..00.11..01.01..001..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.011.110]



        !CHECK BIT<05:00> = "01 0101"
        4651:
        TEST120B3:

              P0,     LOAD-ENUA(ZTARGET432),                       !INSTR5-E88 OUTPUT FOR BIT <05:00>="010 101"
                      LOAD-ERROR(TEST120B3),                       !ERROR DIRECTORY KEY
                      DCS-CTR(C6.),                                !COMPARE AT TARGET
              NEXT,   J/GOBUT120B3                                 !
     (4651)  DCS[1.00.1.0.0.0]  BM[1001..00.11..11.00..011..010...0.0.0..0..0...0.0000...0..0000.0...11.000...000.111.101]

        4075:  !(FREE)
        GOBUT120B3:
              SETUP,  RETURN/TEST120B4,                            !EXEC SUBR WHICH:
                                                                   !(1) D<05:00> -> IR<05:00>
```

```
        NEXT,   CALL[DOS-00]                            !(2) BUT(INSTRS) INTO ZTARGET---
 (4075) DCS[0.00.0.0.0.0] BM[0100..00.11..01.01..000..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.100.000]

    !CHECK THAT D[C] GOT A (0) FROM "CINMUX" = (0)
    4650:
    TEST120B4:
        P0,     LOAD-ENUA(ZTARGET402),                  !BIT<00> = D[C] = (0)
                LOAD-ERROR(TEST120B4),                  !ERROR DIRECTORY KEY
                DCS-CTR(C3.),                           !COMPARE AT TARGET
                BUMP-VERIFY,                            !COUNT
        NEXT,   J/GOBUT120B4                            !
 (4650) DCS[1.00.1.0.0.1] BM[1100..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...000.111.110]

    4076: !(FREE)
    GOBUT120B4:
        SETUP,  RETURN/SCOPE120B,                       !RETURN TO SCOPE LOOP TEST WORD
        NEXT,   GOTO-PAGE(7),                           !BUT TABLE
                J/BUTD[C]A                              !D[C]H IN BIT <00>
 (4076) DCS[0.00.0.0.0.0] BM[0100..00.00..01.11..111..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.100]

    4077: !(FREE)
    SCOPE120B:
        NEXT,   BUTD[SCOPE],                            !NO ERROR:  "TEST121A1" (+1. WORDS)
                J/TEST121A1                             !   ERROR:  "ALU120A1"  (-15. WORDS)
 (4077) DCS[0.00.0.1.0.0] BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...110.110.101]




    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    !THIS NEXT SET OF 16. TESTS EXERCIZES THE ALU FUNCTION
    !"A-XOR-B", AND THE CARRYOUT FUNCTIONS OF "ALU00" AND "ALU07" INTO D[C]

    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -


    !TESTS 121A 1-4 VERIFIES THAT WITH:
    !ALU=(A-XOR-B), A=(000000), B=(052525), THEN D=(052525)
    4665:
    TEST121A1:
        P0,     LOAD-ENUA(ZTARGET405),                  !BIT<15:12> = "0101"
                LOAD-ERROR(TEST121A1),                  !ERROR DIRECTORY KEY
                DCS-CTR(C6.),                           !COMPARE AT TARGET
        NEXT,   J/ALU121A1                              !
 (4665) DCS[1.00.1.0.0.0] BM[1001..00.11..11.00..000..101...0.0.0..0..0...0.0000...0..0000.0...11.000...111.000.110]

    4706:
    ALU121A1:
        P0,     BUMP-VERIFY,                            !COUNT
        P2-T,   D←A-XOR-B, D[C]←ALU00,                  !ALU=(A-XOR-B), D[C]=ALU00=(1)
```

```
                         BUS-A←ASPHI(C000000),                    !A=(000000)
                         BUS-B←CSPO(C052525),                     !B=(052525)
                 NEXT,   J/GOBUT121A1                             !D=(052525)
    (4706)  DCS[0.00.0.0.0.1]  BM[0110..10.00..11.01..100..010...0.1.0..0..0...0.0111...0..0000.0...11.000...001.000.011]

        4103:  !(FREE)
        GOBUT121A1:
                 SETUP,  RETURN/TEST121A2,                        !EXEC SUBR WHICH:
                                                                  !(1) D<15:12> -> IR<15:12>
                 NEXT,   CALL[D15-12]                             !(2) BUT(IR15-12) INTO ZTARGET---
    (4103)  DCS[0.00.0.0.0.0]  BM[0100..00.11..01.11..110..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.011.100]

        !CHECK BIT<11:06> = "0101 01"
        4676:
        TEST121A2:
                 PO,     LOAD-ENUA(ZTARGET405),                   !INSTRS-E78 OUTPUT FOR BIT<11:06>="010 101"
                         LOAD-ERROR(TEST121A2),                   !ERROR DIRECTORY KEY
                         DCS-CTR(C6.),                            !COMPARE AT TARGET
                         BUMP-VERIFY,                             !COUNT
                 NEXT,   J/GOBUT121A2                             !
    (4676)  DCS[1.00.1.0.0.1]  BM[1001..00.11..11.00..000..101...0.0.0..0..0...0.0000...0..0000.0...11.000...001.000.100]

        4104:  !(FREE)
        GOBUT121A2:
                 SETUP,  RETURN/TEST121A3,                        !EXEC SUBR WHICH:
                                                                  !(1) D<11:06> -> IR<11:06>
                 NEXT,   CALL[D11-06]                             !(2) BUT(INSTRS) INTO ZTARGET---
    (4104)  DCS[0.00.0.0.0.0]  BM[0100..00.11..01.11..101..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.011.110]



        !CHECK BIT<05:00> = "01 0101"
        4675:
        TEST121A3:
                 PO,     LOAD-ENUA(ZTARGET432),                   !INSTRS-E88 OUTPUT FOR BIT<05:00>="010 101"
                         LOAD-ERROR(TEST121A3),                   !ERROR DIRECTORY KEY
                         DCS-CTR(C6.),                            !COMPARE AT TARGET
                 NEXT,   J/GOBUT121A3                             !
    (4675)  DCS[1.00.1.0.0.0]  BM[1001..00.11..11.00..011..010...0.0.0..0..0...0.0000...0..0000.0...11.000...001.000.101]

        4105:  !(FREE)
        GOBUT121A3:
                 SETUP,  RETURN/TEST121A4,                        !EXEC SUBR WHICH:
                                                                  !(1) D<05:00> -> IR<05:00>
                 NEXT,   CALL[D05-00]                             !(2) BUT(INSTRS) INTO ZTARGET---
    (4105)  DCS[0.00.0.0.0.0]  BM[0100..00.11..01.11..100..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.100.000]

        !CHECK THAT D[C] GOT A (1) FROM "ALU00"
        4674:
        TEST121A4:
                 PO,     LOAD-ENUA(ZTARGET403),                   !BIT<01> = D[C] = (1)
```

```
                        LOAD-ERROR(TEST121A4),                          !ERROR DIRECTORY KEY
                        DCS-CTR(C3.),                                   !COMPARE AT TARGET
                        BUMP-VERIFY,                                    !COUNT
                NEXT,   J/GOBUT121A4                                    !
        (4674)  DCS[1.00.1.0.0.1]  BM[1100..00.11..11.00..000..011...0.0.0..0..0...0.0000...0..0000.0...11.000...001.000.110]

        4106:   !(FREE)
        GOBUT121A4:
                SETUP,  RETURN/TEST121B1,                               !RETURN TO START OF NEXT SUBTEST
                NEXT,   GOTO-PAGE(7),                                   !BUT TABLE
                        J/BUTD[C]B                                      !D[C]H IN BIT<01>
        (4106)  DCS[0.00.0.0.0.0]  BM[0100..00.11..01.10..011..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.101.000]




        ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

        !TESTS 121B 1-4 VERIFIES THAT WITH:
        !ALU=(A-XOR-B), A=(177777), B=(052525), THEN D=(125252)
        4663:
        TEST121B1:
                P0,     LOAD-ENUA(ZTARGET412),                          !BIT<15:12> = "1010"
                        LOAD-ERROR(TEST121B1),                          !ERROR DIRECTORY KEY
                        DCS-CTR(C6.),                                   !COMPARE AT TARGET
                NEXT,   J/ALU121B1                                      !
        (4663)  DCS[1.00.1.0.0.0]  BM[1001..00.11..11.00..001..010...0.0.0..0..0...0.0000...0..0000.0...11.000...001.000.111]

        4107:   !(FREE)
        ALU121B1:
                P0,     BUMP-VERIFY,                                    !COUNT
                P2-T,   D←A-XOR-B, D[C]←ALU00,                          !ALU=(A-XOR-B), D[C]=ALU00=(0)
                        BUS-A←ASPHI(C177777),                           !A=(177777)
                        BUS-B←CSPD(C052525),                            !B=(052525)
                NEXT,   J/GOBUT121B1                                    !D=(125252)
        (4107)  DCS[0.00.0.0.0.1]  BM[0110..10.00..11.01..101..010...0.1.0..0..0...0.0111...0..0000.0...11.000...001.001.000]

        4110:   !(FREE)
        GOBUT121B1:
                SETUP,  RETURN/TEST121B2,                               !EXEC SUBR WHICH:
                                                                        !(1) D<15:12> -> IR<15:12>
                NEXT,   CALL[D15-12]                                    !(2) BUT(IR15-12) INTO ZTARGET---
        (4110)  DCS[0.00.0.0.0.0]  BM[0100..00.11..01.10..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.011.100]

        !CHECK BIT<11:06> = "1010 10"
        4662:
        TEST121B2:
                P0,     LOAD-ENUA(ZTARGET412),                          !INSTR5-E78 OUTPUT FOR BIT<11:06>="101 010"
                        LOAD-ERROR(TEST121B2),                          !ERROR DIRECTORY KEY
                        DCS-CTR(C6.),                                   !COMPARE AT TARGET
                        BUMP-VERIFY,                                    !COUNT
                NEXT,   J/GOBUT121B2                                    !
```

```
(4662) DCS[1.00.1.0.0.1] BM[1001..00.11..11.00..001..010...0.0.0..0..0...0.0000...0..0000.0...11.000...001.001.001]

4111: !(FREE)
GOBUT121B2:
        SETUP,  RETURN/TEST121B3,                        !EXEC SUBR WHICH:
                                                         !(1) D<11:06> -> IR<11:06>
        NEXT,   CALL[D11-06]                             !(2) BUT(INSTRS) INTO ZTARGET---
(4111) DCS[0.00.0.0.0.0] BM[0100..00.11..01.10..001..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.011.110]



!CHECK BIT<05:00> = "10 1010"
4661:
TEST121B3:

        PO,     LOAD-ENUA(ZTARGET425),                   !INSTRS-E88 OUTPUT FOR BIT<05:00>="101 010"
                LOAD-ERROR(TEST121B3),                   !ERROR DIRECTORY KEY
                DCS-CTR(C6.),                            !COMPARE AT TARGET
        NEXT,   J/GOBUT121B3                             !
(4661) DCS[1.00.1.0.0.0] BM[1001..00.11..11.00..010..101...0.0.0..0..0...0.0000...0..0000.0...11.000...001.001.010]

4112: !(FREE)
GOBUT121B3:
        SETUP,  RETURN/TEST121B4,                        !EXEC SUBR WHICH:
                                                         !(1) D<05:00> -> IR<05:00>
        NEXT,   CALL[D05-00]                             !(2) BUT(INSTRS) INTO ZTARGET---
(4112) DCS[0.00.0.0.0.0] BM[0100..00.11..01.10..000..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.100.000]

!CHECK THAT D[C] GOT A (0) FROM "ALUDO"
4660:
TEST121B4:
        PO,     LOAD-ENUA(ZTARGET401),                   !BIT<01> = D[C] = (0)
                LOAD-ERROR(TEST121B4),                   !ERROR DIRECTORY KEY
                DCS-CTR(C3.),                            !COMPARE AT TARGET
                BUMP-VERIFY,                             !COUNT
        NEXT,   J/GOBUT121B4                             !
(4660) DCS[1.00.1.0.0.1] BM[1100..00.11..11.00..000..001...0.0.0..0..0...0.0000...0..0000.0...11.000...001.001.011]

4113: !(FREE)
GOBUT121B4:
        SETUP,  RETURN/SCOPE121C,                        !RETURN TO SCOPE LOOP TEST WORD
        NEXT,   GOTO-PAGE(7),                            !BUT TABLE
                J/BUTD[C]B                               !D[C]H IN BIT<01]
(4113) DCS[0.00.0.0.0.0] BM[0100..00.00..10.01..100..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.101.000]



4114: !(FREE)
SCOPE121C:
        NEXT,   BUTD[SCOPE],                             !NO ERROR:  "TEST121C1"   (+1. WORDS)
                J/TEST121C1                              !   ERROR:  "ALU121A1"  (-17. WORDS)
```

```
(4114)  DCS[0.00.0.1.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...111.000.111]


        ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

        !TESTS 121C 1-4 VERIFIES THAT WITH:
        !ALU=(A-XOR-B), A=(000000), B=(125252), THEN D=(125252)
        4707:
        TEST121C1:
                PO,     LOAD-ENUA(ZTARGET412),                  !BIT<15:12> = "1010"
                        LOAD-ERROR(TEST121C1),                  !ERROR DIRECTORY KEY
                        DCS-CTR(C6.),                           !COMPARE AT TARGET
                NEXT,   J/ALU121C1                              !
(4707)  DCS[1.00.1.0.0.0]  BM[1001..00.11..11.00..001..010...0.0.0..0..0...0.0000...0..0000.0...11.000...110.111.000]

        4670:
        ALU121C1:
                PO,     BUMP-VERIFY,                            !COUNT
                P2-T,   D+A-XOR-B, D[C]+ALU07,                  !ALU=(A-XOR-B), D[C]=ALU07=(1)
                        BUS-A+ASPHI(C000000),                   !A=(000000)
                        BUS-B+CSPD(C125252),                    !B=(125252)
                NEXT,   J/GOBUT121C1                            !D=(125252)
(4670)  DCS[0.00.0.0.0.1]  BM[0110..10.00..11.01..100..011...0.1.0..0..0...0.0110...0..0000.0...11.000...001.001.101]

        4115:  !(FREE)
        GOBUT121C1:
                SETUP,  RETURN/TEST121C2,                       !EXEC SUBR WHICH:
                                                                !(1) D<15:12> -> IR<15:12>
                NEXT,   CALL[D15-12]                            !(2) BUT(IR15-12) INTO ZTARGET---
(4115)  DCS[0.00.0.0.0.0]  BM[0100..00.11..00.00..101..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.011.100]

        !CHECK BIT<11:06> = "1010 10"
        4605:
        TEST121C2:
                PO,     LOAD-ENUA(ZTARGET412),                  !INSTRS-E78 OUTPUT FOR BIT<11:06>="101 010"
                        LOAD-ERROR(TEST121C2),                  !ERROR DIRECTORY KEY
                        DCS-CTR(C6.),                           !COMPARE AT TARGET
                        BUMP-VERIFY,                            !COUNT
                NEXT,   J/GOBUT121C2                            !
(4605)  DCS[1.00.1.0.0.1]  BM[1001..00.11..11.00..001..010...0.0.0..0..0...0.0000...0..0000.0...11.000...001.001.110]

        4116:  !(FREE)
        GOBUT121C2:
                SETUP,  RETURN/TEST121C3,                       !EXEC SUBR WHICH:
                                                                !(1) D<11:06> -> IR<11:06>
                NEXT,   CALL[D11-06]                            !(2) BUT(INSTRS) INTO ZTARGET---
(4116)  DCS[0.00.0.0.0.0]  BM[0100..00.11..10.01..111..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.011.110]


        !CHECK BIT<05:00> = "10 1010"
        4717:
```

```
    TEST121C3:

            PO,     LOAD-ENUA(ZTARGET425),                          !INSTRS-E88 OUTPUT FOR BIT<05:00>="101 010"
                    LOAD-ERROR(TEST121C3),                          !ERROR DIRECTORY KEY
                    DCS-CTR(C6.),                                   !COMPARE AT TARGET
            NEXT,   J/GOBUT121C3                                    !
  (4717)  DCS[1.00.1.0.0.0]  BM[1001..00.11..11.00..010..101...0.0.0..0..0...0.0000...0..0000.0...11.000...001.001.111]

    4117:  !(FREE)
    GOBUT121C3:
            SETUP,  RETURN/TEST121C4,                               !EXEC SUBR WHICH:
                                                                    !(1) D<05:00> -> IR<05:00>
            NEXT,   CALL[D05-00]                                    !(2) BUT(INSTRS) INTO ZTARGET---
  (4117)  DCS[0.00.0.0.0.0]  BM[0100..00.11..10.01..110..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.100.000]

    !CHECK THAT D[C] GOT A (1) FROM "ALU07"
    4716:
    TEST121C4:
            PO,     LOAD-ENUA(ZTARGET417),                          !BIT<02> = D[C] = (1)
                    LOAD-ERROR(TEST121C4),                          !ERROR DIRECTORY KEY
                    DCS-CTR(C3.),                                   !COMPARE AT TARGET
                    BUMP-VERIFY,                                    !COUNT
            NEXT,   J/GOBUT121C4                                    !
  (4716)  DCS[1.00.1.0.0.1]  BM[1100..00.11..11.00..001..111...0.0.0..0..0...0.0000...0..0000.0...11.000...001.010.000]

    4120:  !(FREE)
    GOBUT121C4:
            SETUP,  RETURN/TEST121D1,                               !RETURN TO START OF NEXT SUBTEST
            NEXT,   GOTO-PAGE(7),                                   !BUT TABLE
                    J/BUTD[C]C                                      !D[C]H IN BIT<02>
  (4120)  DCS[0.00.0.0.0.0]  BM[0100..00.11..10.10..111..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.001.000]

    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    !TESTS 121D 1-4 VERIFIES THAT WITH:
    !ALU=(A-XOR-B), A=(177777), B=(125252), THEN D=(052525)
    4727:
    TEST121D1:
            PO,     LOAD-ENUA(ZTARGET405),                          !BIT<15:12> = "0101"
                    LOAD-ERROR(TEST121D1),                          !ERROR DIRECTORY KEY
                    DCS-CTR(C6.),                                   !COMPARE AT TARGET
            NEXT,   J/ALU121D1                                      !
  (4727)  DCS[1.00.1.0.0.0]  BM[1001..00.11..11.00..000..101...0.0.0..0..0...0.0000...0..0000.0...11.000...001.010.001]

    4121:  !(FREE)
    ALU121D1:
            PO,     BUMP-VERIFY,                                    !COUNT
            P2-T,   D←A-XOR-B, D[C]←ALU07,                          !ALU=(A-XOR-B), D[C]=ALU07=(0)
                    BUS-A←ASPHI(C177777),                           !A=(177777)
```

```
                  BUS-B+CSPD(C125252),                     !B=(125252)
          NEXT,   J/GOBUT121D1                             !D=(052525)
(4121) DCS[0.00.0.0.0.1]  BM[0110..10.00..11.01..101..011...0.1.0..0..0...0.0110...0..0000.0...11.000...001.010.010]

     4122:  !(FREE)
     GOBUT121D1:
          SETUP,  RETURN/TEST121D2,                        !EXEC SUBR WHICH:
                                                           !(1) D<15:12> -> IR<15:12>
          NEXT,   CALL[D15-12]                             !(2) BUT(IR15-12) INTO ZTARGET---
(4122) DCS[0.00.0.0.0.0]  BM[0100..00.11..10.10..110..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.011.100]

     !CHECK BIT<11:06> = "0101 01"
     4726:
     TEST121D2:
          PO,     LOAD-ENUA(ZTARGET405),                   !INSTRS-E78 OUTPUT FOR BIT<11:06>="010 101"
                  LOAD-ERROR(TEST121D2),                   !ERROR DIRECTORY KEY
                  DCS-CTR(C6.),                            !COMPARE AT TARGET
                  BUMP-VERIFY,                             !COUNT
          NEXT,   J/GOBUT121D2                             !
(4726) DCS[1.00.1.0.0.1]  BM[1001..00.11..11.00..000..101...0.0.0..0..0...0.0000...0..0000.0...11.000...001.010.011]

     4123:  !(FREE)
     GOBUT121D2:
          SETUP,  RETURN/TEST121D3,                        !EXEC SUBR WHICH:
                                                           !(1) D<11:06> -> IR<11:06>
          NEXT,   CALL[D11-06]                             !(2) BUT(INSTRS) INTO ZTARGET---
(4123) DCS[0.00.0.0.0.0]  BM[0100..00.11..10.11..111..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.011.110]



     !CHECK BIT<05:00> = "01 0101"
     4737:
     TEST121D3:

          PO,     LOAD-ENUA(ZTARGET432),                   !INSTRS-E88 OUTPUT FOR BIT<05:00>="010 101"
                  LOAD-ERROR(TEST121D3),                   !ERROR DIRECTORY KEY
                  DCS-CTR(C6.),                            !COMPARE AT TARGET
          NEXT,   J/GOBUT121D3                             !
(4737) DCS[1.00.1.0.0.0]  BM[1001..00.11..11.00..011..010...0.0.0..0..0...0.0000...0..0000.0...11.000...001.010.100]

     4124:  !(FREE)
     GOBUT121D3:
          SETUP,  RETURN/TEST121D4,                        !EXEC SUBR WHICH:
                                                           !(1) D<05:00> -> IR<05:00>
          NEXT,   CALL[D05-00]                             !(2) BUT(INSTRS) INTO ZTARGET---
(4124) DCS[0.00.0.0.0.0]  BM[0100..00.11..10.11..110..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.100.000]

     !CHECK THAT D[C] GOT A (0) FROM "ALU07"
     4736:
     TEST121D4:
          PO,     LOAD-ENUA(ZTARGET413),                   !BIT<02> = D[C] = (0)
```

```
                LOAD-ERROR(TEST121D4),              !ERROR DIRECTORY KEY
                DCS-CTR(C3.),                       !COMPARE AT TARGET
                BUMP-VERIFY,                        !COUNT
        NEXT,   J/GOBUT121D4                        !
 (4736) DCS[1.00.1.0.0.1]  BM[1100..00.11..11.00..001..011...0.0.0..0..0...0.0000...0..0000.0...11.000...001.010.101]

    4125:  !(FREE)
    GOBUT121D4:
        SETUP,  RETURN/SCOPE121D,                   !RETURN TO SCOPE LOOP TEST WORD
        NEXT,   GOTO-PAGE(7),                       !BUT TABLE
                J/BUTD[C]C                          !D[C]H IN BIT<02>
 (4125) DCS[0.00.0.0.0.0]  BM[0100..00.00..10.10..110..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.001.000]

    4126:  !(FREE)
    SCOPE121D:
        P0,     BUMP-VERIFY,                        !COUNT
        NEXT,   BUTD[SCOPE],                        !NO ERROR: "TEST122A1" (+1. WORDS)
                J/TEST122A1                         !   ERROR:  "ALU121C1" (-17. WORDS)
 (4126) DCS[0.00.0.1.0.1]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...110.111.001]








    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    !THIS NEXT SET OF 8. TESTS CHECK THE ALU FUNCTIONS "A"
    !AND "A-IOR-B", THE FUNCTION D[C]=CINMUX=(1), AND ALSO
    !THE BUT(D<14:00>=ZERO#D<15>) BUT FOR D=(0)(00000) AND
    !D=(1)(25252)
    4671:
    TEST122A1:
        P0,     LOAD-ENUA(ZTARGET434),              !INSTRS FOR IR=(000000)
                LOAD-ERROR(TEST122A1),              !ERROR DIRECTORY KEY
                DCS-CTR(C6.),                       !COMPARE AT TARGET
        NEXT,   J/ALU122A1                          !
 (4671) DCS[1.00.1.0.0.0]  BM[1001..00.11..11.00..011..100...0.0.0..0..0...0.0000...0..0000.0...11.000...110.111.010]

    4672:
    ALU122A1:
        P0,     BUMP-VERIFY,                        !COUNT
        P2-T,   D←A-IOR-B, D[C]←CINMUX,             !ALU=(A-IOR-B), D[C]=CINMUX=(1)
                BUS-A←ASPHI(C000000),               !A=(000000)
                BUS-B←BSPHI(C000000),               !B=(000000)
        NEXT,   J/GOBUT122A1                        !D=(000000)
 (4672) DCS[0.00.0.0.0.1]  BM[1110..01.11..11.01..100..000...0.1.0..0..0...0.0000...0..0000.0...11.000...001.010.111]

    4127:  !(FREE)
    GOBUT122A1:
        SETUP,  RETURN/TEST122A2,                   !EXEC SUBR WHICH:
```

```
                                                                    !(1) D -> IR
                NEXT,   CALL[DZERO]                                 !(2) BUT(INSTR5) INTO ZTARGET---
      (4127)  DCS[0.00.0.0.0.0]  BM[0100..00.10..11.11..000..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.100.010]



        !CHECK THAT D[C] GOT A (1) FROM CINMUX=(1)
        4570:
        TEST122A2:
                PO,     LOAD-ENUA(ZTARGET403),                      !BIT<00> = D[C] = (1)
                        LOAD-ERROR(TEST122A2),                      !ERROR DIRECTORY KEY
                        DCS-CTR(C3.),                               !COMPARE AT TARGET
                NEXT,   J/GOBUT122A2                                !
      (4570)  DCS[1.00.1.0.0.0]  BM[1100..00.11..11.00..000..011...0.0.0..0..0...0.0000...0..0000.0...11.000...001.011.000]

        4130:  !(FREE)
        GOBUT122A2:
                SETUP,  RETURN/TEST122A3,                           !RETURN TO START OF NEXT SUBTEST
                NEXT,   GOTO-PAGE(7),                               !BUT TABLE
                        J/BUTD[C]A                                  !D[C]H IN BIT <00>
      (4130)  DCS[0.00.0.0.0.0]  BM[0100..00.11..10.11..100..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.100]



        !CHECK THAT D<15>=0, [D<14:00>=ZERO]=1 WHEN D=(000000)
        4734:
        TEST122A3:
                PO,     LOAD-ENUA(ZTARGET402),                      !SETUP FOR D<15:00>=ZERO
                        LOAD-ERROR(TEST122A3),                      !ERROR DIRECTORY KEY
                        DCS-CTR(C3.),                               !COMPARE AT TARGET
                NEXT,   J/GOBUT122A3                                !
      (4734)  DCS[1.00.1.0.0.0]  BM[1100..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...001.011.001]

        4131:  !(FREE)
        GOBUT122A3:
                SETUP,  RETURN/TEST122A4,                           !RETURN TO START OF NEXT SUBTEST
                NEXT,   GOTO-PAGE(7),                               !BUT TABLE
                        J/BUTD-IS-ZERO                              !BIT<1:0> = D<15># D<14:00>=ZERO
      (4131)  DCS[0.00.0.0.0.0]  BM[0100..00.11..10.11..101..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.001]

        !CHECK THAT D<15>=(1), [D<14:00>=ZERO]=(0) WHEN D=(125252)
        4735:
        TEST122A4:
                PO,     LOAD-ENUA(ZTARGET401),                      !SETUP FOR D<15:00>=(125252)
                        LOAD-ERROR(TEST122A4),                      !ERROR DIRECTORY KEY
                        DCS-CTR(C4.),                               !COMPARE AT TARGET
                        BUMP-VERIFY,                                !COUNT
                NEXT,   J/SETD122A4                                 !
      (4735)  DCS[1.00.1.0.0.1]  BM[1011..00.11..11.00..000..001...0.0.0..0..0...0.0000...0..0000.0...11.000...001.011.010]

        4132:  !(FREE)
```

```
    SETD122A4:
            P2-T,     D←CSPD(C125252), D[C]←0,               !SETUP D FOR TEST
            NEXT,     J/GOBUT122A4                           !
 (4132) DCS[0.00.0.0.0.0]  BM[1010..10.00..00.00..000..000...0.1.0..0..0...0.0110...0..0000.0...11.000...001.011.011]

    4133:  !(FREE)
    GOBUT122A4:
            SETUP,    RETURN/SCOPE122A,                      !RETURN TO SCOPE LOOP TEST WORD
            NEXT,     GOTO-PAGE(7),                          !BUT TABLE
                      J/BUTD-IS-ZERO                         !BIT<1:0> = D15#[D<14:00>=ZERO]
 (4133) DCS[0.00.0.0.0.0]  BM[0100..00.00..10.11..100..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.001]



    4134:  !(FREE)
    SCOPE122A:
            P0,       BUSDIN←EMIT-[I],                       !RESET PROC UCON
                      EN-CLK-IR[15-00],                      !
            NEXT,     BUTD[SCOPE],                           !NO ERROR:  "TEST130A1"   (+1. WORDS)
                      J/TEST130A1                            !   ERROR:  "ALU122A1"  (-8. WORDS)
 (4134) DCS[0.00.0.1.0.0]  BM[0000..00.00..00.01..000..100...0.0.0..0..0...1.1001...0..0000.0...11.000...110.111.011]





    !.PAGE===========================================================================================

    .TOC   *   TEST130-136:  ALU ARITHMETIC FUNCTION/CARRY LOOKAHEAD TESTS

    !****************************************************************************************
    !*
    !*      TESTS:  130 - 136                                   UWORDS:  127 + 160
    !*
    !*      FUNCTIONS:
    !*
    !*      ALU ARITHMETIC FUNCTION DECODE, INTERNAL CARRIES, CARRYOUTS, CARRY LOOKAHEAD.
    !*
    !****************************************************************************************

    !
    !       SUMMARY OF ALU ARITHMETIC / CARRY LOOKAHEAD TESTS:
    !
    !       TEST            OPERANDS EMPLOYED:
    !       NUMB            (A/B)+(B/A)+(CIN)=(COUT)(D)        ALU FUNCTION
    !       ----            ---------------------------        ------------------
    !
    !       130A            (0101)+(0101)+(0)=(0)(1010)        A-PLUS-B-PLUS-0
    !       130B            (1010)+(1010)+(1)=(1)(0101)        A-PLUS-B-PLUS-1
    !
    !       131A            (1010)+(0101)+(0)=(0)(1111)        A-PLUS-B-PLUS-PS[C]
    !       131B            (0101)+(1010)+(0)=(0)(1111)        DIVIDE/D[C]=0/A-PLUS-B-PLUS-0
```

```
        !
        !       132A            (1010)-(1010)-(0)=(1)(0000)     A-MINUS-B-MINUS-0
        !       132B            (0101)-(0101)-(0)=(1)(0000)     DIVIDE/D[C]=1/A-MINUS-B-MINUS-0
        !
        !       133A            (1000)+(1000)+(0)=(1)(0000)     A-PLUS-B-PLUS-D[C]
        !       133B            (0111)+(0111)+(1)=(0)(1111)     A-PLUS-NOT-B-PLUS-D[C]
        !
        !       134A            (0100)+(1100)+(0)=(1)(0000)     A-PLUS-B-PLUS-D[C]
        !       134B            (1011)+(0011)+(1)=(0)(1111)     A-PLUS-NOT-B-PLUS-D[C]
        !
        !       135A            (1010)+(0110)+(0)=(1)(0000)     A-PLUS-B-PLUS-D[C]
        !       135B            (0101)+(1001)+(1)=(0)(1111)     A-PLUS-NOT-B-PLUS-D[C]
        !
        !       136A            (0101)+(1011)+(0)=(1)(0000)     A-PLUS-B-PLUS-D[C]
        !       136B            (1010)+(0100)+(1)=(0)(1111)     A-PLUS-NOT-B-PLUS-D[C]
        !
        !
        ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

        !CHECK INTERNAL ALU CARRIES WITH:       (052525)+(052525)+(0)=(125252)
        !ALSO CHECK ALU FUNCTION "A-PLUS-B-PLUS-0", D[C]+COUT15=(0)
        !
        4673:
        TEST130A1:
                P0,     LOAD-ENUA(ZTARGET434),                  !SETUP FOR IR=(000000)/BUTINSTRS TEST
                        LOAD-ERROR(TEST130A1),                  !ERROR DIRECTORY KEY
                        DCS-CTR(C8.),                           !COMPARE AT TARGET
                NEXT,   J/ARITH130A1                            !
  (4673)  DCS[1.00.1.0.0.0]  BM[0111..00.11..11.00..011..100...0.0.0..0..0...0.0000...0..0000.0...11.000...101.100.000]

        4540:
        ARITH130A1:
                P2-T,   D+A-PLUS-B-PLUS-0,                      !ALU=(A-PLUS-B), CIN=(0)
                        D[C]+COUT15,                            !GET CARRYOUT
                        BUS-A+ASPHI(C052525),                   !A=(052525)
                        BUS-B+BSPHI(C052525),                   !B=(052525)
                        SR+A-PLUS-B-PLUS-0,                     !D=(125252), COUT15=(0)
                NEXT,   J/COMP130A1                             !
  (4540)  DCS[0.00.0.0.0.0]  BM[1001..01.11..11.01..111..110...0.1.1..0..0...0.0000...0..0000.0...11.000...001.011.101]

        4135:   !(FREE)
        COMP130A1:
                P0,     BUMP-VERIFY,                            !COUNT
                P2-T,   D+SR-XOR-CSPD(C125252),                 !COMPARE RECEIVED: EXPECTED
                        SAVE-D[C],                              !SAVE CARRY
                NEXT,   J/GOBUT130A1                            !
  (4135)  DCS[0.00.0.0.0.1]  BM[0110..10.00..00.00..000..111...0.1.0..0..0...0.0110...0..0000.0...11.000...001.011.110]

        4136:   !(FREE)
        GOBUT130A1:
                SETUP,  RETURN/TEST130A2,                       !RETURN TO START OF NEXT SUBTEST
                NEXT,   CALL[DINTOIR-5]                         !GO PUT D -> IR, BUT(INSTRS)
  (4136)  DCS[0.00.0.0.0.0]  BM[0100..00.10..11.01..000..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.111.011]
```

```
	!CHECK THAT CARRYOUT OF BIT15 (COUT15) WAS CORRECT
	4550:
	TEST130A2:
		PO,	LOAD-ENUA(ZTARGET402),			!BIT<00> CLEAR
			LOAD-ERROR(TEST130A2),			!ERROR DIRECTORY KEY
			DCS-CTR(C3.),				!COMPARE AT TARGET
		NEXT,	J/GOBUT130A2				!
(4550)	DCS[1.00.1.0.0.0]  BM[1100..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...001.011.111]

	4137:	!(FREE)
	GOBUT130A2:
		SETUP,	RETURN/TEST130B1,			!RETURN TO START OF NEXT SUBTEST
		NEXT,	GOTO-PAGE(7),				!BUT TABLE
			J/BUTD[C]A				!D[C]H= COUT15 H IN BIT<00>
(4137)	DCS[0.00.0.0.0.0]  BM[0100..00.10..10.11..000..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.100]



	! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

	!CHECK INTERNAL ALU CARRIES WITH: (125252)+(125252)+(1)=(052525)
	!ALSO CHECK ALU FUNCTION "A-PLUS-B-PLUS-1", D[C]+COUT15=(1)
	!
	4530:
	TEST130B1:
		PO,	LOAD-ENUA(ZTARGET434),			!SETUP FOR IR=(000000)/BUTINSTR5 TEST
			LOAD-ERROR(TEST130B1),			!ERROR DIRECTORY KEY
			DCS-CTR(C8.),				!COMPARE AT TARGET
		NEXT,	J/ARITH130B1				!
(4530)	DCS[1.00.1.0.0.0]  BM[0111..00.11..11.00..011..100...0.0.0..0..0...0.0000...0..0000.0...11.000...001.100.000]

	4140:	!(FREE)
	ARITH130B1:
		P2-T,	D+A-PLUS-B-PLUS-1,			!ALU=(A-PLUS-B), CIN=(1)
			D[C]+COUT15,				!GET CARRYOUT
			BUS-A+ASPHI(C125252),			!A=(125252)
			BUS-B+BSPHI(C125252),			!B=(125252)
			SR+A-PLUS-B-PLUS-1,			!D=(052525), COUT15=(1)
		NEXT,	J/COMP130B1				!
(4140)	DCS[0.00.0.0.0.0]  BM[1100..01.11..11.01..110..110...0.1.1..0..0...0.0000...0..0000.0...11.000...001.100.001]

	4141:	!(FREE)
	COMP130B1:
		PO,	BUMP-VERIFY,				!COUNT
		P2-T,	D+SR-XOR-CSPD(C052525),			!COMPARE RECEIVED: EXPECTED
			SAVE-D[C],				!SAVE CARRY
		NEXT,	J/GOBUT130B1				!
(4141)	DCS[0.00.0.0.0.1]  BM[0110..10.00..00.00..000..111...0.1.0..0..0...0.0111...0..0000.0...11.000...001.100.010]

	4142:	!(FREE)
```

```
	GOBUT130B1:
		SETUP,	RETURN/TEST130B2,			!RETURN TO START OF NEXT SUBTEST
		NEXT,	CALL[DINTOIR-5]				!GO PUT D -> IR, BUT(INSTRS)
(4142)	DCS[0.00.0.0.0.0]  BM[0100..00.10..10.11..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.111.011]



	!CHECK THAT CARRYOUT OF BIT15 (COUT15) WAS CORRECT
	4532:
	TEST130B2:
		P0,	LOAD-ENUA(ZTARGET403),			!BIT<00> SET
			LOAD-ERROR(TEST130B2),			!ERROR DIRECTORY KEY
			DCS-CTR(C3.),				!COMPARE AT TARGET
		NEXT,	J/GOBUT130B2				!
(4532)	DCS[1.00.1.0.0.0]  BM[1100..00.11..11.00..000..011...0.0.0..0..0...0.0000...0..0000.0...11.000...001.100.011]

	4143:	!(FREE)
	GOBUT130B2:
		SETUP,	RETURN/SCOPE130B,			!RETURN TO SCOPE LOOP TEST WORD
		NEXT,	GOTO-PAGE(7),				!BUT TABLE
			J/BUTD[C]A				!D[C]H= COUT15 H IN BIT<00>
(4143)	DCS[0.00.0.0.0.0]  BM[0100..00.00..11.00..100..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.100]



	4144:	!(FREE)
	SCOPE130B:
		NEXT,	BUTD[SCOPE],				!NO ERROR:  "TEST131A1"  (+1.WORDS)
			J/TEST131A1				!   ERROR:  "ARITH130A1" (-11.WORDS)
(4144)	DCS[0.00.0.1.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...101.100.001]



	! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

	!CHECK INTERNAL ALU CARRIES WITH: (125252)+(052525)+(0)=(177777)
	!ALSO CHECK ALU FUNCTION "A-PLUS-B-PLUS-PS[C]", D[C]←COUT15=(0)
	!CIN=PS[C]=(0) FROM INITIALIZATION ROUTINE
	4541:
	TEST131A1:
		P0,	LOAD-ENUA(ZTARGET434),			!SETUP FOR IR=(000000)/BUTINSTRS TEST
			LOAD-ERROR(TEST131A1),			!ERROR DIRECTORY KEY
			DCS-CTR(C8.),				!COMPARE AT TARGET
		NEXT,	J/ARITH131A1				!
(4541)	DCS[1.00.1.0.0.0]  BM[0111..00.11..11.00..011..100...0.0.0..0..0...0.0000...0..0000.0...11.000...101.010.000]

	4520:
	ARITH131A1:
		P2-T,	D←A-PLUS-B-PLUS-PS[C],			!ALU=(A-PLUS-B), CIN=PS[C]=(0)
			D[C]←COUT15,				!GET CARRYOUT
			BUS-A←ASPHI(C125252),			!A=(125252)
			BUS-B←CSPD(C052525),			!B=(052525)
```

```
                SR+A-PLUS-B-PLUS-PS[C],                 !D=(177777), COUT15=(0)
          NEXT, J/COMP131A1                             !
  (4520)  DCS[0.00.0.0.0.0]  BM[0001..10.00..11.01..110..110...0.1.1..0..0...0.0111...0..0000.0...11.000...001.100.101]

     4145:  !(FREE)
     COMP131A1:
          P0,   BUMP-VERIFY,                            !COUNT
          P2-T, D+SR-XOR-CSPD(C177777),                 !COMPARE RECEIVED: EXPECTED
                SAVE-D[C],                              !SAVE CARRY
          NEXT, J/GOBUT131A1                            !
  (4145)  DCS[0.00.0.0.0.1]  BM[0110..10.00..00.00..000..111...0.1.0..0..0...0.0101...0..0000.0...11.000...001.100.110]

     4146:  !(FREE)
     GOBUT131A1:
          SETUP, RETURN/TEST131A2,                      !RETURN TO START OF NEXT SUBTEST
          NEXT,  CALL[DINTOIR-5]                        !GO PUT D -> IR, BUT(INSTRS)
  (4146)  DCS[0.00.0.0.0.0]  BM[0100..00.10..11.00..100..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.111.011]



     !CHECK THAT CARRYOUT OF BIT15 (COUT15) WAS CORRECT
     4544:
     TEST131A2:
          P0,   LOAD-ENUA(ZTARGET401),                  !BIT<01> CLEAR
                LOAD-ERROR(TEST131A2),                  !ERROR DIRECTORY KEY
                DCS-CTR(C3.),                           !COMPARE AT TARGET
          NEXT, J/GOBUT131A2                            !
  (4544)  DCS[1.00.1.0.0.0]  BM[1100..00.11..11.00..000..001...0.0.0..0..0...0.0000...0..0000.0...11.000...001.100.111]

     4147:  !(FREE)
     GOBUT131A2:
          SETUP, RETURN/TEST131B1,                      !RETURN TO START OF NEXT SUBTEST
          NEXT,  GOTO-PAGE(7),                          !BUT TABLE
                 J/BUTD[C]B                             !D[C]H= COUT15 H IN BIT<01>
  (4147)  DCS[0.00.0.0.0.0]  BM[0100..00.10..11.00..110..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.101.000]



     ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

     !CHECK INTERNAL ALU CARRIES WITH:           (052525)+(125252)+(0)=(177777)
     !ALSO CHECK ALU FUNCTION "DIVIDE-STEP" = "A-PLUS-B" SINCE D[C]H=(0)
     !FROM ABOVE. D[C]+COUT15=(0)
     4546:
     TEST131B1:
          P0,   LOAD-ENUA(ZTARGET434),                  !SETUP FOR IR=(000000)/BUTINSTRS TEST
                LOAD-ERROR(TEST131B1),                  !ERROR DIRECTORY KEY
                DCS-CTR(C8.),                           !COMPARE AT TARGET
          NEXT, J/ARITH131B1                            !
  (4546)  DCS[1.00.1.0.0.0]  BM[0111..00.11..11.00..011..100...0.0.0..0..0...0.0000...0..0000.0...11.000...001.101.000]

     4150:  !(FREE)
```

```
    ARITH131B1:
            P2-T,   D←DIVIDE-STEP,                      !ALU=(A-PLUS-B), CIN=(0)
                    D[C]←COUT15,                        !GET CARRYOUT
                    BUS-A←ASPHI(C052525),               !A=(052525)
                    BUS-B←CSPD(C125252),                !B=(125252)
                    SR←DIVIDE-STEP,                     !D=(177777), COUT15=(0)
            NEXT,   J/COMP131B1                         !
 (4150) DCS[0.00.0.0.0.0] BM[1000..10.00..11.01..111..110...0.1.1..0..0...0.0110...0..0000.0...11.000...001.101.001]

    4151:  !(FREE)
    COMP131B1:
            P0,     BUMP-VERIFY,                        !COUNT
            P2-T,   D←SR-XOR-CSPD(C177777),             !COMPARE RECEIVED: EXPECTED
                    SAVE-D[C],                          !SAVE CARRY
            NEXT,   J/GOBUT131B1                        !
 (4151) DCS[0.00.0.0.0.1] BM[0110..10.00..00.00..000..111...0.1.0..0..0...0.0101...0..0000.0...11.000...001.101.010]

    4152:  !(FREE)
    GOBUT131B1:
            SETUP,  RETURN/TEST131B2,                   !RETURN TO START OF NEXT SUBTEST
            NEXT,   CALL[DINTOIR-5]                     !GO PUT D -> IR, BUT(INSTRS)
 (4152) DCS[0.00.0.0.0.0] BM[0100..00.11..11.01..000..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.111.011]



    !CHECK THAT CARRYOUT OF BIT15 (COUT15) WAS CORRECT
    4750:
    TEST131B2:
            P0,     LOAD-ENUA(ZTARGET413),              !BIT<02> CLEAR
                    LOAD-ERROR(TEST131B2),              !ERROR DIRECTORY KEY
                    DCS-CTR(C3.),                       !COMPARE AT TARGET
            NEXT,   J/GOBUT131B2                        !
 (4750) DCS[1.00.1.0.0.0] BM[1100..00.11..11.00..001..011...0.0.0..0..0...0.0000...0..0000.0...11.000...001.101.011]

    4153:  !(FREE)
    GOBUT131B2:
            SETUP,  RETURN/SCOPE131B,                   !RETURN TO SCOPE LOOP TEST WORD
            NEXT,   GOTO-PAGE(7),                       !BUT TABLE
                    J/BUTD[C]C                          !D[C]H= COUT15 H IN BIT<02>
 (4153) DCS[0.00.0.0.0.0] BM[0100..00.00..11.01..100..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.001.000]



    4154:  !(FREE)
    SCOPE131B:
            P3,     CSPD[05]←EMIT, EMIT/170360,         !CONSTANT FOR USE BELOW
            NEXT,   BUTD[SCOPE],                        !NO ERROR:  "TEST132A1" (+1. WORDS)
                    J/TEST132A1                         !   ERROR:  "ARITH131A1"(-11. WORDS)
 (4154) DCS[0.00.0.1.0.0] BM[1111..10.00..00.11..110..000...0.0.0..0..0...0.1010...1..0000.0...11.000...101.010.001]
```

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      ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

      !CHECK INTERNAL ALU CARRIES  WITH:              (125252)-(125252)-(0)=(000000)
      !ALSO CHECK ALU FUNCTION "A-MINUS-B", D[C]+COUT15=(1)
      !
      4521:
      TEST132A1:
            PO,      LOAD-ENUA(ZTARGET434),                   !SETUP FOR IR=(000000)/BUTINSTRS TEST
                     LOAD-ERROR(TEST132A1),                   !ERROR DIRECTORY KEY
                     DCS-CTR(C7.),                            !COMPARE AT TARGET
            NEXT,    J/ARITH132A1                             !
 (4521)  DCS[1.00.1.0.0.0]  BM[1000..00.11..11.00..011..100...0.0.0..0..0...0.0000...0..0000.0...11.000...101.010.010]

      4522:
      ARITH132A1:
            P3-T,    D+A-MINUS-B,                             !ALU=(A-MINUS-B-MINUS-1), CIN=(1)
                     D[C]+COUT15,                             !GET CARRYOUT
                     BUS-A+ASPHI(C125252),                    !A=(125252)
                     BUS-B+BSPHI(C125252),                    !B=(125252)
                                                              !D=(000000), COUT15=(1)
            NEXT,    J/GOBUT132A1                             !
 (4522)  DCS[0.00.0.0.0.0]  BM[1101..01.11..11.01..110..110...1.1.0..0..0...0.0000...0..0000.0...11.000...001.101.101]

      4155:  !(FREE)
      GOBUT132A1:
            PO,      BUMP-VERIFY,                             !COUNT
            SETUP,   RETURN/TEST132A2,                        !RETURN TO START OF NEXT SUBTEST
            NEXT,    CALL[DINTOIR-5]                          !GO PUT D -> IR, BUT(INSTRS)
 (4155)  DCS[0.00.0.0.0.1]  BM[0100..00.10..10.01..110..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.111.011]



      !CHECK THAT CARRYOUT OF BIT15 (COUT15) WAS CORRECT
      4516:
      TEST132A2:
            PO,      LOAD-ENUA(ZTARGET403),                   !BIT<01> SET
                     LOAD-ERROR(TEST132A2),                   !ERROR DIRECTORY KEY
                     DCS-CTR(C3.),                            !COMPARE AT TARGET
            NEXT,    J/GOBUT132A2                             !
 (4516)  DCS[1.00.1.0.0.0]  BM[1100..00.11..11.00..000..011...0.0.0..0..0...0.0000...0..0000.0...11.000...001.101.110]

      4156:  !(FREE)
      GOBUT132A2:
            SETUP,   RETURN/TEST132B1,                        !RETURN TO START OF NEXT SUBTEST
            NEXT,    GOTO-PAGE(7),                            !BUT TABLE
                     J/BUTD[C]B                               !D[C]H= COUT15 H IN BIT<01>
 (4156)  DCS[0.00.0.0.0.0]  BM[0100..00.10..10.01..111..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.101.000]



      ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
```

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      !CHECK INTERNAL ALU CARRIES WITH:              (052525)-(052525)-(0)=(000000)
      !ALSO CHECK ALU FUNCTION "DIVIDE-STEP" = "A-MINUS-B" SINCE D[C]=(1)
      !FROM ABOVE. D[C]+COUT15=(1)
      4517:
      TEST132B1:
              P0,     LOAD-ENUA(ZTARGET434),                  !SETUP FOR IR=(000000)/BUTINSTRS TEST
                      LOAD-ERROR(TEST132B1),                  !ERROR DIRECTORY KEY
                      DCS-CTR(C7.),                           !COMPARE AT TARGET
              NEXT,   J/ARITH132B1                            !
(4517)  DCS[1.00.1.0.0.0]  BM[1000..00.11..11.00..011..100...0.0.0..0..0...0.0000...0..0000.0...11.000...001.101.111]

      4157:  !(FREE)
      ARITH132B1:
              P3-T,   D+DIVIDE-STEP,                          !ALU=(A-MINUS-B-MINUS-1), CIN=(1)
                      D[C]+COUT15,                            !GET CARRYOUT
                      BUS-A+ASPHI(C052525),                   !A=(052525)
                      BUS-B+BSPHI(C052525),                   !B=(052525)
                                                              !D=(000000), COUT15=(1)
              NEXT,   J/GOBUT132B1                            !
(4157)  DCS[0.00.0.0.0.0]  BM[1000..01.11..11.01..111..110...1.1.0..0..0...0.0000...0..0000.0...11.000...001.110.000]

      4160:  !(FREE)
      GOBUT132B1:
              P0,     BUMP-VERIFY,                            !COUNT
              SETUP,  RETURN/TEST132B2,                       !RETURN TO START OF NEXT SUBTEST
              NEXT,   CALL[DINTOIR-5]                         !GO PUT D -> IR, BUT(INSTRS)
(4160)  DCS[0.00.0.0.0.1]  BM[0100..00.10..01.11..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.111.011]



      !CHECK THAT CARRYOUT OF BIT15 (COUT15) WAS CORRECT
      4472:
      TEST132B2:
              P0,     LOAD-ENUA(ZTARGET417),                  !BIT<02> SET
                      LOAD-ERROR(TEST132B2),                  !ERROR DIRECTORY KEY
                      DCS-CTR(C3.),                           !COMPARE AT TARGET
              NEXT,   J/GOBUT132B2                            !
(4472)  DCS[1.00.1.0.0.0]  BM[1100..00.11..11.00..001..111...0.0.0..0..0...0.0000...0..[illegible]0.0...11.000...001.110.001]

      4161:  !(FREE)
      GOBUT132B2:
              SETUP,  RETURN/SCOPE132B,                       !RETURN TO SCOPE LOOP TEST WORD
              NEXT,   GOTO-PAGE(7),                           !BUT TABLE
                      J/BUTD[C]C                              !D[C]H=COUT15 H IN BIT <02>
(4161)  DCS[0.00.0.0.0.0]  BM[0100..00.00..11.10..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.001.000]



      4162:  !(FREE)
      SCOPE132B:
              P3,     CSPD[06]+EMIT, EMIT/007417,             !CONSTANT FOR USE BELOW
              NEXT,   BUTD[SCOPE],                            !NO ERROR:  "TEST133A1"   (+1. WORDS)
```

```
                J/TEST133A1                              !   ERROR:  "ARITH132A1" (-9. WORDS)
 (4162)  DCS[0.00.0.1.0.0]  BM[0000..10.11..11.00..001..111...0.0.0..0..0...0.1001...1..0000.0...11.000...101.010.011]




    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    !CHECK CARRY PROPOGATE/GENERATE LOGIC WITH:
    !(103607)-PLUS-(103607)-PLUS-(1)=(007417), COUT15=(1)
    4523:
    TEST133A1:
            P0,     LOAD-ENUA(ZTARGET434),                   !SETUP FOR IR=(000000)/BUTINSTRS COMPARE
                    LOAD-ERROR(TEST133A1),                   !ERROR DIRECTORY KEY
                    DCS-CTR(C10.),                           !COMPARE AT TARGET
            NEXT,   J/OPB133A1                               !
 (4523)  DCS[1.00.1.0.0.0]  BM[0101..00.11..11.00..011..100...0.0.0..0..0...0.0000...0..0000.0...11.000...101.001.000]

    4510:
    OPB133A1:
            P3,     CSPD[16]←EMIT,                           !A,B-SIDE OPERANDS:
                    EMIT/103607,                             !"1000 0111 1000 0111"
            NEXT,   J/DOPA133A1                              !
 (4510)  DCS[0.00.0.0.0.0]  BM[1000..10.01..11.10..000..111...0.0.0..0..0...0.0001...1..0000.0...11.000...001.110.011]

    4163:  !(FREE)
    DOPA133A1:
            P2-T,   D←CSPD(D16), D[C]←ALU15,                 !OP-A INTO D, D[C]←1
                    SR←CSPD(D16),                            !OP-A INTO SR TOO
            NEXT,   J/GOTEST133A1                            !(OPA=OPB)
 (4163)  DCS[0.00.0.0.0.0]  BM[1010..10.00..00.00..000..100...0.1.1..0..0...0.0001...0..0000.0...11.000...001.110.100]

    4164:  !(FREE)
    GOTEST133A1:
            P0,     BUMP-VERIFY,                             !COUNT
            SETUP,  RETURN/TEST133A2,                        !EXEC SUBR WHICH:
                                                             !(1) D←OPA-PLUS-OPB-PLUS-1
                                                             !(2) D←007417-XOR-D (EQUAL?)
            NEXT,   CALL[ALUCARRY1]                          !(3) J/BUTINSTRS/(000000) (CHECK ANSWER)
 (4164)  DCS[0.00.0.0.0.1]  BM[0100..00.10..10.00..000..111...0.0.0..0..0...0.0000...0..0000.0...11.100...000.000.111]



    !CHECK THAT CARRYOUT COUT15 ABOVE GENERATED CORRECTLY AS A (1)
    4500:
    TEST133A2:
            P0,     LOAD-ENUA(ZTARGET403),                   !BIT<00>SET
                    LOAD-ERROR(TEST133A2),                   !ERROR DIRECTORY KEY
                    DCS-CTR(C3.),                            !COMPARE AT TARGET
                    BUMP-VERIFY,                             !COUNT
            NEXT,   J/GOBUT133A2                             !
 (4500)  DCS[1.00.1.0.0.1]  BM[1100..00.11..11.00..000..011...0.0.0..0..0...0.0000...0..0000.0...11.000...001.110.101]
```

```
     4165:  !(FREE)
     GOBUT133A2:
             SETUP,   RETURN/TEST133B1,                          !RETURN TO START OF NEXT SUBTEST
             NEXT,    GOTO-PAGE(7),                              !BUT TABLE
                      J/BUTD[C]A                                 !D[C]H = COUT15 IN BIT<00>
(4165) DCS[0.00.0.0.0.0] BM[0100..00.10..10.00..001..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.100]





     ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

     !CHECK CARRY PROPOGATE/GENERATE LOGIC WITH COMPLEMENT OF ABOVE:
     !(074170)-PLUS-(074170)-PLUS-(0)=(170360), COUT15=(0)
     4501:
     TEST133B1:
             P0,      LOAD-ENVA(ZTARGET434),                     !SETUP FOR IR=(000000)/BUTINSTRS COMPARE
                      LOAD-ERROR(TEST133B1),                     !ERROR DIRECTORY KEY
                      DCS-CTR(C9.),                              !COMPARE AT TARGET
             NEXT,    J/OPA133B1                                 !
(4501) DCS[1.00.1.0.0.0] BM[0110..00.11..11.00..011..100...0.0.0..0..0...0.0000...0..0000.0...11.000...001.110.110]

     4166:  !(FREE)
     OPA133B1:                                                   !
             P2-T,    D←NOT-CSPD(D16),
                      D[C]←ALU15,                                !OP-A INTO D, D[C]←D
                      SR←NOT-CSPD(D16),                          !OP-A INTO SR TOO
                                                                 !A-SIDE OPERAND:
                                                                 !"0111 1000 0111 1000"
                                                                 !B-SIDE OPERAND WILL BE:
             NEXT,    J/GOTEST133B1                              !(SAME AS OP-A)
(4166) DCS[0.00.0.0.0.0] BM[0111..10.00..11.01..101..100...0.1.1..0..0...0.0001...0..0000.0...11.000...001.110.111]

     4167:  !(FREE)
     GOTEST133B1:
             SETUP,   RETURN/TEST133B2,                          !EXEC SUBR WHICH:
                                                                 !(1) D←(NOT-OPA)-PLUS-(NOT-OPB)
                                                                 !(2) D←170360-XOR-D (EQUAL?)
             NEXT,    CALL[ALUCARRY2]                            !(3) J/BUTINSTRS/(000000) (CHECK ANSWER)
(4167) DCS[0.00.0.0.0.0] BM[0100..00.10..10.00..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...000.010.000]



     !CHECK THAT CARRYOUT COUT15 ABOVE GENERATED CORRECTLY AS A (0)
     4502:
     TEST133B2:
             P0,      LOAD-ENVA(ZTARGET402),                     !BIT<00> CLEAR
                      LOAD-ERROR(TEST133B2),                     !ERROR DIRECTORY KEY
             NEXT,    J/GOBUT133B2                               !
(4502) DCS[1.00.0.0.0.0] BM[0000..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...001.111.000]
```

```
        4170:  !(FREE)
        GOBUT133B2:
                SETUP,  RETURN/SCOPE133B,                          !RETURN TO SCOPE LOOP TEST WORD
                NEXT,   GOTO-PAGE(7),                              !BUT TABLE
                        J/BUTD[C]A                                 !D[C]H = COUT15 H IN BIT<00>
  (4170)  DCS[0.00.0.0.0.0]  BM[0100..00.00..11.11..001..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.100]



        4171:  !(FREE)
        SCOPE133B:
                P0,     BUMP-VERIFY,                               !COUNT
                NEXT,   BUTD[SCOPE],                               !NO ERROR:  "TEST134A1" (+1. WORDS)
                        J/TEST134A1                                !   ERROR:  "OPA133A1"  (-11. WORDS)
  (4171)  DCS[0.00.0.1.0.1]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...101.001.001]



        ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

        !CHECK CARRY PROPOGATE/GENERATE LOGIC WITH:
        !(045513)-PLUS-(141703)-PLUS-(1)=(007417), COUT15=(1)
        4511:
        TEST134A1:
                P0,     LOAD-ENUA(ZTARGET434),                     !SETUP FOR IR=(000000)/BUTINSTRS COMPARE
                        LOAD-ERROR(TEST134A1),                     !ERROR DIRECTORY KEY
                        DCS-CTR(C11.),                             !COMPARE AT TARGET
                NEXT,   J/OPA134A1                                 !
  (4511)  DCS[1.00.1.0.0.0]  BM[0100..00.11..11.00..011..100...0.0.0..0..0...0.0000...0..0000.0...11.000...101.001.010]

        4512:
        OPA134A1:
                P0,     BUMP-VERIFY,                               !COUNT
                P3,     CSPD[17]←EMIT,                             !A-SIDE OPERAND:
                        EMIT/045513,                               !"0100 1011 0100 1011"
                NEXT,   J/OPB134A1                                 !
  (4512)  DCS[0.00.0.0.0.1]  BM[0100..10.10..11.01..001..011...0.0.0..0..0...0.0000...1..0000.0...11.000...001.111.010]

        4172:  !(FREE)
        OPB134A1:
                P3,     CSPD[16]←EMIT,                             !B-SIDE OPERAND:
                        EMIT/141703,                               !"1100 0011 1100 0011"
                NEXT,   J/DOPA134A1                                !
  (4172)  DCS[0.00.0.0.0.0]  BM[1100..10.00..11.11..000..011...0.0.0..0..0...0.0001...1..0000.0...11.000...001.111.011]

        4173:  !(FREE)
        DOPA134A1:
                P2-T,   D←CSPD(D17), D[C]←ALU00,                   !OP-A INTO D, D[C]←1
                        SR←CSPD(D17),                              !OP-A INTO SR TOO
                NEXT,   J/GOTEST134A1                              !
  (4173)  DCS[0.00.0.0.0.0]  BM[1010..10.00..00.00..000..010...0.1.1..0..0...0.0000...0..0000.0...11.000...001.111.100]

        4174:  !(FREE)
```

```
GOTEST134A1:
        P0,     BUMP-VERIFY,                          !COUNT
        SETUP,  RETURN/TEST134A2,                     !EXEC SUBR WHICH:
                                                      !(1) D←OPA-PLUS-OPB-PLUS-1
                                                      !(2) D←007417-XOR-D (EQUAL?)
        NEXT,   CALL[ALUCARRY1]                       !(3) J/BUTINSTRS/(000000) (CHECK ANSWER)
(4174)  DCS[0.00.0.0.0.1]  BM[0100..00.10..10.00..011..111...0.0.0..0..0...0.0000...0..0000.0...11.100...000.000.111]



!CHECK THAT CARRYOUT COUT15 ABOVE GENERATED CORRECTLY AS A (1)
4503:
TEST134A2:
        P0,     LOAD-ENUA(ZTARGET403),                !BIT<01> SET
                LOAD-ERROR(TEST134A2),                !ERROR DIRECTORY KEY
                DCS-CTR(C3.),                         !COMPARE AT TARGET
                BUMP-VERIFY,                          !COUNT
        NEXT,   J/GOBUT134A2                          !
(4503)  DCS[1.00.1.0.0.1]  BM[1100..00.11..11.00..000..011...0.0.0..0..0...0.0000...0..0000.0...11.000...001.111.101]

4175:   !(FREE)
GOBUT134A2:
        SETUP,  RETURN/TEST134B1,                     !RETURN TO START OF NEXT SUBTEST
        NEXT,   GOTO-PAGE(7),                         !BUT TABLE
                J/BUTD[C]B                            !D[C] = COUT15 IN BIT<01>
(4175)  DCS[0.00.0.0.0.0]  BM[0100..00.10..10.00..100..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.101.000]





! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

!CHECK CARRY PROPOGATE/GENERATE LOGIC WITH COMPLEMENT OF ABOVE:
!(132264)-PLUS-(036074)-PLUS-(0)=(170360), COUT15=(0)
4504:
TEST134B1:
        P0,     LOAD-ENUA(ZTARGET434),                !SETUP FOR IR=(000000)/BUTINSTRS COMPARE
                LOAD-ERROR(TEST134B1),                !ERROR DIRECTORY KEY
                DCS-CTR(C9.),                         !COMPARE AT TARGET
        NEXT,   J/OPA134B1                            !
(4504)  DCS[1.00.1.0.0.0]  BM[0110..00.11..11.00..011..100...0.0.0..0..0...0.0000...0..0000.0...11.000...001.111.110]

4176:   !(FREE)
OPA134B1:
        P2-T,   D←NOT-CSPD(D17),                      !
                D[C]←ALU00,                           !OP-A INTO D, D[C]←(0)
                SR←NOT-CSPD(D17),                     !OP-A INTO SR TOO
                                                      !A-SIDE OPERAND:
                                                      !"1011 0100 1011 0100"
                                                      !B-SIDE OPERAND WILL BE:
        NEXT,   J/GOTEST134B1                         !"0011 1100 0011 1100"
```

```
(4176)  DCS[0.00.0.0.0.0]  BM[0111..10.00..11.01..101..010...0.1.1..0..0...0.0000...0..0000.0...11.000...001.111.111]

        4177:  !(FREE)
        GOTEST134B1:
                SETUP,   RETURN/TEST134B2,                          !EXEC SUBR WHICH:
                                                                    !(1) D←(NOT-OPA)-PLUS-(NOT-OPB)
                                                                    !(2) D←170360-XOR-D (EQUAL?)
                NEXT,    CALL[ALUCARRY2]                            !(3) J/BUTINSTRS/(000000) (CHECK ANSWER)
(4177)  DCS[0.00.0.0.0.0]  BM[0100..00.10..10.00..101..111...0.0.0..0..0...0.0000...0..0000.0...11.100...000.010.000]



        !CHECK THAT CARRYOUT COUT15 ABOVE GENERATED CORRECTLY AS A (0)
        4505:
        TEST134B2:
                PO,      LOAD-ENUA(ZTARGET401),                     !BIT<01> CLEAR
                         LOAD-ERROR(TEST134B2),                     !ERROR DIRECTORY KEY
                         DCS-CTR(C3.),                              !COMPARE AT TARGET
                NEXT,    J/GOBUT134B2                               !
(4505)  DCS[1.00.1.0.0.0]  BM[1100..00.11..11.00..000..001...0.0.0..0..0...0.0000...0..0000.0...11.000...010.000.000]

        4200:  !(FREE)
        GOBUT134B2:
                SETUP,   RETURN/SCOPE134B,                          !RETURN TO SCOPE LOOP TEST WORD
                NEXT,    GOTO-PAGE(7),                              !BUT TABLE
                         J/BUTD[C]B                                 !D[C]H = COUT15 H IN BIT<01>
(4200)  DCS[0.00.0.0.0.0]  BM[0100..00.01..00.00..001..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.101.000]



        4201:  !(FREE)
        SCOPE134B:
                PO,      BUMP-VERIFY,                               !COUNT
                NEXT,    BUTD[SCOPE],                               !NO ERROR:  "TEST135A1" (+1. WORDS)
                         J/TEST135A1                                !   ERROR:  "OPA134A1" (-11. WORDS)
(4201)  DCS[0.00.0.1.0.1]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...101.001.011]



        ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

        !CHECK CARRY PROPOGATE/GENERATE LOGIC WITH:
        !(122645)-PLUS-(064551)-PLUS-(1)=(007417), COUT15=(1)
        4513:
        TEST135A1:
                PO,      LOAD-ENUA(ZTARGET434),                     !SETUP FOR IR=(000000)/BUTINSTRS COMPARE
                         LOAD-ERROR(TEST135A1),                     !ERROR DIRECTORY KEY
                         DCS-CTR(C11.),                             !COMPARE AT TARGET
                NEXT,    J/OPA135A1                                 !
(4513)  DCS[1.00.1.0.0.0]  BM[0100..00.11..11.00..011..100...0.0.0..0..0...0.0000...0..0000.0...11.000...101.001.100]

        4514:
```

```
     OPA135A1:
             P0,      BUMP-VERIFY,                             !COUNT
             P3,      CSPD[17]←EMIT,                           !A-SIDE OPERAND:
                      EMIT/122645,                             !"1010 0101 1010 0101"
             NEXT,    J/OPB135A1                               !
 (4514)  DCS[0.00.0.0.0.1]  BM[1010..10.01..01.10..100..101...0.0.0..0..0...0.0000...1..0000.0...11.000...010.000.010]

     4202:  !(FREE)
     OPB135A1:
             P3,      CSPD[16]←EMIT,                           !B-SIDE OPERAND:
                      EMIT/064551,                             !"0110 1001 0110 1001"
             NEXT,    J/DOPA135A1                              !
 (4202)  DCS[0.00.0.0.0.0]  BM[0110..10.10..01.01..101..001...0.0.0..0..0...0.0001...1..0000.0...11.000...010.000.011]

     4203:  !(FREE)
     DOPA135A1:
             P2-T,    D←CSPD(D17), D[C]←ALU15,                 !OP-A INTO D, D[C]←1
                      SR←CSPD(D17),                            !OP-A INTO SR TOO
             NEXT,    J/GOTEST135A1                            !
 (4203)  DCS[0.00.0.0.0.0]  BM[1010..10.00..00.00..000..100...0.1.1..0..0...0.0000...0..0000.0...11.000...010.000.100]

     4204:  !(FREE)
     GOTEST135A1:
             P0,      BUMP-VERIFY,                             !COUNT
             SETUP,   RETURN/TEST135A2,                        !EXEC SUBR WHICH:
                                                               !(1) D←OPA-PLUS-OPB-PLUS-1
                                                               !(2) D←007417-XOR-D (EQUAL?)
             NEXT,    CALL[ALUCARRY1]                          !(3) J/BUTINSTRS/(000000) (CHECK ANSWER)
 (4204)  DCS[0.00.0.0.0.1]  BM[0100..00.10..10.00..110..111...0.0.0..0..0...0.0000...0..0000.0...11.100...000.000.111]



     !CHECK THAT CARRYOUT COUT15 ABOVE GENERATED CORRECTLY AS A (1)
     4506:
     TEST135A2:
             P0,      LOAD-ENUA(ZTARGET417),                   !BIT<02> SET
                      LOAD-ERROR(TEST135A2),                   !ERROR DIRECTORY KEY
                      DCS-CTR(C3.),                            !COMPARE AT TARGET
                      BUMP-VERIFY,                             !COUNT
             NEXT,    J/GOBUT135A2                             !
 (4506)  DCS[1.00.1.0.0.1]  BM[1100..00.11..11.00..001..111...0.0.0..0..0...0.0000...0..0000.0...11.000...010.000.101]

     4205:  !(FREE)
     GOBUT135A2:
             SETUP,   RETURN/TEST135B1,                        !RETURN TO START OF NEXT SUBTEST
             NEXT,    GOTO-PAGE(7),                            !BUT TABLE
                      J/BUTD[C]C                               !D[C]H = COUT15 IN BIT<02>
 (4205)  DCS[0.00.0.0.0.0]  BM[0100..00.10..10.00..111..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.001.000]
```

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    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    !CHECK CARRY PROPOGATE/GENERATE LOGIC WITH COMPLEMENT OF ABOVE:
    !(055132)-PLUS-(113226)-PLUS-(0)=(170360), COUT15=(0)
    4507:
    TEST135B1:
            P0,     LOAD-ENUA(ZTARGET434),                  !SETUP FOR IR=(000000)/BUTINSTRS COMPARE
                    LOAD-ERROR(TEST135B1),                  !ERROR DIRECTORY KEY
                    DCS-CTR(C9.),                           !COMPARE AT TARGET
            NEXT,   J/OPA135B1                              !
(4507)  DCS[1.00.1.0.0.0]  BM[0110..00.11..11.00..011..100...0.0.0..0..0...0.0000...0..0000.0...11.000...010.000.110]

    4206:  !(FREE)
    OPA135B1:
            P2-T,   D←NOT-CSPD(D17),                        !
                    D[C]←ALU15,                             !OP-A INTO D, D[C]←(0)
                    SR←NOT-CSPD(D17),                       !OP-A INTO SR TOO
                                                            !A-SIDE OPERAND:
                                                            !"0101 1010 0101 1010"
                                                            !B-SIDE OPERAND WILL BE:
            NEXT,   J/GOTEST135B1                           !"1001 0110 1001 0110"
(4206)  DCS[0.00.0.0.0.0]  BM[0111..10.00..11.01..101..100...0.1.1..0..0...0.0000...0..0000.0...11.000...010.000.111]

    4207:  !(FREE)
    GOTEST135B1:
            SETUP,  RETURN/TEST135B2,                       !EXEC SUBR WHICH:
                                                            !(1) D←(NOT-OPA)-PLUS-(NOT-OPB)
                                                            !(2) D←170360-XOR-D (EQUAL?)
            NEXT,   CALL[ALUCARRY2]                         !(3) J/BUTINSTRS/(000000) (CHECK ANSWER)
(4207)  DCS[0.00.0.0.0.0]  BM[0100..00.10..01.11..111..111...0.0.0..0..0...0.0000...0..0000.0...11.100...000.010.000]



    !CHECK THAT CARRYOUT COUT15 ABOVE GENERATED CORRECTLY AS A (0)
    4477:
    TEST135B2:
            P0,     LOAD-ENUA(ZTARGET413),                  !BIT<02> CLEAR
                    LOAD-ERROR(TEST135B2),                  !ERROR DIRECTORY KEY
                    DCS-CTR(C3.),                           !COMPARE AT TARGET
            NEXT,   J/GOBUT135B2                            !
(4477)  DCS[1.00.1.0.0.0]  BM[1100..00.11..11.00..001..011...0.0.0..0..0...0.0000...0..0000.0...11.000...010.001.000]

    4210:  !(FREE)
    GOBUT135B2:
            SETUP,  RETURN/SCOPE135B,                       !RETURN TO SCOPE LOOP TEST WORD
            NEXT,   GOTO-PAGE(7),                           !BUT TABLE
                    J/BUTD[C]C                              !D[C]H = COUT15 H IN BIT<02>
(4210)  DCS[0.00.0.0.0.0]  BM[0100..00.01..00.01..001..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.001.000]
```

```
     4211:  !(FREE)
     SCOPE135B:
             PO,      BUMP-VERIFY,                         !COUNT
             NEXT,    BUTD[SCOPE],                         !NO ERROR:  "TEST136A1"  (+1. WORDS)
                      J/TEST136A1                          !   ERROR:  "OPA135A1"   (-11. WORDS)
(4211)  DCS[0.00.0.1.0.1]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...101.001.101]



     ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

     !CHECK CARRY PROPOGATE/GENERATE LOGIC WITH:
     !(055132)-PLUS-(132264)-PLUS-(1)=(007417), COUT15=(1)
     4515:
     TEST136A1:
             PO,      LOAD-ENUA(ZTARGET434),               !SETUP FOR IR=(000000)/BUTINSTRS COMPARE
                      LOAD-ERROR(TEST136A1),               !ERROR DIRECTORY KEY
                      DCS-CTR(C10.),                       !COMPARE AT TARGET
             NEXT,    J/OPB136A1                           !
(4515)  DCS[1.00.1.0.0.0]  BM[0101..00.11..11.00..011..100...0.0.0..0..0...0.0000...0..0000.0...11.000...101.100.010]

     4542:
     OPB136A1:
             P3,      CSPD[16]←EMIT,                       !B-SIDE OPERAND:
                      EMIT/132264,                         !"1011 0100 1011 0100"
             NEXT,    J/DOPA136A1                          !
(4542)  DCS[0.00.0.0.0.0]  BM[1011..10.01..00.10..110..100...0.0.0..0..0...0.0001...1..0000.0...11.000...010.001.010]

     4212:  !(FREE)
     DOPA136A1:
             P2-T,    D←NOT-CSPD(D17), D[C]←COUT07,        !OP-A INTO D, D[C]←1
                      SR←NOT-CSPD(D17),                    !OP-A INTO SR TOO
             NEXT,    J/GOTEST136A1                        !"0101 1010 0101 1010"
(4212)  DCS[0.00.0.0.0.0]  BM[0111..10.00..11.01..101..101...0.1.1..0..0...0.0000...0..0000.0...11.000...010.001.011]

     4213:  !(FREE)
     GOTEST136A1:
             PO,      BUMP-VERIFY,                         !COUNT
             SETUP,   RETURN/TEST136A2,                    !EXEC SUBR WHICH:
                                                           !(1) D←OPA-PLUS-OPB-PLUS-1
                                                           !(2) D←007417-XOR-D EQUAL?)
             NEXT,    CALL[ALUCARRY1]                      !(3) J/BUTINSTRS/(000000) (CHECK ANSWER)
(4213)  DCS[0.00.0.0.0.1]  BM[0100..00.10..01.11..110..111...0.0.0..0..0...0.0000...0..0000.0...11.100...000.000.111]



     !CHECK THAT CARRYOUT COUT15 ABOVE GENERATED CORRECTLY AS A (1)
     4476:
     TEST136A2:
             PO,      LOAD-ENUA(ZTARGET403),               !BIT<00> SET
                      LOAD-ERROR(TEST136A2),               !ERROR DIRECTORY KEY
                      DCS-CTR(C3.),                        !COMPARE AT TARGET
                      BUMP-VERIFY,                         !COUNT
```

```
                NEXT,   J/GOBUT136A2                            !
        (4476)  DCS[1.00.1.0.0.1]  BM[1100..00.11..11.00..000..011...0.0.0..0..0...0.0000...0..0000.0...11.000...010.001.100]

        4214:   !(FREE)
        GOBUT136A2:
                SETUP,  RETURN/TEST136B1,                       !RETURN TO START OF NEXT SUBTEST
                NEXT,   GOTO-PAGE(7),                           !BUT TABLE
                        J/BUTD[C]A                              !D[C]H = COUT15 IN BIT<00>
        (4214)  DCS[0.00.0.0.0.0]  BM[0100..00.10..01.11..101..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.100]





        ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

        !CHECK CARRY PROPOGATE/GENERATE LOGIC WITH COMPLEMENT OF ABOVE:
        !(122645)-PLUS-(132264)-PLUS-(0)=(170360), COUT15=(0)
        4475:
        TEST136B1:
                P0,     LOAD-ENUA(ZTARGET434),                  !SETUP FOR IR=(000000)/BUTINSTRS COMPARE
                        LOAD-ERROR(TEST136B1),                  !ERROR DIRECTORY KEY
                        DCS-CTR(C9.),                           !COMPARE AT TARGET
                NEXT,   J/OPA136B1                              !
        (4475)  DCS[1.00.1.0.0.0]  BM[0110..00.11..11.00..011..100...0.0.0..0..0...0.0000...0..0000.0...11.000...010.001.101]

        4215:   !(FREE)
        OPA136B1:
                P2-T,   D+CSPD(D17),                            !
                        D[C]+0,                                 !OP-A INTO D, D[C]+0
                        SR+CSPD(D17),                           !OP-A INTO SR TOO
                                                                !A-SIDE OPERAND:
                                                                !"1010 0101 1010 0101"
                                                                !B-SIDE OPERAND WILL BE:
                NEXT,   J/GOTEST136B1                           !"0100 1011 0100 1011"
        (4215)  DCS[0.00.0.0.0.0]  BM[1010..10.00..00.00..000..000...0.1.1..0..0...0.0000...0..0000.0...11.000...010.001.110]

        4216:   !(FREE)
        GOTEST136B1:
                SETUP,  RETURN/TEST136B2,                       !EXEC SUBR WHICH:
                                                                !(1) D+(NOT-OPA)-PLUS-(NOT-OPB)
                                                                !(2) D+170360-XOR-D (EQUAL?)
                NEXT,   CALL[ALUCARRY2]                         !(3) J/BUTINSTRS/(000000) (CHECK ANSWER)
        (4216)  DCS[0.00.0.0.0.0]  BM[0100..00.10..01.11..011..111...0.0.0..0..0...0.0000...0..0000.0...11.100...000.010.000]



        !CHECK THAT CARRYOUT COUT15 ABOVE GENERATED CORRECTLY AS A (0)
        4473:
        TEST136B2:
                P0,     LOAD-ENUA(ZTARGET402),                  !BIT<00> CLEAR
                        LOAD-ERROR(TEST136B2),                  !ERROR DIRECTORY KEY
```

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                DCS-CTR(C3.),                           !COMPARE AT TARGET
        NEXT,   J/GOBUT13682                            !
 (4473) DCS[1.00.1.0.0.0]  BM[1100..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...010.001.111]

    4217:  !(FREE)
    GOBUT13682:
        SETUP,  RETURN/SCOPE136B,                       !RETURN TO SCOPE LOOP TEST WORD
        NEXT,   GOTO-PAGE(7),                           !BUT TABLE
                J/BUTD[C]A                              !D[C]H = COUT15 H IN BIT<00>
 (4217) DCS[0.00.0.0.0.0]  BM[0100..00.01..00.10..000..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.100]



    4220:  !(FREE)
    SCOPE136B:
        PO,     BUMP-VERIFY,                            !COUNT
        NEXT,   BUTD[SCOPE],                            !NO ERROR:  "TEST320A"  (+1. WORDS)
                J/TEST320A                              !   ERROR:  "OPA136A1"  (-11. WORDS)
 (4220) DCS[0.00.0.1.0.1]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...101.100.011]






    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    !       THE FOLLOWING TWO SUBROUTINES ARE USED IN THE ABOVE CARRY LOOKAHEAD/INTERNAL CARRIES TESTS:


    7007:  !(FREE)
    ALUCARRY1:
        P3-T,   D+A-PLUS-B-PLUS-D[C],                   !D <- SUM OF A, B:  D[C] WAS SET PREVIOUSLY
                D[C]+COUT15,                            !GET CARRYOUT FOR EXAMINATION LATER
                SR+A-PLUS-B-PLUS-D[C],                  !ALSO GET IT INTO THE SR
                BUS-A+SR,                               !A-SIDE OPERAND WAS IN THE SR
                BUS-B+CSPD(D16),                        !B-SIDE OPERAND WAS IN CSP(16)
        NEXT,   J/ALUCARRY1A                            !
 (7007) DCS[0.00.0.0.0.0]  BM[0100..10.00..00.00..000..110...1.1.1..0..0...0.0001...0..0000.0...11.000...000.001.111]

    7017:  !(FREE)
    ALUCARRY1A:
        P2-T,   D+SR-XOR-CSPD(D06), SAVE-D[C],          !COMPARE RECEIVED : (007417)
        NEXT,   J/DINTOIRS                              !GO PUT D -> IR, BUT(INSTRS) FOR (000000)
 (7017) DCS[0.00.0.0.0.0]  BM[0110..10.00..00.00..000..111...0.1.0..0..0...0.1001...0..0000.0...11.000...010.111.011]




    7020:  !(FREE)
    ALUCARRY2:
        P3-T,   D+A-PLUS-NOT-B-PLUS-D[C],               !D <- DIFF OF A, B:  D[C] WAS SET PREVIOUSLY
                D[C]+COUT15,                            !GET CARRYOUT FOR EXAMINATION LATER
```

```
                SR+A-PLUS-NOT-B-PLUS-D[C],                  !ALSO GET IT INTO THE SR
                BUS-A+SR,                                   !A-SIDE OPERAND WAS IN THE SR
                BUS-B+CSPD(D16),                            !B-SIDE OPERAND WAS IN CSP(16)
        NEXT,   J/ALUCARRY2A                                !
(7020)  DCS[0.00.0.0.0.0]  BM[0101..10.00..00.00..000..110...1.1.1..0..0...0.0001...0..0000.0...11.000...000.010.001]

    7021:  !(FREE)
    ALUCARRY2A:
        P2-T,   D+SR-XOR-CSPD(D05), SAVE-D[C],              !COMPARE RECEIVED : (170360)
        NEXT,   J/DINTOIRS                                  !GO PUT D -> IR, BUT(INSTRS) FOR (000000)
(7021)  DCS[0.00.0.0.0.0]  BM[0110..10.00..00.00..000..111...0.1.0..0..0...0.1010...0..0000.0...11.000...010.111.011]





    !.PAGE=============================================================================================================


    .TOC   *   TEST320:  D[C] SELECTION / COUT07-DOUT07 / D<14:00>=ZERO@BIT<00>


    !***************************************************************************************
    !*
    !*      TESTS:  320 A - F                           UWORDS:  026 + 014
    !*
    !*      FUNCTIONS:
    !*
    !*      THESE SIX TESTS CHECK THE D[C] ADDRESS SELECTION LOGIC, COUT07 CARRY
    !*      AND DOUT07 BUTS, AND THE D<14:00>=ZERO BUT, WHEN ONLY BIT<00>=1 (NOT
    !*      CHECKED IN TEST410).
    !*
    !***************************************************************************************



    !TEST-320-A SETS ONLY THE D[C] INPUT "ALU00" (CODE=010), AND THEN CHECKS THAT D[C]+ALU00
    !  RESULTS IN A "1".
    4543:
    TEST320A:
        P0,     LOAD-ENUA(ZTARGET403),                      !BIT<00> SET
                LOAD-ERROR(TEST320A),                       !ERROR DIRECTORY KEY
                DCS-CTR(C6.),                               !COMPARE AT TARGET
        NEXT,   J/SETONE320A                                !
(4543)  DCS[1.00.1.0.0.0]  BM[1001..00.11..11.00..000..011...0.0.0..0..0...0.0000...0..0000.0...11.000...111.000.000]

    4700:
    SETONE320A:
        P0,     BUMP-VERIFY,                                !COUNT
        P3,     CSPD[17]+EMIT, EMIT/000001,                 !A ONE
        NEXT,   J/SETD320A                                  !
(4700)  DCS[0.00.0.0.0.1]  BM[0000..10.00..00.00..000..001...0.0.0..0..0...0.0000...1..0000.0...11.000...010.010.001]

    4221:  !(FREE)
```

```
        SETD320A:
                P2-T,     D←CSPD(D17), D[C]←D,                    !D GETS (000001)
                          SR←CSPD(D17),                           !SO DOES SR
                P3,       A#BSPHI[11]←D,                          !STORE THE CONSTANT
                NEXT,     J/GETDC320A                             !
    (4221)  DCS[0.00.0.0.0.0]  BM[1010..10.11..00.01..000..000...0.1.1..0..0...0.0000...0..1011.0...11.000...010.010.010]

        4222:  !(FREE)
        GETDC320A:
                P2-T,     D←A-PLUS-B-PLUS-0, D[C]←ALU00,          !D[C] CODE (010)
                          BUS-A←SR,                               !A=(000001)
                          BUS-B←CSPD(C000000),                    !B=(000000)
                NEXT,     J/GOBUT320A                             !D=(000001), ONLY D[C]=ALU00 SET
    (4222)  DCS[0.00.0.0.0.0]  BM[1001..10.00..00.00..000..010...0.1.0..0..0...0.0100...0..0000.0...11.000...010.010.011]

        4223:  !(FREE)
        GOBUT320A:
                P0,       BUMP-VERIFY,                            !COUNT
                SETUP,    RETURN/TEST320B,                        !RETURN TO START OF NEXT SUBTEST
                NEXT,     GOTO-PAGE(7),                           !BUT TABLE
                          J/BUTD[C]A                              !D[C]H IN BIT<00>
    (4223)  DCS[0.00.0.0.0.1]  BM[0100..00.10..11.01..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.100]




        !  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -

        !TEST-320-B CHECKS THAT D<14:00>=ZERO IS NOT SET WHEN D=(000001)
        4552:
        TEST320B:
                P0,       LOAD-ENUA(ZTARGET400),                  !BIT<01> CLEAR
                          LOAD-ERROR(TEST320B),                   !ERROR DIRECTORY KEY
                          DCS-CTR(C3.),                           !COMPARE AT TARGET
                          BUMP-VERIFY,                            !COUNT
                NEXT,     J/GOBUT320B                             !
    (4552)  DCS[1.00.1.0.0.1]  BM[1100..00.11..11.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...010.010.100]

        4224:  !(FREE)
        GOBUT320B:
                SETUP,    RETURN/TEST320C,                        !RETURN TO START OF NEXT SUBTEST
                NEXT,     GOTO-PAGE(7),                           !BUT TABLE
                          J/BUTD-IS-ZERO                          !CHEK ON IT
    (4224)  DCS[0.00.0.0.0.0]  BM[0100..00.10..11.10..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.001]



        !  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -

        !TEST-320-C CHECKS THAT THE COUT15/COUT07 SIGNALS DON'T TRACK EACH OTHER
        4562:
        TEST320C:
```

```
              P0,      LOAD-ENUA(ZTARGET413),                         !BIT<02> CLEAR
                       LOAD-ERROR(TEST320C),                          !ERROR DIRECTORY KEY
                       DCS-CTR(C6.),                                  !COMPARE AT TARGET
              NEXT,    J/SETONE320C                                   !
     (4562)  DCS[1.00.1.0.0.0]  BM[1001..00.11..11.00..001..011...0.0.0..0..0...0.0000...0..0000.0...11.000...010.010.101]

      4225:  !(FREE)
      SETONE320C:
              P3,      CSPD[16]+EMIT, EMIT/100000,                    !A ONE IN B15
              NEXT,    J/SETD320C                                     !
     (4225)  DCS[0.00.0.0.0.0]  BM[1000..10.00..00.00..000..000...0.0.0..0..0...0.0001...1..0000.0...11.000...010.010.110]

      4226:  !(FREE)
      SETD320C:
              P2-T,    D+CSPD(D16), D[C]+ALU15,                       !D GETS (100000)
                       SR+CSPD(D16),                                  !SO DOES SR
              P3,      A#BSPHI[13]+D,                                 !STORE THE CONSTANT
              NEXT,    J/GETDC320C                                    !
     (4226)  DCS[0.00.0.0.0.0]  BM[1010..10.11..00.01..001..100...0.1.1..0..0...0.0001...0..1011.0...11.000...010.010.111]

      4227:  !(FREE)
      GETDC320C:
              P0,      BUMP-VERIFY,                                   !COUNT
              P2-T,    D+A-PLUS-B-PLUS-0, D[C]+COUT07,                !D[C] GETS COUT07=0, COUT15=1
                       BUS-A+SR,                                      !A=(100000)
                       BUS-B+CSPD(C125252),                           !B=(125252)
              NEXT,    J/GOBUT320C                                    !D=(025252)
     (4227)  DCS[0.00.0.0.0.1]  BM[1001..10.00..00.00..000..101...0.1.0..0..0...0.0110...0..0000.0...11.000...010.011.000]

      4230:  !(FREE)
      GOBUT320C:
              SETUP,   RETURN/TEST320D,                               !RETURN TO START OF NEXT SUBTEST
              NEXT,    GOTO-PAGE(7),                                  !BUT TABLE
                       J/BUTD[C]C                                     !D[C]H IN BIT<02>
     (4230)  DCS[0.00.0.0.0.0]  BM[0100..00.10..10.11..111..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.001.000]





      ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

      !TEST-320-D CHECKS THAT THE BUTR(COUT07#DOUT07) SEES THE (01*) THAT WAS GENERATED
      4537:
      TEST320D:
              P0,      LOAD-ENUA(ZTARGET403),                         !BIT<2:1> = "01"
                       LOAD-ERROR(TEST320D),                          !ERROR DIRECTORY KEY
                       DCS-CTR(C3.),                                  !COMPARE AT TARGET
              NEXT,    J/GOBUT320D                                    !
     (4537)  DCS[1.00.1.0.0.0]  BM[1100..00.11..11.00..000..011...0.0.0..0..0...0.0000...0..0000.0...11.000...010.011.001]

      4231:  !(FREE)
      GOBUT320D:
```

```
            SETUP,  RETURN/TEST320E,                      !RETURN TO START OF NEXT SUBTEST
            NEXT,   GOTO-PAGE(7),                         !BUT TABLE
                    J/BUTCOUT7DOUT7                       !COUT07#D07 IN BIT<2:1>
    (4231)  DCS[0.00.0.0.0.0]  BM[0100..00.10..11.01..100..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.001.001]




    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    !TEST-320-E SETS ONLY THE D[C] INPUT "COUT07" (CODE=101), AND THEN CHECKS THAT D[C]+COUT07
    !  RESULTS IN A "1".
    4554:
    TEST320E:
            P0,     LOAD-ENVA(ZTARGET403),                !BIT<01> SET
                    LOAD-ERROR(TEST320E),                 !ERROR DIRECTORY KEY
                    DCS-CTR(C6.),                         !COMPARE AT TARGET
            NEXT,   J/SETONE320E                          !
    (4554)  DCS[1.00.1.0.0.0]  BM[1001..00.11..11.00..000..011...0.0.0..0..0...0.0000...0..0000.0...11.000...010.011.010]

    4232:   !(FREE)
    SETONE320E:
            P0,     BUMP-VERIFY,                          !COUNT
            P3,     CSPD[15]+EMIT, EMIT/000200,           !A ONE IN BIT07
            NEXT,   J/SETD320E                            !
    (4232)  DCS[0.00.0.0.0.1]  BM[0000..10.00..00.10..000..000...0.0.0..0..0...0.0010...1..0000.0...11.000...010.011.011]

    4233:   !(FREE)
    SETD320E:
            P2-T,   D+CSPD(D15), D[C]+0,                  !D GETS (000200)
                    SR+CSPD(D15),                         !SO DOES SR
            P3,     A#BSPHI[15]+D,                        !STORE THE CONSTANT
            NEXT,   J/GETDC320E                           !
    (4233)  DCS[0.00.0.0.0.0]  BM[1010..10.11..00.01..010..000...0.1.1..0..0...0.0010...0..1011.0...11.000...010.011.100]

    4234:   !(FREE)
    GETDC320E:
            P2-T,   D+A-PLUS-B-PLUS-0, D[C]+COUT07,       !D[C] CODE (101)
                    BUS-A+SR,                             !A=(000200)
                    BUS-B+CSPD(D15),                      !B=(000200)
            NEXT,   J/GOBUT320E                           !D=(000400), ONLY D[C]=COUT07 SET
    (4234)  DCS[0.00.0.0.0.0]  BM[1001..10.00..00.00..000..101...0.1.0..0..0...0.0010...0..0000.0...11.000...010.011.101]

    4235:   !(FREE)
    GOBUT320E:
            SETUP,  RETURN/TEST320F,                      !RETURN TO START OF NEXT SUBTEST
            NEXT,   GOTO-PAGE(7),                         !BUT TABLE
                    J/BUTD[C]B                            !D[C]H IN BIT<01>
    (4235)  DCS[0.00.0.0.0.0]  BM[0100..00.10..11.01..110..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.101.000]
```

```

!  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -

!TEST-320-F CHECKS THAT THE BUTR(COUT07#DOUT07) SEES THE (10*) THAT WAS GENERATED
4556:
TEST320F:
        PO,     LOAD-ENUA(ZTARGET405),                  !BIT<2:1> = "10"
                LOAD-ERROR(TEST320F),                   !ERROR DIRECTORY KEY
                DCS-CTR(C3.),                           !COMPARE AT TARGET
        NEXT,   J/GOBUT320F                             !
(4556)  DCS[1.00.1.0.0.0]  BM[1100..00.11..11.00..000..101...0.0.0..0..0...0.0000...0..0000.0...11.000...010.011.110]

4236:  !(FREE)
GOBUT320F:
        SETUP,  RETURN/SCOPE320,                        !RETURN TO SCOPE LOOP TEST WORD
        NEXT,   GOTO-PAGE(7),                           !BUT TABLE
                J/BUTCOUT7DOUT7                         !COUT07#D07 IN BIT<2:1>
(4236)  DCS[0.00.0.0.0.0]  BM[0100..00.01..00.11..111..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.001.001]


4237:  !(FREE)
SCOPE320:
        PO,     BUMP-VERIFY,                            !COUNT
                BUSDIN+EMIT-[I],                        !RESET PROC UCONS
                EN-CLK-IR[15-00],                       !
        NEXT,   BUTD[SCOPE],                            !NO ERROR:  "TEST350" (+1. WORDS)
                J/TEST350                               !   ERROR:  "SETONE320A"  (-20. WORDS)
(4237)  DCS[0.00.0.1.0.1]  BM[0000..00.00..00.01..000..100...0.0.0..0..0...1.1001...0..0000.0...11.000...111.000.001]







!.PAGE==========================================================================================

.TOC   *   TEST350-352:  ASP/BSP HI/LO ADDRESSING MODES, DATA VALIDITY

!*****************************************************************************
!*
!*      TESTS:  350 - 352                               UWORDS:  075 + 125
!*
!*      FUNCTIONS:
!*
!*      VERIFIES THE ASP/BSP ADDRESSING MODES.
!*
!*****************************************************************************



!TEST 350 A-D USES THE A/B SP "SF" AND "DF" ADDRESS MODES TO WRITE A UNIQUE PATTERN TO
```

```
	!LOCATIONS (00:07) OF ASPHI, ASPLO, BSPHI, BSPLO, THRU USE OF A COUNT LOOP.
	!THE GENERATED PATTERN IS THEN READ BACK, AND COMPARED TO A REGENERATED ORIGINAL,
	!TO CHECK FOR ADDRESSING CORRECTNESS, ABILITY TO READ/WRITE, AND DATAPATH VALIDITY.
	!
	!FIRST FILL UP THE SCRATCHPADS:
	!
	!	AT THE END OF THE FILLUP LOOP, A/B SP HI/LO LOOK LIKE THIS:
	!
	!	LOCTN	ASPHI		BSPHI		ASPLO		BSPLO
	!	-----	------		------		------		------
	!
	!	 00	050700		050700		057077		057077
	!	 01	051611		051611		056166		056166
	!	 02	052522		052522		055255		055255
	!	 03	053433		053433		054344		054344
	!	 04	054344		054344		053433		053433
	!	 05	055255		055255		052522		052522
	!	 06	056166		056166		051611		051611
	!	 07	057077		057077		050700		050700
	!	 10	------		------		------		------
	!	 11	000001		000001		------		------
	!	 12	000152		000152		------		------
	!	 13	100000		100000		000125		000125
	!	 14	------		------		------		------
	!	 15	000200		000200		------		------
	!	 16	------		------		------		------
	!	 17	------		------		------		------
	!
	!	NOTE:  CONSTANTS FOR DCS IN ASPHI/BSPHI 01/03/05/07 WERE DESTROYED,
	!		AND *MUST* BE RESTORED AFTER LEAVING THIS TEST SEQUENCE.
	!
	!
	! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -


	4701:
	TEST350:
		P0,	LOAD-ERROR(TEST350),			!ERROR DIRECTORY KEY
		P3,	CSPD[15]←EMIT, EMIT/177067,		!ADDED TO PATTERN "N" TO GET "N+1"
		NEXT,	J/START350				!
(4701)	DCS[1.00.0.0.0.0]  BM[1111..10.11..10.00..110..111...0.0.0..0..0...0.0010...1..0000.0...11.000...010.100.000]

	4240:	!(FREE)
	START350:
		P0,	BUMP-VERIFY,				!COUNT
		P3,	CSPD[14]←EMIT, EMIT/057077,		!THE INITIAL PATTERN
								!SF=0, DM=7, DF=7
		NEXT,	J/LOADSRD350				!
(4240)	DCS[0.00.0.0.0.1]  BM[0101..10.11..10.00..111..111...0.0.0..0..0...0.0011...1..0000.0...11.000...010.100.001]

	4241:	!(FREE)
	LOADSRD350:
		P2-T,	D←CSPD(D14),				!INITIAL PATTERN
			SR←CSPD(D14),				!D->IR, SR-TEMP
```

```
             NEXT,    GOTO-PAGE(7),                        !
                      J/DINTOIR350                         !
     (4241) DCS[0.00.0.0.0.0] BM[1010..10.00..00.00..000..111...0.1.1..0..0...0.0011...0..0000.0...11.100...011.101.011]

    !*** LOOP BACK POINT FOR SP FILLUP ***

    7353:
    DINTOIR350:
             SETUP,   RETURN/WRITEDF350,                   !CALL SUBR FOR D -> IR
             NEXT,    CALL[DINTOIR]                        !
     (7353) DCS[0.00.0.0.0.0] BM[0100..00.00..00.00..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.110.111]

    4002:  !(FREE)
    WRITEDF350:
             P0,      DCS-CTR(C15.),                       !HOLD UP
             P3,      A*BSPHI[DF]<-D,                      !USE DF TO WRITE A/B HI, W/ WR(AB,H,A)
             NEXT,    GOTO-PAGE(7),                        !
                      J/WRITESF350                         !
     (4002) DCS[0.00.1.0.0.0] BM[0000..00.00..00.10..000..111...0.0.0..0..0...0.0000...0..1011.0...11.100...000.001.110]

    7016:  !(FREE)
    WRITESF350:
             P3,      A*BSPLO[SF]<-D,                      !USE SF TO WRITE A/B LO, W/ WR(AB,L,B)
             NEXT,    J/NEXTPAT350                         !
     (7016) DCS[0.00.0.0.0.0] BM[0000..00.01..00.11..000..000...0.0.0..0..0...0.0000...0..0011.0...11.000...000.010.011]

    7023:  !(FREE)
    NEXTPAT350:
             P2-T,    SR*D<-SR-PLUS-CSPD(D15), SAVE-D[C],  !INCREMENT PATTERN
             NEXT,    BUTR(DMO),                           !IF TRUE:  "LOADHI350" (+1. WORDS) EXIT LOOP
                      J/DINTOIR350                         !IF FALSE: "DINTOIR350" (-3. WORDS) KEEP GOING
     (7023) DCS[0.00.0.0.0.0] BM[1001..10.00..00.00..000..111...0.1.1..0..0...0.0010...0..0000.0...01.001...011.101.011]


    !COME HERE IF DONE LOOPING
    7357:
    LOADHI350:
                                                           !*** IF ANY ASP/BSP HI/LO BIT<03> IN ADDR STUCK ZERO,
                                                           !       ONE OF THE FOLLOWING TWO WORDS WILL OVERWRITE
                                                           !       A PREVIOUSLY WRITTEN LOCATION (IE, 02 OR 03) ***
             P2-T,    D<-CSPD(D01), SAVE-D[C],             !PATTERN OF (000152)
             P3,      A*BSPHI[12]<-D,                      !WRITE SPHI WITH ADDRS BIT<03> SET, DF=0, W/ WR(AB,H,A)
             NEXT,    J/LOADHIA350                         !  FOR USE IN TEST373
     (7357) DCS[0.00.0.0.0.0] BM[1010..10.10..00.00..001..111...0.1.0..0..0...0.1110...0..1011.0...11.000...000.010.100]

    7024:  !(FREE)
    LOADHIA350:
             P2-T,    D<-CSPD(D02), SAVE-D[C],             !PATTERN OF (000125)
             P3,      A*BSPLO[13]<-D,                      !WRITE SPHI WITH ADDRS BIT<03> SET, DF=0, W/ WR(AB,L,B)
             NEXT,    J/AGAINSRD350                        !
     (7024) DCS[0.00.0.0.0.0] BM[1010..10.11..00.01..001..111...0.1.0..0..0...0.1101...0..0011.0...11.000...000.010.101]
```

```
     7025:  !(FREE)
     AGAINSRD350:
             P2-T,    D←CSPD(D14),                         !AGAIN RESET D, SR TO INITIAL PATTERN
                      SR←CSPD(D14),                        !OF (057077)
             NEXT,    GOTO-PAGE(4),                        !
                      J/DINTOIRA350                        !
(7025)  DCS[0.00.0.0.0.0]  BM[1010..10.00..00.00..000..100...0.1.1..0..0...0.0011...0..0000.0...11.100...101.110.011]

     !*** LOOP BACK ENTRY POINT FOR TESTS ***

     4563:
     DINTOIRA350:
             SETUP,   RETURN/TEST350A,                     !GO TO SUBR WHICH PUTS SR -> IR FOR SF/DF/DM
             NEXT,    CALL[SRINTOIR]                       !
(4563)  DCS[0.00.0.0.0.0]  BM[0100..00.11..11.01..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.110.110]


     ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

     !TEST 350A CHECKS BSP-ADDRS/SF, BSPLO ADDRS FOR ERRORS
     4752:
     TEST350A:
             PO,      LOAD-ENVA(ZTARGET434),               !INSTRS FOR IR=(000000)
                      LOAD-ERROR(TEST350A),                !ERROR DIRECTORY KEY
                      DCS-CTR(C7.),                        !COMPARE AT TARGET
             NEXT,    J/COMP350A                           !
(4752)  DCS[1.00.1.0.0.0]  BM[1000..00.11..11.00..011..100...0.0.0..0..0...0.0000...0..0000.0...11.000...111.000.010]

     4702:
     COMP350A:
             P2-T,    D←SR-XOR-BSPLO[SF], SAVE-D[C],       !COMPARE EXPECTED:RECEIVED, BITWISE
             NEXT,    J/GOBUT350A                          !
(4702)  DCS[0.00.0.0.0.0]  BM[0110..00.01..00.00..000..111...0.1.0..0..0...0.0000...0..0000.0...11.000...010.100.011]

     4243:  !(FREE)
     GOBUT350A:
             PO,      BUMP-VERIFY,                         !COUNT
             SETUP,   RETURN/RESETIR350A,                  !GO TO SUBR WHICH:
             NEXT,    CALL[DINTOIR-5]                      !  D -> IR, BUT(INSTRS)
(4243)  DCS[0.00.0.0.0.1]  BM[0111..00.00..00.10..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.111.011]

     7022:  !(FREE)
     RESETIR350A:
             SETUP,   RETURN/TEST350B,                     !GO TO SUBR WHICH PUTS SR -> IR FOR SF/DF/DM
             NEXT,    CALL[SRINTOIR]                       !
(7022)  DCS[0.00.0.0.0.0]  BM[0100..00.11..11.01..011..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.110.110]


     ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

     !TEST 350B CHECKS BSP-ADDRS/DF, BSPHI ADDRS FOR ERRORS
```

```
        4753:
        TEST350B:
                PO,     LOAD-ENUA(ZTARGET434),                   !INSTRS FOR IR=(000000)
                        LOAD-ERROR(TEST350B),                    !ERROR DIRECTORY KEY
                        DCS-CTR(C7.),                            !COMPARE AT TARGET
                NEXT,   J/COMP350B                               !
   (4753) DCS[1.00.1.0.0.0] BM[1000..00.11..11.00..011..100...0.0.0..0..0...0.0000...0..0000.0...11.000...010.100.100]

        4244:  !(FREE)
        COMP350B:
                P2-T,   D+SR-XOR-BSPHI[DF], SAVE-D[C],           !COMPARE EXPECTED:RECEIVED, BITWISE
                NEXT,   J/GOBUT350B                              !
   (4244) DCS[0.00.0.0.0.0] BM[0110..01.00..00.00..000..111...0.1.0..0..0...0.0000...0..0000.0...11.000...010.100.101]

        4245:  !(FREE)
        GOBUT350B:
                SETUP,  RETURN/RESETIR350B,                      !GO TO SUBR WHICH:
                NEXT,   CALL[DINTOIR-5]                          !  D -> IR, BUT(INSTRS)
   (4245) DCS[0.00.0.0.0.0] BM[0111..00.00..00.10..110..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.111.011]

        7026:  !(FREE)
        RESETIR350B:
                SETUP,  RETURN/TEST350C,                         !GO TO SUBR WHICH PUTS SR -> IR FOR SF/DF/DM
                NEXT,   CALL[SRINTOIR]                           !
   (7026) DCS[0.00.0.0.0.0] BM[0100..00.11..11.00..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.110.110]



        ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

        !TEST 350C CHECKS ASP-ADDRS/DF, ASPLO ADDRS FOR ERRORS
        4742:
        TEST350C:
                PO,     LOAD-ENUA(ZTARGET434),                   !INSTRS FOR IR=(000000)
                        LOAD-ERROR(TEST350C),                    !ERROR DIRECTORY KEY
                        DCS-CTR(C7.),                            !COMPARE AT TARGET
                        BUMP-VERIFY,                             !COUNT
                NEXT,   J/COMP350C                               !
   (4742) DCS[1.00.1.0.0.1] BM[1000..00.11..11.00..011..100...0.0.0..0..0...0.0000...0..0000.0...11.000...010.100.110]

        4246:  !(FREE)
        COMP350C:
                P2-T,   D+ASPLO[DF]-XOR-BSPHI[SF], SAVE-D[C],    !COMPARE RECEIVED:EXPECTED, BITWISE
                NEXT,   J/GOBUT350C                              !
   (4246) DCS[0.00.0.0.0.0] BM[0110..01.01..10.10..000..111...0.1.0..0..0...0.0000...0..0000.0...11.000...010.100.111]

        4247:  !(FREE)
        GOBUT350C:
                SETUP,  RETURN/RESETIR350C,                      !GO TO SUBR WHICH:
                NEXT,   CALL[DINTOIR-5]                          !  D -> IR, BUT(INSTRS)
   (4247) DCS[0.00.0.0.0.0] BM[0111..00.00..00.10..111..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.111.011]
```

```
        7027:  !(FREE)
        RESETIR350C:
                SETUP,   RETURN/TEST350D,                          !GO TO SUBR WHICH PUTS SR -> IR FOR SF/DF/DM
                NEXT,    CALL[SRINTOIR]                            !
 (7027)  DCS[0.00.0.0.0.0]  BM[0100..00.11..11.00..011..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.110.110]



        ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

        !TEST 350D CHECKS ASP-ADDRS/SF, ASPHI ADDRS FOR ERRORS
        4743:
        TEST350D:
                P0,      LOAD-ENUA(ZTARGET434),                    !INSTRS FOR IR=(000000)
                         LOAD-ERROR(TEST350D),                     !ERROR DIRECTORY KEY
                         DCS-CTR(C7.),                             !COMPARE AT TARGET
                NEXT,    J/COMP350D                                !
 (4743)  DCS[1.00.1.0.0.0]  BM[1000..00.11..11.00..011..100...0.0.0..0..0...0.0000...0..0000.0...11.000...010.101.000]

        4250:  !(FREE)
        COMP350D:
                P0,      BUMP-VERIFY,                              !COUNT
                P2-T,    D+ASPHI[SF]-XOR-BSPLO[DF], SAVE-D[C],     !COMPARE RECEIVED:EXPECTED, BITWISE
                NEXT,    J/GOBUT350D                               !
 (4250)  DCS[0.00.0.0.0.1]  BM[0110..00.00..11.11..000..111...0.1.0..0..0...0.0000...0..0000.0...11.000...010.101.001]

        4251:  !(FREE)
        GOBUT350D:
                P0,      BUMP-VERIFY,                              !COUNT
                SETUP,   RETURN/SCOPE350,                          !GO TO SUBR WHICH:
                NEXT,    CALL[DINTOIR-5]                           !  D -> IR, BUT(INSTRS)
 (4251)  DCS[0.00.0.0.0.1]  BM[0100..00.01..01.01..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.111.011]



        4252:  !(FREE)
        SCOPE350:
                P2-T,    D+SR, SAVE-D[C],                          !FOR DISPLAY OF SF/DM/DF
                NEXT,    BUTD[SCOPE],                              !NO ERROR:  "RESETIR350" (+1. WORDS)  KEEP ON TESTING
                         J/RESETIR350                              !   ERROR:  "COMP350A"  (-11. WORDS)  HOLD UP PATTERN
 (4252)  DCS[0.00.0.1.0.0]  BM[1111..00.00..00.00..000..111...0.1.0..0..0...0.0000...0..0000.0...11.000...111.000.011]



        ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

        4703:
        RESETIR350:
                P0,      BUMP-VERIFY,                              !COUNT
                SETUP,   RETURN/NEXTPATA350,                       !PUT OLD PAT FROM SR INTO IR FOR DMO TEST
                NEXT,    CALL[SRINTOIR]                            !
 (4703)  DCS[0.00.0.0.0.1]  BM[0100..00.01..01.01..011..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.110.110]
```

```
        4253:  !(FREE)
        NEXTPATA350:
                P2-T,     SR#D←SR-PLUS-CSPD(D15), SAVE-D[C],        !GENER NEXT PATTERN INTO D, SR
                NEXT,     BUTR(DMO),                                !IF TRUE:  "LOAD05-351" (+1. WORDS) ALL DONE HERE
                          J/DINTOIRA350                             !IF FALSE: "DINTOIRA" (-14. WORDS)  KEEP ON TESTING
    (4253)  DCS[0.00.0.0.0.0]  BM[1001..10.00..00.00..000..111...0.1.1..0..0...0.0010...0..0000.0...01.001...101.110.011]


        ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

        !COME HERE IF DONE LOOPING
        !THESE CONSTANTS ARE USED IN THE NEXT TESTS:
        4567:
        LOAD05-351:
                P0,       BUMP-VERIFY,                              !COUNT
                P3,       CSPD[05]←EMIT, EMIT/055255,               !SF=2, DF=5 CONSTANT
                NEXT,     J/LOAD06-351                              !
    (4567)  DCS[0.00.0.0.0.1]  BM[0101..10.10..10.10..101..101...0.0.0..0..0...0.1010...1..0000.0...11.000...010.101.100]

        4254:  !(FREE)
        LOAD06-351:
                P3,       CSPD[06]←EMIT, EMIT/054344,               !SF=3, DF=4 CONSTANT
                NEXT,     J/TEST351A                                !
    (4254)  DCS[0.00.0.0.0.0]  BM[0101..10.10..00.11..100..100...0.0.0..0..0...0.1001...1..0000.0...11.000...111.011.010]


        ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

        !TESTS 351 A-D VERIFY THAT THE RIF ADDRESS, WITH ASP HI/LO IMMED0/1 MODES, OPERATES CORRECTLY

        ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

        !TEST 351A CHECKS ASPLO RIF ADDR "001 0"=(02)
        4732:
        TEST351A:
                P0,       LOAD-ENUA(ZTARGET434),                    !INSTRS FOR IR=(000000)
                          LOAD-ERROR(TEST351A),                     !ERROR DIRECTORY KEY
                          DCS-CTR(C7.),                             !COMPARE AT TARGET
                NEXT,     J/COMP351A                                !
    (4732)  DCS[1.00.1.0.0.0]  BM[1000..00.11..11.00..011..100...0.0.0..0..0...0.0000...0..0000.0...11.000...111.000.100]

        4704:
        COMP351A:
                P2-T,     D←CSPD[05]-XOR-ASPLO(R02), SAVE-D[C],     !COMPARE EXPECTED:RECEIVED, BITWISE
                NEXT,     J/GOBUT351A                               !CSP[05]=(055255)
    (4704)  DCS[0.00.0.0.0.0]  BM[0110..10.00..10.00..101..111...0.1.0..0..0...0.1010...0..0000.0...11.000...010.101.110]

        4256:  !(FREE)
        GOBUT351A:
                P0,       BUMP-VERIFY,                              !COUNT
```

```
               SETUP,   RETURN/TEST351B,                            !GO TO SUBR WHICH:
               NEXT,    CALL[DINTOIR-5]                             !  D -> IR, BUT(INSTR5)
     (4256)  DCS[0.00.0.0.0.1]  BM[0100..00.11..10.10..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.111.011]


     !  - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

     !TEST 351B CHECKS ASPLO RIF ADDR "001 1"=(03)
     4722:
     TEST351B:
               P0,      LOAD-ENVA(ZTARGET434),                      !INSTR5 FOR IR=(000000)
                        LOAD-ERROR(TEST351B),                       !ERROR DIRECTORY KEY
                        DCS-CTR(C7.),                               !COMPARE AT TARGET
               NEXT,    J/COMP351B                                  !
     (4722)  DCS[1.00.1.0.0.0]  BM[1000..00.11..11.00..011..100...0.0.0..0..0...0.0000...0..0000.0...11.000...010.101.111]

     4257:  !(FREE)
     COMP351B:
               P2-T,    D+CSPD[06]-XOR-ASPLO(R03), SAVE-D[C],      !COMPARE EXPECTED:RECEIVED, BITWISE
               NEXT,    J/GOBUT351B                                 !CSP[06]=(054344)
     (4257)  DCS[0.00.0.0.0.0]  BM[0110..10.00..10.01..101..111...0.1.0..0..0...0.1001...0..0000.0...11.000...010.110.000]

     4260:  !(FREE)
     GOBUT351B:
               SETUP,   RETURN/TEST351C,                            !GO TO SUBR WHICH:
               NEXT,    CALL[DINTOIR-5]                             !  D -> IR, BUT(INSTR5)
     (4260)  DCS[0.00.0.0.0.0]  BM[0100..00.11..10.10..011..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.111.011]


     !  - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

     !TEST 351C CHECKS ASPHI RIF ADDR "010 0"=(04)
     4723:
     TEST351C:
               P0,      LOAD-ENVA(ZTARGET434),                      !INSTR5 FOR IR=(000000)
                        LOAD-ERROR(TEST351C),                       !ERROR DIRECTORY KEY
                        DCS-CTR(C7.),                               !COMPARE AT TARGET
                        BUMP-VERIFY,                                !COUNT
               NEXT,    J/COMP351C                                  !
     (4723)  DCS[1.00.1.0.0.1]  BM[1000..00.11..11.00..011..100...0.0.0..0..0...0.0000...0..0000.0...11.000...010.110.001]

     4261:  !(FREE)
     COMP351C:
               P2-T,    D+CSPD[06]-XOR-ASPHI(R04), SAVE-D[C],      !COMPARE EXPECTED:RECEIVED, BITWISE
               NEXT,    J/GOBUT351C                                 !CSP[06]=(054344)
     (4261)  DCS[0.00.0.0.0.0]  BM[0110..10.00..11.00..110..111...0.1.0..0..0...0.1001...0..0000.0...11.000...010.110.010]

     4262:  !(FREE)
     GOBUT351C:
               SETUP,   RETURN/TEST351D,                            !GO TO SUBR WHICH:
               NEXT,    CALL[DINTOIR-5]                             !  D -> IR, BUT(INSTR5)
```

```
(4262)  DCS[0.00.0.0.0.0]  BM[0100..00.11..10.01..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.111.011]


        ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

        !TEST 351D CHECKS ASPHI RIF ADDR "010 1"=(05)
        4712:
        TEST351D:
                PO,     LOAD-ENUA(ZTARGET434),                  !INSTRS FOR IR=(000000)
                        LOAD-ERROR(TEST351D),                   !ERROR DIRECTORY KEY
                        DCS-CTR(C7.),                           !COMPARE AT TARGET
                NEXT,   J/COMP351D                              !
(4712)  DCS[1.00.1.0.0.0]  BM[1000..00.11..11.00..011..100...0.0.0..0..0...0.0000...0..0000.0...11.000...010.110.011]

        4263:  !(FREE)
        COMP351D:
                PO,     BUMP-VERIFY,                            !COUNT
                P2-T,   D+CSPD[05]-XOR-ASPHI(R05), SAVE-D[C],   !COMPARE EXPECTED:RECEIVED, BITWISE
                NEXT,   J/GOBUT351D                             !CSP[05]=(055255)
(4263)  DCS[0.00.0.0.0.1]  BM[0110..10.00..11.01..110..111...0.1.0..0..0...0.1010...0..0000.0...11.000...010.110.100]

        4264:  !(FREE)
        GOBUT351D:
                PO,     BUMP-VERIFY,                            !COUNT
                SETUP,  RETURN/SCOPE351,                        !GO TO SUBR WHICH:
                NEXT,   CALL[DINTOIR-5]                         !  D -> IR, BUT(INSTRS)
(4264)  DCS[0.00.0.0.0.1]  BM[0100..00.01..01.10..101..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.111.011]



        4265:  !(FREE)
        SCOPE351:
                NEXT,   BUTD[SCOPE],                            !NO ERROR:  "TEST352A" (+1. WORDS)
                        J/TEST352A                              !   ERROR:  "COMP351A"  (-11. WORDS)
(4265)  DCS[0.00.0.1.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...111.000.101]




        ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

        !TESTS 352 A-D VERIFY THAT THE RIF ADDRESS, WITH BSP HI/LO IMMED0/1 MODES, OPERATES CORRECTLY

        ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

        !TEST 352A CHECKS BSPLO RIF ADDR "001 0"=(02)
        4705:
        TEST352A:
                PO,     LOAD-ENUA(ZTARGET434),                  !INSTRS FOR IR=(000000)
                        LOAD-ERROR(TEST352A),                   !ERROR DIRECTORY KEY
                        DCS-CTR(C7.),                           !COMPARE AT TARGET
                NEXT,   J/COMP352A                              !
(4705)  DCS[1.00.1.0.0.0]  BM[1000..00.11..11.00..011..100...0.0.0..0..0...0.0000...0..0000.0...11.000...111.001.100]
```

```

4714:
COMP352A:
        P2-T,   D+ASPLO[02]-XOR-BSPLO(R02), SAVE-D[C],  !COMPARE EXPECTED:RECEIVED, BITWISE
        NEXT,   J/GOBUT352A                             !DATA=(055255)
(4714)  DCS[0.00.0.0.0.0]  BM[0110..00.10..10.00..101..111...0.1.0..0..0...0.0000...0..0000.0...11.000...010.110.110]

4266:  !(FREE)
GOBUT352A:
        P0,     BUMP-VERIFY,                            !COUNT
        SETUP,  RETURN/TEST352B,                        !GO TO SUBR WHICH:
        NEXT,   CALL[DINTOIR-5]                         !  D -> IR, BUT(INSTRS)
(4266)  DCS[0.00.0.0.0.1]  BM[0100..00.11..10.01..011..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.111.011]


!  - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

!TEST 352B CHECKS BSPLO RIF ADDR "001 1"=(03)
4713:
TEST352B:
        P0,     LOAD-ENUA(ZTARGET434),                  !INSTRS FOR IR=(000000)
                LOAD-ERROR(TEST352B),                   !ERROR DIRECTORY KEY
                DCS-CTR(C7.),                           !COMPARE AT TARGET
        NEXT,   J/COMP352B                              !
(4713)  DCS[1.00.1.0.0.0]  BM[1000..00.11..11.00..011..100...0.0.0..0..0...0.0000...0..0000.0...11.000...010.110.111]

4267:  !(FREE)
COMP352B:
        P2-T,   D+ASPLO[03]-XOR-BSPLO(R03), SAVE-D[C],  !COMPARE EXPECTED:RECEIVED, BITWISE
        NEXT,   J/GOBUT352B                             !DATA=(054344)
(4267)  DCS[0.00.0.0.0.0]  BM[0110..00.11..10.01..101..111...0.1.0..0..0...0.0000...0..0000.0...11.000...010.111.000]

4270:  !(FREE)
GOBUT352B:
        SETUP,  RETURN/TEST352C,                        !GO TO SUBR WHICH:
        NEXT,   CALL[DINTOIR-5]                         !  D -> IR, BUT(INSTRS)
(4270)  DCS[0.00.0.0.0.0]  BM[0100..00.11..10.10..100..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.111.011]


!  - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

!TEST 352C CHECKS BSPLO RIF ADDR "010 0"=(04)
4724:
TEST352C:
        P0,     LOAD-ENUA(ZTARGET434),                  !INSTRS FOR IR=(000000)
                LOAD-ERROR(TEST352C),                   !ERROR DIRECTORY KEY
                DCS-CTR(C7.),                           !COMPARE AT TARGET
                BUMP-VERIFY,                            !COUNT
        NEXT,   J/COMP352C                              !
(4724)  DCS[1.00.1.0.0.1]  BM[1000..00.11..11.00..011..100...0.0.0..0..0...0.0000...0..0000.0...11.000...010.111.001]

4271:  !(FREE)
```

```
COMP352C:
        P2-T,   D+ASPLO[04]-XOR-BSPLO(R04), SAVE-D[C],  !COMPARE EXPECTED:RECEIVED, BITWISE
        NEXT,   J/GOBUT352C                             !DATA=(053433)
 (4271) DCS[0.00.0.0.0.0]  BM[0110..00.10..10.00..110..111...0.1.0..0..0...0.0000...0..0000.0...11.000...010.111.010]

 4272:  !(FREE)
 GOBUT352C:
        SETUP,  RETURN/TEST352D,                        !GO TO SUBR WHICH:
        NEXT,   CALL[DINTOIR-5]                         !  D -> IR, BUT(INSTRS)
 (4272) DCS[0.00.0.0.0.0]  BM[0100..00.11..10.10..101..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.111.011]


 ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

 !TEST 352D CHECKS BSPLO RIF ADDR "010 1"=(05)
 4725:
 TEST352D:
        P0,     LOAD-ENUA(ZTARGET434),                  !INSTRS FOR IR=(000000)
                LOAD-ERROR(TEST352D),                   !ERROR DIRECTORY KEY
                DCS-CTR(C7.),                           !COMPARE AT TARGET
        NEXT,   J/COMP352D                              !
 (4725) DCS[1.00.1.0.0.0]  BM[1000..00.11..11.00..011..100...0.0.0..0..0...0.0000...0..0000.0...11.000...010.111.011]

 4273:  !(FREE)
 COMP352D:
        P0,     BUMP-VERIFY,                            !COUNT
        P2-T,   D+ASPLO[05]-XOR-BSPLO(R05), SAVE-D[C],  !COMPARE EXPECTED:RECEIVED, BITWISE
        NEXT,   J/GOBUT352D                             !DATA=(052522)
 (4273) DCS[0.00.0.0.0.1]  BM[0110..00.11..10.01..110..111...0.1.0..0..0...0.0000...0..0000.0...11.000...010.111.100]

 4274:  !(FREE)
 GOBUT352D:
        P0,     BUMP-VERIFY,                            !COUNT
        SETUP,  RETURN/SCOPE352,                        !GO TO SUBR WHICH:
        NEXT,   CALL[DINTOIR-5]                         !  D -> IR, BUT(INSTRS)
 (4274) DCS[0.00.0.0.0.1]  BM[0100..00.01..01.11..101..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.111.011]



 4275:  !(FREE)
 SCOPE352:
        P2-T,   D+CSPD(D13), D[C]+0,                    !RESTORE CONSTANT (000000)
        P3,     A*BSPHI[01]+D,                          !
        NEXT,   BUTD[SCOPE],                            !NO ERROR:  "RESTORE01" (+1. WORDS)
                J/RESTORE01                             !   ERROR:  "COMP352A"  (-11. WORDS)
 (4275) DCS[0.00.0.1.0.0]  BM[1010..10.11..00.01..100..000...0.1.0..0..0...0.0100...0..1011.0...11.000...111.001.101]


 ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

 !      THIS SECTION OF CODE FINISHES RESTORING THE 4 CONSTANTS IN ASPHI/BSPHI
 !      THAT WERE WIPED OUT IN THE PREVIOUS GROUP OF TESTS.
```

```

    4715:
    RESTORED01:
            P2-T,     D←CSPD(D10),                            !(052525)
            P3,       A*BSPHI[07]←D,                          !
            NEXT,     GOTO-PAGE(7),                           !
                      J/RESTORED2                             !
(4715)  DCS[0.00.0.0.0.0]  BM[1010..10.11..00.01..111..111...0.1.0..0..0...0.0111...0..1011.0...11.100...000.011.000]

    7030:  !(FREE)
    RESTORED2:
            P2-T,     D←CSPD(D11), D[C]←0,                    !(125252)
            P3,       A*BSPHI[05]←D,                          !
            NEXT,     J/RESTORED3                             !
(7030)  DCS[0.00.0.0.0.0]  BM[1010..10.11..00.01..110..000...0.1.0..0..0...0.0110...0..1011.0...11.000...000.011.010]

    7032:  !(FREE)
    RESTORED3:
            P2-T,     D←CSPD(D12), D[C]←0,                    !(177777)
            P3,       A*BSPHI[03]←D,                          !
            NEXT,     J/RESTORED4                             !
(7032)  DCS[0.00.0.0.0.0]  BM[1010..10.11..00.01..101..000...0.1.0..0..0...0.0101...0..1011.0...11.000...000.011.011]

    7033:  !(FREE)
    RESTORED4:
            SETUP,    RETURN/TEST361A,                        !GO TO SUBR THAT RESTORES CURRENT
            NEXT,     GOTO-PAGE(7),                           !  DCS MICROCODE VERSION NUMBER,
                      J/INSERTREVNO                           !  B<15>=(0), INTO B.M. GPR "RS"
(7033)  DCS[0.00.0.0.0.0]  BM[0110..00.10..11.11..011..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.001.110]





    !.PAGE========================================================================================================================


    .TOC   *   TEST361-372:  TESTING SR, GUARD, RES, AND XMUX

    !***********************************************************************************************
    !*
    !*      TESTS:  361 - 372                                  UWORDS: 125 + 117
    !*
    !*      FUNCTIONS:      TESTS THAT SR CAN BE LOADED FROM ALU OUT, READ THRU
    !*                      SR AND FLOAT PORTS OF XMUX, SR CAN BE SHIFTED LEFT, RIGHT,
    !*                      AND NOP, GUARD-ENABLED, DISABLED, SHIFTED, AND THAT
    !*                      ANY "BUTTABLE" BITS CAN BE TESTED.
    !*                      PREVIOUSLY TESTED IN TEST 105 A-E WAS THE ABILITY TO
    !*                      LOAD/READ THE SR THRU XMUX/SR, AND BUT(SR3-0).
    !*                      THESE FUNCTIONS ARE NOT TESTED HERE.
    !*
    !***********************************************************************************************

```

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        ! ---------------------------------------------------------------

        !*** TEST 361A ***
        !TEST-361A TESTS THAT SR CAN BE LOADED, GUARD CLEARED, WITH PATTERN (052525)(0);
        !READ THRU XMUX-FLTPT PORT = (100125)
        6573:
        TEST361A:
                PO,       LOAD-ENUA(ZTARGET434),                 !SETUP FOR IR=(000000)/INSTRS TEST
                          LOAD-ERROR(TEST361A),                  !ERROR DIRECTORY KEY
                          DCS-CTR(C11.),                         !COMPARE ENUA:TNUA AT TARGET
                NEXT,     J/SETRES361A                           !
(6573)  DCS[1.00.1.0.0.0]  BM[0100..00.11..11.00..011..100...0.0.0..0..0...0.0000...0..0000.0...11.000...101.111.000]

        6570:
        SETRES361A:
                P3,       CSPD[16]←EMIT,                         !CSP GETS
                EMITC,    SENDMUX-4567-SEL,                      !RES REG VALUES
                          SR-LOAD, GUARD-EN,                     !
                NEXT,     J/LOADRES361A                          !
(6570)  DCS[0.00.0.0.0.0]  BM[0000..10.10..00.00..000..000...0.0.0..0..0...0.0001...1..0000.0...11.000...000.000.001]

        6001:  !(FREE)
        LOADRES361A:
                PO,       BUMP-VERIFY,                           !COUNT
                P2-T,     RES←CSPB(B16),                         !STORE RES
                          D←ASPHI(C000000), D[C]←1,              !SET D=ZEROES, D[C]=1
                NEXT,     J/LOADSR361A                           !
(6001)  DCS[0.00.0.0.0.1]  BM[1111..11.01..11.01..100..000...0.1.0..0..0...0.0000...0..1000.1...11.000...000.000.010]

        6002:  !(FREE)
        LOADSR361A:
                P2-T,     SR←BSPHI(C052525),                     !LOAD SR WITH DATA
                NEXT,     J/EXPEC361B                            !
(6002)  DCS[0.00.0.0.0.0]  BM[1010..01.11..00.00..111..000...0.0.1..0..0...0.0000...0..0000.0...11.000...000.000.011]

        6003:  !(FREE)
        EXPEC361B:
                PO,       BUMP-VERIFY,                           !COUNT
                P3,       CSPD[16]←EMIT,                         !EXPECTED VALUE OUT OF XMUX-FLOAT
                          EMIT/100125,                           !(100125)
                NEXT,     J/COMP361B                             !
(6003)  DCS[0.00.0.0.0.1]  BM[1000..10.00..00.01..010..101...0.0.0..0..0...0.0001...1..0000.0...11.000...000.000.100]

        6004:  !(FREE)
        COMP361B:
                SETUP,    RETURN/TEST361D,                       !RETURN TO START OF NEXT SUBTEST
                NEXT,     CALL[CSP16XORFLTTOIR-5]                !SUBR: CSP(16).XOR.FLOAT -> IR, BUT(INSTRS)
(6004)  DCS[0.00.0.0.0.0]  BM[0110..00.11..11.11..001..111...0.0.0..0..0...0.0000...0..0000.0...11.100...000.011.101]
```

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     !----------------------------------------------------------------------

     !*** TEST 361D ***
     !TEST 361D CHECKS THAT THE BUT ON SR<1:0> READS THE (052525) IN THE SR CORRECTLY
     6771:
     TEST361D:
             PO,      LOAD-ENUA(ZTARGET403),                      !EXPECTED VALUE "01"#"1" IN SR<1:0>
                      LOAD-ERROR(TEST361D),                       !ERROR DIRECTORY KEY
                      DCS-CTR(C3.),                               !COMPARE ENUA:TNUA AT TARGET
             NEXT,    J/GOBUT361D                                 !
(6771)  DCS[1.00.1.0.0.0]  BM[1100..00.11..11.00..000..011...0.0.0..0..0...0.0000...0..0000.0...11.000...000.000.101]

     6005:  !(FREE)
     GOBUT361D:
             SETUP,   RETURN/TEST361E,                            !RETURN TO START OF NEXT SUBTEST
             NEXT,    GOTO-PAGE(7),                               !BUT'S ARE ON PAGE 7
                      J/BUTSR1-0                                  !GO BUT ON SR<1:0>
(6005)  DCS[0.00.0.0.0.0]  BM[0110..00.11..11.10..111..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.001.101]





     !----------------------------------------------------------------------

     !*** TEST 361E ***
     !TEST-361E CHECKS THAT GD<3:2> IS CLEARED UNDER SR-LOAD, GUARD-ENABLED
     6767:
     TEST361E:
             PO,      LOAD-ENUA(ZTARGET400),                      !EXPECTED VALUE "00" IN GUARD<3:2>
                      LOAD-ERROR(TEST361E),                       !ERROR DIRECTORY KEY
                      DCS-CTR(C3.),                               !COMPARE ENUA:TNUA AT TARGET
                      BUMP-VERIFY,                                !COUNT
             NEXT,    J/GOBUT361E                                 !
(6767)  DCS[1.00.1.0.0.1]  BM[1100..00.11..11.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...000.000.110]

     6006:  !(FREE)
     GOBUT361E:
             SETUP,   RETURN/TEST362A,                            !RETURN TO START OF NEXT SUBTEST
             NEXT,    GOTO-PAGE(7),                               !BUT'S ARE ON PAGE 7
                      J/BUTGD3-2                                  !GO BUT ON GD<3:2>
(6006)  DCS[0.00.0.0.0.0]  BM[0110..00.11..11.10..101..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.001.100]
```

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        ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

        !*** TEST 362A ***
        !TEST-362A CHECKS THAT THE SR#GD CAN BE SHIFTED RIGHT 1 POSITION, INSERTING
        !A "1" FROM D<00> INTO SR<15>, SHIFTING THE "1" IN SR<00> INTO GD<3>
        6765:
        TEST362A:
                P0,     LOAD-ENUA(ZTARGET434),                  !SETUP FOR IR=(000000)/INSTRS TEST
                        LOAD-ERROR(TEST362A),                   !ERROR DIRECTORY KEY
                        DCS-CTR(C10.),                          !COMPARE ENUA:TNUA AT TARGET
                NEXT,   J/SETRES362A                            !
  (6765)  DCS[1.00.1.0.0.0]  BM[0101..00.11..11.00..011..100...0.0.0..0..0...0.0000...0..0000.0...11.000...000.000.111]

        6007:  !(FREE)
        SETRES362A:
                P0,     BUMP-VERIFY,                            !COUNT
                P3,     CSPD[16]+EMIT,                          !CSP GETS
                EMITC,  SENDMUX-4567-SEL,                       !RES REG VALUES
                        SR-RIGHT, GUARD-EN,                     !
                NEXT,   J/SETDDC362A                            !
  (6007)  DCS[0.00.0.0.0.1]  BM[0010..10.10..00.00..000..000...0.0.0..0..0...0.0001...1..0000.0...11.000...000.001.000]

        6010:  !(FREE)
        SETDDC362A:
                P2-T,   D+BSPHI(C000001), D[C]+0,               !SETUP D<00>=1 FOR SHIFT
                NEXT,   J/LOADRES362A                           !
  (6010)  DCS[0.00.0.0.0.0]  BM[1010..01.11..00.00..000..000...0.1.0..0..0...0.0000...0..0000.0...11.000...000.001.001]

        6011:  !(FREE)
        LOADRES362A:
                P2,     RES+CSPB(B16),                          !STORE RES
                P3-T,   SR+SR-RIGHT-1,                          !SHIFT SR RIGHT, GUARD-ENABLED
                NEXT,   J/COMP362A                              !
  (6011)  DCS[0.00.0.0.0.0]  BM[0000..11.01..00.00..000..000...1.0.1..0..0...0.0000...0..1000.1...11.000...000.001.010]

        6012:  !(FREE)
        COMP362A:
                P0,     BUMP-VERIFY,                            !COUNT
                P2-T,   D+SR-XOR-BSPHI(C125252), SAVE-D[C],     !D + (125252)=SR, BITWISE
                NEXT,   J/GOBUT362A                             !
  (6012)  DCS[0.00.0.0.0.1]  BM[0110..01.11..00.00..110..111...0.1.0..0..0...0.0000...0..0000.0...11.000...000.001.011]

        6013:  !(FREE)
        GOBUT362A:
                SETUP,  RETURN/TEST362B,                        !RETURN TO START OF NEXT SUBTEST
                NEXT,   CALL[DINTOIR-5]                         !SUBR: D -> IR, BUT(INSTRS)
  (6013)  DCS[0.00.0.0.0.0]  BM[0110..00.11..11.10..011..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.111.011]






        ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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    !*** TEST 362B ***
    !TEST-362B CHECKS THAT SR-XMUX-FLOAT PORT CAN BE READ, WITH SR=(125252)
    6763:
    TEST362B:
            P0,     LOAD-ENUA(ZTARGET434),                  !SETUP FOR IR=(000000)/INSTRS TEST
                    LOAD-ERROR(TEST362B),                   !ERROR DIRECTORY KEY
                    DCS-CTR(C8.),                           !COMPARE ENUA:TNUA AT TARGET
            NEXT,   J/EXPEC362B                             !
(6763)  DCS[1.00.1.0.0.0]  BM[0111..00.11..11.00..011..100...0.0.0..0..0...0.0000...0..0000.0...11.000...000.001.100]

    6014:  !(FREE)
    EXPEC362B:
            P0,     BUMP-VERIFY,                            !COUNT
            P3,     CSPD[16]←EMIT,                          !EXPECTED VALUE OF XMUX-FLOAT
                    EMIT/000052,                            !(000052)
            NEXT,   J/COMP362B                              !
(6014)  DCS[0.00.0.0.0.1]  BM[0000..10.00..00.00..101..010...0.0.0..0..0...0.0001...1..0000.0...11.000...000.001.101]

    6015:  !(FREE)
    COMP362B:
            SETUP,  RETURN/TEST362D,                        !RETURN TO START OF NEXT SUBTEST
            NEXT,   CALL[CSP16XORFLTTOIR-5]                 !SUBR: CSP(16).XOR.FLOAT -> IR, BUT(INSTRS)
(6015)  DCS[0.00.0.0.0.0]  BM[0110..00.11..11.01..111..111...0.0.0..0..0...0.0000...0..0000.0...11.100...000.011.101]





    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    !*** TEST 362D ***
    !TEST-362D CHECKS THAT THE BUT ON SR<1:0> READS THE (125252) IN THE SR CORRECTLY
    6757:
    TEST362D:
            P0,     LOAD-ENUA(ZTARGET405),                  !EXPECTED VALUE "10"#"1" IN SR<1:0>
                    LOAD-ERROR(TEST362D),                   !ERROR DIRECTORY KEY
                    DCS-CTR(C3.),                           !COMPARE ENUA:TNUA AT TARGET
            NEXT,   J/GOBUT362D                             !
(6757)  DCS[1.00.1.0.0.0]  BM[1100..00.11..11.00..000..101...0.0.0..0..0...0.0000...0..0000.0...11.000...000.001.110]

    6016:  !(FREE)
    GOBUT362D:
            SETUP,  RETURN/TEST362E,                        !RETURN TO START OF NEXT SUBTEST
            NEXT,   GOTO-PAGE(7),                           !BUT'S ARE ON PAGE 7
                    J/BUTSR1-0                              !GO BUT ON SR<1:0>
(6016)  DCS[0.00.0.0.0.0]  BM[0110..00.11..11.01..101..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.001.101]
```

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!-------------------------------------------

!*** TEST 362E ***
!TEST-362E CHECKS THAT GD<3:2> RECEIVED THE "1" IN SR<00> AFTER THE SHIFT RIGHT
6755:
TEST362E:
        PO,     LOAD-ENUA(ZTARGET402),              !EXPECTED VALUE "10" IN GUARD<3:2>
                LOAD-ERROR(TEST362E),               !ERROR DIRECTORY KEY
                DCS-CTR(C3.),                       !COMPARE ENUA:TNUA AT TARGET
        NEXT,   J/GOBUT362E                         !
(6755)  DCS[1.00.1.0.0.0]  BM[1100..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...000.001.111]

6017:  !(FREE)
GOBUT362E:
        SETUP,  RETURN/TEST363A,                    !RETURN TO START OF NEXT SUBTEST
        PO,     BUMP-VERIFY,                        !COUNT
        NEXT,   GOTO-PAGE(7),                       !BUT'S ARE ON PAGE 7
                J/BUTGD3-2                          !GO BUT ON GD<3:2>
(6017)  DCS[0.00.0.0.0.1]  BM[0110..00.11..11.01..011..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.001.100]





!-------------------------------------------

!*** TEST 363A ***
!TEST-363A CHECKS THAT THE SR#GD CAN AGAIN BE SHIFTED RIGHT 1 POSITION, INSERTING
!A "0" FROM D<00> INTO SR<15>, SHIFTING THE "0" IN SR<00> INTO GD<3>
6753:
TEST363A:
        PO,     LOAD-ENUA(ZTARGET434),              !SETUP FOR IR=(000000)/INSTRS TEST
                LOAD-ERROR(TEST363A),               !ERROR DIRECTORY KEY
                DCS-CTR(C9.),                       !COMPARE ENUA:TNUA AT TARGET
        NEXT,   J/SETDDC363A                        !
(6753)  DCS[1.00.1.0.0.0]  BM[0110..00.11..11.00..011..100...0.0.0..0..0...0.0000...0..0000.0...11.000...000.010.000]

6020:  !(FREE)
SETDDC363A:
        P3-T,   D+NOT-ASPHI(C000001), D[C]+1,       !SETUP D=(177776), D[C]=0 FOR SHIFT RIGHT
        NEXT,   J/SHIFT363A                         !
(6020)  DCS[0.00.0.0.0.0]  BM[0000..00.00..11.01..000..000...1.1.0..0..0...0.0000...0..0000.0...11.000...000.010.001]

6021:  !(FREE)
SHIFT363A:
        PO,     BUMP-VERIFY,                        !COUNT
        P2-T,   SR+SR-RIGHT-1,                      !SHIFT SR RIGHT, GUARD-ENABLED
        NEXT,   J/COMP363A                          !
(6021)  DCS[0.00.0.0.0.1]  BM[0000..00.00..00.00..000..000...0.0.1..0..0...0.0000...0..0000.0...11.000...000.010.010]

6022:  !(FREE)
COMP363A:
        P2-T,   D+SR-XOR-BSPHI(C052525), SAVE-D[C],   !D + (052525)=SR, BITWISE
```

```
                NEXT,   J/GOBUT363A                             !
        (6022)  DCS[0.00.0.0.0.0]  BM[0110..01.11..00.00..111..111...0.1.0..0..0...0.0000...0..0000.0...11.000...000.010.011]

        6023:  !(FREE)
        GOBUT363A:
                SETUP,  RETURN/TEST363B,                        !RETURN TO START OF NEXT SUBTEST
                NEXT,   CALL[DINTOIR-5]                         !SUBR: D -> IR, BUT(INSTR5)
        (6023)  DCS[0.00.0.0.0.0]  BM[0110..00.11..11.01..001..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.111.011]





        ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

        !*** TEST 363B ***
        !TEST-363B CHECKS THE GUARD REGISTER WAS SHIFTED RIGHT ALSO
        6751:
        TEST363B:
                PO,     LOAD-ENUA(ZTARGET401),                  !EXPECTED VALUE "01" IN GUARD<3:2>
                        LOAD-ERROR(TEST363B),                   !ERROR DIRECTORY KEY
                        DCS-CTR(C3.),                           !COMPARE ENUA:TNUA AT TARGET
                NEXT,   J/GOBUT363B                             !
        (6751)  DCS[1.00.1.0.0.0]  BM[1100..00.11..11.00..000..001...0.0.0..0..0...0.0000...0..0000.0...11.000...000.010.100]

        6024:  !(FREE)
        GOBUT363B:
                SETUP,  RETURN/TEST364A,                        !RETURN TO START OF NEXT SUBTEST
                NEXT,   GOTO-PAGE(7),                           !BUT'S ARE ON PAGE 7
                        J/BUTGD3-2                              !GO BUT ON GD<3:2>
        (6024)  DCS[0.00.0.0.0.0]  BM[0110..00.11..11.00..111..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.001.100]





        ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

        !*** TEST 364A ***
        !TEST-364A/364B CHECK THAT WE ARE ABLE TO FILTER A "1" DOWN TO GD<0>, AND
        !SUBSEQUENTLY ABLE TO RECOVER IT, SO GD<3:0>="0101"
        6747:
        TEST364A:
                PO,     LOAD-ENUA(ZTARGET402),                  !EXPECTED VALUE "10" IN GUARD <3:2>
                        LOAD-ERROR(TEST364A),                   !ERROR DIRECTORY KEY
                        DCS-CTR(C4.),                           !COMPARE ENUA:TNUA AT TARGET
                        BUMP-VERIFY,                            !COUNT
                NEXT,   J/SETDDC364A                            !
        (6747)  DCS[1.00.1.0.0.1]  BM[1011..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...000.010.101]

        6025:  !(FREE)
        SETDDC364A:
```

```
              P2-T,    D←NOT-ASPHI(C000001), D[C]←1,             !SETUP D=(177776), D[C]=0 FOR SHIFT RIGHT
              NEXT,    J/GOBUT364A                               !  WHERE  SR<15> <- (0)
     (6025)  DCS[0.00.0.0.0.0]  BM[0000..00.00..11.01..000..000...0.1.0..0..0...0.0000...0..0000.0...11.000...000.010.110]

        6026:  !(FREE)
        GOBUT364A:
              SETUP,   RETURN/TEST364B,                          !RETURN TO START OF NEXT SUBTEST
              P3-T,    SR←SR-RIGHT-1,                            !SHIFT SR#GD RIGHT
              NEXT,    GOTO-PAGE(7),                             !BUT'S ARE ON PAGE 7
                       J/BUTGD3-2                                !GO BUT ON GD<3:2>
     (6026)  DCS[0.00.0.0.0.0]  BM[0110..00.11..11.00..101..111...1.0.1..0..0...0.0000...0..0000.0...11.100...011.001.100]





        ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

        !*** TEST 364B ***
        !TEST-364B CHECKS THAT GD<3:2> READS AS "01"
        6745:
        TEST364B:
              P0,      LOAD-ENUA(ZTARGET401),                    !EXPECTED VALUE "01" IN GUARD<3:2>
                       LOAD-ERROR(TEST364B),                     !ERROR DIRECTORY KEY
                       DCS-CTR(C4.),                             !COMPARE ENUA:TNUA AT TARGET
              NEXT,    J/SETDDC364B                              !
     (6745)  DCS[1.00.1.0.0.0]  BM[1011..00.11..11.00..000..001...0.0.0..0..0...0.0000...0..0000.0...11.000...000.010.111]

        6027:  !(FREE)
        SETDDC364B:
              P3-T,    D←BSPHI(C000001), D[C]←0,                 !SETUP D, D[C] FOR SR<15>←"1"
              NEXT,    J/GOBUT364B                               !
     (6027)  DCS[0.00.0.0.0.0]  BM[1010..01.11..00.00..000..000...1.1.0..0..0...0.0000...0..0000.0...11.000...000.011.000]

        6030:  !(FREE)
        GOBUT364B:
              SETUP,   RETURN/TEST365A,                          !RETURN TO START OF NEXT SUBTEST
              P2-T,    SR←SR-RIGHT-1,                            !SHIFT SR#GD RIGHT AGAIN
              NEXT,    GOTO-PAGE(7),                             !BUT'S ARE ON PAGE 7
                       J/BUTGD3-2                                !GO BUT ON GD<3:2>
     (6030)  DCS[0.00.0.0.0.0]  BM[0110..00.11..11.00..011..111...0.0.1..0..0...0.0000...0..0000.0...11.100...011.001.100]





        ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

        !*** TEST 365A ***
        !TEST-365A CHECKS THAT CAN SHIFT SR-RIGHT, W/GUARD-DISABLED
        6743:
        TEST365A:
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                PO,      LOAD-ENUA(ZTARGET434),                  !SETUP FOR IR=(000000)/INSTRS TEST
                         LOAD-ERROR(TEST365A),                   !ERROR DIRECTORY KEY
                         DCS-CTR(C10.),                          !COMPARE ENUA:TNUA AT TARGET
                NEXT,    J/SETRES365A                            !
  (6743)  DCS[1.00.1.0.0.0]  BM[0101..00.11..11.00..011..100...0.0.0..0..0...0.0000...0..0000.0...11.000...000.011.001]

        6031:  !(FREE)
        SETRES365A:
                PO,      BUMP-VERIFY,                            !COUNT
                P3,      CSPD[16]+EMIT,                          !CSP GETS
                EMITC,   SENDMUX-4567-SEL,                       !RES REG VALUES
                         SR-RIGHT, GUARD-DIS,                    !
                NEXT,    J/LOADRES365A                           !
  (6031)  DCS[0.00.0.0.0.1]  BM[0010..10.00..00.00..000..000...0.0.0..0..0...0.0001...1..0000.0...11.000...000.011.010]

        6032:  !(FREE)
        LOADRES365A:
                P2,      RES+CSPB(B16),                          !STORE RES
                P3-T,    SR+SR-RIGHT-1,                          !SHIFT SR RIGHT, GUARD-DISABLED
                NEXT,    J/EXPEC365A                             !
  (6032)  DCS[0.00.0.0.0.0]  BM[0000..11.01..00.00..000..000...1.0.1..0..0...0.0000...0..1000.1...11.000...000.011.011]

        6033:  !(FREE)
        EXPEC365A:
                PO,      BUMP-VERIFY,                            !COUNT
                P3,      CSPD[16]+EMIT,                          !EXPECTED VALUE OUT OF XMUX-SR
                         EMIT/145252,                            !(145252)
                NEXT,    J/COMP365A                              !
  (6033)  DCS[0.00.0.0.0.1]  BM[1100..10.10..10.10..101..010...0.0.0..0..0...0.0001...1..0000.0...11.000...000.011.100]

        6034:  !(FREE)
        COMP365A:
                SETUP,   RETURN/TEST365B,                        !RETURN TO START OF NEXT SUBTEST
                NEXT,    CALL[CSP16XORSRTOIR-5]                  !SUBR: CSP(16).XOR.SR -> IR, BUT(INSTR5)
  (6034)  DCS[0.00.0.0.0.0]  BM[0110..00.11..11.00..001..111...0.0.0..0..0...0.0000...0..0000.0...11.100...000.011.001]





        ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

        !*** TEST 365B ***
        !TEST-365B CHECKS THAT THE GUARD WASN'T ALTERED ON SHIFT RIGHT/DISABLED
        6741:
        TEST365B:
                PO,      LOAD-ENUA(ZTARGET401),                  !EXPECTED VALUE "01" IN GUARD<3:2>
                         LOAD-ERROR(TEST365B),                   !ERROR DIRECTORY KEY
                         DCS-CTR(C3.),                           !COMPARE ENUA:TNUA AT TARGET
                NEXT,    J/GOBUT365B                             !
  (6741)  DCS[1.00.1.0.0.0]  BM[1100..00.11..11.00..000..001...0.0.0..0..0...0.0000...0..0000.0...11.000...000.011.101]

        6035:  !(FREE)
```

```
GOBUT365B:
        SETUP,  RETURN/TEST366A,                           !RETURN TO START OF NEXT SUBTEST
        NEXT,   GOTO-PAGE(7),                              !BUT'S ARE ON PAGE 7
                J/BUTGD3-2                                 !GO BUT ON GD(3:2)
(6035) DCS[0.00.0.0.0.0] BM[0110..00.11..10.11..111..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.001.100]





!- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

!*** TEST 366A ***
!TEST-366A CHECKS THAT SR CAN SHIFT LEFT, GUARD-DISABLED & NOT ALTERED, "0" IN
!D[C] SHIFTED INTO SR<00>
6737:
TEST366A:
        P0,     LOAD-ENVA(ZTARGET434),                     !SETUP FOR IR=(000000)/INSTRS TEST
                LOAD-ERROR(TEST366A),                      !ERROR DIRECTORY KEY
                DCS-CTR(C11.),                             !COMPARE ENVA:TNVA AT TARGET
        NEXT,   J/SETRES366A                               !
(6737) DCS[1.00.1.0.0.0] BM[0100..00.11..11.00..011..100...0.0.0..0..0...0.0000...0..0000.0...11.000...000.011.110]

6036: !(FREE)
SETRES366A:
        P0,     BUMP-VERIFY,                               !COUNT
        P3,     CSPD[16]+EMIT,                             !CSP GETS
        EMITC,  SENDMUX-4567-SEL,                          !RES REG VALUES
                SR-LEFT, GUARD-DIS,                        !
        NEXT,   J/LOADRES366A                              !
(6036) DCS[0.00.0.0.0.1] BM[0001..10.00..00.00..000..000...0.0.0..0..0...0.0001...1..0000.0...11.000...000.011.111]

6037: !(FREE)
LOADRES366A:
        P2-T,   RES+CSPB(B16),                             !STORE RES
                D+ZERO, D[C]+ALU07,                        !AND SET D, D[C]
        NEXT,   J/SHIFT366A                                !
(6037) DCS[0.00.0.0.0.0] BM[0011..11.01..00.00..000..011...0.1.0..0..0...0.0000...0..1000.1...11.000...000.100.000]

6040: !(FREE)
SHIFT366A:
        P0,     BUMP-VERIFY,                               !COUNT
        P3-T,   SR+SR-LEFT-1,                              !SHIFT SR LEFT 1, SR<00>+D[C]="0"
        NEXT,   J/EXPEC366A                                !
(6040) DCS[0.00.0.0.0.1] BM[0000..00.00..00.00..000..000...1.0.1..0..0...0.0000...0..0000.0...11.000...000.100.001]

6041: !(FREE)
EXPEC366A:
        P3,     CSPD[16]+EMIT,                             !EXPECTED RESULT AFTER SHIFT
                EMIT/112524,                               !(112524)
        NEXT,   J/COMP366A
(6041) DCS[0.00.0.0.0.0] BM[1001..10.01..01.01..010..100...0.0.0..0..0...0.0001...1..0000.0...11.000...000.100.010]
```

```
	6042:	!(FREE)
	COMP366A:
		SETUP,	RETURN/TEST366B,			!RETURN TO START OF NEXT SUBTEST
		NEXT,	CALL[CSP16XORSRTOIR-5]			!SUBR: CSP(16).XOR.SR -> IR, BUT(INSTRS)
(6042)	DCS[0.00.0.0.0.0]  BM[0110..00.11..10.11..101..111...0.0.0..0..0...0.0000...0..0000.0...11.100...000.011.001]



	! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

	!*** TEST 366B ***
	!TEST-366B CHECKS THAT GUARD WASN'T ALTERED ON SHIFT LEFT/GUARD-DISABLED
	6735:
	TEST366B:
		P0,	LOAD-ENUA(ZTARGET401),			!GUARD SHOULD STILL BE "01"#"01"
			LOAD-ERROR(TEST366B),			!ERROR DIRECTORY KEY
			DCS-CTR(C3.),				!COMPARE ENUA:TNUA AT TARGET
		NEXT,	J/GOBUT366B
(6735)	DCS[1.00.1.0.0.0]  BM[1100..00.11..11.00..000..001...0.0.0..0..0...0.0000...0..0000.0...11.000...000.100.011]

	6043:	!(FREE)
	GOBUT366B:
		SETUP,	RETURN/TEST366C,			!RETURN TO START OF NEXT SUBTEST
		NEXT,	GOTO-PAGE(7),				!BUT'S ARE ON PAGE 7
			J/BUTGD3-2				!GO BUT ON GUARD <3:2>
(6043)	DCS[0.00.0.0.0.0]  BM[0110..00.11..10.11..011..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.001.100]



	! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

	!*** TEST 366C ***
	!TEST-366C CHECKS THAT SR CAN AGAIN SHIFT LEFT, GUARD-DISABLED, SR<00>+D[C]="1"
	6733:
	TEST366C:
		P0,	LOAD-ENUA(ZTARGET434),			!SETUP FOR IR=(000000)/INSTRS TEST
			LOAD-ERROR(TEST366C),			!ERROR DIRECTORY KEY
			DCS-CTR(C10.),				!COMPARE ENUA:TNUA AT TARGET
		NEXT,	J/SETDDC366C
(6733)	DCS[1.00.1.0.0.0]  BM[0101..00.11..11.00..011..100...0.0.0..0..0...0.0000...0..0000.0...11.000...000.100.100]

	6044:	!(FREE)
	SETDDC366C:
		P2-T,	D+ASPHI(C177777), D[C]+1,		!SETUP D, D[C]
		NEXT,	J/SHIFT366C				!
(6044)	DCS[0.00.0.0.0.0]  BM[1111..00.00..11.01..101..000...0.1.0..0..0...0.0000...0..0000.0...11.000...000.100.101]
```

```
	6045:	!(FREE)
	SHIFT366C:
		P2-T,	SR+SR-LEFT-1,				!SHIFT SR LEFT 1, SR<00>+D[C]="1"
		NEXT,	J/EXPEC366C
(6045)	DCS[0.00.0.0.0.0]	BM[0000..00.00..00.00..000..000...0.0.1..0..0...0.0000...0..0000.0...11.000...000.100.110]

	6046:	!(FREE)
	EXPEC366C:
		P0,	BUMP-VERIFY,				!COUNT
		P3,	CSPD[16]+EMIT,				!EXPECTED VALUE AFTER SHIFT
			EMIT/025251,				!(025251)
		NEXT,	J/COMP366C				!
(6046)	DCS[0.00.0.0.0.1]	BM[0010..10.10..10.10..101..001...0.0.0..0..0...0.0001...1..0000.0...11.000...000.100.111]

	6047:	!(FREE)
	COMP366C:
		SETUP,	RETURN/TEST367A,			!RETURN TO START OF NEXT SUBTEST
		NEXT,	CALL[CSP16XORSRTOIR-5]			!SUBR: CSP(16).XOR.SR -> IR, BUT(INSTRS)
(6047)	DCS[0.00.0.0.0.0]	BM[0110..00.11..10.11..001..111...0.0.0..0..0...0.0000...0..0000.0...11.100...000.011.001]





	! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

	!*** TEST 367A ***
	!TEST-367A CHECKS THAT LOAD/GUARD-DISABLED LOADS SR, GUARD NOT ALTERED
	!CHECK THAT BUTA(CLEAR-FLAGS) CLEARS RES TO SR-LOAD/GUARD-DIS
	6731:
	TEST367A:
		P0,	LOAD-ENUA(ZTARGET401),			!GUARD SHOULD STILL BE "01"*"01" AFTER LOAD
			LOAD-ERROR(TEST367A),			!ERROR DIRECTORY KEY
			DCS-CTR(C6.),				!COMPARE ENUA:TNUA AT TARGET
		NEXT,	J/SETRES367A				!
(6731)	DCS[1.00.1.0.0.0]	BM[1001..00.11..11.00..000..001...0.0.0..0..0...0.0000...0..0000.0...11.000...000.101.000]

	6050:	!(FREE)
	SETRES367A:
		P0,	BUMP-VERIFY,				!COUNT
		P3,	CSPD[16]+EMIT,				!CSP GETS
		EMITC,	SENDMUX-4567-SEL,			!RES VALUES
			SR-NOP, GUARD-EN,			!FIRST LOAD COMPLEMENT OF THOSE AFTER BUTA(CLEAR-FLAGS)
		NEXT,	J/LOADRES367A				!
(6050)	DCS[0.00.0.0.0.1]	BM[0011..10.10..00.00..000..000...0.0.0..0..0...0.0001...1..0000.0...11.000...000.101.001]

	6051:	!(FREE)
	LOADRES367A:
		P0,	BUMP-VERIFY,				!COUNT
		P2-T,	RES+CSPB(B16),				!STORE RES
			D+ZERO, D[C]+ALU07,			!SET D, D[C]
```

```
              P3,      BUTA(CLR-FLAG-RES-UCON),                        !RESET RES TO SR-LOAD, CUARD-DIS
              NEXT,    J/LOADSR367A                                    !
     (6051)  DCS[0.00.0.0.0.1]  BM[0011..11.01..00.00..000..011...0.1.0..0..0...0.0000...0..1000.1...11.010...000.101.010]

        6052:  !(FREE)
        LOADSR367A:
              P2-T,    SR+BSPHI(C052525),                              !SR+(052525)
              NEXT,    J/GOBUT367B                                     !
     (6052)  DCS[0.00.0.0.0.0]  BM[1010..01.11..00.00..111..000...0.0.1..0..0...0.0000...0..0000.0...11.000...000.101.011]

        6053:  !(FREE)
        GOBUT367B:
              SETUP,   RETURN/TEST370A,                                !RETURN TO START OF NEXT SUBTEST
              NEXT,    GOTO-PAGE(7),                                   !BUT'S ARE ON PAGE 7
                       J/BUTGD3-2                                      !GO BUT ON GUARD <3:2>
     (6053)  DCS[0.00.0.0.0.0]  BM[0110..00.11..10.10..101..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.001.100]






        ! -----------------------------------------------------------

        !*** TEST 370A ***
        !TEST-370A CHECKS THAT SHIFT LEFT/GUARD-ENABLED SHIFTS GD<3>="0" INTO SR<00>
        6725:
        TEST370A:
              P0,      LOAD-ENUA(ZTARGET434),                          !SETUP FOR IR=(000000)/INSTRS TEST
                       LOAD-ERROR(TEST370A),                           !ERROR DIRECTORY KEY
                       DCS-CTR(C10.),                                  !COMPARE ENUA:TNUA AT TARGET
              NEXT,    J/SETRES370A                                    !
     (6725)  DCS[1.00.1.0.0.0]  BM[0101..00.11..11.00..011..100...0.0.0..0..0...0.0000...0..0000.0...11.000...000.101.100]

        6054:  !(FREE)
        SETRES370A:
              P0,      BUMP-VERIFY,                                    !COUNT
              P3,      CSPD[16]+EMIT,                                  !CSP GETS
              EMITC,   SENDMUX-4567-SEL,                               !RES VALUES
                       SR-LEFT, GUARD-EN,                              !
              NEXT,    J/LOADRES370A                                   !
     (6054)  DCS[0.00.0.0.0.1]  BM[0001..10.10..00.00..000..000...0.0.0..0..0...0.0001...1..0000.0...11.000...000.101.101]

        6055:  !(FREE)
        LOADRES370A:
              P2-T,    RES+CSPB(B16),                                  !STORE RES
                       D+ASPHI(C000000), D[C]+1,                       !SETUP D, D[C]
              NEXT,    J/SHIFT370A                                     !
     (6055)  DCS[0.00.0.0.0.0]  BM[1111..11.01..11.01..100..000...0.1.0..0..0...0.0000...0..1000.1...11.000...000.101.110]

        6056:  !(FREE)
        SHIFT370A:
              P2-T,    SR+SR-LEFT-1,                                   !SHIFT SR LEFT 1, SR<00>+GD<3>="0"
```

```
        NEXT,   J/COMP370A                                  !
(6056) DCS[0.00.0.0.0.0] BM[0000..00.00..00.00..000..000...0.0.1..0..0...0.0000...0..0000.0...11.000...000.101.111]

    6057:  !(FREE)
    COMP370A:
        P2-T,   D+SR-XOR-BSPHI(C125252), SAVE-D[C],         !D + (125252)=SR,  BITWISE
        NEXT,   J/GOBUT370A
(6057) DCS[0.00.0.0.0.0] BM[0110..01.11..00.00..110..111...0.1.0..0..0...0.0000...0..0000.0...11.000...000.110.000]

    6060:  !(FREE)
    GOBUT370A:
        SETUP,  RETURN/TEST370B,                            !RETURN TO START OF NEXT SUBTEST
        NEXT,   CALL[DINTOIR-5]                             !SUBR: D -> IR, BUT(INSTRS)
(6060) DCS[0.00.0.0.0.0] BM[0110..00.11..10.10..011..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.111.011]






    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    !*** TEST 370B ***
    !TEST-370B CHECKS THAT THE GUARD, NOW ENABLED, WAS ALSO SHIFTED LEFT
    6723:
    TEST370B:
        P0,     LOAD-ENUA(ZTARGET402),                      !GUARD IS NOW "10"#"10"
                LOAD-ERROR(TEST370B),                       !ERROR DIRECTORY KEY
                DCS-CTR(C3.),                               !COMPARE ENUA:TNUA AT TARGET
        NEXT,   J/GOBUT370B                                 !
(6723) DCS[1.00.1.0.0.0] BM[1100..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...000.110.001]

    6061:  !(FREE)
    GOBUT370B:
        SETUP,  RETURN/TEST370C,                            !RETURN TO START OF NEXT SUBTEST
        P0,     BUMP-VERIFY,                                !COUNT
        NEXT,   GOTO-PAGE(7),                               !BUT'S ARE ON PAGE 7
                J/BUTGD3-2                                  !GO BUT ON GUARD <3:2>
(6061) DCS[0.00.0.0.0.1] BM[0110..00.11..10.10..001..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.001.100]







    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    !*** TEST 370C ***
    !TEST-370C CHECKS THAT SHIFT LEFT/GUARD-ENABLED SHIFTS GD<3>="1" INTO SR<00>
    6721:
    TEST370C:
```

```
         PO,     LOAD-ENUA(ZTARGET434),                      !SETUP FOR IR=(000000)/INSTRS TEST
                 LOAD-ERROR(TEST370C),                       !ERROR DIRECTORY KEY
                 DCS-CTR(C9.),                               !COMPARE ENUA:TNUA AT TARGET
         NEXT,   J/SETDDC370C                                !
  (6721) DCS[1.00.1.0.0.0]  BM[0110..00.11..11.00..011..100...0.0.0..0..0...0.0000...0..0000.0...11.000...000.110.010]

    6062:  !(FREE)
    SETDDC370C:
         PO,     BUMP-VERIFY,                                !COUNT
         P2-T,   D+ZERO, D[C]+ALU07,                         !SET D, D[C]
         NEXT,   J/SHIFT370C                                 !
  (6062) DCS[0.00.0.0.0.1]  BM[0011..00.00..00.00..000..011...0.1.0..0..0...0.0000...0..0000.0...11.000...000.110.011]

    6063:  !(FREE)
    SHIFT370C:
         P3-T,   SR+SR-LEFT-1,                               !SHIFT SR LEFT, SR<00>+GD<3>="1"
         NEXT,   J/COMP370C                                  !
  (6063) DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...1.0.1..0..0...0.0000...0..0000.0...11.000...000.110.100]

    6064:  !(FREE)
    COMP370C:
         P2-T,   D+SR-XOR-BSPHI(C052525), SAVE-D[C],         !D + (052525)=SR, BITWISE
         NEXT,   J/GOBUT370C                                 !
  (6064) DCS[0.00.0.0.0.0]  BM[0110..01.11..00.00..111..111...0.1.0..0..0...0.0000...0..0000.0...11.000...000.110.101]

    6065:  !(FREE)
    GOBUT370C:
         SETUP,  RETURN/TEST370D,                            !RETURN TO START OF NEXT SUBTEST
         NEXT,   CALL[DINTOIR-5]                             !SUBR: D -> IR, BUT(INSTRS)
  (6065) DCS[0.00.0.0.0.0]  BM[0110..00.11..10.01..111..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.111.011]







    !- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    !*** TEST 370D ***
    !TEST-370D CHECKS THAT THE "1" THAT GOT PUT IN GD<0> CAN BE SHIFTED BACK
    6717:
    TEST370D:
         PO,     LOAD-ENUA(ZTARGET401),                      !GUARD IS NOW "01"#"00"
                 LOAD-ERROR(TEST370D),                       !ERROR DIRECTORY KEY
                 DCS-CTR(C3.),                               !COMPARE ENUA:TNUA AT TARGET
         NEXT,   J/GOBUT370D                                 !
  (6717) DCS[1.00.1.0.0.0]  BM[1100..00.11..11.00..000..001...0.0.0..0..0...0.0000...0..0000.0...11.000...000.110.110]

    6066:  !(FREE)
    GOBUT370D:
         SETUP,  RETURN/TEST371A,                            !RETURN TO START OF NEXT SUBTEST
         NEXT,   GOTO-PAGE(7),                               !BUT'S ARE ON PAGE 7
```

```
                J/BUTGD3-2                                  !GO BUT ON GUARD <3:2>
(6066)  DCS[0.00.0.0.0.0]  BM[0110..00.11..10.01..101..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.001.100]







        !-----------------------------------------------------------------

        !*** TEST 371A ***
        !TEST-371A CHECKS THAT SR-NOP FUNCTION DOES NOTHING
        6715:
        TEST371A:
             P0,        LOAD-ENUA(ZTARGET434),                 !SETUP FOR IR=(000000)/INSTRS TEST
                        LOAD-ERROR(TEST371A),                  !ERROR DIRECTORY KEY
                        DCS-CTR(C10.),                         !COMPARE ENUA:TNUA AT TARGET
             NEXT,      J/SETRES371A                           !
(6715)  DCS[1.00.1.0.0.0]  BM[0101..00.11..11.00..011..100...0.0.0..0..0...0.0000...0..0000.0...11.000...000.110.111]

        6067:  !(FREE)
        SETRES371A:
             P0,        BUMP-VERIFY,                           !COUNT
             P3,        CSPD[16]+EMIT,                         !CSP GETS
             EMITC,     SENDMUX-4567-SEL,                      !RES VALUES
                        SR-NOP, GUARD-EN,                      !
             NEXT,      J/LOADRES371A                          !
(6067)  DCS[0.00.0.0.0.1]  BM[0011..10.10..00.00..000..000...0.0.0..0..0...0.0001...1..0000.0...11.000...000.111.000]

        6070:  !(FREE)
        LOADRES371A:
             P2-T,      RES+CSPB(B16),                         !STORE RES
                        D+ASPHI(C000000), D[C]+1,              !SETUP D, D[C]
             NEXT,      J/SHIFT371A                            !
(6070)  DCS[0.00.0.0.0.0]  BM[1111..11.01..11.01..100..000...0.1.0..0..0...0.0000...0..1000.1...11.000...000.111.001]

        6071:  !(FREE)
        SHIFT371A:
             P0,        BUMP-VERIFY,                           !COUNT
             P2-T,      CLK-SR,                                !DO AN SR-NOP
             NEXT,      J/COMP371A                             !
(6071)  DCS[0.00.0.0.0.1]  BM[0000..00.00..00.00..000..000...0.0.1..0..0...0.0000...0..0000.0...11.000...000.111.010]

        6072:  !(FREE)
        COMP371A:
             P2-T,      D+SR-XOR-BSPHI(C052525), SAVE-D[C],    !D + (052525)=SR, BITWISE
             NEXT,      J/GOBUT371A                            !
(6072)  DCS[0.00.0.0.0.0]  BM[0110..01.11..00.00..111..111...0.1.0..0..0...0.0000...0..0000.0...11.000...000.111.011]

        6073:  !(FREE)
        GOBUT371A:
             SETUP,     RETURN/TEST371B,                       !RETURN TO START OF NEXT SUBTEST
```

```
        PO,     BUMP-VERIFY,                        !COUNT
        NEXT,   CALL[DINTOIR-5]                     !SUBR: D -> IR, BUT(INSTRS)
(6073)  DCS[0.00.0.0.0.1]  BM[0110..00.11..10.01..011..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.111.011]







  ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

  !*** TEST 371B ***
  !TEST-371B CHECKS THAT THE GUARD WASN'T ALTERED EITHER
  6713:
  TEST371B:
        PO,     LOAD-ENUA(ZTARGET401),              !GUARD IS STILL "01"#"00"
                LOAD-ERROR(TEST371B),               !ERROR DIRECTORY KEY
                DCS-CTR(C3.),                       !COMPARE ENUA:TNUA AT TARGET
        NEXT,   J/GOBUT371B                         !
(6713)  DCS[1.00.1.0.0.0]  BM[1100..00.11..11.00..000..001...0.0.0..0..0...0.0000...0..0000.0...11.000...000.111.100]

  6074:  !(FREE)
  GOBUT371B:
        SETUP,  RETURN/SCOPE371,                    !RETURN TO SCOPE LOOP TEST WORD
        NEXT,   GOTO-PAGE(7),                       !BUT'S ARE ON PAGE 7
                J/BUTGD3-2                          !GO BUT ON GUARD <3:2>
(6074)  DCS[0.00.0.0.0.0]  BM[0110..00.00..01.11..101..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.001.100]


  !SCOPE LOOP TEST FOR SR, GUARD, XMUX, RES AREA CODE
  6075:  !(FREE)
  SCOPE371:
        PO,     BUMP-VERIFY,                        !COUNT
        P2,     RES+CSPD(C000000),                  !RESET RES TO SR-LOAD/GUARD-DIS
        NEXT,   BUTD[SCOPE],                        !NO ERROR:  "TEST372A" [+3. WORDS]
                J/TEST372A                          !   ERROR:  "SETRES361A" [-85. WORDS]
(6075)  DCS[0.00.0.1.0.1]  BM[0000..10.00..00.00..000..000...0.0.0..0..0...0.0100...0..1000.1...11.000...101.111.001]




  ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

  !     THE LLOWING TWO SUBROUTINES ARE ALSO USED IN THE ABOVE TESTS:


  7031:  !(FREE)
  CSP16XORSRTOIRS:
        P2-T,   D+SR-XOR-CSPB(B16), SAVE-D[C],      !COMPARE SR-XMUX:EXPECTED VALUE, BITWISE
        NEXT,   J/DINTOIRS                          !  AND PUT IN IR TO DO INSTRS TEST
(7031)  DCS[0.00.0.0.0.0]  BM[0110..11.01..00.00..000..111...0.1.0..0..0...0.0000...0..0000.0...11.000...010.111.011]
```

```
        7035:  !(FREE)
        CSP16XORFLTTOIRS:
                P2-T,   D←FLTPT-XOR-CSPB(B16), SAVE-D[C],          !COMPARE FLTPT-XMUX:EXPECTED VALUE, BITWISE
                NEXT,   J/DINTOIRS                                 !  AND PUT IN IR TO DO INSTRS TEST
  (7035)  DCS[0.00.0.0.0.0.0]  BM[0110..11.01..00.01..000..111...0.1.0..0..0...0.0000...0..0000.0...11.000...010.111.011]




        !.PAGE===================================================================================================

        .TOC    *    TEST372A-372B:  TESTING CUA, PROCESSOR MUX, AND BUTA[SUBR A]

        !*************************************************************************************
        !*
        !*      TESTS:  372A - 372B                                  UWORDS: 015 + 002
        !*
        !*      FUNCTIONS:      TESTS THAT CUA IS LOADED, AND CAN BE READ THRU PROCESSOR MUX.
        !*                      ALSO TESTS THAT CAN BE PUT INTO D, AND BUT[SUBR A] LOADS
        !*                      D<14:03> INTO RETURN.
        !*
        !*************************************************************************************




        ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

        !*** TEST 372A ***
        !TEST-372A CHECKS THE CUA -> D -> SUBR A -> RETURN PATH WITH PATTERN [6222]
        6571:
        TEST372A:
                P0,     LOAD-ENUA(CUA372A),                        !WHERE WE BUT [RETURN] TO
                        LOAD-ERROR(TEST372A),                      !ERROR DIRECTORY KEY
                        DCS-CTR(C7.),                              !IN 7. MICROWORDS
                NEXT,   J/LOOP372A                                 !
  (6571)  DCS[1.00.1.0.0.0.0]  BM[1000..00.11..00.10..010..010...0.0.0..0..0...0.0000...0..0000.0...11.000...101.100.000]

        6540:
        LOOP372A:
                SELECT, UCON-PROC,                                 !SELECT PROCESSOR UCON CONTROL
                ENABLE, BUSDIN←CUA[14-03],                         !  PUT 0#CUA[11-00]#EXFLAG<2:1>#FOVP ON BUSDIN
                P0,     SET-UCON-CONTROL,                          !LOAD UCON REGISTER AT P0
                        BUMP-VERIFY,                               !COUNT
                P3,     BUTA(CUA-TRACK),                           !RESET TRACKING OF CUA
                NEXT,   J/SETDC372A                                !
  (6540)  DCS[0.00.0.0.0.0.1]  BM[0000..00.00..01.01..000..000...0.0.0..0..0...1.1001...0..0000.0...11.001...000.111.110]

        6076:  !(FREE)
```

```
    SETDC372A:
            P2-T,   D+ASPHI(C000000), D[C]+1,                   !SET D[C] FLAG = (1) FOR FIRST LOOP
            NEXT,   J/CUA372A                                   !
(6076)  DCS[0.00.0.0.0.0]  BM[1111..00.00..11.01..100..000...0.1.0..0..0...0.0000...0..0000.0...11.000...010.010.010]

    6222:
    CUA372A:
            P3,     CSPD[16]+BUSDIN, RETURN/BUTERROR6,          !COPY CUA [WHICH IS ADDRESS OF THIS UWORD] INTO CSP
            NEXT,   BUTR(D[C]-B),                               !IF D[C] SET [PASS 1], GO TO "LOAD372A"
                    J/TEST372B                                  !IF D[C] RESET [PASS 2], GO TO "TEST372B"
(6222)  DCS[0.00.0.0.0.0]  BM[0110..10.01..11.11..110..000...0.0.0..0..0...0.0001...1..0000.0...10.011...111.000.001]

    6703:
    LOAD372A:
            P0,     BUMP-VERIFY,                                !COUNT
            P2-T,   D+CSPB(B16), D[C]+0,                        !PUT CUA FROM CSP INTO D, RESET D[C]
            NEXT,   J/SUBRA372A                                 !
(6703)  DCS[0.00.0.0.0.1]  BM[1010..11.01..00.00..000..000...0.1.0..0..0...0.0000...0..0000.0...11.000...000.111.111]

    6077: !(FREE)
    SUBRA372A:
            SETUP,  RETURN/BUTERROR6,                           !IF BUTA(SUBR-B) USED INSTEAD
            NEXT,   PAGE(7),                                    !SUBROUTINE IS ON PAGE 7
                    BUTA(SUBR-A),                               !LOAD PAGE, LOAD RETURN FROM D
                    J/ZTARGET555                                !THE SUBROUTINE
(6077)  DCS[0.00.0.0.0.0]  BM[0110..00.01..11.11..110..111...0.0.0..0..0...0.0000...0..0000.0...11.101...101.101.101]

    !NEXT WORD COMES FROM 'ZTARGET555', WHICH DOES ONLY A BUTA[RETURN],
    !WHICH SHOULD RETURN TO 'CUA372A' [-3. WORDS]







    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    !*** TEST 372B ***
    !TEST-372B CHECKS THE CUA -> D -> SUBR A -> RETURN PATH WITH PATTERN [5555]
    6701:
    TEST372B:
            P0,     LOAD-ENUA(CUA372B),                         !WHERE WE BUT[RETURN] TO
                    LOAD-ERROR(TEST372B),                       !ERROR DIRECTORY KEY
                    DCS-CTR(C7.),                               !IN 7. MICROWORDS
            NEXT,   J/PAGE372B                                  !
(6701)  DCS[1.00.1.0.0.0]  BM[1000..00.10..11.01..101..101...0.0.0..0..0...0.0000...0..0000.0...11.000...001.000.000]

    6100: !(FREE)
    PAGE372B:
            SETUP,  RETURN/BUTERROR5,                           !JUNK IN RETURN REGISTER
            NEXT,   GOTO-PAGE(5),                               !XFER TO PAGE 5
                    J/SETDC372B                                 !
```

```
(6100)  DCS[0.00.0.0.0.0]  BM[0101..00.01..11.11..110..101...0.0.0..0..0...0.0000...0..0000.0...11.100...000.000.000]

        5000:  !(FREE)
        SETDC372B:
                 P0,       BUMP-VERIFY,                              !COUNT
                 P2-T,     D+ASPHI(C000000), D[C]+1,                 !SET D[C] FLAG = (1) FOR FIRST LOOP
                 P3,       BUTA(CUA-TRACK),                          !RESET TRACKING OF CUA
                 NEXT,     J/CUA372B                                 !
(5000)  DCS[0.00.0.0.0.1]  BM[1111..00.00..11.01..100..000...0.1.0..0..0...0.0000...0..0000.0...11.001...101.101.101]

        5555:
        CUA372B:
                 P3,       CSPD[16]+BUSDIN, RETURN/BUTERRORS,        !COPY CUA [WHICH IS ADDRESS OF THIS WORD] INTO CSP
                 NEXT,     BUTR(D[C]-B),                             !IF D[C] SET [PASS 1], GO TO "LOAD372B"
                           J/SCOPE372B                               !IF D[C] RESET [PASS2], GO TO "SCOPE372B"
(5555)  DCS[0.00.0.0.0.0]  BM[0101..10.01..11.11..110..000...0.0.0..0..0...0.0001...1..0000.0...10.011...101.000.001]

        5503:
        LOAD372B:
                 P2-T,     D+CSPB(B16), D[C]+0,                      !PUT CUA FROM CSP INTO D, RESET D[C]
                 NEXT,     J/SUBRA372B                               !
(5503)  DCS[0.00.0.0.0.0]  BM[1010..11.01..00.00..000..000...0.1.0..0..0...0.0000...0..0000.0...11.000...010.010.011]

        5223:  !(FREE)
        SUBRA372B:
                 P0,       BUMP-VERIFY,                              !COUNT
                 SETUP,    RETURN/BUTERRORS,                         !IF BUTA(SUBR-B) USED INSTEAD
                 NEXT,     PAGE(7),                                  !SUBROUTINE IS ON PAGE 7
                           BUTA(SUBR-A),                             !LOAD PAGE, LOAD RETURN FROM D
                           J/RESETUCONP                              !THE SUBR:  RESETS PROC UCON:  BUSDIN+EMIT, EN-CLK-IR
(5223)  DCS[0.00.0.0.0.1]  BM[0101..00.01..11.11..110..111...0.0.0..0..0...0.0000...0..0000.0...11.101...010.111.001]

        !NEXT WORD COMES FROM 'RESETUCONP', WHICH DOES ONLY A BUTA[RETURN],
        !WHICH SHOULD RETURN TO 'CUA372B' [-3.WORDS]

        5501:
        SCOPE372B:
                 NEXT,     GOTO-PAGE(6),                             !XFER
                           BUTD[SCOPE],                              !NO ERROR:  "TEST373A" [+1.WORDS]
                           J/TEST373A                                !   ERROR:  "LOOP372A" [-12.WORDS]
(5501)  DCS[0.00.0.1.0.0]  BM[0000..00.00..00.00..000..110...0.0.0..0..0...0.0000...0..0000.0...11.100...101.100.001]





        !.PAGE==========================================================================================


        .TOC    *    TEST373:  CHECK JAMUPP W/ BUTA(DIAGNOSE), BM EXT BIT FLPADR
```

```
!*****************************************************************************
!*
!*      TESTS:  373 A - B                               UWORDS:  007 + 014
!*
!*      FUNCTIONS:
!*
!*      THE FOLLOWING SET OF TWO TESTS PERFORMS SEVERAL FUNCTIONS:
!*
!*              TEST-373-A CHECKS THAT CONTROL CAN BE PASSED TO THE BASE MACHINE, VIA
!*              BUTA(DIAGNOSE), AND SEVERAL B.M. WORDS EXECUTED.  A BUTA(DIAGNOSE) IN
!*              THE B.M. SHOULD THEN BE ENCOUNTERED, RETURNING CONTROL TO THE DCS VIA
!*              A JAMUPP FORCE.
!*
!*              TEST-373-B THEN CHECKS THAT THE B.M. MACHINE CODE CORRECTL
!*              ASSERTED THE "FLPADR-L" EXTENSION BIT, FORCING A READ, VIA THE ASP/DF
!*              FIELD MODE, OF A SCRATCHPAD.
!*
!*****************************************************************************



!THIS TEST GOES TO THE B.M. VIA BUTA(DIAGNOSE)
6541:
TEST373A:
        P0,     LOAD-ENUA(4777),                        !JAMUPPS GO HERE IN DCS
                LOAD-ERROR(TEST373A),                   !ERROR DIRECTORY KEY
                DCS-CTR(C7.),                           !COMPARE AT JAMUPP
        NEXT,   J/RETURN373A                            !
(6541)  DCS[1.00.1.0.0.0]  BM[1000..00.10..01.11..111..111...0.0.0..0..0...0.0000...0..0000.0...11.000...101.110.010]

6562:
RETURN373A:
        P3,     CSPD[00]+EMIT, RETURN/TEST373B,         !RETURN AFTER PROCESSING, TO NEXT TEST
        NEXT,   GOTO-PAGE(7),                           !JAMUPP ROUTINE EXPECTS RETURN ADDRESS IN CSP(00)
                J/SETIR373A                             !
(6562)  DCS[0.00.0.0.0.0]  BM[0110..10.10..11.11..010..111...0.0.0..0..0...0.1111...1..0000.0...11.100...000.011.100]

7034:  !(FREE)
SETIR373A:
        P2-U,   IR+EMIT, EMIT/000002,                   !SET DF=(2) IN IR
        P3,     BUTA(DIAGNOSE),                         !BEGIN THE TRANSFER SEQUENCE
        NEXT,   J/SETSR373A                             !
(7034)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..010...0.0.0..0..0...1.1010...0..0000.0...11.011...000.011.111]

7037:  !(FREE)
SETSR373A:
        P2-T,   SR+CSPD(C052525),                       !SET SR(00)=(1) FOR JAMUPP EXPECTED (BY JAMUPP SERVICER)
        NEXT,   GOTO-PAGE(3),                           !SET PAGE TO BE ACTUAL (3)
                J/MED25                                 !POINT UPF TO B.M. DISP. ON PAGE
(7037)  DCS[0.00.0.0.0.0]  BM[1010..10.00..00.00..000..011...0.0.1..0..0...0.0111...0..0000.0...11.100...000.010.000]

!THE SEQUENCE OF CONTROL SHOULD NOW BE COMING FROM THE B.M.:
```

```
!3020:
!MED25:
!       NEXT,   GOTO-PAGE(2),                           !XFER
!               J/MED25A                                !
!
!2071:
!MED25A:
!       P2-T,   D+ASPHI[DF]-TOP, SAVE-D[C],             !READ FROM ASPHI/DF, WITH FLPADR ASSERTED
!                                                       !SINCE DF=(2), THE SPADDRS=(12) WILL BE FORCED
!       P3,     BUTA(DIAGNOSE),                         !ALSO START TO RETURN XFER TO DCS, VIA JAMUPP
!       NEXT,   J/MED19A                                !
!
!2066:
!MED19A:
!       NEXT,   GOTO-PAGE(3),                           !THIS WORD ALSO GETS EXECUTED
!               J/MED19                                 !BUT NOW JAMUPP GETS FORCED, AND WE GO NO FURTHER
!
!*** CONTROL NOW COMES BACK TO DCS JAMUPP POINT ***
!
!4777:
!JAMUPP001:
!       P3-T,   SR+D,                                   !SAVE OLD D IN SR
!       NEXT,   BUTR(SR00),                             !TEST SR<00>:
!                                                       !IF=(0), NOT-EXPECTED JAM, GOTO(JAMUPP003), (SEE JAMUPP ROUTINE)
!               J/JAMUPP003                             !IF=(1), EXPECTED JAM, GOTO(JAMUPP002B)
!
!* COME HERE FOR EXPECTED JAM *
!4757:
!JAMUPP002B:
!       P2-T,   D+CSPD(D00), SAVE-D[C],                 !GET RETURN ADDRESS, STORED IN CSP(00)
!       NEXT,   J/JAMUPP002C                            !
!
!=[4000:4777]
!JAMUPP002C:
!       P0,     RETURN+D[14-03], PAGE(7),               !PUT RETURN ADDRESS INTO RETURN REGISTER
!       P2-T,   D+SR, SAVE-D[C],                        !RESTORE OLD D
!       NEXT,   J/JAMUPP002D                            !
!
!=[7000:7377]
!JAMUPP002D:
!       P2-T,   SR+ZERO,                                !ZERO OUT SR<00>, FURTHER JAMUPPS NOW ILLEGAL
!       NEXT,   BUTA(RETURN),                           !AND RETURN TO FLOWS
!               J/BUTERROR7                             !ONLY IF ERROR
!

!AT THIS POINT, CONTROL SHOULD NOW RETURN TO THIS POINT; THE NEXT TEST
!THIS TEST NOW CHECKS TO SEE THAT THE B.M. FUNCTION WAS EXECUTED CORRECTLY
!NOTE THAT IN TEST-350 ( A WHILE BACK ), A#BSPHI[12] WERE LOADED WITH (000152) DATA

6572:
TEST373B:
        P0,     LOAD-ENUA(ZTARGET425),                  !FOR INSTRS-E7B-(425) DECODE
                LOAD-ERROR(TEST373B),                   !ERROR DIRECTORY KEY
```

```
                DCS-CTR(C6.),                            !COMPARE AT TARGET
          NEXT, J/GOBUT373B                              !
  (6572) DCS[1.00.1.0.0.0] BM[1001..00.11..11.00..010..101...0.0.0..0..0...0.0000...0..0000.0...11.000...001.000.001]

     6101:  !(FREE)
     GOBUT373B:
          SETUP, RETURN/SCOPE373,                        !RETURN TO SCOPE LOOP TEST WORD
          NEXT,  CALL[DINTOIR-5]                         !GO DO D -> DBUF -> IR, BUT(INSTRS)
  (6101) DCS[0.00.0.0.0.0] BM[0110..00.00..10.00..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.111.011]



     6102:  !(FREE)
     SCOPE373:
          PO,    BUMP-VERIFY,                            !COUNT
          NEXT,  BUTD[SCOPE],                            !NO ERROR:  "TEST374"  (+1. WORDS)
                 J/TEST374                               !   ERROR:  "RETURN373A"  (-12. WORDS)
  (6102) DCS[0.00.0.1.0.1] BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...101.110.011]





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     .TOC   *   TEST374:  A/B SP REWRITE MODES VERIFICATION


     !******************************************************************************************
     !*
     !*      TESTS:  374 A - F                               UWORDS:  076 + 336
     !*
     !*      FUNCTIONS:
     !*
     !*      THE FOLLOWING GROUP OF TWELVE TESTS PERFORMS A VERIFICATION OF THE A/B SP REWRITE
     !*      FUNCTIONS:
     !*
     !*              WR(A,L,A)       WR(A,L,B)       WR(A,H,A)       WR(A,H,B)
     !*              WR(B,L,A)       WR(B,L,B)       WR(B,H,A)       WR(B,H,B)
     !*              WR(AB,L,A)      WR(AB,L,B)      WR(AB,H,A)      WR(AB,H,B)
     !*
     !*      EACH FUNCTION IS INVOKED, AND THE RESULTANT SCRATCHPADS ARE CHECKED TO INSURE
     !*      THAT (1) ONLY THE RIGHT SCRATCHPADS WERE WRITTEN, AND (2) THE CORRECT ADDRESS
     !*      WAS USED FOR THE REWRITE.
     !*
     !******************************************************************************************

     !
     !       SUMMARY OF ASP/BSP HI/LO REWRITE FUNCTIONALITY TESTS:
     !
     !                                                --DF---  --SF---
     !       TEST  REWRITE--FUNCTION   ASP   BSP     ASP BSP  ASP BSP  SR IN
```

```
        !        NUMB  A/B  HI/LO  A/B-ADR   ADDR  ADDR   H-L H-L  H-L H-L  OCTAL
        !        ----  ---  -----  -------   ----  ----   - - - -  - - - -  ------
        !
        !         A1    A    LO    A-ADDR    SF/4  DF/2   0 0 0 0  0 1 0 0  002100
        !         A2    "    ""    B-ADDR     "     "     0 1 0 0  0 0 0 0
        !
        !         B1    A    HI    A-ADDR    DF/2  SF/4   1 0 0 0  0 0 0 0  100010
        !         B2    "    ""    B-ADDR     "     "     0 0 0 0  1 0 0 0
        !
        !         C1    B    LO    A-ADDR    DF/4  SF/2   0 0 0 1  0 0 0 0  010001
        !         C2    "    ""    B-ADDR     "     "     0 0 0 0  0 0 0 1
        !
        !         D1    B    HI    A-ADDR    SF/2  DF/4   0 0 0 0  0 0 1 0  001040
        !         D2    "    ""    B-ADDR     "     "     0 0 1 0  0 0 0 0
        !
        !         E1    AB   LO    A-ADDR    SF/4  DF/2   0 0 0 0  0 1 0 1  002520
        !         E2    ""   ""    B-ADDR     "     "     0 1 0 1  0 0 0 0
        !
        !         F1    AB   HI    A-ADDR    DF/4  SF/2   1 0 1 0  0 0 0 0  120012
        !         F2    ""   ""    B-ADDR     "     "     0 0 0 0  1 0 1 0
        !





        ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

        !*** TEST 374A ***

        6563:
        TEST374:
                P0,     BUMP-VERIFY,                            !COUNT
                        LOAD-ERROR(TEST374),                    !ERROR DIRECTORY KEY
                P3,     CSPD[01]←EMIT,                          !CONSTANT FOR:
                EMITC,  SR-LEFT, GUARD-DIS,                     !SETUP RES FOR SR FUNCTION
                        EMIT07/1,                               !FLAG BIT FOR TESTING
                NEXT,   J/LOADRES374                            !
    (6563)  DCS[1.00.0.0.0.1]  BM[0001..10.00..00.10..000..000...0.0.0..0..0...0.1110...1..0000.0...11.000...001.000.011]

        6103:   !(FREE)
        LOADRES374:
                P0,     DCS-CTR(C15.),                          !HOLD UP ERROR COUNTER
                P2,     RES←CSPD(D01),                          !SR NOW SETUP
                NEXT,   GOTO-PAGE(5),                           !XFR
                        J/EXPEC374A1                            !
    (6103)  DCS[0.00.1.0.0.0]  BM[0000..10.00..00.00..000..101...0.0.0..0..0...0.1110...0..1000.1...11.100...010.010.010]

        5222:   !(FREE)
        EXPEC374A1:
                P3,     CSPD[02]←EMIT, EMIT/002100,             !EXPECTED "SERIAL" REPRESENTATION OF RESULT
                NEXT,   J/ZERO374A1                             !
    (5222)  DCS[0.00.0.0.0.0]  BM[0000..10.01..00.01..000..000...0.0.0..0..0...0.1101...1..0000.0...11.000...101.011.110]
```

```

        5536:
        ZERO374A1:
                PO,      BUMP-VERIFY,                               !COUNT
                SETUP,   RETURN/DOWRITE374A1,                       !EXEC SUBR WHICH:
                                                                    !(1) (000402) -> IR,
                NEXT,    CALL[ZEROSF04DF02]                         !(2)  WRITES ZEROES TO A/B SP HI/LO SF/DF
 (5536)  DCS[0.00.0.0.0.1], BM[0101..00.01..00.10..101..111...0.0.0..0..0...0.0000...0..0000.0...11.100...000.100.001]

        5225:  !(FREE)
        DOWRITE374A1:
                P2-T,    D←CSPD(D01), D[C]←0,                       !DATA WITH BIT<07> SET
                         ASP-ADDRS-R[SF],                           !ADDRESS ASP WITH SF MODE
                         BSP-ADDRS-R[DF],                           !ADDRESS BSP WITH DF MODE
                P3,      WR(A,LO,A-ADDR),                           !SELECT THE PARTICULAR FUNCTION TO TEST,
                NEXT,    J/GETTEM374A1                              !  USING A-ADDR FOR REWRITE
 (5225)  DCS[0.00.0.0.0.0]  BM[1010..10.00..00.11..000..000...0.1.0..0..0...0.1110...0..0001.0...11.000...010.010.110]

        5226:  !(FREE)
        GETTEM374A1:
                P3,      CSPD[00]←EMIT, RETURN/ZERO374A2,           !(SEE DESCRIP OF SUBR FOR FUNCTION)
                NEXT,    CALL[SFDFTOSR]                             !
 (5226)  DCS[0.00.0.0.0.0]  BM[0101..10.01..00.10..111..101...0.0.0..0..0...0.1111...1..0000.0...11.100...111.100.110]



        5227:  !(FREE)
        ZERO374A2:
                SETUP,   RETURN/DOWRITE374A2,                       !AGAIN GO WRITE ZEROES TO A/B-SP-HI/LO
                NEXT,    CALL[ZEROSF04DF02]                         !
 (5227)  DCS[0.00.0.0.0.0]  BM[0101..00.01..00.11..000..111...0.0.0..0..0...0.0000...0..0000.0...11.100...000.100.001]

        5230:  !(FREE)
        DOWRITE374A2:
                P2-T,    D←CSPD(D01), D[C]←0,                       !DATA WITH BIT<07> SET
                         ASP-ADDRS-R[SF],                           !ADDRESS ASP WITH SF MODE
                         BSP-ADDRS-R[DF],                           !ADDRESS BSP WITH DF MODE
                P3,      WR(A,LO,B-ADDR),                           !USE SAME FUNCTION AS ABOVE,
                NEXT,    J/GETTEM374A2                              !  ONLY USE B-ADDR FOR REWRITE THIS TIME
 (5230)  DCS[0.00.0.0.0.0]  BM[1010..10.00..00.11..000..000...0.1.0..0..0...0.1110...0..0101.0...11.000...010.011.001]

        5231:  !(FREE)
        GETTEM374A2:
                P3,      CSPD[00]←EMIT, RETURN/TEST374A2,           !(SEE DESCRIP OF SUBR FOR FUNCTION)
                NEXT,    CALL[SFDFTOSR]                             !
 (5231)  DCS[0.00.0.0.0.0]  BM[0101..10.11..00.00..100..101...0.0.0..0..0...0.1111...1..0000.0...11.100...111.100.110]

        5604:
        TEST374A2:
                PO,      LOAD-ENUA(ZTARGET434),                     !NOW SETUP FOR IR=ZERO COMPARE
                         LOAD-ERROR(TEST374A2),                     !ERROR DIRECTORY KEY
                         DCS-CTR(C6.),                              !COMPARE AT TARGET
```

```
                  BUMP-VERIFY,                          !COUNT
          NEXT,   J/GOTEST374A2                         !
 (5604) DCS[1.00.1.0.0.1]  BM[1001..00.11..11.00..011..100...0.0.0..0..0...0.0000...0..0000.0...11.000...010.011.010]

   5232:  !(FREE)
   GOTEST374A2:
          SETUP,  RETURN/SCOPE374A,                     !GO EXEC SUBR THAT:
          NEXT,   CALL[DINTOIR-5]                       !  PUTS D -> IR, BUT(INSTRS) TO TEST FOR ZERO
 (5232) DCS[0.00.0.0.0.0]  BM[0101..00.01..00.11..011..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.111.011]




   5233:  !(FREE)
   SCOPE374A:
          NEXT,   BUTD[SCOPE],                          !NO ERROR:  "EXPEC374B1" (+1. WORDS)
                  J/EXPEC374B1                          !   ERROR:  "ZERO374A1" (-8. WORDS)
 (5233) DCS[0.00.0.1.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...101.011.111]




   ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

   !*** TEST 374B ***

   5537:
   EXPEC374B1:
          P3,     CSPD[02]+EMIT, EMIT/100010,           !EXPECTED "SERIAL" REPRESENTATION OF RESULT
          NEXT,   J/ZERO374B1                           !
 (5537) DCS[0.00.0.0.0.0]  BM[1000..10.00..00.00..001..000...0.0.0..0..0...0.1101...1..0000.0...11.000...101.101.110]

   5556:
   ZERO374B1:
          P0,     BUMP-VERIFY,                          !COUNT
          SETUP,  RETURN/DOWRITE374B1,                  !EXEC SUBR WHICH:
                                                        !(1) (000402) -> IR,
          NEXT,   CALL[ZEROSF04DF02]                    !(2)  WRITES ZEROES TO A/B SP HI/LO SF/DF
 (5556) DCS[0.00.0.0.0.1]  BM[0101..00.01..00.11..100..111...0.0.0..0..0...0.0000...0..0000.0...11.100...000.100.001]

   5234:  !(FREE)
   DOWRITE374B1:
          P2-T,   D+CSPD(D01), D[C]+0,                  !DATA WITH BIT<07> SET
                  ASP-ADDRS-R[DF],                      !ADDRESS ASP WITH DF MODE
                  BSP-ADDRS-R[SF],                      !ADDRESS BSP WITH SF MODE
          P3,     WR(A,HI,A-ADDR),                      !SELECT THE PARTICULAR FUNCTION TO TEST,
          NEXT,   J/GETTEM374B1                         !  USING A-ADDR FOR REWRITE
 (5234) DCS[0.00.0.0.0.0]  BM[1010..10.01..00.10..000..000...0.1.0..0..0...0.1110...0..1001.0...11.000...010.011.101]

   5235:  !(FREE)
   GETTEM374B1:
          P3,     CSPD[00]+EMIT, RETURN/ZERO374B2,      !(SEE DESCRIP OF SUBR FOR FUNCTION)
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              NEXT,   CALL[SFDFTOSR]                          !
       (5235) DCS[0.00.0.0.0.0] BM[0101..10.01..00.11..110..101...0.0.0..0..0...0.1111...1..0000.0...11.100...111.100.110]



       5236:  !(FREE)
       ZERO374B2:
              SETUP,  RETURN/DOWRITE374B2,                    !AGAIN GO WRITE ZEROES TO A/B-SP-HI/LO
              NEXT,   CALL[ZEROSF04DF02]                      !
       (5236) DCS[0.00.0.0.0.0] BM[0101..00.01..00.11..111..111...0.0.0..0..0...0.0000...0..0000.0...11.100...000.100.001]

       5237:  !(FREE)
       DOWRITE374B2:
              P2-T,   D+CSPD(D01), D[C]+0,                    !DATA WITH BIT<07> SET
                      ASP-ADDRS-R[DF],                        !ADDRESS ASP WITH DF MODE
                      BSP-ADDRS-R[SF],                        !ADDRESS BSP WITH SF MODE
              P3,     WR(A,HI,B-ADDR),                        !USE SAME FUNCTION AS ABOVE,
              NEXT,   J/GETTEM374B2                           !  ONLY USE B-ADDR FOR REWRITE THIS TIME
       (5237) DCS[0.00.0.0.0.0] BM[1010..10.01..00.10..000..000...0.1.0..0..0...0.1110...0..1101.0...11.000...010.100.000]

       5240:  !(FREE)
       GETTEM374B2:
              P3,     CSPD[00]+EMIT, RETURN/TEST374B2,        !(SEE DESCRIP OF SUBR FOR FUNCTION)
              NEXT,   CALL[SFDFTOSR]                          !
       (5240) DCS[0.00.0.0.0.0] BM[0101..10.11..00.00..110..101...0.0.0..0..0...0.1111...1..0000.0...11.100...111.100.110]

       5606:
       TEST374B2:
              P0,     LOAD-ENVA(ZTARGET434),                  !NOW SETUP FOR IR=ZERO COMPARE
                      LOAD-ERROR(TEST374B2),                  !ERROR DIRECTORY KEY
                      DCS-CTR(C6.),                           !COMPARE AT TARGET
                      BUMP-VERIFY,                            !COUNT
              NEXT,   J/GOTEST374B2                           !
       (5606) DCS[1.00.1.0.0.1] BM[1001..00.11..11.00..011..100...0.0.0..0..0...0.0000...0..0000.0...11.000...010.100.001]

       5241:  !(FREE)
       GOTEST374B2:
              SETUP,  RETURN/SCOPE374B,                       !GO EXEC SUBR THAT:
              NEXT,   CALL[DINTOIR-5]                         !  PUTS D -> IR, BUT(INSTRS) TO TEST FOR ZERO
       (5241) DCS[0.00.0.0.0.0] BM[0101..00.01..01.00..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.111.011]




       5242:  !(FREE)
       SCOPE374B:
              NEXT,   BUTD[SCOPE],                            !NO ERROR:  "EXPEC374C1" (+1. WORDS)
                      J/EXPEC374C1                            !   ERROR:  "ZERO374B1" (-8. WORDS)
       (5242) DCS[0.00.0.1.0.0] BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...101.101.111]
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        ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

        !*** TEST 374C ***

        5557:
        EXPEC374C1:
                P3,     CSPD[02]+EMIT, EMIT/010001,              !EXPECTED "SERIAL" REPRESENTATION OF RESULT
                NEXT,   J/ZERO374C1                              !
  (5557) DCS[0.00.0.0.0.0] BM[0001..10.00..00.00..000..001...0.0.0..0..0...0.1101...1..0000.0...11.000...101.110.110]

        5566:
        ZERO374C1:
                P0,     BUMP-VERIFY,                             !COUNT
                SETUP,  RETURN/DOWRITE374C1,                     !EXEC SUBR WHICH:
                                                                 !(1) (000204) -> IR,
                NEXT,   CALL[ZEROSF02DF04]                       !(2)  WRITES ZEROES TO A/B SP HI/LO SF/DF
  (5566) DCS[0.00.0.0.0.1] BM[0101..00.01..01.00..011..111...0.0.0..0..0...0.0000...0..0000.0...11.100...000.011.110]

        5243:  !(FREE)
        DOWRITE374C1:
                P2-T,   D+CSPD(D01), D[C]+0,                     !DATA WITH BIT<07> SET
                        ASP-ADDRS-R[DF],                         !ADDRESS ASP WITH DF MODE
                        BSP-ADDRS-R[SF],                         !ADDRESS BSP WITH SF MODE
                P3,     WR(B,LO,A-ADDR),                         !SELECT THE PARTICULAR FUNCTION TO TEST,
                NEXT,   J/GETTEM374C1                            !  USING A-ADDR FOR REWRITE
  (5243) DCS[0.00.0.0.0.0] BM[1010..10.01..00.10..000..000...0.1.0..0..0...0.1110...0..0010.0...11.000...010.100.100]

        5244:  !(FREE)
        GETTEM374C1:
                P3,     CSPD[00]+EMIT, RETURN/ZERO374C2,         !(SEE DESCRIP OF SUBR FOR FUNCTION)
                NEXT,   CALL[SFDFTOSR]                           !
  (5244) DCS[0.00.0.0.0.0] BM[0101..10.01..01.00..110..101...0.0.0..0..0...0.1111...1..0000.0...11.100...111.100.110]



        5246:  !(FREE)
        ZERO374C2:
                SETUP,  RETURN/DOWRITE374C2,                     !AGAIN GO WRITE ZEROES TO A/B-SP-HI/LO
                NEXT,   CALL[ZEROSF02DF04]                       !
  (5246) DCS[0.00.0.0.0.0] BM[0101..00.01..01.00..111..111...0.0.0..0..0...0.0000...0..0000.0...11.100...000.011.110]

        5247:  !(FREE)
        DOWRITE374C2:
                P2-T,   D+CSPD(D01), D[C]+0,                     !DATA WITH BIT<07> SET
                        ASP-ADDRS-R[DF],                         !ADDRESS ASP WITH DF MODE
                        BSP-ADDRS-R[SF],                         !ADDRESS BSP WITH SF MODE
                P3,     WR(B,LO,B-ADDR),                         !USE SAME FUNCTION AS ABOVE,
                NEXT,   J/GETTEM374C2                            !  ONLY USE B-ADDR FOR REWRITE THIS TIME
  (5247) DCS[0.00.0.0.0.0] BM[1010..10.01..00.10..000..000...0.1.0..0..0...0.1110...0..0110.0...11.000...010.101.000]

        5250:  !(FREE)
```

```
       GETTEM374C2:
              P3,     CSPD[00]+EMIT, RETURN/TEST374C2,          !(SEE DESCRIP OF SUBR FOR FUNCTION)
              NEXT,   CALL[SFDFTOSR]                            !
   (5250)  DCS[0.00.0.0.0.0]  BM[0101..10.10..10.10..100..101...0.0.0..0..0...0.1111...1..0000.0...11.100...111.100.110]

       5524:
       TEST374C2:
              P0,     LOAD-ENUA(ZTARGET434),                    !NOW SETUP FOR IR=ZERO COMPARE
                      LOAD-ERROR(TEST374C2),                    !ERROR DIRECTORY KEY
                      DCS-CTR(C6.),                             !COMPARE AT TARGET
                      BUMP-VERIFY,                              !COUNT
              NEXT,   J/GOTEST374C2                             !
   (5524)  DCS[1.00.1.0.0.1]  BM[1001..00.11..11.00..011..100...0.0.0..0..0...0.0000...0..0000.0...11.000...010.101.001]

       5251:  !(FREE)
       GOTEST374C2:
              SETUP,  RETURN/SCOPE374C,                         !GO EXEC SUBR THAT:
              NEXT,   CALL[DINTOIR-5]                           !  PUTS D -> IR, BUT(INSTRS) TO TEST FOR ZERO
   (5251)  DCS[0.00.0.0.0.0]  BM[0101..00.01..01.01..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.111.011]




       5252:  !(FREE)
       SCOPE374C:
              NEXT,   BUTD[SCOPE]                               !NO ERROR:  "EXPEC374D1" (+1. WORDS)
                      J/EXPEC374D1                              !   ERROR:  "ZERO374C1" (-8. WORDS)
   (5252)  DCS[0.00.0.1.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...101.110.111]




       ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

       !*** TEST 374D ***

       5567:
       EXPEC374D1:
              P3,     CSPD[02]+EMIT, EMIT/001040,               !EXPECTED "SERIAL" REPRESENTATION OF RESULT
              NEXT,   J/ZERO374D1                               !
   (5567)  DCS[0.00.0.0.0.0]  BM[0000..10.00..10.00..100..000...0.0.0..0..0...0.1101...1..0000.0...11.000...101.001.100]

       5514:
       ZERO374D1:
              P0,     BUMP-VERIFY,                              !COUNT
              SETUP,  RETURN/DOWRITE374D1,                      !EXEC SUBR WHICH:
                                                                !(1) (000204) -> IR,
              NEXT,   CALL[ZEROSF02DF04]                        !(2)  WRITES ZEROES TO A/B SP HI/LO SF/DF
   (5514)  DCS[0.00.0.0.0.1]  BM[0101..00.01..01.01..011..111...0.0.0..0..0...0.0000...0..0000.0...11.100...000.011.110]

       5253:  !(FREE)
       DOWRITE374D1:
```

```
          P2-T,   D←CSPD(D01), D[C]←0,                   !DATA WITH BIT<07> SET
                  ASP-ADDRS-R[SF],                       !ADDRESS ASP WITH SF MODE
                  BSP-ADDRS-R[DF],                       !ADDRESS BSP WITH DF MODE
          P3,     WR(B,HI,A-ADDR),                       !SELECT THE PARTICULAR FUNCTION TO TEST,
          NEXT,   J/GETTEM374D1                          !  USING A-ADDR FOR REWRITE
 (5253)  DCS[0.00.0.0.0.0]  BM[1010..10.00..00.11..000..000...0.1.0..0..0...0.1110...0..1010.0...11.000...010.101.100]

    5254: !(FREE)
    GETTEM374D1:
          P3,     CSPD[00]←EMIT, RETURN/ZERO374D2,       !(SEE DESCRIP OF SUBR FOR FUNCTION)
          NEXT,   CALL[SFDFTOSR]                         !
 (5254)  DCS[0.00.0.0.0.0]  BM[0101..10.01..01.01..101..101...0.0.0..0..0...0.1111...1..0000.0...11.100...111.100.110]



    5255: !(FREE)
    ZERO374D2:
          SETUP,  RETURN/DOWRITE374D2,                   !AGAIN GO WRITE ZEROES TO A/B-SP-HI/LO
          NEXT,   CALL[ZEROSF02DF04]                     !
 (5255)  DCS[0.00.0.0.0.0]  BM[0101..00.01..01.01..110..111...0.0.0..0..0...0.0000...0..0000.0...11.100...000.011.110]

    5256: !(FREE)
    DOWRITE374D2:
          P2-T,   D←CSPD(D01), D[C]←0,                   !DATA WITH BIT<07> SET
                  ASP-ADDRS-R[SF],                       !ADDRESS ASP WITH SF MODE
                  BSP-ADDRS-R[DF],                       !ADDRESS BSP WITH DF MODE
          P3,     WR(B,HI,B-ADDR),                       !USE SAME FUNCTION AS ABOVE,
          NEXT,   J/GETTEM374D2                          !  ONLY USE B-ADDR FOR REWRITE THIS TIME
 (5256)  DCS[0.00.0.0.0.0]  BM[1010..10.00..00.11..000..000...0.1.0..0..0...0.1110...0..1110.0...11.000...010.101.111]

    5257: !(FREE)
    GETTEM374D2:
          P3,     CSPD[00]←EMIT, RETURN/TEST374D2,       !(SEE DESCRIP OF SUBR FOR FUNCTION)
          NEXT,   CALL[SFDFTOSR]                         !
 (5257)  DCS[0.00.0.0.0.0]  BM[0101..10.10..10.00..000..101...0.0.0..0..0...0.1111...1..0000.0...11.100...111.100.110]

    5500:
    TEST374D2:
          P0,     LOAD-ENUA(ZTARGET434),                 !NOW SETUP FOR IR=ZERO COMPARE
                  LOAD-ERROR(TEST374D2),                 !ERROR DIRECTORY KEY
                  DCS-CTR(C6.),                          !COMPARE AT TARGET
                  BUMP-VERIFY,                           !COUNT
          NEXT,   J/GOTEST374D2                          !
 (5500)  DCS[1.00.1.0.0.1]  BM[1001..00.11..11.00..011..100...0.0.0..0..0...0.0000...0..0000.0...11.000...010.110.000]

    5260: !(FREE)
    GOTEST374D2:
          SETUP,  RETURN/SCOPE374D,                      !GO EXEC SUBR THAT:
          NEXT,   CALL[DINTOIR-5]                        !  PUTS D -> IR, BUT(INSTRS) TO TEST FOR ZERO
 (5260)  DCS[0.00.0.0.0.0]  BM[0101..00.01..01.10..001..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.111.011]
```

```
      5261:  !(FREE)
      SCOPE374D:
              NEXT,    BUTD[SCOPE],                         !NO ERROR:  "EXPEC374E1" (+1. WORDS)
                       J/EXPEC374E1                         !   ERROR:  "ZERO374D1" (-8. WORDS)
  (5261)  DCS[0.00.0.1.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...101.001.101]



      ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

      !*** TEST 374E ***

      5515:
      EXPEC374E1:
              P3,      CSPD[02]←EMIT, EMIT/002520,          !EXPECTED "SERIAL" REPRESENTATION OF RESULT
              NEXT,    J/ZERO374E1                          !
  (5515)  DCS[0.00.0.0.0.0]  BM[0000..10.01..01.01..010..000...0.0.0..0..0...0.1101...1..0000.0...11.000...101.010.110]

      5526:
      ZERO374E1:
              P0,      BUMP-VERIFY,                         !COUNT
              SETUP,   RETURN/DOWRITE374E1,                 !EXEC SUBR WHICH:
                                                            !(1) (000402) -> IR,
              NEXT,    CALL[ZEROSF04DF02]                   !(2)  WRITES ZEROES TO A/B SP HI/LO SF/DF
  (5526)  DCS[0.00.0.0.0.1]  BM[0101..00.01..01.10..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...000.100.001]

      5262:  !(FREE)
      DOWRITE374E1:
              P2-T,    D←CSPD(D01), D[C]←0,                 !DATA WITH BIT<07> SET
                       ASP-ADDRS-R[SF],                     !ADDRESS ASP WITH SF MODE
                       BSP-ADDRS-R[DF],                     !ADDRESS BSP WITH DF MODE
              P3,      WR(AB,LO,A-ADDR),                    !SELECT THE PARTICULAR FUNCTION TO TEST,
              NEXT,    J/GETTEM374E1                        !  USING A-ADDR FOR REWRITE
  (5262)  DCS[0.00.0.0.0.0]  BM[1010..10.00..00.11..000..000...0.1.0..0..0...0.1110...0..0011.0...11.000...010.110.011]

      5263:  !(FREE)
      GETTEM374E1:
              P3,      CSPD[00]←EMIT, RETURN/ZERO374E2,     !(SEE DESCRIP OF SUBR FOR FUNCTION)
              NEXT,    CALL[SFDFTOSR]                       !
  (5263)  DCS[0.00.0.0.0.0]  BM[0101..10.01..01.10..100..101...0.0.0..0..0...0.1111...1..0000.0...11.100...111.100.110]



      5264:  !(FREE)
      ZERO374E2:
              SETUP,   RETURN/DOWRITE374E2,                 !AGAIN GO WRITE ZEROES TO A/B-SP-HI/LO
              NEXT,    CALL[ZEROSF04DF02]                   !
  (5264)  DCS[0.00.0.0.0.0]  BM[0101..00.01..01.10..101..111...0.0.0..0..0...0.0000...0..0000.0...11.100...000.100.001]
```

```
        5265:  !(FREE)
        DOWRITE374E2:
                P2-T,   D←CSPD(D01), D[C]←0,               !DATA WITH BIT<07> SET
                        ASP-ADDRS-R[SF],                    !ADDRESS ASP WITH SF MODE
                        BSP-ADDRS-R[DF],                    !ADDRESS BSP WITH DF MODE
                P3,     WR(AB LO B-ADDR),                   !USE SAME FUNCTION AS ABOVE
                NEXT,   J/GETTEM374E2                       !  ONLY USE B-ADDR FOR REWRITE THIS TIME
 (5265) DCS[0.00.0.0.0.0]  BM[1010..10.00..00.11..000..000...0.1.0..0..0...0.1110...0..0111.0...11.000...010.110.110]

        5266:  !(FREE)
        GETTEM374E2:
                P3,     CSPD[00]←EMIT, RETURN/TEST374E2,    !(SEE DESCRIP OF SUBR FOR FUNCTION)
                NEXT,   CALL[SFDFTOSR]                      !
 (5266) DCS[0.00.0.0.0.0]  BM[0101..10.10..10.00..010..101...0.0.0..0..0...0.1111...1..0000.0...11.100...111.100.110]

        5502:
        TEST374E2:
                P0,     LOAD-ENUA(ZTARGET434),              !NOW SETUP FOR IR=ZERO COMPARE
                        LOAD-ERROR(TEST374E2),              !ERROR DIRECTORY KEY
                        DCS-CTR(C6.),                       !COMPARE AT TARGET
                        BUMP-VERIFY,                        !COUNT
                NEXT,   J/GOTEST374E2                       !
 (5502) DCS[1.00.1.0.0.1]  BM[1001..00.11..11.00..011..100...0.0.0..0..0...0.0000...0..0000.0...11.000...010.110.111]

        5267:  !(FREE)
        GOTEST374E2:
                SETUP,  RETURN/SCOPE374E,                   !GO EXEC SUBR THAT:
                NEXT,   CALL[DINTOIR-5]                     !  PUTS D -> IR, BUT(INSTRS) TO TEST FOR ZERO
 (5267) DCS[0.00.0.0.0.0]  BM[0101..00.01..01.11..000..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.111.011]




        5270:  !(FREE)
        SCOPE374E:
                NEXT,   BUTD[SCOPE],                        !NO ERROR:  "EXPEC374F1" (+1. WORDS)
                        J/EXPEC374F1                        !    ERROR:  "ZERO374E1" (-8. WORDS)
 (5270) DCS[0.00.0.1.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...101.010.111]




        ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

        !*** TEST 374F ***

        5527:
        EXPEC374F1:
                P3,     CSPD[02]←EMIT, EMIT/120012,         !EXPECTED "SERIAL" REPRESENTATION OF RESULT
                NEXT,   J/ZERO374F1                         !
 (5527) DCS[0.00.0.0.0.0]  BM[1010..10.00..00.00..001..010...0.0.0..0..0...0.1101...1..0000.0...11.000...101.001.110]

        5516:
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        ZERO374F1:
                P0,      BUMP-VERIFY,                                  !COUNT
                SETUP,   RETURN/DOWRITE374F1,                          !EXEC SUBR WHICH:
                                                                       !(1) (000204) -> IR,
                NEXT,    CALL[ZEROSF02DF04]                            !(2)  WRITES ZEROES TO A/B SP HI/LO SF/DF
   (5516)  DCS[0.00.0.0.0.1]  BM[0101..00.01..01.11..001..111...0.0.0..0..0...0.0000...0..0000.0...11.100...000.011.110]

        5271:  !(FREE)
        DOWRITE374F1:
                P2-T,    D←CSPD(D01), D[C]←0,                          !DATA WITH BIT<07> SET
                         ASP-ADDRS-R[DF],                              !ADDRESS ASP WITH DF MODE
                         BSP-ADDRS-R[SF],                              !ADDRESS BSP WITH SF MODE
                P3,      WR(AB,HI,A-ADDR),                             !SELECT THE PARTICULAR FUNCTION TO TEST,
                NEXT,    J/GETTEM374F1                                 !  USING A-ADDR FOR REWRITE
   (5271)  DCS[0.00.0.0.0.0]  BM[1010..10.01..00.10..000..000...0.1.0..0..0...0.1110...0..1011.0...11.000...010.111.010]

        5272:  !(FREE)
        GETTEM374F1:
                P3,      CSPD[00]←EMIT, RETURN/ZERO374F2,              !(SEE DESCRIP OF SUBR FOR FUNCTION)
                NEXT,    CALL[SFDFTOSR]                                !
   (5272)  DCS[0.00.0.0.0.0]  BM[0101..10.01..01.11..011..101...0.0.0..0..0...0.1111...1..0000.0...11.100...111.100.110]



        5273:  !(FREE)
        ZERO374F2:
                SETUP,   RETURN/DOWRITE374F2,                          !AGAIN GO WRITE ZEROES TO A/B-SP-HI/LO
                NEXT,    CALL[ZEROSF02DF04]                            !
   (5273)  DCS[0.00.0.0.0.0]  BM[0101..00.01..01.11..100..111...0.0.0..0..0...0.0000...0..0000.0...11.100...000.011.110]

        5274:  !(FREE)
        DOWRITE374F2:
                P2-T,    D←CSPD(D01), D[C]←0,                          !DATA WITH BIT<07> SET
                         ASP-ADDRS-R[DF],                              !ADDRESS ASP WITH DF MODE
                         BSP-ADDRS-R[SF],                              !ADDRESS BSP WITH SF MODE
                P3,      WR(AB,HI,B-ADDR),                             !USE SAME FUNCTION AS ABOVE,
                NEXT,    J/GETTEM374F2                                 !  ONLY USE B-ADDR FOR REWRITE THIS TIME
   (5274)  DCS[0.00.0.0.0.0]  BM[1010..10.01..00.10..000..000...0.1.0..0..0...0.1110...0..1111.0...11.000...010.111.101]

        5275:  !(FREE)
        GETTEM374F2:
                P3,      CSPD[00]←EMIT, RETURN/TEST374F2,              !(SEE DESCRIP OF SUBR FOR FUNCTION)
                NEXT,    CALL[SFDFTOSR]                                !
   (5275)  DCS[0.00.0.0.0.0]  BM[0101..10.10..10.00..100..101...0.0.0..0..0...0.1111...1..0000.0...11.100...111.100.110]

        5504:
        TEST374F2:
                P0,      LOAD-ENWA(ZTARGET434),                        !NOW SETUP FOR IR=ZERO COMPARE
                         LOAD-ERROR(TEST374F2),                        !ERROR DIRECTORY KEY
                         DCS-CTR(C6.),                                 !COMPARE AT TARGET
                         BUMP-VERIFY,                                  !COUNT
                NEXT,    J/GOTEST374F2                                 !
```

```
(5504) DCS[1.00.1.0.0.1] BM[1001..00.11..11.00..011..100...0.0.0..0..0...0.0000...0..0000.0...11.000...010.111.110]

    5276: !(FREE)
    GOTEST374F2:
            SETUP,  RETURN/SCOPE374F,                   !GO EXEC SUBR THAT:
            NEXT,   CALL[DINTOIR-5]                     !  PUTS D -> IR, BUT(INSTRS) TO TEST FOR ZERO
(5276) DCS[0.00.0.0.0.0] BM[0101..00.01..01.11..111..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.111.011]




    5277: !(FREE)
    SCOPE374F:
            P2,     RES+CSPD(C000000),                  !RESET RES TO SR-LOAD/GUARD-DISABLED
            NEXT,   BUTD[SCOPE],                        !NO ERROR:  "TEST375A" (+17. WORDS)
                    J/TEST375A                          !   ERROR:  "ZERO374F1" (-8. WORDS)
(5277) DCS[0.00.0.1.0.0] BM[0000..10.00..00.00..000..000...0.0.0..0..0...0.0100...0..1000.1...11.000...101.001.111]




    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
    !
    !       THE FOLLOWING SUBROUTINES ARE USED IN THE ABOVE TESTS (374 A1-F2):
    !
    !       THIS FIRST SUBROUTINE LOADS THE IR WITH THE APPROPRIATELY
    !               SELECTED SF AND DF FIELD VALUES, THEN PROCEEDS TO
    !               ZERO OUT THE ASP AND BSP LOCATIONS CORRESPONDING TO
    !               THESE VALUES, IN BOTH ASP/BSP HI/LO SP'S.
    !
    !               NOTE:  THIS SUBR MUST BE ENTERED WITH BUSDIN+EMIT AND
    !                         EN CLK IR PROC UCONS ENABLED
    !
    !               ALSO:  THE WRITE FUNCTION USED IS:   WR(AB,H,A) OR WR(AB,L,A)
    !                         WITH A-ADDR = SF OR DF, RESPECTIVELY
    !

    7036: !(FREE)
    ZEROSF02DF04:
            P2-U,   IR+EMIT, EMIT/000204,               !SF=2, DF=4
            NEXT,   J/ZEROSFDF                          !GO ZERO
(7036) DCS[0.00.0.0.0.0] BM[0000..00.00..00.10..000..100...0.0.0..0..0...1.1010...0..0000.0...11.000...000.100.010]

    7041: !(FREE)
    ZEROSF04DF02:
            P2-U,   IR+EMIT, EMIT/000402,               !SF=4, DF=2
            NEXT,   J/ZEROSFDF                          !GO ZERO
(7041) DCS[0.00.0.0.0.0] BM[0000..00.00..01.00..000..010...0.0.0..0..0...1.1010...0..0000.0...11.000...000.100.010]

    7042: !(FREE)
    ZEROSFDF:
            P2-T,   D+ZERO, SAVE-D[C],                  !ZEROES
            P3,     A#BSPHI[DF]+D,                      !
```

```
                NEXT,   J/ZEROSFDFA                                     !
        (7042)  DCS[0.00.0.0.0.0]  BM[0011..00.00..00.10..000..111...0.1.0..0..0...0.0000...0..1011.0...11.000...000.100.011]

        7043:   !(FREE)
        ZEROSFDFA:
                P3,     A#BSPLO[DF]←D,                                  !
                NEXT,   J/ZEROSF                                        !
        (7043)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.10..000..000...0.0.0..0..0...0.0000...0..0011.0...11.000...000.100.100]

        7044:   !(FREE)
        ZEROSF:
                P2-T,   D←ZERO, SAVE-D[C],                              !ENTER HERE FOR SF ONLY
                P3,     A#BSPHI[SF]←D,                                  !
                NEXT,   J/ZEROSFA                                       !
        (7044)  DCS[0.00.0.0.0.0]  BM[0011..00.01..00.11..000..111...0.1.0..0..0...0.0000...0..1011.0...11.000...000.100.101]

        7045:   !(FREE)
        ZEROSFA:
                P3,     A#BSPLO[SF]←D,                                  !
                NEXT,   BUTA(RETURN),                                   !AND RETURN
                        J/BUTERROR7                                     !
        (7045)  DCS[0.00.0.0.0.0]  BM[0000..00.01..00.11..000..000...0.0.0..0..0...0.0000...0..0011.0...11.111...011.111.110]



        ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

        !       THIS SECOND SUBROUTINE NOW READS BACK ALL THE REGISTERS IN ASP/BSP,
        !               HI/LO, SF/DF THAT THE WRITE COULD HAVE REFERENCED.
        !               IF LOCATION WAS WRITTEN, BIT<07> SHOULD BE SET,
        !               ELSE IT SHOULD REMAIN CLEAR (FROM ZEROSFXXDFXX ROUTINE)
        !               THE BITS ARE SHIFTED SERIALLY INTO THE SR, AND AFTER
        !               TWO WRITES (WHICH GIVES 16. BITS, THE SR JUST FILLED),
        !               THE COMPARE IS MADE BETWEEN EXPECTED:RECEIVED ANSWERS.
        !
        !               NOTE:   THIS SUBR REQUIRES SR-LEFT/GUARD-DISABLED SETUP,
        !                       AND CSP(02) CONTAINS EXPECTED ANSWER.
        !                       CSP(00) CONTAINS RETURN ADDRESS, IN BITS<14:03>.
        !

        5746:
        SFDFTOSR:
                P0,     LOAD-ENUA(ZTARGET777),                          !COMPARE POINT IS AT EXIT
                        LOAD-ERROR(SFDFTOSR),                           !THEORETICALLY THIS CODE SHOULD NEVER BE USED
                        DCS-CTR(C11.),                                  !COMPARE AT TARGET
                NEXT,   GOTO-PAGE(7),                                   !SUBR IS HERE, NOTE OVERLAP W/ BIT<2:0> OF ENUA
                        J/SFDFTOSRAA                                    !
        (5746)  DCS[1.00.1.0.0.0]  BM[0100..00.11..11.11..111..111...0.0.0..0..0...0.0000...0..0000.0...11.100...000.100.000]

        7040:   !(FREE)
        SFDFTOSRAA:
                P2-T,   D←ASPHI[DF], D[C]←ALU07,                        !SR<15,07> = ASPHI/DF
                NEXT,   J/SFDFTOSRA                                     !
```

```
      (7040)  DCS[0.00.0.0.0.0]  BM[1111..00.00..11.10..000..011...0.1.0..0..0...0.0000...0..0000.0...11.000...000.100.111]

         7047:  !(FREE)
         SFDFTOSRA:
                 P2-T,     SR←SR-LEFT-1,                                   !STORE PAST
                           D←ASPLO[DF], D[C]←ALU07,                        !SR<14,06> = ASPLO/DF
                 NEXT,     J/SFDFTOSRB                                     !
      (7047)  DCS[0.00.0.0.0.0]  BM[1111..00.00..10.10..000..011...0.1.1..0..0...0.0000...0..0000.0...11.000...000.101.000]

         7050:  !(FREE)
         SFDFTOSRB:
                 P2-T,     SR←SR-LEFT-1,                                   !STORE PAST
                           D←BSPHI[DF], D[C]←ALU07,                        !SR<13,05> = BSPHI/DF
                 NEXT,     J/SFDFTOSRC                                     !
      (7050)  DCS[0.00.0.0.0.0]  BM[1010..01.00..00.00..000..011...0.1.1..0..0...0.0000...0..0000.0...11.000...000.101.001]

         7051:  !(FREE)
         SFDFTOSRC:
                 P2-T,     SR←SR-LEFT-1,                                   !STORE PAST
                           D←BSPLO[DF], D[C]←ALU07,                        !SR<12,04> = BSPLO/DF
                 NEXT,     J/SFDFTOSRD                                     !
      (7051)  DCS[0.00.0.0.0.0]  BM[1010..00.00..00.00..000..011...0.1.1..0..0...0.0000...0..0000.0...11.000...000.101.010]

         7052:  !(FREE)
         SFDFTOSRD:
                 P2-T,     SR←SR-LEFT-1,                                   !STORE PAST
                           D←ASPHI[SF], D[C]←ALU07,                        !SR<11,03> = ASPHI/SF
                 NEXT,     J/SFDFTOSRE                                     !
      (7052)  DCS[0.00.0.0.0.0]  BM[1111..00.00..11.11..000..011...0.1.1..0..0...0.0000...0..0000.0...11.000...000.101.011]

         7053:  !(FREE)
         SFDFTOSRE:
                 P2-T,     SR←SR-LEFT-1,                                   !STORE PAST
                           D←ASPLO[SF], D[C]←ALU07,                        !SR<10,02> = ASPLO/SF
                 NEXT,     J/SFDFTOSRF                                     !
      (7053)  DCS[0.00.0.0.0.0]  BM[1111..00.00..10.11..000..011...0.1.1..0..0...0.0000...0..0000.0...11.000...000.101.100]

         7054:  !(FREE)
         SFDFTOSRF:
                 P2-T,     SR←SR-LEFT-1,                                   !STORE PAST
                           D←BSPHI[SF], D[C]←ALU07,                        !SR<09,01> = BSPHI/SF
                 NEXT,     J/SFDFTOSRG                                     !
      (7054)  DCS[0.00.0.0.0.0]  BM[1010..01.01..00.00..000..011...0.1.1..0..0...0.0000...0..0000.0...11.000...000.101.101]

         7055:  !(FREE)
         SFDFTOSRG:
                 P2-T,     SR←SR-LEFT-1,                                   !STORE PAST
                           D←BSPLO[SF], D[C]←ALU07,                        !SR<08,00> = BSPLO/SF
                 NEXT,     J/SFDFTOSRH                                     !
      (7055)  DCS[0.00.0.0.0.0]  BM[1010..00.01..00.00..000..011...0.1.1..0..0...0.0000...0..0000.0...11.000...000.101.110]

         7056:  !(FREE)
         SFDFTOSRH:
                 P2-T,     SR←SR-LEFT-1,                                   !STORE PAST
```

```
                D+CSPD(D00), D[C]+0,                        !RETRIEVE RETURN ADDRESS
        NEXT,   J/SFDFTOSRI                                 !
  (7056) DCS[0.00.0.0.0.0] BM[1010..10.00..00.00..000..000...0.1.1..0..0...0.1111...0..0000.0...11.000...000.101.111]

    7057:  !(FREE)
    SFDFTOSRI:
        P0,     RETURN+D[14-03], PAGE(7),                   !PUT RETURN ADDRESS INTO RETURN REGISTER,
        P2-T,   D+SR-XOR-CSPD(D02), SAVE-D[C],              !COMPARE RECEIVED:EXPECTED
        NEXT,   J/ZTARGET777                                !GO DO A BUTA(RETURN)
  (7057) DCS[0.00.0.0.0.0] BM[0110..10.00..00.00..000..111...0.1.0..0..0...0.1101...0..0000.0...11.101...111.111.111]





    !.PAGE==================================================================================================


    .TOC   *   TEST375-376:  BYTE WRITE TO ASP/BSP LO, SP ADDRS R-OR-1/FLTPT-INHIBIT


    !*************************************************************************************
    !*
    !*      TESTS:  375A - 376                          UWORDS:  020 + 017
    !*
    !*      FUNCTIONS:
    !*
    !*      THE FOLLOWING SET OF THREE CHECKS TESTS THE FOLLOWING FEATURES OF THE ASP/BSP:
    !*
    !*      TEST 375 A/B TEST THAT BYTE WRITES CAN BE PERFORMED TO ASP/BSP LO, USING THE
    !*      "DAD" EXTENSION BIT COMBINATION.
    !*
    !*      TEST 376 VERIFIES THAT A FLOATING POINT INSTRUCTION IN THE IR FORCES SF-ADDRS
    !*      BIT<02> TO A (0), AND THAT BUTA(R-OR-1) IN THE REFERENCING MICROWORD FORCES
    !*      BIT<00> TO A (1).
    !*
    !*************************************************************************************



    !TEST 375 A CHECKS THAT THE DAD BIT COMBINATION /11 DOES A BYTE WRITE (IE, LO BYTE ONLY)
    5517:
    TEST375A:
        P0,     LOAD-ENUA(ZTARGET432),                      !SETUP FOR INSTRS IR=(000125)/E78/432
                LOAD-ERROR(TEST375A),                       !ERROR DIRECTORY KEY
                DCS-CTR(C11.),                              !COMPARE AT TARGET
        NEXT,   J/SETSP375A                                 !
  (5517) DCS[1.00.1.0.0.0] BM[0100..00.11..11.00..011..010...0.0.0..0..0...0.0000...0..0000.0...11.000...101.000.110]

    5506:
    SETSP375A:
        P2-T,   D+CSPD(C125252),                            !FIRST SETUP SP'S WITH JUNK
        P3,     A#BSPLO[06]+D-[A],                          !
        NEXT,   GOTO-PAGE(7),                               !XFER FOR DCS-DAD BITS
```

```
                       J/FIRST375A                              !
        (5506)  DCS[0.00.0.0.0.0]  BM[1010..10.00..00.00..111..111...0.1.0..0..0...0.0110...0..0011.0...11.100...000.100.110]

        7046:  !(FREE)
        FIRST375A:
                SETUP,  FIRST-1-OR-2,                           !DAD/01, SHOULDN'T CAUSE BYTE WRITE
                P2-T,   D+ZERO,                                 !SHOULD WRITE ALL ZEROES
                P3,     ASPLO[06]+D,                            !
                NEXT,   J/SECOND375A                            !
        (7046)  DCS[0.01.0.0.0.0]  BM[0011..00.00..00.00..111..000...0.1.0..0..0...0.0000...0..0001.0...11.000...000.110.001]

        7061:  !(FREE)
        SECOND375A:
                SETUP,  SECOND-1-OR-2,                          !DAD/10, SHOULDN'T CAUSE BYTE WRITE
                P2-T,   D+ZERO,                                 !SHOULD WRITE ALL ZEROES
                P3,     BSPLO[06]+D,                            !
                NEXT,   J/BYTE375A                              !
        (7061)  DCS[0.10.0.0.0.0]  BM[0011..00.10..00.00..111..000...0.1.0..0..0...0.0000...0..0110.0...11.000...000.110.010]

        7062:  !(FREE)
        BYTE375A:
                SETUP,  BYTE-WRITE,                             !DAD/11, SHOULD CAUSE A BYTE WRITE
                P2-T,   D+ASPHI(C052525),                       !WRITE THE (125) IN THE LOW BYTE
                P3,     A#BSPLO[06]+D-[B],                      !UPPER BYTE SHOULD BE (000) FROM ABOVE
                NEXT,   J/CHECK375A                             !
        (7062)  DCS[0.11.0.0.0.0]  BM[1111..00.10..11.01..111..000...0.1.0..0..0...0.0000...0..0111.0...11.000...000.110.011]

        7063:  !(FREE)
        CHECK375A:
                P2-T,   D+ASPLO(R06),                           !GET THE A SIDE SP
                NEXT,   J/GOBUT375A                             !
        (7063)  DCS[0.00.0.0.0.0]  BM[1111..00.00..10.00..111..000...0.1.0..0..0...0.0000...0..0000.0...11.000...000.110.100]

        7064:  !(FREE)
        GOBUT375A:
                SETUP,  RETURN/TEST375B,                        !RETURN TO START OF NEXT SUBTEST
                NEXT,   CALL[DINTOIR-5]                         !GO CHECK (000125) OBTAINED
        (7064)  DCS[0.00.0.0.0.0]  BM[0101..00.11..00.10..101..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.111.011]






        !TEST 375 B NOW CHECKS THE SAME THING (000125) IS ON THE B SIDE
        5625:
        TEST375B:
                P0,     LOAD-ENUA(ZTARGET432),                  !SETUP FOR INSTRS IR=(000125)/E78/432
                        LOAD-ERROR(TEST375B),                   !ERROR DIRECTORY KEY
                        DCS-CTR(C7.),                           !COMPARE AT TARGET
                NEXT,   J/CHECK375B                             !
        (5625)  DCS[1.00.1.0.0.0]  BM[1000..00.11..11.00..011..010...0.0.0..0..0...0.0000...0..0000.0...11.000...011.000.000]
```

```
        5300:   !(FREE)
        CHECK375B:
                P2-T,    D+BSPLO(R06),                              !GET THE B SIDE SP
                NEXT,    J/GOBUT375B                                !
  (5300)  DCS[0.00.0.0.0.0]  BM[1010..00.10..00.00..111..000...0.1.0..0..0...0.0000...0..0000.0...11.000...011.000.001]

        5301:   !(FREE)
        GOBUT375B:
                SETUP,   RETURN/TEST376A,                           !RETURN TO START OF NEXT SUBTEST
                NEXT,    CALL[DINTOIR-5]                            !GO CHECK (000125) OBTAINED
  (5301)  DCS[0.00.0.0.0.0]  BM[0101..00.10..10.01..011..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.111.011]





        !  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -


        !TEST 376 A NOW DOES THE SF ADDRESS MODE, W/ FLTPT-INHIBIT AND BUTA(R-OR-1) ACTIVE
        !NOTE:
        !       THE ASPHI CONTAINS THE FOLLOWING VALUES IN THESE LOCATIONS:
        !
        !       ASPHI(02)       ASPHI(03)       ASPHI(06)       ASPHI(07)
        !       (052522)        (177777)        (056166)        (052525)
        !

        5513:
        TEST376A:
                P0,      LOAD-ENUA(DOIT376A),                       !MAKE SURE BUTA(R-OR-1) DOESN'T CAUSE A BRANCH
                         LOAD-ERROR(TEST376A),                      !ERROR DIRECTORY KEY
                         DCS-CTR(C2.),                              !COMPARE AT TARGET
                NEXT,    J/SETIR376A                                !
  (5513)  DCS[1.00.1.0.0.0]  BM[1101..00.10..11.00..100..000...0.0.0..0..0...0.0000...0..0000.0...11.000...011.000.010]

        5302:   !(FREE)
        SETIR376A:
                SETUP,   BUTA(R-OR-1),                              !SETUP ACTIVE BUT MODIFICATION OF SF BIT<00> ADDRESS
                P2-U,    IR+EMIT, EMIT/170600,                      !IR=FLTPT INSTR, SF=(6)
                NEXT,    J/DOIT376A                                 !
  (5302)  DCS[0.00.0.0.0.0]  BM[1111..00.00..01.10..000..000...0.0.0..0..0...1.1010...0..0000.0...10.010...100.100.000]

        5440:
        DOIT376A:
                P2-T,    D+A-XOR-B,                                 !COMPARE SF/OBTAINED:REGISTER EXPECTED
                         BUS-A+ASPHI[SF],                           !SF ON A GOES FROM (6) -> (2) FROM FLTPT,
                                                                    !AND FROM (2) -> (3) FOR (R-OR-1)
                         BUS-B+BSPHI(R03),                          !THIS WE EXPECT
                NEXT,    J/TEST376A1                                !
  (5440)  DCS[0.00.0.0.0.0]  BM[0110..01.11..11.11..101..000...0.1.0..0..0...0.0000...0..0000.0...11.000...110.001.100]

        !     -      -      -      -      -      -      -      -      -      -      -      -      -
```

```
        !NOW CHECK THE RIGHT RESULT WAS OBTAINED
        5614:
        TEST376A1:
                PO,     LOAD-ENUA(ZTARGET434),                    !SETUP FOR IR=(000000)/INSTRS COMPARE
                        LOAD-ERROR(TEST376A1),                    !ERROR DIRECTORY KEY
                        DCS-CTR(C6.),                             !COMPARE AT TARGET
                NEXT,   J/GOBUT376A                               !
   (5614) DCS[1.00.1.0.0.0]  BM[1001..00.11..11.00..011..100...0.0.0..0..0...0.0000...0..0000.0...11.000...011.000.011]

        5303:  !(FREE)
        GOBUT376A:
                SETUP,  RETURN/SCOPE376,                          !RETURN TO SCOPE LOOP TEST WORD
                NEXT,   CALL[DINTOIR-5]                           !CHECK FOR (000000)
   (5303) DCS[0.00.0.0.0.0]  BM[0101..00.01..10.00..100..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.111.011]


        5304:  !(FREE)
        SCOPE376:
                PO,     BUMP-VERIFY,                              !COUNT
                NEXT,   BUTD[SCOPE],                              !NO ERROR:  "TEST410"  (+1. WORDS)
                        J/TEST410                                 !   ERROR:  "SETSP375A"  (-12. WORDS)
   (5304) DCS[0.00.0.1.0.1]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...101.000.111]


        !.PAGE==========================================================================================

        .TOC   *   TEST410:  BYTE/BYTE CONSTANT/D=ZERO

        !****************************************************************************
        !*
        !*      TESTS:  410 A - E                                 UWORDS:  044 + 020
        !*
        !*      FUNCTIONS:
        !*
        !*      THE FOLLOWING TESTS RUN A COUNT PATTERN THRU THE IR, MAINTAING TOTALS OF
        !*      THE NUMBER OF TIMES:
        !*
        !*      BYTE-H=LOW, BYTE/1-OR-2-FIRST=HIGH, BYTE/1-OR-2-SECOND=HIGH,
        !*      (D=ZERO)-H=HIGH, AND (D=ZERO)-H=LOW.
        !*
        !*      AT THE END, THE TESTS COMPARE THE EXPECTED COUNTS TO THE RECEIVED COUNTS.
        !*
        !****************************************************************************

        5507:
        TEST410:
```

```
          P0,     LOAD-ERROR(TEST410),                    !ERROR DIRECTORY KEY
                  DCS-CTR(C6.),                           !COMPARE BELOW
          NEXT,   GOTO-PAGE(6),                           !XFER
                  J/SETBYTEB410                           !
 (5507) DCS[1.00.1.0.0.0] BM[1001..00.00..00.00..000..110...0.0.0..0..0...0.0000...0..0000.0...11.100...101.110.000]

    6560:
    SETBYTEB410:
          P2-T,   D←ZERO,                                 !ZEROES INTO:
          P3,     A#BSPHI[10]←D-[A],                      !ASPHI[10] = BYTE-FIRST
          NEXT,   GOTO-PAGE(7),                           !
                  J/SETBYTEC410                           !BSPHI[10] = WORD (=-BYTE)
 (6560) DCS[0.00.0.0.0.0] BM[0011..00.00..00.00..000..111...0.1.0..0..0...0.0000...0..1011.0...11.100...000.110.000]

    7060:  !(FREE)
    SETBYTEC410:
          P3,     A#BSPLO[10]←D-[B],                      !ASPLO[10] = BYTE-SECOND
          NEXT,   J/SETBYTED410                           !BSPLO[10] = IR-DATA
 (7060) DCS[0.00.0.0.0.0] BM[0000..00.10..00.00..000..000...0.0.0..0..0...0.0000...0..0111.0...11.000...000.110.110]

    7066:  !(FREE)
    SETBYTED410:
          P3,     A#BSPLO[11]←D-[B],                      !ASPLO[11] = D-NONZERO
          NEXT,   GOTO-PAGE(6),                           !BSPLO[11] = D-ZERO
                  J/SETBYTEE410                           !
 (7066) DCS[0.00.0.0.0.0] BM[0000..00.11..00.00..000..110...0.0.0..0..0...0.0000...0..0111.0...11.100...000.000.000]

    6000:  !(FREE)
    SETBYTEE410:
          P0,     BUMP-VERIFY,                            !COUNT
          P3,     CSPD[17]←EMIT, EMIT/000001,             !A (1) IN BYTE-CONSTANT
          NEXT,   J/SETBYTEG410                           !  LOCATION IN CSP
 (6000) DCS[0.00.0.0.0.1] BM[0000..10.00..00.00..000..001...0.0.0..0..0...0.0000...1..0000.0...11.000...001.000.101]

    6105:  !(FREE)
    SETBYTEG410:
          P2-U,   IR←DBUF-[I],                            !SETUP UCONS FOR D --> IR
          P3,     DBUF←D-[I],                             !
          NEXT,   J/TESTD410                              !
 (6105) DCS[0.00.0.0.0.0] BM[0100..00.00..00.01..000..100...0.0.0..0..0...1.1011...0..0000.0...11.000...111.111.011]



    !*** LOOP BACK ENTRY POINT ***

    6773:
    TESTD410:
          P0,     LOAD-ENUA(GOFOR410),                    !COMPARE AT END OF LOOP
                  LOAD-ERROR(TESTD410),                   !ERROR DIRECTORY KEY
                  DCS-CTR(C15.),                          !RELOAD EACH TIME THROUGH
          P2-U,   IR←DBUF,                                !(DON'T CARE HERE)
```

```
                P3,     DBUF←D,                                       !COPY IR-DATA FROM D --> DBUF
                NEXT,   BUTR(D14-00-EQ-0),                            !TEST D<14:00>H:
                        J/DNONZERO410                                 !ZERO --> DZERO410, NONZERO --> DNONZERO410
     (6773)  DCS[1.00.1.0.0.0]  BM[0000..00.11..10.11..110..001...0.0.0..0..0...1.1010...0..0000.0...01.101...101.011.001]

        !ENTER HERE IF D<14:00> WAS DETECTED AS NON-ZERO
        6531:
        DNONZERO410:
                P2-T,   D←ASPLO[DNONZERO]-PLUS-1,                     !BUMP NON ZERO COUNTER
                P2-U,   IR←DBUF,                                      !COPY IR-DATA FROM DBUF --> IR
                P3,     ASPLO[11]←D,                                  !SAVE NON ZERO COUNTER
                        DBUF←D,                                       !(DON'T CARE HERE)
                NEXT,   GOTO-PAGE(7),                                 !XFR TO 7 FOR DAD
                        J/NEXTPAT410                                  !
     (6531)  DCS[0.00.0.0.0.0]  BM[1001..01.11..10.01..000..111...0.1.0..0..0...1.1010...0..0001.0...11.100...000.110.101]

        !ENTER HERE IF D<14:00> WAS DETECTED AS ZERO
        6533:
        DZERO410:
                P2-T,   D←BSPLO[DZERO]-PLUS-1,                        !BUMP ZERO COUNTER
                P2-U,   IR←DBUF,                                      !COPY IR-DATA FROM DBUF --> IR
                P3,     BSPLO[11]←D,                                  !SAVE ZERO COUNTER
                        DBUF←D,                                       !(DON'T CARE NOW)
                NEXT,   GOTO-PAGE(7),                                 !XFR TO 7 FOR DAD
                        J/NEXTPAT410                                  !
     (6533)  DCS[0.00.0.0.0.0]  BM[1001..00.11..11.01..000..111...0.1.0..0..0...1.1010...0..0110.0...11.100...000.110.101]

        7065:  !(FREE)
        NEXTPAT410:
                SETUP,  FIRST-1-OR-2,                                 !SELECT DAD BITS FOR "BYTEFIRSTR410"
                P2-T,   D←BSPLO[IR-DATA]-PLUS-2,                      !(INCRE DATA FOR -NEXT- TIME THRU)
                        D[C]←COUT15,                                  !WHEN THIS SETS WE'RE DONE
                P3,     BSPLO[10]←D,                                  !SAVE NEXT
                NEXT,   J/BYTEFIRST410                                !
     (7065)  DCS[0.01.0.0.0.0]  BM[1100..00.10..11.01..000..110...0.1.0..0..0...0.0000...0..0110.0...11.000...000.111.000]

        7070:  !(FREE)
        BYTEFIRST410:
                SETUP,  SECOND-1-OR-2,                                !SELECT DAD BITS FOR "BYTESECOND410"
                P2-T,   D←ASPHI[BYTE-FIRST]-PLUS-CSP[1-0],            !BYTE-FIRST SELECTS EITHER
                        SAVE-D[C],                                    !CSP(17)=1 OR CSP(13)=0
                P3,     ASPHI[10]←D,                                  !WRITE BACK
                NEXT,   BUTR(BYTE),                                   !BYTE --> "BYTESECOND410"
                        J/WORD410                                     !-BYTE --> "WORD410
     (7070)  DCS[0.10.0.0.0.0]  BM[1001..10.00..11.00..000..111...0.1.0..0..0...0.0100...0..1001.0...01.001...011.110.110]

        !ENTER HERE IF BYTE-H NOT ASSERTED, IE IR=(WORD)
        7366:
        WORD410:
                SETUP,  SECOND-1-OR-2,                                !SELECT DAD BITS FOR "BYTESECOND410"
                P2-T,   D←BSPHI[WORD]-PLUS-1,                         !BUMP WORD=-BYTE COUNTER
                        SAVE-D[C],                                    !SAVE PAST CARRYOUT STATUS
```

```
        P3,     BSPHI[10]←D,                            !WRITE BACK
        NEXT,   J/BYTESECOND410                         !NOW GO TRY BYTE-SECOND
(7366)  DCS[0.10.0.0.0.0.0]  BM[1001..01.10..11.01..000..111...0.1.0..0..0...0.0000...0..1110.0...11.000...011.110.111]

    !ENTER HERE IF BYTE-H WAS ASSERTED, IE IR=(BYTE)
    7367:
    BYTESECOND410:
        SETUP,  NO-DAD,                                 !KEEP FOR NOISE
        P2-T,   D←ASPLO[BYTE-SECOND]-PLUS-CSP[1-0],     !BYTE-SECOND SELECTS EITHER
                SAVE-D[C],                              !CSP[17]=1 OR CSP[13]=0
        P3,     ASPLO[10]←D,                            !WRITE BACK
        NEXT,   BUTR(D[C]-B),                           !IF SET, SKIP OUT TO TEST-410A
                J/GOFOR410                              !IF CLEAR, FALL THRU TO  NEXT
(7367)  DCS[0.00.0.0.0.0.0]  BM[1001..10.00..10.00..000..111...0.1.0..0..0...0.0100...0..0001.0...10.011...011.110.001]

    7361:                                               !01, P7
    GOFOR410:
        P2-T,   D←BSPLO[IR-DATA],                       !GET DATA FOR IR INTO D
        NEXT,   GOTO-PAGE(6),                           !
                J/TESTD410                              !LOOP BACK FOR NEXT
(7361)  DCS[0.00.0.0.0.0.0]  BM[1010..00.10..00.00..000..110...0.1.0..0..0...0.0000...0..0000.0...11.100...111.111.011]




    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    !TEST 410A CHECKS THAT D<14:00>=ZERO WAS ONLY ASSERTED TWICE
    7363:                                               !11, P7
    EXPEC410A:
        NEXT,   GOTO-PAGE(6),                           !FOR LOADING DCS-CTR
                J/TEST410A                              !
(7363)  DCS[0.00.0.0.0.0.0]  BM[0000..00.00..00.00..000..110...0.0.0..0..0...0.0000...0..0000.0...11.100...111.001.001]

    6711:
    TEST410A:
        P0,     LOAD-ENUA(ZTARGET422),                  !FOR IR=(000002) W/INSTR5
                LOAD-ERROR(TEST410A),                   !ERROR DIRECTORY KEY
                DCS-CTR(C7.),                           !COMPARE AT TARGET
        NEXT,   J/COMP410A                              !
(6711)  DCS[1.00.1.0.0.0.0]  BM[1000..00.11..11.00..010..010...0.0.0..0..0...0.0000...0..0000.0...11.000...001.000.110]

    6106:  !(FREE)
    COMP410A:
        P2-T,   D←BSPLO[DZERO],                         !GET DATA
        NEXT,   J/INTOIR410A                            !
(6106)  DCS[0.00.0.0.0.0.0]  BM[1010..00.11..00.00..000..000...0.1.0..0..0...0.0000...0..0000.0...11.000...001.000.111]

    6107:  !(FREE)
    INTOIR410A:
        SETUP,  RETURN/TEST410B,                        !COPY D --> IR, RESET BUSDIN←EMIT
        NEXT,   CALL[DINTOIR-5]                         ! AND CHECK ITS ALL ZERO
```

```
 (6107)  DCS[0.00.0.0.0.0]  BM[0110..00.11..10.00..100..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.111.011]

        ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

        !TEST 410B CHECKS THAT D<14:00>=ZERO WAS NOT ASSERTED
        ! 32768.-2. = 32766. (077776) TIMES
        6704:
        TEST410B:
                PO,     LOAD-ENUA(ZTARGET434),                  !FOR IR=(000000) W/INSTRS
                        LOAD-ERROR(TEST410B),                   !ERROR DIRECTORY KEY
                        DCS-CTR(C8.),                           !COMPARE AT TARGET
                        BUMP-VERIFY,                            !COUNT
                NEXT,   J/EXPEC410B                             !
 (6704)  DCS[1.00.1.0.0.1]  BM[0111..00.11..11.00..011..100...0.0.0..0..0...0.0000...0..0000.0...11.000...001.001.000]

        6110:  !(FREE)
        EXPEC410B:
                P3,     CSPD[17]←EMIT, EMIT/077776,             !EXPECTED NUMBER OF TIMES
                NEXT,   J/COMP410B                              !D<14:00> WAS NON ZERO
 (6110)  DCS[0.00.0.0.0.0]  BM[0111..10.11..11.11..111..110...0.0.0..0..0...0.0000...1..0000.0...11.000...001.001.001]

        6111:  !(FREE)
        COMP410B:
                P3-T,   D←ASPLO[DNONZERO]-MINUS-CSPD[17],       !COMPARE RECEIVED:EXPECTED
                NEXT,   J/GOPUT410B                             !
 (6111)  DCS[0.00.0.0.0.0]  BM[1101..10.00..10.01..000..000...1.1.0..0..0...0.0000...0..0000.0...11.000...001.001.010]

        6112:  !(FREE)
        GOPUT410B:
                SETUP,  RETURN/TEST410C,                        !GO PUT D --> IR
                NEXT,   CALL[DINTOIR-5]                         !  AND CHECK IT-S ALL ZERO
 (6112)  DCS[0.00.0.0.0.0]  BM[0110..00.11..10.00..111..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.111.011]

        ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

        !TEST 410C CHECKS THAT BYTE-H WAS NOT ASSERTED 21696.,
        !OR WAS ASSERTED 11072. TIMES IN 32768. ITERATIONS
        6707:
        TEST410C:
                PO,     LOAD-ENUA(ZTARGET402),                  !SETUP FOR D=ZERO TEST
                        LOAD-ERROR(TEST410C),                   !ERROR DIRECTORY KEY
                        DCS-CTR(C6.),                           !COMPARE AT TARGET
                NEXT,   J/EXPEC410C                             !
 (6707)  DCS[1.00.1.0.0.0]  BM[1001..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...001.001.011]

        6113:  !(FREE)
```

```
EXPEC410C:
        P3,     CSPD[17]+EMIT, EMIT/52300,              !32768.-#TIMES BYTE-H ASSERTED
        NEXT,   J/ASIDE410C                             !  216%.=(52300)
 (6113) DCS[0.00.0.0.0.0] BM[0101..10.01..00.11..000..000...0.0.0..0..0...0.0000...1..0000.0...11.000...001.001.100]

    6114: !(FREE)
ASIDE410C:
        P2-T,   SR+CSPD(D17),                           !GET ONTO A-SIDE
        NEXT,   J/COMP410C                              !
 (6114) DCS[0.00.0.0.0.0] BM[1010..10.00..00.00..000..000...0.0.1..0..0...0.0000...0..0000.0...11.000...001.001.101]

    6115: !(FREE)
COMP410C:
        P3-T,   D+SR-MINUS-BSPHI[WORD],                 !COMPARE EXPEC:RECEIVED
        NEXT,   J/GOBUT410C                             !
 (6115) DCS[0.00.0.0.0.0] BM[1101..01.10..00.00..000..000...1.1.0..0..0...0.0000...0..0000.0...11.000...001.001.110]

    6116: !(FREE)
GOBUT410C:
        SETUP,  RETURN/TEST410D,                        !RETURN TO START OF NEXT SUBTEST
        NEXT,   GOTO-PAGE(7),                           !BUT TABLE
                J/BUTD-IS-ZERO                          !GO CHECK EQUALITY
 (6116) DCS[0.00.0.0.0.0] BM[0110..00.11..10.10..111..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.001]




!  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -

!TEST 410D CHECKS THAT BYTE-CONSTANT WAS ASSERTED (4270)=2232.
!TIMES UNDER "FIRST-1-OR-2"
6727:
TEST410D:
        P0,     LOAD-ENUA(ZTARGET402),                  !SETUP FOR D=ZERO TEST
                LOAD-ERROR(TEST410D),                   !ERROR DIRECTORY KEY
                DCS-CTR(CS.),                           !COMPARE AT TARGET
        NEXT,   J/EXPEC410D                             !
 (6727) DCS[1.00.1.0.0.0] BM[1010..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...001.001.111]

    6117: !(FREE)
EXPEC410D:
        P0,     BUMP-VERIFY,                            !COUNT
        P3,     CSPD[17]+EMIT,                          !
                EMIT/004270,                            !(4270)=2232. TIMES FOR FIRST
        NEXT,   J/COMP410D                              !
 (6117) DCS[0.00.0.0.0.1] BM[0000..10.10..00.10..111..000...0.0.0..0..0...0.0000...1..0000.0...11.000...001.010.000]

    6120: !(FREE)
COMP410D:
        P3-T,   D+ASPHI[BYTE-FIRST]-MINUS-CSPD[17],     !COMPARE RECEIVED:EXPEC
        NEXT,   J/GOBUT410D                             !
 (6120) DCS[0.00.0.0.0.0] BM[1101..10.00..11.00..000..000...1.1.0..0..0...0.0000...0..0000.0...11.000...001.010.001]
```

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        6121:  !(FREE)
        GOBUT410D:
                SETUP,  RETURN/TEST410E,                        !RETURN TO START OF NEXT SUBTEST
                NEXT,   GOTO-PAGE(7),                           !BUT TABLE
                        J/BUTD-IS-ZERO                          !CHECK EQUALITY
   (6121)  DCS[0.00.0.0.0.0]  BM[0110..00.11..10.00..101..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.001]




        ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

        !TEST 410E CHECKS THAT BYTE-CONSTANT WAS ASSERTED (3600)=1920.
        !TIMES UNDER "SECOND-1-OR-2"
        6705:
        TEST410E:
                P0,     LOAD-ENUA(ZTARGET402),                  !SETUP FOR D=ZERO TEST
                        LOAD-ERROR(TEST410E),                   !ERROR DIRECTORY KEY
                        DCS-CTR(CS.),                           !COMPARE AT TARGET
                NEXT,   J/EXPEC410E                             !
   (6705)  DCS[1.00.1.0.0.0]  BM[1010..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...001.010.010]

        6122:  !(FREE)
        EXPEC410E:
                P0,     BUMP-VERIFY,                            !COUNT
                P3,     CSPD[17]+EMIT,                          !
                        EMIT/003600,                            !(3600)=1920. TIMES FOR SECOND
                NEXT,   J/COMP410E                              !
   (6122)  DCS[0.00.0.0.0.1]  BM[0000..10.01..11.10..000..000...0.0.0..0..0...0.0000...1..0000.0...11.000...001.010.011]

        6123:  !(FREE)
        COMP410E:
                P3-T,   D+ASPLO[BYTE-SECOND]-MINUS-CSPD[17],    !COMPARE RECEIVED:EXPEC
                NEXT,   J/GOBUT410E                             !
   (6123)  DCS[0.00.0.0.0.0]  BM[1101..10.00..10.00..000..000...1.1.0..0..0...0.0000...0..0000.0...11.000...001.010.100]

        6124:  !(FREE)
        GOBUT410E:
                SETUP,  RETURN/SCOPE410,                        !RETURN TO SCOPE LOOP TEST WORD
                NEXT,   GOTO-PAGE(7),                           !BUT TABLE
                        J/BUTD-IS-ZERO                          !CHECK EQUALITY
   (6124)  DCS[0.00.0.0.0.0]  BM[0110..00.00..10.10..101..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.001]


        6125:  !(FREE)
        SCOPE410:
                P0,     BUSDIN+EMIT-[I],                        !RESET PROC UCON
                        EN-CLK-IR[15-00],                       !
                NEXT,   BUTD[SCOPE],                            !NO ERROR:  "TEST500" (+1. WORDS)
                        J/TEST500                               !   ERROR:  "SETBYTEB410" (-34. WORDS)
   (6125)  DCS[0.00.0.1.0.0]  BM[0000..00.00..00.01..000..100...0.0.0..0..0...1.1001...0..0000.0...11.000...101.110.001]

```

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!.PAGE==========================================================================================

!*** VERSION /V101A0/ ***

.TOC   *   TEST500:  PREFETCH/OVERLAP/SP DEFEAT

!******************************************************************************
!*
!*      TESTS:  500C - 500F                               UWORDS: 034 + 013
!*
!*      FUNCTIONS:        TESTS 500C - 500F RUN PATTERNS THRU THE IR TO TEST
!*                        THE PREFETCH/OVERLAP ROM & THE SP WRITE DEFEAT LOGIC.
!*
!******************************************************************************



6561:
TEST500:
        P0,     LOAD-ENUA(SETFETCHG500),                  !INTERMEDIATE COMPARE AT START OF LOOP
                LOAD-ERROR(TEST500),                      !ERROR DIRECTORY KEY
                DCS-CTR(CS.),                             !COMPARE AT TARGET
        NEXT,   J/SETFETCHB500                            !
(6561)  DCS[1.00.1.0.0.0]  BM[1010..00.11..00.01..011..001...0.0.0..0..0...0.0000...0..0000.0...11.000...110.111.110]

6676:
SETFETCHB500:
        P2-T,   D+ZERO, D[C]+ALU15,                       !ZERO
                SR+ZERO,                                  !TO FLAG JAMUPPS AS ILLEGAL -- KEEP ZERO THRU "TEST505"
        P3,     A#BSPLO[OVERLAP]+D,                       !ZERO OVERLAP -A, -B COUNTERS
        NEXT,   J/SETFETCHD500                            !
(6676)  DCS[0.00.0.0.0.0]  BM[0011..00.00..10.00..000..100...0.1.1..0..0...0.0000...0..0011.0...11.000...001.010.110]

6126:  !(FREE)
SETFETCHD500:
        P3,     A#BSPHI[PATTERN]+D,                       !ZERO PATTERN (A AND B)
        NEXT,   J/SETFETCHE500                            !
(6126)  DCS[0.00.0.0.0.0]  BM[0000..00.00..11.01..011..000...0.0.0..0..0...0.0000...0..1011.0...11.000...001.010.111]

6127:  !(FREE)
SETFETCHE500:
        P3,     A#BSPHI[PREFETCH]+D,                      !ZERO PREFETCH-A COUNTER, ALSO B SIDE
        NEXT,   J/SETFETCHF500                            !
(6127)  DCS[0.00.0.0.0.0]  BM[0000..00.00..11.00..000..000...0.0.0..0..0...0.0000...0..1011.0...11.000...001.011.000]

6130:  !(FREE)
SETFETCHF500:
```

K02


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            P0,      BUMP-VERIFY,                       !COUNT
            P3,      CSPD[17]←020010,                   !
            NEXT,    J/SETFETCHG500                     !MASK CONSTANT FOR DATA PATTERN
    (6130)  DCS[0.00.0.0.0.1]  BM[0010..10.00..00.00..001..000...0.0.0..0..0...0.0000...1..0000.0...11.000...001.011.001]

     6131:  !(FREE)
     SETFETCHG500:
            P0,      BUMP-VERIFY,                       !COUNT
            P2-U,    IR←DBUF-[I],                       !SETUP THESE UCON'S,
            P3,      DBUF←D-[I],                        !DON'T WORRY ABOUT EFFECT HERE
            NEXT,    J/TESTD500                         !
    (6131)  DCS[0.00.0.0.0.1]  BM[0100..00.00..00.01..000..100...0.0.0..0..0...1.1011...0..0000.0...11.000...110.111.001]


     !*** LOOP-BACK ENTRY POINT ***

     6671:
     TESTD500:
            P0,      LOAD-ENUA(NEXTPAT500),             !COMPARE POINT IN LOOP
                     LOAD-ERROR(TESTD500),              !ERROR DIRECTORY KEY
                     DCS-CTR(C4.),                      !COMPARE AT TARGET
            P2-U,    IR←DBUF,                           !JUST HAPPENS, DON'T CARE NOW
            P3,      DBUF←D,                            !PUT PATTERN LEFT IN D INTO DBUF
            NEXT,    J/LOADIR500                        !
    (6671)  DCS[1.00.1.0.0.0]  BM[1011..00.11..00.11..111..111...0.0.0..0..0...1.1010...0..0000.0...11.000...001.011.010]

     6132:  !(FREE)
     LOADIR500:
            P2-U,    IR←DBUF,                           !PUT PATTERN NOW IN DBUF TO IR
            P3,      DBUF←D,                            !JUST HAPPENS, DON'T CARE NOW
            NEXT,    J/TESTINHBSP500                    !
    (6132)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...1.1010...0..0000.0...11.000...001.011.011]

     6133:  !(FREE)
     TESTINHBSP500:
            P2-T,    D←BSPLO[OVERLAP]-PLUS-1,           !GET BUMPED OVERLAP COUNT, B-SIDE
                     D[C]←D,                            !
            P3,      BSPLO[OVERLAP]←D,                  !ONLY WRITTEN BACK IF
                     BUTA(INSTR-1),                     !"OVERLAP L" ASSERTED
            NEXT,    J/TESTINHASP500                    !(BRANCH EFFECT OF BUT MASKED)
    (6133)  DCS[0.00.0.0.0.0]  BM[1001..00.10..11.01..000..000...0.1.0..0..0...0.0000...0..0110.0...00.110...111.111.111]

     6777:
     TESTINHASP500:
            P2-T,    D←ASPLO[OVERLAP]-PLUS-1,           !GET BUMPED OVERLAP COUNT, A-SIDE
                     SAVE-D[C],                         !
            P3,      ASPLO[OVERLAP]←D,                  !ONLY WRITTEN BACK IF
                     BUTA(INSTR-1),                     !  "OVERLAP L" ASSERTED
            NEXT,    J/NEXTPAT500                       !(BRANCH EFFECT OF BUT MASKED)
    (6777)  DCS[0.00.0.0.0.0]  BM[1001..01.11..10.00..000..111...0.1.0..0..0...0.0000...0..0001.0...00.110...011.111.111]

     6377:
     NEXTPAT500:
            P2-T,    D←ASPHI[PATTERN]-PLUS-020010-PLUS-1,   !GET NEXT DATA PATTERN IN D
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                        D[C]+COUT15,                        !GET D[C]=OVERFLOW OUT OF BIT<15>
              P3,       A#BSPHI[PATTERN]+D,                 !WRITE BACK UNMASKED NEXT PATTERN
              NEXT,     BUTR(PREFETCH-L),                   !IF ASSERTED, "ASSERTFOV500"
                        J/ASSERTFOV500                      !OTHERWISE, "FIXPAT500"
     (6377)  DCS[0.00.0.0.0.0]  BM[1100..11.00..11.01..011..110...0.1.0..0..0...0.0000...0..1011.0...10.000...101.010.101]

     !ENTER HERE IF "PREFETCH-L" WAS ASSERTED, LOW
     6525:
     ASSERTFOV500:
              P2-T,     D+ASPHI[PREFETCH]-PLUS-1,           !"PREFETCH(D)H" ASSERTED, BUMP COUNT
                        SAVE-D[C],                          !(SAVE CARRYOUT)
              P3,       ASPHI[PREFETCH]+D,                  !
              NEXT,     J/FIXPAT500                         !
     (6525)  DCS[0.00.0.0.0.0]  BM[1001..01.11..11.00..000..111...0.1.0..0..0...0.0000...0..1001.0...11.000...101.010.111]

     !ENTER HERE IF "PREFETCH-L" WAS NOT ASSERTED, HIGH
     6527:
     FIXPAT500:
              P2-T,     D+ASPHI[PATTERN]-AND-NOT-020010,    !CLEAR UNNEEDED BITS
                        SAVE-D[C],                          !KEEP D[C] CONSTANT FOR "BUT"
              P3,       A#BSPHI[PATTERN]+D,                 !RESTORE PATTERN, ALSO LEAVE IN D
              NEXT,     BUTR(D[C]-B),                       !TEST CARRYOUT:
                        J/TESTD500                          !IF CLEAR, NEXT PATTERN AT: "TESTD500" (-6.WORDS)
     (6527)  DCS[0.00.0.0.0.0]  BM[0111..11.00..11.01..011..111...0.1.0..0..0...0.0000...0..1011.0...10.011...110.111.001]
                                                            !IF SET, EXIT LOOP TO: "TEST500A" (+1. WORD)


     ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

     !*** TEST 500A ***
     !CHECK THAT REGISTER OPPOSITE ASPHI[PREFETCH], IN BSPHI, STILL ZERO
     6673:
     TEST500A:
              P0,       LOAD-ENVA(ZTARGET434),              !SETUP FOR IR=(000000)/INSTRS TEST
                        LOAD-ERROR(TEST500A),               !ERROR DIRECTORY KEY
                        DCS-CTR(C7.),                       !COMPARE AT TARGET
                        BUMP-VERIFY,                        !COUNT
              NEXT,     J/COMP500A                          !
     (6673)  DCS[1.00.1.0.0.1]  BM[1000..00.11..11.00..011..100...0.0.0..0..0...0.0000...0..0000.0...11.000...001.011.100]

     6134:  !(FREE)
     COMP500A:
              P2-T,     D+BSPHI[PREFETCH],                  !GET REGISTER
                        SAVE-D[C],                          !
              NEXT,     J/GOBUT500A                         !
     (6134)  DCS[0.00.0.0.0.0]  BM[1010..01.10..00.00..000..111...0.1.0..0..0...0.0000...0..0000.0...11.000...001.011.101]

     6135:  !(FREE)
     GOBUT500A:
              P0,       BUMP-VERIFY,                        !COUNT
              SETUP,    RETURN/TEST500C,                    !RETURN TO START OF NEXT SUBTEST
              NEXT,     CALL[DINTOIR-5]                     !PUT D -> DBUF -> IR, DO INSTRS BUT FOR (000000)
     (6135)  DCS[0.00.0.0.0.1]  BM[0110..00.11..10.10..110..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.111.011]
```

```
                                                        !
                                                        !*** ALSO SETS UP BUSDIN <- EMIT UPON EXIT ***




        ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

        !*** TEST 500C ***
        !CHECK THAT ASSERTING "OVERLAP L" ONLY ALLOWED A SP REWRITE (DURING
        !A BUT[INSTR-1]) IN ASPLO 4005. TIMES / 16384. DATA PATTERNS
        6726:
        TEST500C:
                P0,     LOAD-ENUA(ZTARGET402),          !SETUP FOR D =0 TEST
                        LOAD-ERROR(TEST500C),           !ERROR DIRECTORY KEY
                        DCS-CTR(CS.),                   !COMPARE AT TARGET
                        BUMP-VERIFY,                    !COUNT
                NEXT,   J/EXPEC500C                     !
  (6726)  DCS[1.00.1.0.0.1]  BM[1010..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...001.011.110]

        6136:  !(FREE)
        EXPEC500C:
                P3,     CSPD[EXPEC]+EMIT,               !EXPECTED COUNT =
                        EMIT/7645,                      !   (7645) = 4005.
                NEXT,   J/COMP500C                      !
  (6136)  DCS[0.00.0.0.0.0]  BM[0000..10.11..11.10..100..101...0.0.0..0..0...0.0000...1..0000.0...11.000...001.011.111]

        6137:  !(FREE)
        COMP500C:
                P0,     BUMP-VERIFY,                    !COUNT
                P3-T,   D+ASPLO[OVERLAP]-MINUS-CSPB[EXPEC],  !COMPARE RECEIVED:EXPECTED
                        SAVE-D[C],                      !
                NEXT,   J/GOBUT500C                     !
  (6137)  DCS[0.00.0.0.0.1]  BM[1101..11.00..10.00..000..111...1.1.0..0..0...0.0000...0..0000.0...11.000...001.100.000]

        6140:  !(FREE)
        GOBUT500C:
                SETUP,  RETURN/TEST500D,                !RETURN TO START OF NEXT SUBTEST
                NEXT,   GOTO-PAGE(7),                   !BUT TABLE
                        J/BUTD-IS-ZERO                  !CHECK EQUALITY
  (6140)  DCS[0.00.0.0.0.0]  BM[0110..00.11..11.00..110..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.001]





        ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

        !*** TEST 500D ***
        !CHECK THAT ASSERTING "OVERLAP L" ALLOWED THE SAME NUMBER OF SP REWRITES
        !TO ASPLO (CHECKED ABOVE) AS TO BSPLO (CHECKED HERE)
        6746:
        TEST500D:
```

```
            P0,     LOAD-ENVA(ZTARGET402),                       !SETUP FOR D=0 TEST
                    LOAD-ERROR(TEST500D),                        !ERROR DIRECTORY KEY
                    DCS-CTR(C4.),                                !COMPARE AT TARGET
            NEXT,   J/COMP500D                                   !
    (6746) DCS[1.00.1.0.0.0]  BM[1011..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...001.100.001]

    6141:   !(FREE)
    COMP500D:
            P3-T,   D+ASPLO[OVERLAP]-MINUS-BSPLO[OVERLAP],       !COMPARE A-COUNT:B-COUNT
                    SAVE-D[C],                                   !
            NEXT,   J/GOBUT500D                                  !
    (6141) DCS[0.00.0.0.0.0]  BM[1101..00.10..10.00..000..111...1.1.0..0..0...0.0000...0..0000.0...11.000...001.100.010]

    6142:   !(FREE)
    GOBUT500D:
            P0,     BUMP-VERIFY,                                 !COUNT
            SETUP,  RETURN/TEST500E,                             !RETURN TO START OF NEXT SUBTEST
            NEXT,   GOTO-PAGE(7),                                !BUT TABLE
                    J/BUTD-IS-ZERO                               !CHECK EQUALITY
    (6142) DCS[0.00.0.0.0.1]  BM[0110..00.11..10.11..110..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.001]





    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    !*** TEST 500E ***
    !CHECK THAT "PREFETCH(0)H" WAS ONLY ASSERTED 357. TIMES/16384. DATA PATTERNS
    6736:
    TEST500E:
            P0,     LOAD-ENVA(ZTARGET402),                       !SETUP FOR D=0 TEST
                    LOAD-ERROR(TEST500E),                        !ERROR DIRECTORY KEY
                    DCS-CTR(C5.),                                !COMPARE AT TARGET
            NEXT,   J/EXPEC500E                                  !
    (6736) DCS[1.00.1.0.0.0]  BM[1010..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...001.100.011]

    6143:   !(FREE)
    EXPEC500E:
            P0,     BUMP-VERIFY,                                 !
            P3,     CSPD[EXPEC]+EMIT,                            !EXPECTED COUNT=
                    EMIT/545,                                    ! (545)=357.
            NEXT,   J/COMP500E                                   !
    (6143) DCS[0.00.0.0.0.1]  BM[0000..10.00..01.01..100..101...0.0.0..0..0...0.0000...1..0000.0...11.000...001.100.100]

    6144:   !(FREE)
    COMP500E:
            P3-T,   D+ASPHI[PREFETCH]-MINUS-CSPB[EXPEC],         !COMPARE RECEIVED:EXPECTED
                    SAVE-D[C],                                   !
            NEXT,   J/GOBUT500E                                  !
    (6144) DCS[0.00.0.0.0.0]  BM[1101..11.00..11.00..000..111...1.1.0..0..0...0.0000...0..0000.0...11.000...001.100.101]

    6145:   !(FREE)
```

```
GOBUTSOOE:
        SETUP,  RETURN/SCOPESOOF,                    !RETURN TO SCOPE LOOP TEST WORD
        NEXT,   GOTO-PAGE(7),                        !BUT TABLE
                J/BUTD-IS-ZERO                       !CHECK EQUALITY
(6145) DCS[0.00.0.0.0.0] BM[0110..00.00..11.00..110..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.001]

6146: !(FREE)
SCOPESOOF:
        PO,     BUMP-VERIFY,                         !COUNT
                BUSDIN←EMIT-[I],                     !RESET PROC UCON
                EN-CLK-IR[15-00],                    !
        NEXT,   BUTD[SCOPE],                         !NO ERROR: "TEST503A" (+1. WORDS)
                J/TEST503A                           !   ERROR: "SETFETCHB500" (-27.WORDS)
(6146) DCS[0.00.0.1.0.1] BM[0000..00.00..00.01..000..100...0.0.0..0..0...1.1001...0..0000.0...11.000...110.111.111]

!.PAGE==========================================================================================

.TOC  *  TEST503-510: PROCESSOR UCON TESTS (FLAGS, FPS, PS, BUTM) & ASSOC LOGIC

!***************************************************************************
!*
!*      TESTS:  503A - 510F                  UWORDS: 214 + 245
!*
!*      FUNCTIONS:      TESTS 503A - 510F MANIPULATE THE VARIOUS PROCESSOR UCON
!*                      FUNCTIONS (FLAGS, EXFLAGS, FPS, PS, CUA) AND RELATED "BUT"
!*                      TESTS TO SEE THAT ALL ARE FUNCTIONAL.
!*
!***************************************************************************

! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

!*** TEST 503 ***

!TESTS 503 A-I USE DATA PATTERNS OF:
!       FLAG<8:4,2:0>H = "10101010", EXFLAG<2:1>H = "01",
!       FPS<7:0>H = "1010 1010"

! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

!*** TEST 503A ***
```

```
!LOAD FLAGS<8:4,2:0> WITH "10101010", EXFLAGS<2:1> WITH "01", FPS<7:4> WITH "1010",
!FPS<3:0> WITH "1010", AND READ BACK THRU "FLAGS#FPS" PORT OF PROCESSOR MUX
6677:
TEST503A:
        P0,     LOAD-ENUA(LOADNZWS),                    !COMPARE 1/2 WAY THRU BM SUBR
                LOAD-ERROR(TEST503A),                   !ERROR DIRECTORY KEY
                DCS-CTR(C10.),                          !COMPARE IN ...
                BUMP-VERIFY,                            !COUNT
        NEXT,   J/LOADFLAGS03A                          !
(6677)  DCS[1.00.1.0.0.1]  BM[0101..00.10..00.11..011..010...0.0.0..0..0...0.0000...0..0000.0...11.000...110.001.100]

6614:
LOADFLAGS03A:
        P2-U,   IR+EMIT,                                !(125122)=NOT-FLTPT-H INSTR (NOTE UCON/CSPADDR OVLP)
                                                        !ALSO NOTE IR=(NOT-PREFETCH), SO PREFETCH-SAVE WILL GET "0"
                                                        !AFTER SUBSEQUENT JAMUPP (IN LOADFPSCC ROUTINE EXIT)
        P3,     CSPD[05]+EMIT,                          !INITIAL VALUE:
                EMIT/125122,                            !FLAG<8:4,2:0>="10101010", EXFLAG<2:1>="01"
        NEXT,   J/LOADFPS503A                           !"10101010 0101 0010"
(6614)  DCS[0.00.0.0.0.0]  BM[1010..10.10..10.01..010..010...0.0.0..0..0...1.1010...1..0000.0...11.000...001.100.111]

6147:   !(FREE)
LOADFPS503A:
        P0,     BUMP-VERIFY,                            !COUNT
        P3,     CSPD[06]+EMIT,                          !INITIAL VALUE IN FPS<7:4>:
                EMIT/052655,                            !"01010101 1010 1101"
        NEXT,   J/EXPEC503A                             !
(6147)  DCS[0.00.0.0.0.1]  BM[0101..10.01..01.10..101..101...0.0.0..0..0...0.1001...1..0000.0...11.000...001.101.000]

6150:   !(FREE)
EXPEC503A:
        !### NOTE:  FLAG<8>, UBREAK ENABLE, GETS SET HERE.  KEEP SR=(000000)  [SET IN TEST500] TO FLAG
        !       THAT ANY SPURIOUS UBREAKS ARE ILLEGAL (IE, CAUSING A JAMUPP SEQUENCE  ###
        P3,     CSPD[02]+EMIT,                          !EXPECTED VALUE LOADS FLAGS, FPS<7:0>
                EMIT/125252,                            !OF "FLAGS#FPS" PORT
        NEXT,   J/MASK503A                              !"10101010 1010 1010"
(6150)  DCS[0.00.0.0.0.0]  BM[1010..10.10..10.10..101..010...0.0.0..0..0...0.1101...1..0000.0...11.000...001.101.001]

6151:   !(FREE)
MASK503A:
        P3,     CSPD[04]+EMIT,                          !MASK OUT (TO ZEROS)
                EMIT/177777,                            !LOOK AT ALL THE BITS
        NEXT,   J/LOADFCC503A                           !
(6151)  DCS[0.00.0.0.0.0]  BM[1111..10.11..11.11..111..111...0.0.0..0..0...0.1011...1..0000.0...11.000...001.101.010]

6152:   !(FREE)
LOADFCC503A:
        P3,     CSPD[15]+EMIT,                          !FPS<3:0> COME FROM CSP(15)<3:0>[MD]
                EMIT/000012,                            !"1010"
        NEXT,   J/DOFCC503A                             !
(6152)  DCS[0.00.0.0.0.0]  BM[0000..10.00..00.00..001..010...0.0.0..0..0...0.0010...1..0000.0...11.000...001.101.011]

6153:   !(FREE)
DOFCC503A:
```

```
            P3,     CSPD[00]+EMIT,                          !CALL BM SUBR WHICH DOES THE LOAD
                    RETURN/TESTA503A,                       !RETURN INLINE
            NEXT,   CALL[LOADFPSCC]                         !
    (6153)  DCS[0.00.0.0.0.0]  BM[0110..10.11..10.01..100..111...0.0.0..0..0...0.1111...1..0000.0...11.100...010.110.100]

    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    !NOW CHECK ALL THE RITE BITS WERE SET BY READING THEM BACK

    6714:
    TESTA503A:
            P0,     LOAD-ENUA(ZTARGET402),                  !SETUP FOR D=ZERO COMPARE
                    LOAD-ERROR(TESTA503A),                  !ERROR DIRECTORY KEY
                    DCS-CTR(C14.),                          !COMPARE AT TARGET
            P3,     BUTA(CUA-TRACK),                        !RESET CUA TRACKING AFTER JAMUPP
            NEXT,   J/GOPUT503A                             !
    (6714)  DCS[1.00.1.0.0.0]  BM[0001..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.001...001.101.100]

    6154:   !(FREE)
    GOPUT503A:
            SETUP,  RETURN/GOBUT503A,                       !GO TO SUBR WHICH:
            NEXT,   CALL[FLAGFPSSEQLOD]                     !1) CSP(05) -> FLAGS, EXFLAGS
    (6154)  DCS[0.00.0.0.0.0]  BM[0110..00.00..11.01..101..111...0.0.0..0..0...0.0000...0..0000.0...11.100...000.111.011]
                                                            !2) CSP(06) -> FPS<7:4>

    6155:   !(FREE)
    GOBUT503A:
            SETUP,  RETURN/TEST503B,                        !RETURN TO START OF NEXT SUBTEST
            NEXT,   CALL[FLAGFPSTOD]                        ! FLAGS#FPS.XOR.CSP(02) -> D, BUT(D=0)
    (6155)  DCS[0.00.0.0.0.0]  BM[0110..00.11..00.11..000..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.101.010]




    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    !*** TEST 503B ***
    !DO THE "MULTIPLE BUT" ON "FLAG7-H" TO CHECK IT'S CLEAR
    6630:
    TEST503B:
            P0,     LOAD-ENUA(ZTARGET406),                  !BIT<00> CLEAR
                    LOAD-ERROR(TEST503B),                   !ERROR DIRECTORY KEY
                    DCS-CTR(C4.),                           !COMPARE AT TARGET
            NEXT,   J/GOBUT503B                             !
    (6630)  DCS[1.00.1.0.0.0]  BM[1011..00.11..11.00..000..110...0.0.0..0..0...0.0000...0..0000.0...11.000...001.101.110]

    6156:   !(FREE)
    GOBUT503B:
            SETUP,  RETURN/TEST503C,                        !RETURN TO START OF NEXT SUBTEST
            NEXT,   GOTO-PAGE(7),                           !BUT TABLE
                    J/BUTMFLAG7                             !FLAG 7-H IN BIT<00>
```

```
(6156)  DCS[0.00.0.0.0.0]  BM[0110..00.11..00.11..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.010.101]




        ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

        !*** TEST 503C ***
        !DO THE "BUT" ON "FLTPT-PROC-H"="FLAGS-H*EXFLAG1-L" TO CHECK IT'S CLEAR
        6632:
        TEST503C:
                PO,     LOAD-ENUA(ZTARGET402),                  !BIT<00> CLEAR
                        LOAD-ERROR(TEST503C),                   !ERROR DIRECTORY KEY
                        DCS-CTR(C3.),                           !COMPARE AT TARGET
                        BUMP-VERIFY,                            !COUNT
                NEXT,   J/GOBUT503C                             !
(6632)  DCS[1.00.1.0.0.1]  BM[1100..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...001.101.111]

        6157:  !(FREE)
        GOBUT503C:
                SETUP,  RETURN/TEST503DA,                       !RETURN TO START OF NEXT SUBTEST
                NEXT,   GOTO-PAGE(7),                           !BUT TABLE
                        J/BUTFPPROC                             !FLAGS-H*EXFLAG1-L IN BIT<00>
(6157)  DCS[0.00.0.0.0.0]  BM[0110..00.11..00.00..001..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.101.100]




        ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

        !*** TEST 503DA ***
        !DO THE "MULTIPLE BUT" ON "FLTPT" TO CHECK IT'S CLEAR, IR=(125122), NOT-FLTPT-H INSTR
        6601:
        TEST503DA:
                PO,     LOAD-ENUA(ZTARGET406),                  !BIT<00> CLEAR
                        LOAD-ERROR(TEST503DA),                  !ERROR DIRECTORY KEY
                        DCS-CTR(C4.),                           !COMPARE AT TARGET
                NEXT,   J/GOBUT503DA                            !
(6601)  DCS[1.00.1.0.0.0]  BM[1011..00.11..11.00..000..110...0.0.0..0..0...0.0000...0..0000.0...11.000...001.110.000]

        6160:  !(FREE)
        GOBUT503DA:
                SETUP,  RETURN/TEST503D,                        !RETURN TO START OF NEXT SUBTEST
                NEXT,   GOTO-PAGE(7),                           !BUT TABLE
                        J/BUTMFLTPTS                            !FLTPT-H IN BIT<00>
(6160)  DCS[0.00.0.0.0.0]  BM[0110..00.11..01.11..000..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.011.001]




        ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
```

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    !*** TEST 503D ***
    !DO AN INSTR-1 FLOATING POINT DECODE, TO CHECK THAT FLAG<4:5> -> BIT<1:0>
    6670:
    TEST503D:
            P0,     LOAD-ENUA(ZTARGET476),                          !INSTR-1 FLTPT, BIT<1:0>="10"
                    LOAD-ERROR(TEST503D),                           !ERROR DIRECTORY KEY
                    DCS-CTR(C4.),                                   !COMPARE AT TARGET
            NEXT,   J/LOADIR503D
  (6670)  DCS[1.00.1.0.0.0]  BM[1011..00.11..11.00..111..110...0.0.0..0..0...0.0000...0..0000.0...11.000...001.110.001]

    6161:  !(FREE)
    LOADIR503D:
            P0,     BUMP-VERIFY,                                    !COUNT
            P2-U,   IR<EMIT,                                        !IR <- FLTPT INSTR
                    EMIT/175252,                                    !
            NEXT,   J/GOBUT503D                                     !
  (6161)  DCS[0.00.0.0.0.1]  BM[1111..00.10..10.10..101..010...0.0.0..0..0...1.1010...0..0000.0...11.000...001.110.010]

    6162:  !(FREE)
    GOBUT503D:
            SETUP,  RETURN/TEST503E,                                !RETURN TO START OF NEXT SUBTEST
            NEXT,   GOTO-PAGE(7),                                   !BUT TABLE
                    J/BUTINSTR1                                     !FULL WIDTH
  (6162)  DCS[0.00.0.0.0.0]  BM[0110..00.11..10.00..000..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.000.110]




    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    !*** TEST 503E ***
    !READ EXFLAGS<2:1> = "01" IN CUA-PORT<2:1>,
    !ALSO "PREFETCH-SAVE-H" = "0"  FROM PREVIOUS SETUP
    6700:
    TEST503E:
            P0,     LOAD-ENUA(ZTARGET402),                          !SETUP FOR D=0 TEST
                    LOAD-ERROR(TEST503E),                           !ERROR DIRECTORY KEY
                    DCS-CTR(C10.),                                  !COMPARE AT TARGET
            NEXT,   J/EXPEC503E                                     !
  (6700)  DCS[1.00.1.0.0.0]  BM[0101..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...001.110.011]

    6163:  !(FREE)
    EXPEC503E:
            P0,     BUMP-VERIFY,                                    !COUNT
            P3,     CSPD[02]<EMIT,                                  !CUA PORT READS AS:
                    EMIT/073732,                                    !0#CUA<11:00>#EXFLAG<2:1>#PREFETCH
            NEXT,   J/GOPUT503E                                     !
  (6163)  DCS[0.00.0.0.0.1]  BM[0111..10.01..11.11..011..010...0.0.0..0..0...0.1101...1..0000.0...11.000...001.110.100]

    6164:  !(FREE)
    GOPUT503E:
            SETUP,  RETURN/TEST503F,                                !GO TO SUBR WHICH:
```

```
        NEXT,   CALL[CUATOD]                        !PUTS CUA#EXFLAGS.XOR.CSP(02) -> D, BUT(D=ZERO)
(6164)  DCS[0.00.0.0.0.0.0]  BM[0110..00.11..10.01..000..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.101.111]

   ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

   !*** TEST 503F ***
   !DO THE "MULTIPLE BUT" ON EXFLAG<2> TO CHECK IT'S CLEAR
   6710:
   TEST503F:
        PO,     LOAD-ENUA(ZTARGET406),              !BIT<00> CLEAR
                LOAD-ERROR(TEST503F),               !ERROR DIRECTORY KEY
                DCS-CTR(C4.),                       !COMPARE AT TARGET
        NEXT,   J/GOBUT503F                         !
(6710)  DCS[1.00.1.0.0.0]  BM[1011..00.11..11.00..000..110...0.0.0..0..0...0.0000...0..0000.0...11.000...001.110.101]

   6165:  !(FREE)
   GOBUT503F:
        SETUP,  RETURN/TEST503G,                    !RETURN TO START OF NEXT SUBTEST
        NEXT,   GOTO-PAGE(7),                       !BUT TABLE
                J/BUTMEXFLAG2                       !EXFLAG<2>H IN BIT<00>
(6165)  DCS[0.00.0.0.0.0.0]  BM[0110..00.11..10.10..000..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.011.011]

   ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

   !*** TEST 503G ***
   !DO THE "MULTIPLE BUT" ON EXFLAG<1> TO CHECK IT'S SET
   6720:
   TEST503G:
        PO,     LOAD-ENUA(ZTARGET407),              !BIT<00> SET
                LOAD-ERROR(TEST503G),               !ERROR DIRECTORY KEY
                DCS-CTR(C4.),                       !COMPARE AT TARGET
                BUMP-VERIFY,                        !COUNT
        NEXT,   J/GOBUT503G                         !
(6720)  DCS[1.00.1.0.0.1]  BM[1011..00.11..11.00..000..111...0.0.0..0..0...0.0000...0..0000.0...11.000...001.110.110]

   6166:  !(FREE)
   GOBUT503G:
        SETUP,  RETURN/TEST503H,                    !RETURN TO START OF NEXT SUBTEST
        NEXT,   GOTO-PAGE(7),                       !BUT TABLE
                J/BUTMEXFLAG1                       !EXFLAG<1>H IN BIT<00>
(6166)  DCS[0.00.0.0.0.0.0]  BM[0110..00.11..10.11..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.010.111]
```

HO3


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        ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

        !*** TEST 503H ***
        !CHECK FPS<5> SET, VIA BUTR
        6732:
        TEST503H:
                PO,     LOAD-ENUA(ZTARGET407),                   !BIT<00> SET
                        LOAD-ERROR(TEST503H),                    !ERROR DIRECTORY KEY
                        DCS-CTR(C3.),                            !COMPARE AT TARGET
                        BUMP-VERIFY,                             !COUNT
                NEXT,   J/GOBUT503H                              !
    (6732)  DCS[1.00.1.0.0.1]  BM[1100..00.11..11.00..000..111...0.0.0..0..0...0.0000...0..0000.0...11.000...001.110.111]

        6167:  !(FREE)
        GOBUT503H:
                SETUP,  RETURN/TEST503I,                         !RETURN TO START OF NEXT SUBTEST
                NEXT,   GOTO-PAGE(7),                            !BUT TABLE
                        J/BUTFPS05                               !FPS <05> IN BIT<00>
    (6167)  DCS[0.00.0.0.0.0]  BM[0110..00.11..11.00..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.001.010]




        ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

        !*** TEST 503I ***
        !CHECK FLTPT-FD-H = F(FPS<7:6>,FLAG<5,2,1,EX1>) IS CLEAR
        6742:
        TEST503I:
                PO,     LOAD-ENUA(ZTARGET402),                   !BIT<00> CLEAR
                        LOAD-ERROR(TEST503I),                    !ERROR DIRECTORY KEY
                        DCS-CTR(C3.),                            !COMPARE AT TARGET
                NEXT,   J/GOBUT503I                              !
    (6742)  DCS[1.00.1.0.0.0]  BM[1100..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...001.111.000]

        6170:  !(FREE)
        GOBUT503I:
                PO,     BUMP-VERIFY,                             !COUNT
                SETUP,  RETURN/TEST503J,                         !RETURN TO START OF NEXT SUBTEST
                NEXT,   GOTO-PAGE(7),                            !BUT TABLE
                        J/BUTFPFD                                !FLTPT-FD-H IN BIT<00>
    (6170)  DCS[0.00.0.0.0.1]  BM[0110..00.11..11.01..110..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.111.001]

        ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

        !*** TEST 503J ***
        !DO THE "MULTIPLE BUT" ON "D<00>" TO CHECK IT'S CLEAR  (D WAS ZEROED IN TEST503E, ABOVE)
        6756:
        TEST503J:
                PO,     LOAD-ENUA(ZTARGET406),                   !BIT<00> CLEAR
                        LOAD-ERROR(TEST503J),                    !ERROR DIRECTORY KEY
                        DCS-CTR(C4.),                            !COMPARE AT TARGET
```

```
        NEXT,   J/GOBUT503J                                     !
 (6756) DCS[1.00.1.0.0.0] BM[1011..00.11..11.00..000..110...0.0.0..0..0...0.0000...0..0000.0...11.000...001.111.001]

    6171:   !(FREE)
    GOBUT503J:
        SETUP,  RETURN/TEST503K,                                !RETURN TO START OF NEXT SUBTEST
        NEXT,   GOTO-PAGE(7),                                   !BUT TABLE
                J/BUTMD00                                       !D<00>-H IN BIT<00>
 (6171) DCS[0.00.0.0.0.0] BM[0110..00.11..01.00..110..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.010.001]


    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    !*** TEST 503K ***
    !DO THE "MULTIPLE BUT" ON "FLTPT" TO CHECK IT'S SET, IR=(175252), FLTPT-H INSTR
    6646:
    TEST503K:
        PO,     LOAD-ENUA(ZTARGET407),                          !BIT<00> SET
                LOAD-ERROR(TEST503K),                           !ERROR DIRECTORY KEY
                DCS-CTR(C4.),                                   !COMPARE AT TARGET
                BUMP-VERIFY,                                    !COUNT
        NEXT,   J/GOBUT503K                                     !
 (6646) DCS[1.00.1.0.0.1] BM[1011..00.11..11.00..000..111...0.0.0..0..0...0.0000...0..0000.0...11.000...001.111.010]

    6172:   !(FREE)
    GOBUT503K:
        SETUP,  RETURN/SCOPE503,                                !RETURN TO SCOPE LOOP TEST WORD
        NEXT,   GOTO-PAGE(7),                                   !BUT TABLE
                J/BUTMFLTPTS                                    !FLTPT-H IN BIT<00>
 (6172) DCS[0.00.0.0.0.0] BM[0110..00.00..11.11..011..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.011.001]






    6173:   !(FREE)
    SCOPE503:
        PO,     BUSDIN+EMIT-[I],                                !RESET PROC UCONS
                EN-CLK-IR[15-00],                               !
        NEXT,   BUTD[SCOPE],                                    !NO ERROR: "TEST504A" (+1. WORDS)
                J/TEST504A                                      !   ERROR: "LOADFLAG503A" (-34. WORDS)
 (6173) DCS[0.00.0.1.0.0] BM[0000..00.00..00.01..000..100...0.0.0..0..0...1.1001...0..0000.0...11.000...110.001.101]
```

```
        ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

        !*** TEST 504 ***

        !TESTS 504 A-I USE DATA PATTERNS OF:
        !       FLAG<8:4,2:0>H = "01010101", EXFLAG<2:1>H = "10",
        !       FPS<7:0>H = "0101 0101"

        ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

        !*** TEST 504A ***
        !LOAD FLAGS<8:4,,2:0> WITH "01010101", EXFLAGS<2:1> WITH "10", FPS<7:4> WITH "0101",
        !FPS<3:0> WITH "0101", AND READ BACK THRU "FLAGS#FPS" PORT OF PROCESSOR MUX
        6615:
        TEST504A:
                PO,     LOAD-ENWA(4777),                        !SETUP FOR COMPARE 1/2 WAY + 1 THRU BM SUBR
                        LOAD-ERROR(TEST504A),                   !ERROR DIRECTORY KEY
                        DCS-CTR(C11.),                          !COMPARE AT ...
                NEXT,   J/LOADFLAG504A                          !
 (6615)  DCS[1.00.1.0.0.0]  BM[0100..00.10..01.11..111..111...0.0.0..0..0...0.0000...0..0000.0...11.000...110.010.010]

        6622:
        LOADFLAG504A:
                P2-U,   IR+EMIT,                                !ALSO NOTE IR=(NOT-PREFETCH), SO PREFETCH-SAVE WILL GET "0"
                                                                !AFTER SUBSEQUENT JAMUPP (IN LOADFPSCC ROUTINE EXIT)
                P3,     CSPD[05]+EMIT,                          !INITIAL VALUE:
                        EMIT/052644,                            !FLAG<8:4,2:0>="01010101", EXFLAG<2:1>="10"
                NEXT,   J/LOADFPS504A                           !"01010101 1010 0100"
 (6622)  DCS[0.00.0.0.0.0]  BM[0101..10.01..01.10..100..100...0.0.0..0..0...1.1010...1..0000.0...11.000...001.111.100]

        6174:  !(FREE)
        LOADFPS504A:
                P3,     CSPD[06]+EMIT,                          !INITIAL VALUE IN FPS<7:4>:
                        EMIT/125133,                            !"10101010 0101 1011"
                NEXT,   J/EXPEC504A                             !
 (6174)  DCS[0.00.0.0.0.0]  BM[1010..10.10..10.01..011..011...0.0.0..0..0...0.1001...1..0000.0...11.000...001.111.101]

        6175:  !(FREE)
        EXPEC504A:
                P3,     CSPD[02]+EMIT,                          !EXPECTED VALUE LOADS FLAGS, FPS<7:0>
                        EMIT/052525,                            !OF "FLAGS#FPS" PORT
                NEXT,   J/LOADFCC504A                           !"01010101 0101 0101"
 (6175)  DCS[0.00.0.0.0.0]  BM[0101..10.01..01.01..010..101...0.0.0..0..0...0.1101...1..0000.0...11.000...001.111.110]

        6176:  !(FREE)
        LOADFCC504A:
                P3,     CSPD[15]+EMIT,                          !FPS<3:0> COME FROM CSP(15)<3:0>[MD]
                        EMIT/000005,                            !"0101"
                NEXT,   J/DOFCC504A                             !
 (6176)  DCS[0.00.0.0.0.0]  BM[0000..10.00..00.00..000..101...0.0.0..0..0...0.0010...1..0000.0...11.000...001.111.111]

        6177:  !(FREE)
        DOFCC504A:
                P3,     CSPD[00]+EMIT,                          !CALL BM SUBR WHICH DOES THE LOAD
```

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                RETURN/TESTA504A,                           !RETURN INLINE
        NEXT,   CALL[LOADFPSCC]                             !
 (6177) DCS[0.00.0.0.0.0]  BM[0110..10.11..11.10..110..111...0.0.0..0..0...0.1111...1..0000.0...11.100...010.110.100]

    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    !NOW CHECK ALL THE RITE BITS WERE SET BY READING THEM BACK

    6766:
    TESTA504A:
        P0,     LOAD-ENUA(ZTARGET402),                      !SETUP FOR D=ZERO TEST
                LOAD-ERROR(TESTA504A),                      !ERROR DIRECTORY KEY
                DCS-CTR(C14.),                              !COMPARE AT TARGET
                BUMP-VERIFY,                                !COUNT
        P3,     BUTA(CUA-TRACK),                            !RESET CUA TRACKING AFTER JAMUPP
        NEXT,   J/GOPUT504A                                 !
 (6766) DCS[1.00.1.0.0.1]  BM[0001..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.001...010.000.000]

    6200:  !(FREE)
    GOPUT504A:
        SETUP,  RETURN/GOBUT504A,                           !GO TO SUBR WHICH:
        NEXT,   CALL[FLAGFPSSEQLOD]                         !1) CSP(05) -> FLAGS, EXFLAGS
 (6200) DCS[0.00.0.0.0.0]  BM[0110..00.01..00.00..001..111...0.0.0..0..0...0.0000...0..0000.0...11.100...000.111.011]
                                                            !2) CSP(06) -> FPS<7:4>

    6201:  !(FREE)
    GOBUT504A:
        SETUP,  RETURN/TEST504B,                            !RETURN TO START OF NEXT SUBTEST
        NEXT,   CALL[FLAGFPSTOD]                            ! FLAGS#FPS.XOR.CSP(02) -> D, BUT(D=0)
 (6201) DCS[0.00.0.0.0.0]  BM[0110..00.11..10.11..000..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.101.010]



    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    !*** TEST 504B ***
    !DO THE "MULTIPLE BUT" ON "FLAG7-H" TO CHECK IT'S SET
    6730:
    TEST504B:
        P0,     LOAD-ENUA(ZTARGET407),                      !BIT<00> SET
                LOAD-ERROR(TEST504B),                       !ERROR DIRECTORY KEY
                DCS-CTR(C4.),                               !COMPARE AT TARGET
        NEXT,   J/GOBUT504B                                 !
 (6730) DCS[1.00.1.0.0.0]  BM[1011..00.11..11.00..000..111...0.0.0..0..0...0.0000...0..0000.0...11.000...010.000.010]

    6202:  !(FREE)
    GOBUT504B:
        SETUP,  RETURN/TEST504C,                            !RETURN TO START OF NEXT SUBTEST
        NEXT,   GOTO-PAGE(7),                               !BUT TABLE
                J/BUTMFLAG7                                 !FLAG7-H IN BIT<00>
```

```
(6202)  DCS[0.00.0.0.0.0]  BM[0110..00.11..11.00..000..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.010.101]




    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    !*** TEST 504C ***
    !DO THE "BUT" ON "FLTPT-PROC-H"="FLAG<5>-H*EXFLAG<1>-L" TO CHECK IT'S SET
    6740:
    TEST504C:
            P0,     LOAD-ENVA(ZTARGET403),                  !BIT<00> SET
                    LOAD-ERROR(TEST504C),                   !ERROR DIRECTORY KEY
                    DCS-CTR(C3.),                           !COMPARE AT TARGET
                    BUMP-VERIFY,                            !COUNT
            NEXT,   J/GOBUT504C                             !
(6740)  DCS[1.00.1.0.0.1]  BM[1100..00.11..11.00..000..011...0.0.0..0..0...0.0000...0..0000.0...11.000...010.000.011]

    6203:   !(FREE)
    GOBUT504C:
            SETUP,  RETURN/TEST504D,                        !RETURN TO START OF NEXT SUBTEST
            NEXT,   GOTO-PAGE(7),                           !BUT TABLE
                    J/BUTFPPROC                             !FLAGS-H*EXFLAG1-L IN BIT<00>
(6203)  DCS[0.00.0.0.0.0]  BM[0110..00.11..11.01..000..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.101.100]




    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    !*** TEST 504D ***
    !DO AN INSTR-1 FLOATING POINT DECODE, TO CHECK THAT FLAG<4:5> -> BIT<1:0>
    6750:
    TEST504D:
            P0,     LOAD-ENVA(ZTARGET475),                  !INSTR-1 FLTPT, BIT<1:0>="01"
                    LOAD-ERROR(TEST504D),                   !ERROR DIRECTORY KEY
                    DCS-CTR(C4.),                           !COMPARE AT TARGET
            NEXT,   J/LOADIR504D                            !
(6750)  DCS[1.00.1.0.0.0]  BM[1011..00.11..11.00..111..101...0.0.0..0..0...0.0000...0..0000.0...11.000...010.000.100]

    6204:   !(FREE)
    LOADIR504D:
            P0,     BUMP-VERIFY,                            !COUNT
            P2-U,   IR←EMIT,                                !IR <- FLTPT INSTR
                    EMIT/172525,                            !
            NEXT,   J/GOBUT504D                             !
(6204)  DCS[0.00.0.0.0.1]  BM[1111..00.01..01.01..010..101...0.0.0..0..0...1.1010...0..0000.0...11.000...010.000.101]

    6205:   !(FREE)
    GOBUT504D:
            SETUP,  RETURN/TEST504E,                        !RETURN TO START OF NEXT SUBTEST
            NEXT,   GOTO-PAGE(7),                           !BUT TABLE
                    J/BUTINSTR1                             !FULL WIDTH
```

```
(6205) DCS[0.00.0.0.0.0] BM[0110..00.11..11.10..000..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.000.110]




   ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

   !*** TEST 504E ***
   !READ EXFLAGS<2:1>="10" IN CUA-PORT<2:1>
   !ALSO "PREFETCH-SAVE-H"="0" FROM PREVIOUS SETUP
   6760:
   TEST504E:
           P0,     LOAD-ENUA(ZTARGET402),                    !SETUP FOR D=0 TEST
                   LOAD-ERROR(TEST504E),                     !ERROR DIRECTORY KEY
                   DCS-CTR(C10.),                            !COMPARE AT TARGET
           NEXT,   J/EXPEC504E                               !
(6760) DCS[1.00.1.0.0.0] BM[0101..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...010.000.110]

   6206: !(FREE)
   EXPEC504E:
           P0,     BUMP-VERIFY,                              !COUNT
           P3,     CSPD[02]←EMIT,                            !CUA PORT READS AS:
                   EMIT/073734,                              !0#CUA<11:00>#EXFLAG<2:1>#PREFETCH
           NEXT,   J/GOPUT504E                               !
(6206) DCS[0.00.0.0.0.1] BM[0111..10.01..11.11..011..100...0.0.0..0..0...0.1101...1..0000.0...11.000...010.000.111]

   6207: !(FREE)
   GOPUT504E:
           SETUP,  RETURN/TEST504F,                          !GO TO SUBR WHICH:
           NEXT,   CALL[CUATOD]                              !PUTS CUA#EXFLAGS.XOR.CSP(02) -> D, BUT(D=ZERO)
(6207) DCS[0.00.0.0.0.0] BM[0110..00.11..01.11..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.101.111]




   ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

   !*** TEST 504F ***
   !DO THE "MULTIPLE BUT" ON EXFLAG<2> TO CHECK IT'S SET
   6672:
   TEST504F:
           P0,     LOAD-ENUA(ZTARGET407),                    !BIT<00> SET
                   LOAD-ERROR(TEST504F),                     !ERROR DIRECTORY KEY
                   DCS-CTR(C4.),                             !COMPARE AT TARGET
           NEXT,   J/GOBUT504F                               !
(6672) DCS[1.00.1.0.0.0] BM[1011..00.11..11.00..000..111...0.0.0..0..0...0.0000...0..0000.0...11.000...010.001.000]

   6210: !(FREE)
   GOBUT504F:
           SETUP,  RETURN/TEST504G,                          !RETURN TO START OF NEXT SUBTEST
           NEXT,   GOTO-PAGE(7),                             !BUT TABLE
                   J/BUTMEXFLAG2                             !EXFLAG<2>H IN BIT 0
```

```
(6210)  DCS[0.00.0.0.0.0]  BM[0110..00.11..10.00..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.011.011]




    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    !*** TEST 504G ***
    !DO THE "MULTIPLE BUT" ON EXFLAG<1> TO CHECK IT'S CLEAR
    6702:
    TEST504G:
            PO,     LOAD-ENUA(ZTARGET406),                       !BIT<00> CLEAR
                    LOAD-ERROR(TEST504G),                        !ERROR DIRECTORY KEY
                    DCS-CTR(C4.),                                !COMPARE AT TARGET
                    BUMP-VERIFY,                                 !COUNT
            NEXT,   J/GOBUT504G                                  !
(6702)  DCS[1.00.1.0.0.1]  BM[1011..00.11..11.00..000..110...0.0.0..0..0...0.0000...0..0000.0...11.000...010.001.001]

    6211:  !(FREE)
    GOBUT504G:
            SETUP,  RETURN/TEST504H,                             !RETURN TO START OF NEXT SUBTEST
            NEXT,   GOTO-PAGE(7),                                !BUT TABLE
                    J/BUTMEXFLAG1                                !EXFLAG<1>H IN BIT 0
(6211)  DCS[0.00.0.0.0.0]  BM[0110..00.11..10.00..110..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.010.111]




    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    !*** TEST 504H ***
    !CHECK FPS<5> CLEAR, VIA BUTR
    6706:
    TEST504H:
            PO,     LOAD-ENUA(ZTARGET406),                       !BIT<00> CLEAR
                    LOAD-ERROR(TEST504H),                        !ERROR DIRECTORY KEY
                    DCS-CTR(C3.),                                !COMPARE AT TARGET
                    BUMP-VERIFY,                                 !COUNT
            NEXT,   J/GOBUT504H                                  !
(6706)  DCS[1.00.1.0.0.1]  BM[1100..00.11..11.00..000..110...0.0.0..0..0...0.0000...0..0000.0...11.000...010.001.010]

    6212:  !(FREE)
    GOBUT504H:
            SETUP,  RETURN/TEST504I,                             !RETURN TO START OF NEXT SUBTEST
            NEXT,   GOTO-PAGE(7),                                !BUT TABLE
                    J/BUTFPS05                                   !FPS<05> IN BIT<00>
(6212)  DCS[0.00.0.0.0.0]  BM[0110..00.11..10.01..110..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.001.010]
```

```
	! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

	!*** TEST 504I ***
	!CHECK FLTPT-FD-H = F(FPS<7:6>,FLAG<5,2,1,EX1>) IS SET
	6716:
	TEST504I:
		PO,	LOAD-ENUA(ZTARGET403),			!BIT<00> SET
			LOAD-ERROR(TEST504I),			!ERROR DIRECTORY KEY
			DCS-CTR(C3.),				!COMPARE AT TARGET
		NEXT,	J/GOBUT504I				!
   (6716)  DCS[1.00.1.0.0.0]  BM[1100..00.11..11.00..000..011...0.0.0..0..0...0.0000...0..0000.0...11.000...010.001.011]

	6213:  !(FREE)
	GOBUT504I:
		PO,	BUMP-VERIFY,				!COUNT
		SETUP,	RETURN/SCOPE504,			!RETURN TO SCOPE LOOP TEST WORD
		NEXT,	GOTO-PAGE(7),				!BUT TABLE
			J/BUTFPFD				!FLTPT-FD-H IN BIT<00>
   (6213)  DCS[0.00.0.0.0.1]  BM[0110..00.01..00.01..100..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.111.001]



	6214:  !(FREE)
	SCOPE504:
		PO,	BUSDIN+EMIT-[I],			!RESET PROC UCON
			EN-CLK-IR[15-00],			!
		NEXT,	BUTD[SCOPE],				!NO ERROR: "TEST505A" (+1. WORDS)
			J/TEST505A				!   ERROR: "LOADFLAG504A" (-27. WORDS)
   (6214)  DCS[0.00.0.1.0.0]  BM[0000..00.00..00.01..000..100...0.0.0..0..0...1.1001...0..0000.0...11.000...110.010.011]










	! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

	!*** TEST 505 ***

	!TESTS 505 A-C USE DATA PATTERNS OF:
	!	FLAG<8:4,2:0>H = "11111000", EXFLAG<2:1>H = "10",
	!	FPS<7:0>H = "0101 0101"

	! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

	!*** TEST 505A ***
	!CHECK THAT BUTA(CLEAR-FLAG-RES-UCON) ONLY CLEARS SHORT-TERM FLAGS
	6623:
	TEST505A:
		PO,	LOAD-ENUA(ZTARGET402),			!SERUP FOR D=ZERO TEST
```

```
                       LOAD-ERROR(TEST505A),                        !ERROR DIRECTORY KEY
                       DCS-CTR(C15.),                               !COMPARE AT TARGET
                NEXT,  J/LOAD505A                                   !
        (6623) DCS[1.00.1.0.0.0]  BM[0000..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...110.010.000]

        6620:
        LOAD505A:
                P3,    CSPD[05]+EMIT,                               !LOAD FLAGS<8:4,2:0>,
                       EMIT/177406,                                 !EXFLAG<2:1> WITH ALL 1-S
                NEXT,  J/EXPEC505A                                  !
        (6620) DCS[0.00.0.0.0.0.0]  BM[1111..10.11..11.00..000..110...0.0.0..0..0...0.1010...1..0000.0...11.000...010.001.101]

        6215:  !(FREE)
        EXPEC505A:
                P0,    BUMP-VERIFY,                                 !COUNT
                P3,    CSPD[02]+EMIT,                               !AFTER BUTA(CLR-FLAG-...), EXPECT THIS IN FLAGS#FPS PORT:
                       EMIT/174125,                                 !"11111000 0101 0101"
                NEXT,  J/SETFLAG505A                                !
        (6215) DCS[0.00.0.0.0.0.1]  BM[1111..10.10..00.01..010..101...0.0.0..0..0...0.1101...1..0000.0...11.000...010.001.110]

        6216:  !(FREE)
        SETFLAG505A:
                P0,    BUMP-VERIFY,                                 !COUNT
                SETUP, RETURN/BUTCLR505A,                           !GO TO SUBR WHICH:
                NEXT,  CALL[FLAGLOD]                                !PUTS CSP(05) INTO THE FLAGS
        (6216) DCS[0.00.0.0.0.0.1]  BM[0110..00.01..00.01..111..111...0.0.0..0..0...0.0000...0..0000.0...11.100...000.111.110]

        6217:  !(FREE)
        BUTCLR505A:
                P0,    DCS-CTR(C9.),                                !POINT COUNTER AT TARGET
                P3,    BUTA(CLR-FLAG-RES-UCON),                     !CLEAR SHORT-TERM FLAGS
                NEXT,  J/GOPUT505A                                  !
        (6217) DCS[0.00.1.0.0.0]  BM[0110..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.010...010.010.000]

        6220:  !(FREE)
        GOPUT505A:
                SETUP, RETURN/TEST505B,                             !GO TO SUBR WHICH:
                NEXT,  CALL[FLAGFPSTOD]                             !FLAGS#FPS.XOR.CSP(2) -> D, BUT(D=ZERO)
        (6220) DCS[0.00.0.0.0.0.0]  BM[0110..00.11..10.01..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.101.010]




        ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

        !*** TEST 505B ***
        !CHECK EXFLAG<2> NOT CLEARED, VIA BUTM
        6712:
        TEST505B:
                P0,    LOAD-ENUA(ZTARGET407),                       !BIT<00> SET
                       LOAD-ERROR(TEST505B),                        !ERROR DIRECTORY KEY
                       DCS-CTR(C4.),                                !COMPARE AT TARGET
```

```
                       BUMP-VERIFY,                                  !COUNT
              NEXT,    J/GOBUT505B                                   !
        (6712) DCS[1.00.1.0.0.1]  BM[1011..00.11..11.00..000..111...0.0.0..0..0...0.0000...0..0000.0...11.000...010.010.001]

     6221:  !(FREE)
     GOBUT505B:
              SETUP,   RETURN/TEST505C,                              !RETURN TO START OF NEXT SUBTEST
              NEXT,    GOTO-PAGE(7),                                 !BUT TABLE
                       J/BUTMEXFLAG2                                 !EXFLAG<2> IN BIT<00>
        (6221) DCS[0.00.0.0.0.0]  BM[0110..00.11..10.10..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.011.011]




     ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

     !*** TEST 505C ***
     !CHECK EXFLAG<1> WAS CLEARED, VIA BUTM
     6722:
     TEST505C:
              P0,      LOAD-ENUA(ZTARGET406),                        !BIT<00> CLEAR
                       LOAD-ERROR(TEST505C),                         !ERROR DIRECTORY KEY
                       DCS-CTR(C4.),                                 !COMPARE AT TARGET
              NEXT,    J/GOBUT505C                                   !
        (6722) DCS[1.00.1.0.0.0]  BM[1011..00.11..11.00..000..110...0.0.0..0..0...0.0000...0..0000.0...11.000...010.010.011]

     6223:  !(FREE)
     GOBUT505C:
              SETUP,   RETURN/SCOPE505,                              !RETURN TO SCOPE LOOP TEST WORD
              NEXT,    GOTO-PAGE(7),                                 !BUT TABLE
                       J/BUTMEXFLAG1                                 !EXFLAG<1> IN BIT<00>
        (6223) DCS[0.00.0.0.0.0]  BM[0110..00.01..00.10..100..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.010.111]

     6224:  !(FREE)
     SCOPE505:
              P0,      BUMP-VERIFY,                                  !COUNT
                       BUSDIN←EMIT-[I],                              !EMIT FOR CONSTANTS
              P3,      FLAG[8-0]←D[15-8]-[I],                        !ZERO ALL FLAGS. D WAS LEFT
                       FPS[7-4]←D[7-4]-[I],                          !  ZERO FROM TEST505A, IF ALL OK.
              NEXT,    BUTD[SCOPE],                                  !NO ERROR: "TEST506A" (+1. WORDS)
                       J/TEST506A                                    !   ERROR: "LOAD505A" (-9. WORDS)
        (6224) DCS[0.00.0.1.0.1]  BM[0000..00.00..00.01..100..001...0.0.0..0..0...1.1011...0..0000.0...11.000...110.010.001]






     ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

     !*** TEST 506 ***

```

```
        !TESTS 506 A-E USE A "0-1-1010-1010" PATTERN IN PS<15,13,7:4,3:0>

        ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

        !* TEST 506A *
        !LOAD UP PS<HI,MID,LO> IN ORDER, READ BACK THRU PS PORT OF PROC MUX
        !  ALSO CHECK THAT BUTA(CLR-FLAG-RES-UCON) CLEARS UCON REGISTER, SO THAT:
        !     (1) BUSDIN+EMIT IS SELECTED, VIA UCON-SELECT(1)H=LOW, AND
        !     (2) MAKE SURE THAT THE OTHER UCON BIT LATCHES ARE ALSO CLEARED
        6621:
        TEST506A:
                P0,     LOAD-ENUA(ZTARGET402),                  !SETUP FOR D=ZERO TEST
                        LOAD-ERROR(TEST506A),                   !ERROR DIRECTORY KEY
                        DCS-CTR(C15.),                          !STALL FOR NOW
                NEXT,   J/EXPEC506A                             !
 (6621) DCS[1.00.1.0.0.0] BM[0000..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...110.001.010]

        6612:
        EXPEC506A:
                P3,     CSPD[02]+EMIT,                          !EXPECTED VALUE TO BE READ OUT OF
                        EMIT/030252,                            !PS AFTER LOADING:
                NEXT,   J/SETUCON506A                           !"0011 0000 1010 1010"
 (6612) DCS[0.00.0.0.0.0] BM[0011..10.00..00.10..101..010...0.0.0..0..0...0.1101...1..0000.0...11.000...010.010.101]

        6225:  !(FREE)
        SETUCON506A:
                P0,     BUSDIN+FLAGS#FPS-[I],                   !TAKE EMIT OFF BUSDIN, FLAG#FPS=(000005)
                P3,     BUTA(CLR-FLAG-RES-UCON),                !THIS SHOULD NOW CLEAR THE UCON REGISTER,
                                                                !  SETTING UCON-SELECT(1)H=L; FORCING BUSDIN+EMIT
                NEXT,   J/PSHI506A                              !
 (6225) DCS[0.00.0.0.0.0] BM[0000..00.00..11.01..000..000...0.0.0..0..0...1.1001...0..0000.0...11.010...010.010.110]

        6226:  !(FREE)
        PSHI506A:
                P0,     BUMP-VERIFY,                            !COUNT
                P3,     CSPD[05]+EMIT,                          !VALUE IN D WHEN LOAD PS<15,13>:
                        EMIT/063125,                            !"0110 0110 0101 0101"
                NEXT,   J/PSMID506A                             !
 (6226) DCS[0.00.0.0.0.1] BM[0110..10.01..10.01..010..101...0.0.0..0..0...0.1010...1..0000.0...11.000...010.010.111]

        6227:  !(FREE)
        PSMID506A:
                P3,     CSPD[06]+EMIT,                          !VALUE IN D WHEN LOAD PS<7:4>:
                        EMIT/143245,                            !"1100 0110 1010 0101"
                NEXT,   J/PSLO506A                              !
 (6227) DCS[0.00.0.0.0.0] BM[1100..10.01..10.10..100..101...0.0.0..0..0...0.1001...1..0000.0...11.000...010.011.000]

        6230:  !(FREE)
        PSLO506A:
                P0,     BUMP-VERIFY,                            !COUNT
                P3,     CSPD[07]+EMIT,                          !VALUE IN D WHEN LOAD PS<3:0>:
                        EMIT/143132,                            !"1100 0110 0101 1010"
                NEXT,   J/FUDGEPS506A                           !
 (6230) DCS[0.00.0.0.0.1] BM[1100..10.01..10.01..011..010...0.0.0..0..0...0.1000...1..0000.0...11.000...010.011.001]
```

```
     6231:  !(FREE)
     FUDGEPS506A:
             SETUP,   RETURN/LOADUCON506A,                     !GO TO SUBR WHICH:
                                                                !1) CSP(05) -> PS<15,13>
                                                                !2) CSP(06) -> PS<7:4>
             NEXT,    CALL[PSSEQLOD]                            !3) CSP(07) -> PS<3:0>
 (6231)  DCS[0.00.0.0.0.0]  BM[0111..00.00..01.10..111..111...0.0.0..0..0...0.0000...0..0000.0...11.100...001.000.000]

     7067:  !(FREE)
     LOADUCON506A:
             SETUP,   UCON-PROC,                                !SETUP FOR UCON-PROC:
             ENABLE,  BUSDIN+FLAGS#FPS-[I],                     !FLAGS#FPS=(000005)
                      EN-CLK-PS[15-12], EN-CLK-PS[7-4],         !SETUP FOR CLOCKING PS BITS
                      EN-CLK-PS[3-0],                           !
             P0,      SET-UCON-CONTROL,                         !WRITE THE UCON REGISTER AT P0,
             P3,      BUTA(CLR-FLAG-RES-UCON),                  !BUT AT P3, NOW CLEAR IT OUT
             NEXT,    J/DOIT506A                                !
 (7067)  DCS[0.00.0.0.0.0]  BM[1000..00.00..11.01..010..010...0.0.0..0..0...1.1001...0..0000.0...11.010...000.111.010]

     7072:  !(FREE)
     DOIT506A:
             P2-T,    D+ZERO,                                   !SETUP D WITH A (000000)
             NEXT,    GOTO-PAGE(6),                             !XFER
                      J/LOADDCS506A                             !
 (7072)  DCS[0.00.0.0.0.0]  BM[0011..00.00..00.00..000..110...0.1.0..0..0...0.0000...0..0000.0...11.100...001.000.100]

     6104:  !(FREE)
     LOADDCS506A:
             P0,      DCS-CTR(C9.),                             !COMPARE AT TARGET
             P2,      UCON-OPERATION,                           !IF THE UCON REGISTER WASN'T CLEARED, ABOVE,
             NEXT,    GOTO-PAGE(7),                             !  THE PS SHOULD BE OVER-WRITTEN WITH (000000),
                      J/GOBUT506A                               !    IN SOME COMBINATION OF PS<15:12,7:4,3:0>
 (6104)  DCS[0.00.1.0.0.0]  BM[0110..00.00..00.00..000..111...0.0.0..0..0...1.1010...0..0000.0...11.100...000.111.001]

     7071:  !(FREE)
     GOBUT506A:
             SETUP,   RETURN/TEST506B,                          !RETURN TO START OF NEXT SUBTEST
             NEXT,    CALL[PSTOD]                               !  PS-XOR-CSP(02) -> D, BUT(D=ZERO)
 (7071)  DCS[0.00.0.0.0.0]  BM[0110..00.11..11.01..100..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.101.011]




     ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

     !* TEST 506B *
     !CHECK THAT BUTR(PS15) SHOWS PS<15>H CLEAR
     6754:
     TEST506B:
             P0,      LOAD-ENUA(ZTARGET402),                    !BIT<00> CLEAR
```

```
                      LOAD-ERROR(TEST506B),                      !ERROR DIRECTORY KEY
                      DCS-CTR(C3.),                              !COMPARE AT TARGET
               NEXT,  J/GOBUT506B                                !
  (6754)  DCS[1.00.1.0.0.0]  BM[1100..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...010.011.011]

      6233:  !(FREE)
      GOBUT506B:
               SETUP, RETURN/TEST506C,                           !RETURN TO START OF NEXT SUBTEST
               NEXT,  GOTO-PAGE(7),                              !BUT TABLE HERE
                      J/BUTPS15                                  !PS<15>H IN BIT<00>
  (6233)  DCS[0.00.0.0.0.0]  BM[0110..00.11..11.00..100..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.011]




      ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

      !* TEST 506C *
      !CHECK THAT BUTM(PS03) SHOWS PS<03>H SET
      6744:
      TEST506C:
               P0,    LOAD-ENUA(ZTARGET407),                     !BIT<00> SET
                      LOAD-ERROR(TEST506C),                      !ERROR DIRECTORY KEY
                      DCS-CTR(C4.),                              !COMPARE AT TARGET
                      BUMP-VERIFY,                               !COUNT
               NEXT,  J/GOBUT506C                                !
  (6744)  DCS[1.00.1.0.0.1]  BM[1011..00.11..11.00..000..111...0.0.0..0..0...0.0000...0..0000.0...11.000...010.011.100]

      6234:  !(FREE)
      GOBUT506C:
               SETUP, RETURN/TEST506D,                           !RETURN TO START OF NEXT SUBTEST
               NEXT,  GOTO-PAGE(7),                              !BUT TABLE HERE
                      J/BUTMPS[N]                                !PS[N]=PS<03>H IN BIT<00>
  (6234)  DCS[0.00.0.0.0.0]  BM[0110..00.11..10.11..100..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.010.011]




      ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

      !* TEST 506D *
      !CHECK THAT WHEN FLAG<0>H=L AND PS<04>H=L,
      !  MASKED-PS[T]-H=FLAG<0>L*PS<04>H, IS LOW
      6734:
      TEST506D:
               P0,    LOAD-ENUA(ZTARGET406),                     !BIT<00> CLEAR
                      LOAD-ERROR(TEST506D),                      !ERROR DIRECTORY KEY
                      DCS-CTR(C4.),                              !COMPARE AT TARGET
               NEXT,  J/GOBUT506D                                !
  (6734)  DCS[1.00.1.0.0.0]  BM[1011..00.11..11.00..000..110...0.0.0..0..0...0.0000...0..0000.0...11.000...010.011.101]

      6235:  !(FREE)
```

```
    GOBUT506D:
            PO,      BUMP-VERIFY,                         !COUNT
            SETUP,   RETURN/TEST506E,                     !RETURN TO START OF NEXT SUBTEST
            NEXT,    GOTO-PAGE(7),                        !BUT TABLE HERE
                     J/BUTMMASKPS[T]                      !FLAG<0>L#PS<04>H IN BIT<00>
  (6235)  DCS[0.00.0.0.0.1]  BM[0110..00.11..00.00..101..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.001.111]




    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    !* TEST 506E *
    !CHECK THAT INTR-HIGH-H=SERVICE(0)H*NOT(MASKED-PS[T]-H) IS HIGH,
    !  WHEN SERVICE(0)H=HIGH, MASKED-PS[T]-H=LOW
    !NOTE:  THE SUBR CALLED SHOULD SET SERVICE(0)H=HIGH (NEGATED) BY CLEARING OUT ALL ITS INPUT CONDITIONS
    6605:
    TEST506E:
            PO,      LOAD-ENUA(ZTARGET403),               !BIT<01> SET
                     LOAD-ERROR(TEST506E),                !ERROR DIRECTORY KEY
                     DCS-CTR(C9.),                        !COMPARE AT TARGET
            NEXT,    J/CLEAR506E                          !
  (6605)  DCS[1.00.1.0.0.0]  BM[0110..00.11..11.00..000..011...0.0.0..0..0...0.0000...0..0000.0...11.000...010.011.110]

    6236:  !(FREE)
    CLEAR506E:
            PO,      BUMP-VERIFY,                         !COUNT
            SETUP,   RETURN/GOBUT506E,                    !GO TO SUBR WHICH CLEARS OUT
            NEXT,    CALL[CLEAR-I-O-B]                    !  ALL THE UNIBUS/I-O/SERVICE LATCHES  (NO UNIBUS INIT)
  (6236)  DCS[0.00.0.0.0.1]  BM[0110..00.01..00.11..111..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.011.000]

    6237:  !(FREE)
    GOBUT506E:
            SETUP,   RETURN/SCOPE506,                     !RETURN TO SCOPE LOOP TEST WORD
            NEXT,    GOTO-PAGE(7),                        !BUT TABLE HERE
                     J/BUTINTRHIGH                        !INTR HIGH H IN BIT<01>
  (6237)  DCS[0.00.0.0.0.0]  BM[0110..00.01..01.00..000..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.101.101]




    6240:  !(FREE)
    SCOPE506:
            PO,      BUSDIN←EMIT-[I],                     !KEEP EMIT FOR CONSTANTS
            P2,      PS←D-[I],                            !ZERO PS: D LEFT ZERO FROM
                                                          !PREVIOUS TESTS IF ALL OK
            NEXT,    BUTD[SCOPE],                         !NO ERROR: "TEST507A" (+1. WORDS)
                     J/TEST507A                           !   ERROR: "MASK506A" (-16. WORDS)
  (6240)  DCS[0.00.0.1.0.0]  BM[1000..00.00..00.01..010..010...0.0.0..0..0...1.1011...0..0000.0...11.000...110.001.011]
```

```
!- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

!*** TEST 507 ***

!TESTS 507 A-F USE A "1-0-0101-0101" PATTERN IN PS<15,13,7:4,3:0>

! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

!* TEST 507A *
!LOAD UP PS<HI,MID,LO> IN ORDER, READ BACK THRU PS PORT OF PROC MUX
6613:
TEST507A:
        P0,     LOAD-ENUA(ZTARGET402),                  !SETUP FOR D=ZERO TEST
                LOAD-ERROR(TEST507A),                   !ERROR DIRECTORY KEY
                DCS-CTR(C15.),                          !STALL FOR NOW
        NEXT,   J/EXPEC507A                             !
 (6613) DCS[1.00.1.0.0.0]  BM[0000..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...110.000.010]

6602:
EXPEC507A:
        P3,     CSPD[02]←EMIT,                          !EXPECTED VALUE TO BE READ OUT OF
                EMIT/140125,                            !PS AFTER LOADING:
        NEXT,   J/PSHI507A                              !"1100 0000 0101 0101"
 (6602) DCS[0.00.0.0.0.0]  BM[1100..10.00..00.01..010..101...0.0.0..0..0...0.1101...1..0000.0...11.000...010.100.001]

6241:  !(FREE)
PSHI507A:
        P0,     BUMP-VERIFY,                            !COUNT
        P3,     CSPD[05]←EMIT,                          !VALUE IN D WHEN LOAD PS<15,13>:
                EMIT/113252,                            !"1001 0110 1010 1010"
        NEXT,   J/PSMID507A                             !
 (6241) DCS[0.00.0.0.0.1]  BM[1001..10.01..10.10..101..010...0.0.0..0..0...0.1010...1..0000.0...11.000...010.100.010]

6242:  !(FREE)
PSMID507A:
        P3,     CSPD[06]←EMIT,                          !VALUE IN D WHEN LOAD PS<7:4>:
                EMIT/033122,                            !"0011 0110 0101 1010"
        NEXT,   J/PSLO507A                              !
 (6242) DCS[0.00.0.0.0.0]  BM[0011..10.01..10.01..010..010...0.0.0..0..0...0.1001...1..0000.0...11.000...010.100.011]

6243:  !(FREE)
PSLO507A:
        P0,     BUMP-VERIFY,                            !COUNT
        P3,     CSPD[07]←EMIT,                          !VALUE IN D WHEN LOAD PS<3:0>:
                EMIT/033245,                            !"0011 0110 1010 0101"
        NEXT,   J/FUDGEPS507A                           !
 (6243) DCS[0.00.0.0.0.1]  BM[0011..10.01..10.10..100..101...0.0.0..0..0...0.1000...1..0000.0...11.000...010.100.100]

6244:  !(FREE)
FUDGEPS507A:
```

```
        SETUP,  RETURN/LOADDCS507A,                   !GO TO SUBR WHICH:
        NEXT,   CALL[PSSEQLOD]                        !1) CSP(05) -> PS<15,13>
(6244)  DCS[0.00.0.0.0.0]  BM[0110..00.01..01.00..101..111...0.0.0..0..0...0.0000...0..0000.0...11.100...001.000.000]
                                                      !2) CSP(06) -> PS<7:4>
                                                      !3) CSP(07) -> PS<3:0>

    6245:  !(FREE)
    LOADDCS507A:
        PO,     DCS-CTR(C9.),                         !COMPARE AT TARGET
        NEXT,   J/GOBUT507A                           !
(6245)  DCS[0.00.1.0.0.0]  BM[0110..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...010.100.110]

    6246:  !(FREE)
    GOBUT507A:
        SETUP,  RETURN/TEST507B,                      !RETURN TO START OF NEXT SUBTEST
        NEXT,   CALL[PSTOD]                           !  CSP(02)-XOR-PS -> D, BUT(D=ZERO)
(6246)  DCS[0.00.0.0.0.0]  BM[0110..00.11..10.10..100..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.101.011]




    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    !* TEST 507B *
    !CHECK THAT BUTR(PS15) SHOWS PS<15>H SET
    6724:
    TEST507B:
        PO,     LOAD-ENVA(ZTARGET403),                !BIT<00> SET
                LOAD-ERROR(TEST507B),                 !ERROR DIRECTORY KEY
                DCS-CTR(C3.),                         !COMPARE AT TARGET
        NEXT,   J/GOBUT507B                           !
(6724)  DCS[1.00.1.0.0.0]  BM[1100..00.11..11.00..000..011...0.0.0..0..0...0.0000...0..0000.0...11.000...010.100.111]

    6247:  !(FREE)
    GOBUT507B:
        SETUP,  RETURN/TEST507C,                      !RETURN TO START OF NEXT SUBTEST
        NEXT,   GOTO-PAGE(7),                         !BUT TABLE HERE
                J/BUTPS15                             !PS<15>H IN BIT<00>
(6247)  DCS[0.00.0.0.0.0]  BM[0110..00.11..00.01..001..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.011]




    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    !* TEST 507C *
    !CHECK THAT BUTM(PS03) SHOWS PS<03>H CLEAR
    6611:
    TEST507C:
        PO,     LOAD-ENVA(ZTARGET406),                !BIT<00> CLEAR
                LOAD-ERROR(TEST507C),                 !ERROR DIRECTORY KEY
```

```
                    DCS-CTR(C4.),                       !COMPARE AT TARGET
                    BUMP-VERIFY,                        !COUNT
            NEXT,   J/GOBUT507C                         !
    (6611)  DCS[1.00.1.0.0.1]  BM[1011..00.11..11.00..000..110...0.0.0..0..0...0.0000...0..0000.0...11.000...010.101.000]

    6250:   !(FREE)
    GOBUT507C:
            SETUP,  RETURN/TEST507D,                    !RETURN TO START OF NEXT SUBTEST
            NEXT,   GOTO-PAGE(7),                       !BUT TABLE HERE
                    J/BUTMPS[N]                         !PS[N]=PS<03>H IN BIT<00>
    (6250)  DCS[0.00.0.0.0.0]  BM[0110..00.10..11.01..111..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.010.011]




    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    !* TEST 507D *
    !CHECK THAT WHEN FLAG<0>H=L AND PS<04>H=H,
    !   MASKED-PS[T]-H=FLAG<0>L*PS<04>H, IS HIGH
    6557:
    TEST507D:
            PO,     LOAD-ENUA(ZTARGET407),              !BIT<00> SET
                    LOAD-ERROR(TEST507D),               !ERROR DIRECTORY KEY
                    DCS-CTR(C4.),                       !COMPARE AT TARGET
            NEXT,   J/GOBUT507D                         !
    (6557)  DCS[1.00.1.0.0.0]  BM[1011..00.11..11.00..000..111...0.0.0..0..0...0.0000...0..0000.0...11.000...010.101.001]

    6251:   !(FREE)
    GOBUT507D:
            PO,     BUMP-VERIFY,                        !COUNT
            SETUP,  RETURN/TEST507E,                    !RETURN TO START OF NEXT SUBTEST
            NEXT,   GOTO-PAGE(7),                       !BUT TABLE HERE
                    J/BUTMMASKPS[T]                     !FLAG<0>L*PS<04>H IN BIT<00>
    (6251)  DCS[0.00.0.0.0.1]  BM[0110..00.11..01.11..100..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.001.111]




    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    !* TEST 507E *
    !CHECK THAT INTR-HIGH-H=SERVICE(0)H*NOT(MASKED-PS[T]-H) IS LOW,
    !   WHEN SERVICE(0)H=HIGH, MASKED-PS[T]-H=HIGH
    6674:
    TEST507E:
            PO,     LOAD-ENUA(ZTARGET401),              !BIT<01> CLEAR
                    LOAD-ERROR(TEST507E),               !ERROR DIRECTORY KEY
                    DCS-CTR(C3.),                       !COMPARE AT TARGET
                    BUMP-VERIFY,                        !COUNT
            NEXT,   J/GOBUT507E                         !
    (6674)  DCS[1.00.1.0.0.1]  BM[1100..00.11..11.00..000..001...0.0.0..0..0...0.0000...0..0000.0...11.000...010.101.011]
```

```
    6253:  !(FREE)
    GOBUTS07E:
            SETUP,  RETURN/TEST507F,                          !RETURN TO START OF NEXT SUBTEST
            NEXT,   GOTO-PAGE(7),                             !BUT TABLE HERE
                    J/BUTINTRHIGH                             !INTR HIGH H IN BIT<01>
 (6253)  DCS[0.00.0.0.0.0]  BM[0110..00.11..01.00..111..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.101.101]



    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    !* TEST 507F *
    !CHECK THAT PS[C]-H CAN BE READ AS A "1" THRU D[C]←CINMUX=PS[C], AND D[C]←PS[C]
    !  IT WAS PREVIOUSLY CHECKED, IN ALU LOGIC TESTS, THAT THESE WERE OK WITH PS[C]="0"
    6647:
    TEST507F:
            P0,     LOAD-ENUA(ZTARGET407),                    !SETUP FOR SR<3:0> = "0111"
                    LOAD-ERROR(TEST507F),                     !ERROR DIRECTORY KEY
                    DCS-CTR(C7.),                             !COMPARE AT TARGET
            NEXT,   J/CIN507F                                 !
 (6647)  DCS[1.00.1.0.0.0]  BM[1000..00.11..11.00..000..111...0.0.0..0..0...0.0000...0..0000.0...11.000...010.101.100]

    6254:  !(FREE)
    CIN507F:
            P0,     BUMP-VERIFY,                              !COUNT
            P2-T,   D←ZERO, D[C]←CINMUX,                      !SET D[C]=CINMUX=PS[C]=(1)
                    SR←ZERO,                                  !SET SR<3:0>="0000"
            P3,     BSPLO[17]←D,                              !B-SIDE COPY OF SR
            NEXT,   J/SETPS507F                               !
 (6254)  DCS[0.00.0.0.0.1]  BM[0011..00.11..00.00..011..000...0.1.1..0..0...0.0000...0..0110.0...11.000...010.101.110]

    6256:  !(FREE)
    SETPS507F:
            P2-T,   D←A-PLUS-B-PLUS-D[C], D[C]←PS[C],         !SET D[C]=PS[C]=(1)
                    SR←A-PLUS-B-PLUS-D[C],                    !D, SR, BSP <- SR-LEFT-1, SR<02> <- PREV D[C] = CINMUX/PS[C]
                            BUS-A←SR,                         !
                            BUS-B←BSPLO(R17),                 !
            P3,     BSPLO[17]←D,                              !SAVE ON B-SIDE
            NEXT,   J/SETSR507F                               !
 (6256)  DCS[0.00.0.0.0.0]  BM[0100..00.11..00.00..011..001...0.1.1..0..0...0.0000...0..0110.0...11.000...010.101.111]

    6257:  !(FREE)
    SETSR507F:
            P0,     BUMP-VERIFY,                              !COUNT
            P2-T,   D←A-PLUS-B-PLUS-D[C], D[C]←ALU15,         !SET D[C]=0
                    SR←A-PLUS-B-PLUS-D[C],                    !D, SR, BSP <- SR-LEFT-1, SR<01> <- PREV D[C] = PS[C]
                            BUS-A←SR,                         !
                            BUS-B←BSPLO(R17),                 !
            P3,     BSPLO[17]←D,                              !SAVE ON B-SIDE
            NEXT,   J/SETCIN507F                              !
 (6257)  DCS[0.00.0.0.0.1]  BM[0100..00.11..00.00..011..100...0.1.1..0..0...0.0000...0..0110.0...11.000...010.110.000]
```

```
	6260:	!(FREE)
	SETCIN507F:
		P2-T,	D←A-PLUS-B-PLUS-PS[C], D[C]←ALU15,	!SET D[C]=0
			SR←A-PLUS-B-PLUS-PS[C],		!D, SR, BSP <- SR-LEFT-1, SR<00> <- CIN/PS[C]
				BUS-A←SR,		!
				BUS-B←BSPLO(R17),	!
		NEXT,	J/GOBUT507F			!
  (6260)  DCS[0.00.0.0.0.0]  BM[0001..00.11..00.00..011..100...0.1.1..0..0...0.0000...0..0000.0...11.000...010.110.001]

	6261:	!(FREE)
	GOBUT507F:
		SETUP,	RETURN/SCOPE507,		!RETURN TO SCOPE LOOP TEST WORD
		NEXT,	GOTO-PAGE(7),			!BUT TABLE
			J/BUTSR3-0			!CHECK THAT WE GOT "0111" = (07)
  (6261)  DCS[0.00.0.0.0.0]  BM[0110..00.01..01.10..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.111.110]





	6262:	!(FREE)
	SCOPE507:
		P0,	BUSDIN←EMIT-[I],		!KEEP EMIT FOR CONSTANTS
		P2,	PS←D-[I],			!ZERO PS; D LEFT ZERO FROM
							!PREVIOUS TESTS IF ALL OK
		NEXT,	BUTD[SCOPE],			!NO ERROR: "TEST510A" (+1. WORDS)
			J/TEST510A			!   ERROR: "EXPEC507A" (-21. WORDS)
  (6262)  DCS[0.00.0.1.0.0]  BM[1000..00.00..00.01..010..010...0.0.0..0..0...1.1011...0..0000.0...11.000...110.000.011]






	! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

	!*** TEST 510 ***

	!TESTS 510 A-F USE PS<7:5>H="111", PS<4>H="1", VARIOUS FLAG<7,0>H COMBINATIONS,
	!  TO TEST THE INTR-HIGH-H, SERVICE-H, AND MASKED-PS[T]-H LOGIC

	! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

	!* TEST 510A *
	!CHECK THAT BG-SERVICE(0)H=HIGH WHEN PS<7:5>H="111" (PSW PRIORITY 7); EG, BR>PS-H=LOW, SINCE NO
	!  EXTERNAL UNIBUS DEVICE CAN THEN REQUEST AN INTERRUPT (IE, IT IS MASKED OUT)
	6603:
	TEST510A:
		P0,	LOAD-ENUA(ZTARGET407),		!BIT<02> SET
			LOAD-ERROR(TEST510A),		!ERROR DIRECTORY KEY
			DCS-CTR(CS.),			!COMPARE AT TARGET
		NEXT,	J/SETONES510A			!
  (6603)  DCS[1.00.1.0.0.0]  BM[1010..00.11..11.00..000..111...0.0.0..0..0...0.0000...0..0000.0...11.000...110.000.110]
```

```
    6606:
    SETONES510A:
            P2-T,    D←ALL-ONES, SAVE-D[C],                 !ALL ONES FOR LOAD PRIORITY 7
            NEXT,    J/LOADPRIO510A                         !
 (6606)  DCS[0.00.0.0.0.0]  BM[1111..00.00..11.01..101..111...0.1.0..0..0...0.0000...0..0000.0...11.000...010.110.011]

    6263:  !(FREE)
    LOADPRIO510A:
            P0,      BUSDIN←EMIT-[I],                       !KEEP IT ON
            P3-T,    PS[7-4]←D[7-4]-[I],                    !PRIO 7, T-BIT (PS04) SET
            NEXT,    J/GOBUT510A                            !
 (6263)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.01..010..000...1.0.0..0..0...1.1011...0..0000.0...11.000...010.110.100]

    6264:  !(FREE)
    GOBUT510A:
            SETUP,   RETURN/TEST510B,                       !RETURN TO START OF NEXT SUBTEST
            NEXT,    GOTO-PAGE(7),                          !BUT TABLE
                     J/BUTBGSERVL                           !BG-SERVICE(0)H IN BIT<02>
 (6264)  DCS[0.00.0.0.0.0]  BM[0110..00.11..01.11..101..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.001.110]





    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    !* TEST 510B *
    !CHECK THAT BUT[ NOT(BG-SERVICE(0)H) + NOT(FLTPT-SERVICE-L) ] IN BIT<03>
    !  SEES BG-SERVICE(0)H=HIGH, FLTPT-SERVICE-L=HIGH, AND THUS IS NOT ASSERTED (=LOW)
    6675:
    TEST510B:
            P0,      LOAD-ENUA(ZTARGET407),                 !BIT<03> CLEAR
                     LOAD-ERROR(TEST510B),                  !ERROR DIRECTORY KEY
                     DCS-CTR(C3.),                          !COMPARE AT TARGET
            NEXT,    J/GOBUT510B                            !
 (6675)  DCS[1.00.1.0.0.0]  BM[1100..00.11..11.00..000..111...0.0.0..0..0...0.0000...0..0000.0...11.000...010.110.101]

    6265:  !(FREE)
    GOBUT510B:
            SETUP,   RETURN/TEST510C,                       !RETURN TO START OF NEXT SUBTEST
            NEXT,    GOTO-PAGE(7),                          !BUT TABLE
                     J/BUTBGFPSERV                          !RESULT IN BIT<03>
 (6265)  DCS[0.00.0.0.0.0]  BM[0110..00.11..00.01..110..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.000.111]





    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    !* TEST 510C *
```

```
!CHECK THAT SERVICE-H=INTR-HIGH-H*BG-SERVICE(0)H*NOT(FLAG<7>H) IS HIGH,
!  WHEN INTR-HIGH-H=LOW, BG-SERVICE(0)H=HIGH, FLAG<7>H=LOW
6616:
TEST510C:
        P0,     LOAD-ENVA(ZTARGET403),                  !BIT<00> SET
                LOAD-ERROR(TEST510C),                   !ERROR DIRECTORY KEY
                DCS-CTR(C3.),                           !COMPARE AT TARGET
        NEXT,   J/GOBUT510C                             !
(6616)  DCS[1.00.1.0.0.0]  BM[1100..00.11..11.00..000..011...0.0.0..0..0...0.0000...0..0000.0...11.000...010.110.110]

6266:   !(FREE)
GOBUT510C:
        SETUP,  RETURN/TEST510D,                        !RETURN TO START OF NEXT SUBTEST
        NEXT,   GOTO-PAGE(7),                           !BUT TABLE
                J/BUTSERVICE                            !SERVICE-H IN BIT<00>
(6266)  DCS[0.00.0.0.0.0]  BM[0110..00.11..00.00..000..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.101]



!`- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

!* TEST 510D *
!SET ONLY FLAG<0>H, FLAG<7>H, LEAVE PS<04>H SET,
!CHECK MASKED-PS[T]-H=PS<04>H*FLAG<0>L IS LOW
6600:
TEST510D:
        P0,     LOAD-ENVA(ZTARGET406),                  !BIT<00> CLEAR
                LOAD-ERROR(TEST510D),                   !ERROR DIRECTORY KEY
                DCS-CTR(C7.),                           !COMPARE AT TARGET
                BUMP-VERIFY,                            !COUNT
        NEXT,   J/FLAG510D                              !
(6600)  DCS[1.00.1.0.0.1]  BM[1000..00.11..11.00..000..110...0.0.0..0..0...0.0000...0..0000.0...11.000...010.110.111]

6267:   !(FREE)
FLAG510D:
        P3,     CSPD[01]+EMIT,                          !
                EMIT/040401,                            !BITS FOR FLAG<7,0> ONLY, BIT<00> OF D
        NEXT,   J/ENFLAG510D                            !
(6267)  DCS[0.00.0.0.0.0]  BM[0100..10.00..01.00..000..001...0.0.0..0..0...0.1110...1..0000.0...11.000...010.111.000]

6270:   !(FREE)
ENFLAG510D:
        P3-T,   D+CSPD(D01), D[C]+0,                    !INTO D
        NEXT,   J/SETFLAG510D                           !
(6270)  DCS[0.00.0.0.0.0]  BM[1010..10.00..00.00..000..000...1.1.0..0..0...0.1110...0..0000.0...11.000...010.111.001]

6271:   !(FREE)
SETFLAG510D:
        P3-T,   FLAG[8-0]+D[15-8]-[I],                  !SET FLAGS<7,0>H ONLY
        NEXT,   J/GOBUT510D                             !
(6271)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.01..000..001...1.0.0..0..0...1.1011...0..0000.0...11.000...010.111.010]

6272:   !(FREE)
```

```
    GOBUT510D:
            SETUP,  RETURN/TEST510DA,                          !RETURN TO START OF NEXT SUBTEST
            NEXT,   GOTO-PAGE(7),                              !BUT TABLE HERE
                    J/BUTMMASKPS[T]                            !FLAG<0>L*PS<04>H IN BIT<00>
(6272) DCS[0.00.0.0.0.0] BM[0110..00.11..00.01..111..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.001.111]




    ! - - - - - - - - - - - - - - - - - - - - - - - - - - -

    !*** TEST 510DA ***
    !DO THE "MULTIPLE BUT" ON "D<00>H" TO CHECK IT'S SET  (DURING TEST510D, ABOVE)
    6617:
    TEST510DA:
            P0,     LOAD-ENUA(ZTARGET407),                     !BIT<00> SET
                    LOAD-ERROR(TEST510DA),                     !ERROR DIRECTORY KEY
                    DCS-CTR(C4.),                              !COMPARE AT TARGET
                    BUMP-VERIFY,                               !COUNT
            NEXT,   J/GOBUT510DA                               !
(6617) DCS[1.00.1.0.0.1] BM[1011..00.11..11.00..000..111...0.0.0..0..0...0.0000...0..0000.0...11.000...010.111.011]

    6273:  !(FREE)
    GOBUT510DA:
            SETUP,  RETURN/TEST510E,                           !RETURN TO START OF NEXT SUBTEST
            NEXT,   GOTO-PAGE(7),                              !BUT TABLE
                    J/BUTMD00                                  !D<00>-H IN BIT<00>
(6273) DCS[0.00.0.0.0.0] BM[0110..00.11..00.00..100..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.010.001]




    ! - - - - - - - - - - - - - - - - - - - - - - - - - - -

    !* TEST 510E *
    !CHECK THAT SERVICE-H=INTR-HIGH-H*BG-SERVICE(0)H*NOT(FLAG<7>H) IS HIGH,
    !  WHEN INTR-HIGH-H=HIGH, BG-SERVICE(0)H=HIGH, FLAG<7>H=HIGH
    6604:
    TEST510E:
            P0,     LOAD-ENUA(ZTARGET403),                     !BIT<00> SET
                    LOAD-ERROR(TEST510E),                      !ERROR DIRECTORY KEY
                    DCS-CTR(C4.),                              !COMPARE AT TARGET
            NEXT,   J/ZERO0510E                                !
(6604) DCS[1.00.1.0.0.0] BM[1011..00.11..11.00..000..011...0.0.0..0..0...0.0000...0..0000.0...11.000...010.111.100]

    6274:  !(FREE)
    ZERO0510E:
            P2-T,   D←ZERO, D[C]←ALU15,                        !ZEROES FOR BELOW
            NEXT,   J/GOBUT510E                                !
(6274) DCS[0.00.0.0.0.0] BM[0011..00.00..00.00..000..100...0.1.0..0..0...0.0000...0..0000.0...11.000...010.111.101]

    6275:  !(FREE)
```

```
GOBUT510E:
        PO,     BUMP-VERIFY,                            !COUNT
        SETUP,  RETURN/TEST510F,                        !RETURN TO START OF NEXT SUBTEST
        NEXT,   GOTO-PAGE(7),                           !BUT TABLE HERE
                J/BUTSERVICE                            !SERVICE-H IN BIT<00>
(6275) DCS[0.00.0.0.0.1] BM[0110..00.11..00.01..000..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.101]




! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

!* TEST 510F *
!CHECK THAT SERVICE-H=INTR-HIGH-H*BG-SERVICE(0)H*NOT(FLAG<7>H) IS LOW,
!  WHEN INTR-HIGH-H=HIGH, BG-SERVICE(0)H=HIGH, FLAG<7>H=LOW
6610:
TEST510F:
        PO,     LOAD-ENVA(ZTARGET402),                  !BIT<00> CLEAR
                LOAD-ERROR(TEST510F),                   !ERROR DIRECTORY KEY
                DCS-CTR(C4.),                           !COMPARE AT TARGET
        NEXT,   J/ZEROFLAGS10E                          !
(6610) DCS[1.00.1.0.0.0] BM[1011..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...010.111.110]

6276:  !(FREE)
ZEROFLAGS10E:
        P2,     PS+D-[I],                               !ZERO PS-T-BIT, AND ALL THE OTHERS,
                FPS[7-4]+D[7-4]-[I],                    !ZERO THE FPS
        P3,     FLAG[8-0]+D[15-8]-[I],                  !ZERO FLAGS (D ZEROED ABOVE)
        NEXT,   J/GOBUT510F                             !
(6276) DCS[0.00.0.0.0.0] BM[1000..00.00..00.01..110..011...0.0.0..0..0...1.1011...0..0000.0...11.000...010.111.111]

6277:  !(FREE)
GOBUT510F:
        SETUP,  RETURN/SCOPE510,                        !RETURN TO SCOPE LOOP TEST WORD
        NEXT,   GOTO-PAGE(7),                           !BUT TABLE HERE
                J/BUTSERVICE                            !SERVICE-H IN BIT<00>
(6277) DCS[0.00.0.0.0.0] BM[0110..00.01..10.00..000..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.101]





6300:  !(FREE)
SCOPE510:
        PO,     BUSDIN+EMIT-[I],                        !KEEP EMIT FOR CONSTANTS
        P2,     PS+D-[I],                               !ZERO PS; D LEFT ZERO FROM
                                                        !PREVIOUS TESTS IF ALL OK
        NEXT,   BUTD[SCOPE],                            !NO ERROR: "TEST511A" (+11. WORDS)
                J/TEST511A                              !   ERROR: "SETONES510A" (-20. WORDS)
(6300) DCS[0.00.0.1.0.0] BM[1000..00.00..00.01..010..010...0.0.0..0..0...1.1011...0..0000.0...11.000...110.000.111]
```

```
        ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

        !
        !       THIS FIRST SUBROUTINE COPIES:
        !               CSP(D6) -> FPS<7:4>
        !               CSP(D5) -> FLAGS<8:4,2:0>, EXFLAG<2:1>
        !       THEN RETURNS
        !
        7073:  !(FREE)
        FLAGFPSSEQLOD:
                P3-T,   D←CSPD(D06), D[C]←0,                    !GET VALUE TO LOAD TO FPS<7:4>H
                NEXT,   J/FLAGFPS02                             !
    (7073)  DCS[0.00.0.0.0.0]  BM[1010..10.00..00.00..000..000...1.1.0..0..0...0.1001...0..0000.0...11.000...000.111.101]

        7075:  !(FREE)
        FLAGFPS02:
                P0,     BUSDIN←EMIT-[I],                        !
                P3-T,   FPS[7-4]←D[7-4]-[I],                    !LOAD FPS<7:4>H FROM D<7:4>H
                NEXT,   J/FLAGFPS03                             !
    (7075)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.01..100..000...1.0.0..0..0...1.1011...0..0000.0...11.000...000.111.110]

        7076:  !(FREE)
        FLAGFPS03:
                P3-T,   D←CSPD(D05), D[C]←0,                    !GET VALUE TO LOAD TO FLAGS<8:0>H,
                NEXT,   J/FLAGFPS04                             !EXFLAG<2:1>H
    (7076)  DCS[0.00.0.0.0.0]  BM[1010..10.00..00.00..000..000...1.1.0..0..0...0.1010...0..0000.0...11.000...000.111.111]

        7077:  !(FREE)
        FLAGFPS04:
                P0,     BUSDIN←EMIT-[I],                        !KEEP IT ON
                P3-T,   FLAG[8-0]←D[15-8]-[I],                  !LOAD FLAGS FROM D
                NEXT,   BUTA(RETURN),                           !AND RETURN
                        J/BUTERROR7                             !
    (7077)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.01..000..001...1.0.0..0..0...1.1011...0..0000.0...11.111...011.111.110]

        !
        !       THIS SECOND SUBROUTINE COPIES:
        !               CSP(D5) -> PS<15:12>
        !               CSP(D6) -> PS<7:4>
        !               CSP(D7) -> PS<3:0>
        !       THEN RETURNS
        !
        7100:  !(FREE)
        PSSEQLOD:
                P3-T,   D←CSPD(D05), D[C]←0,                    !GET VALUE TO LOAD PS<15:12>H
                NEXT,   J/PSSEQLOD02                            !
    (7100)  DCS[0.00.0.0.0.0]  BM[1010..10.00..00.00..000..000...1.1.0..0..0...0.1010...0..0000.0...11.000...001.000.001]

        7101:  !(FREE)
        PSSEQLOD02:
                P0,     BUSDIN←EMIT-[I],                        !
                P3-T,   PS[15-12]←D[15#13]-[I],                 !LOAD PS<15-12>H FROM D<15,13>H
                NEXT,   J/PSSEQLOD03                            !
```

```
(7101) DCS[0.00.0.0.0.0] BM[0000..00.00..00.01..000..010...1.0.0..0..0...1.1011...0..0000.0...11.000...001.000.010]

   7102: !(FREE)
   PSSEQL0D03:
           P3-T,    D←CSPD(D06), D[C]←0,          !GET VALUE TO LOAD PS<7:4>H
           NEXT,    J/PSSEQL0D04                  !
(7102) DCS[0.00.0.0.0.0] BM[1010..10.00..00.00..000..000...1.1.0..0..0...0.1001...0..0000.0...11.000...001.000.011]

   7103: !(FREE)
   PSSEQL0D04:
           P0,      BUSDIN←EMIT-[I],              !
           P3-T,    PS[7-4]←D[7-4]-[I],           !LOAD PS<7:4>H FROM D<7:4>H
           NEXT,    J/PSSEQL0D05                  !
(7103) DCS[0.00.0.0.0.0] BM[0000..00.00..00.01..010..000...1.0.0..0..0...1.1011...0..0000.0...11.000...001.000.100]

   7104: !(FREE)
   PSSEQL0D05:
           P3-T,    D←CSPD(D07), D[C]←0,          !GET VALUE TO LOAD TO PS<3:0>H
           NEXT,    J/PSSEQL0D06                  !
(7104) DCS[0.00.0.0.0.0] BM[1010..10.00..00.00..000..000...1.1.0..0..0...0.1000...0..0000.0...11.000...001.000.101]

   7105: !(FREE)
   PSSEQL0D06:
           P0,      BUSDIN←EMIT-[I],              !KEEP IT ON
           P2-T,    PS[3-0]←D[3-0]-[I],           !LOAD PS<3:0>H FROM D<3:0>H
           NEXT,    BUTA(RETURN),                 !AND RETURN
                    J/BUTERROR7                   !
(7105) DCS[0.00.0.0.0.0] BM[1000..00.00..00.01..000..000...0.0.0..0..0...1.1011...0..0000.0...11.111...011.111.110]





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   .TOC    *    TEST511:  MFSS LOGIC TESTS


   !*****************************************************************************************
   !*
   !*     TESTS:  511 A - B                              UWORDS:  022 + 060
   !*
   !*     FUNCTIONS:
   !*
   !*     THE FOLLOWING TESTS VERIFY THAT THE "MF SAME STACK" LOGIC OPERATES
   !*     CORRECTLY, AND THAT THE "SR6-H" DECODE IS CORRECT.
   !*
   !*****************************************************************************************



   !
   !      SUMMARY OF "MF SAME STACK H" LOGIC TESTS
```

```
        !
        !   MF SAME STACK H = FLAG2-H * IR8-H * IR7-H * IR6-L * (PS15-H=PS13-H)-H
        !
        !   TEST   PS15,13H  FLAG2H  IR8-6H/SR6H  MFSS-H   DATA
        !   ----   --------  ------  -----------  ------   ------
        !
        !    A1       0-0       1       110-1        1     002601
        !
        !    A2       0-1       1       110-1        0     022600
        !
        !    A3       1-1       1       110-1        1     122601
        !
        !    A4       1-0       1       110-1        0     102600
        !
        !
        !    B1       0-0       0       110-1        0     000600
        !
        !    B2       0-0       1       010-0        0     002200
        !
        !    B3       0-0       1       100-0        0     002400
        !
        !    B4       0-0       1       111-0        0     002700
        !
        !
        !
        !   TESTING SUBR USED FOR ABOVE TESTS USES THE DATA AS FOLLOWS:
        !
        !   DATA<15,13> -> PS<15,13>,   DATA<10> -> FLAG<2>,
        !   DATA<8:6> -> IR<8:6>,   DATA<0> = EXPECTED MFSS-H OUTPUT


    6232:  !(FREE)
    MFSS01:
            P2-U,    IR+DBUF-[I],                        !DONT CARE ABOUT AFFECT, ONLY SET
            P3,      DBUF+D-[I],                         !THESE UCONS UP
            NEXT,    J/MFSS02                            !
 (6232)  DCS[0.00.0.0.0.0]  BM[0100..00.00..00.01..000..100...0.0.0..0..0...1.1011...0..0000.0...11.000...011.000.010]

    6302:  !(FREE)
    MFSS02:
            P2-T,    D+CSPB(B17), D[C]+ALU00,            !GET DATA INTO D, D[C]+EXPECTED MFSS-H
            P2-U,    IR+DBUF,                            !IGNORE FOR NOW
            P3,      DBUF+D,                             !GET DATA INTO DBUF, TO GO TO IR NEXT
            NEXT,    J/MFSS03                            !
 (6302)  DCS[0.00.0.0.0.0]  BM[1010..11.00..00.00..000..010...0.1.0..0..0...1.1010...0..0000.0...11.000...011.000.011]

    6303:  !(FREE)
    MFSS03:
            P0,      BUMP-VERIFY,                        !COUNT
            P2-U,    IR+DBUF,                            !SETUP IR<8:6> FROM DATA<8:6>
            P3,      DBUF+D,                             !IGNORE FOR NOW
            NEXT,    J/MFSS04                            !
 (6303)  DCS[0.00.0.0.0.1]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...1.1010...0..0000.0...11.000...011.000.100]
```

```
        6304:  !(FREE)
        MFSS04:
                PO,     BUSDIN←EMIT-[I],                        !RESET
                P3,     FLAG[8-0]←D[15-8]-[I],                  !SETUP FLAG<2> FROM DATA<10>
                        PS[15-12]←D[15&13]-[I],                 !SETUP PS<15,13> FROM D<15,13>
                NEXT,   BUTR(D[C]-A),                           !IF EXPECT MFSS-H=(1), J/MFSS06
                        J/MFSS05                                !IF EXPECT MFSS-H=(0), J/MFSS05
  (6304)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.01..000..011...0.0.0..0..0...1.1011...0..0000.0...01.111...101.101.010]

        !* COME HERE IF EXPECT MFSS-H=(0)
        6552:
        MFSS05:
                PO,     LOAD-ENUA(MFSSEXPEC0),                  !SETUP FOR (0)
                        LOAD-ERROR(MFSS05),                     !ERROR DIRECTORY KEY
                        DCS-CTR(C1.),                           !COMPARE AT TARGET
                        BUMP-VERIFY,                            !COUNT
                NEXT,   BUTR(MFSS),                             !TEST MFSS:  (0)=MFSSEXPEC0, (1)=MFSSEXPEC1
                        J/MFSSEXPEC0                            !
  (6552)  DCS[1.00.1.0.0.1]  BM[1110..00.11..01.01..100..101...0.0.0..0..0...0.0000...0..0000.0...01.100...101.100.101]

        !* COME HERE IF EXPECT MFSS-H=(1)
        6553:
        MFSS06:
                P1,     LOAD-ENUA(MFSSEXPEC1),                  !SETUP FOR (0)
                        LOAD-ERROR(MFSS06),                     !ERROR DIRECTORY KEY
                        DCS-CTR(C1.),                           !COMPARE AT TARGET
                NEXT,   BUTR(MFSS),                             !TEST MFSS:  (0)=MFSSEXPEC0, (1)=MFSSEXPEC1
                        J/MFSSEXPEC0                            !
  (6553)  DCS[1.00.1.0.0.0]  BM[1110..00.11..01.01..100..111...0.0.0..0..0...0.0000...0..0000.0...01.100...101.100.101]


        !* COME HERE IF MFSS-H TESTS AS A (0)
        6545:
        MFSSEXPEC0:
                PO,     BUSDIN←EMIT-[I],                        !RESET PROC UCON
                NEXT,   BUTA(RETURN),                           !AND RETURN
                        J/BUTERROR6                             !*** COMPARE DONE HERE ***
  (6545)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.01..000..000...0.0.0..0..0...1.1001...0..0000.0...11.111...011.111.110]

        !* COME HERE IF MFSS-H TESTS AS A (1)
        6547:
        MFSSEXPEC1:
                PO,     BUSDIN←EMIT-[I],                        !RESET PROC UCON
                NEXT,   BUTA(RETURN),                           !AND RETURN
                        J/BUTERROR6                             !*** COMPARE DONE HERE ***
  (6547)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.01..000..000...0.0.0..0..0...1.1001...0..0000.0...11.111...011.111.110]

        ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

        !       THE TESTS ACTUALLY START HERE:

        ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -


```

```
       6607:
       TEST511A:
               P0,     LOAD-ERROR(TEST511A),                     !ERROR DIRECTORY KEY
               P3,     CSPD[17]+EMIT, EMIT/002601,               !* TEST 511 A1 DATA *
               NEXT,   J/GOTEST511A1                             !
   (6607)  DCS[1.00.0.0.0.0]  BM[0000..10.01..01.10..000..001...0.0.0..0..0...0.0000...1..0000.0...11.000...101.101.000]

       6550:
       GOTEST511A1:
               SETUP,  RETURN/TEST511A2,                         !GO DO THE TEST
               NEXT,   CALL[MFSS-TEST]                           !
   (6550)  DCS[0.00.0.0.0.0]  BM[0111..00.00..01.11..100..110...0.0.0..0..0...0.0000...0..0000.0...11.100...010.011.010]


       7074:  !(FREE)
       TEST511A2:
               P3,     CSPD[17]+EMIT, EMIT/022600,               !* TEST 511 A2 DATA *
               NEXT,   J/GOTEST511A2                             !
   (7074)  DCS[0.00.0.0.0.0]  BM[0010..10.01..01.10..000..000...0.0.0..0..0...0.0000...1..0000.0...11.000...001.000.111]

       7107:  !(FREE)
       GOTEST511A2:
               SETUP,  RETURN/TEST511A3,                         !GO DO THE TEST
               NEXT,   CALL[MFSS-TEST]                           !
   (7107)  DCS[0.00.0.0.0.0]  BM[0111..00.00..10.01..000..110...0.0.0..0..0...0.0000...0..0000.0...11.100...010.011.010]


       7110:  !(FREE)
       TEST511A3:
               P3,     CSPD[17]+EMIT, EMIT/122601,               !* TEST 511 A3 DATA *
               NEXT,   J/GOTEST511A3                             !
   (7110)  DCS[0.00.0.0.0.0]  BM[1010..10.01..01.10..000..001...0.0.0..0..0...0.0000...1..0000.0...11.000...001.001.001]

       7111:  !(FREE)
       GOTEST511A3:
               SETUP,  RETURN/TEST511A4,                         !GO DO THE TEST
               NEXT,   CALL[MFSS-TEST]                           !
   (7111)  DCS[0.00.0.0.0.0]  BM[0111..00.00..10.01..010..110...0.0.0..0..0...0.0000...0..0000.0...11.100...010.011.010]


       7112:  !(FREE)
       TEST511A4:
               P3,     CSPD[17]+EMIT, EMIT/102600,               !* TEST 511 A4 DATA *
               NEXT,   J/GOTEST511A4                             !
   (7112)  DCS[0.00.0.0.0.0]  BM[1000..10.01..01.10..000..000...0.0.0..0..0...0.0000...1..0000.0...11.000...001.001.011]

       7113:  !(FREE)
       GOTEST511A4:
               SETUP,  RETURN/SCOPE511A,                         !GO DO THE TEST
               NEXT,   CALL[MFSS-TEST]                           !
   (7113)  DCS[0.00.0.0.0.0]  BM[0110..00.01..10.00..001..110...0.0.0..0..0...0.0000...0..0000.0...11.100...010.011.010]
```

```
        6301:   !(FREE)
        SCOPE511A:
                P3,       CSPD[17]←EMIT, EMIT/002601,                  !RESET DATA FOR TEST 511 A1
                NEXT,     BUTD[SCOPE],                                 !NO ERROR:  "TEST511B1" (+1. WORDS)
                          J/TEST511B1                                  !   ERROR:  "GOTEST511A1" (-7. WORDS)
     (6301)  DCS[0.00.0.1.0.0]  BM[0000..10.01..01.10..000..001...0.0.0..0..0...0.0000...1..0000.0...11.000...101.101.001]




        ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -


        6551:
        TEST511B1:
                P3,       CSPD[17]←EMIT, EMIT/000600,                  !* TEST 511 B1 DATA *
                NEXT,     J/GOTEST511B1                                !
     (6551)  DCS[0.00.0.0.0.0]  BM[0000..10.00..01.10..000..000...0.0.0..0..0...0.0000...1..0000.0...11.000...101.101.100]

        6554:
        GOTEST511B1:
                SETUP,    RETURN/TEST511B2,                            !GO DO THE TEST
                NEXT,     CALL[MFSS-TEST]                              !
     (6554)  DCS[0.00.0.0.0.0]  BM[0111..00.00..10.00..110..110...0.0.0..0..0...0.0000...0..0000.0...11.100...010.011.010]


        7106:   !(FREE)
        TEST511B2:
                P3,       CSPD[17]←EMIT, EMIT/002200,                  !* TEST 511 B2 DATA *
                NEXT,     J/GOTEST511B2                                !
     (7106)  DCS[0.00.0.0.0.0]  BM[0000..10.01..00.10..000..000...0.0.0..0..0...0.0000...1..0000.0...11.000...001.001.101]

        7115:   !(FREE)
        GOTEST511B2:
                SETUP,    RETURN/TEST511B3,                            !GO DO THE TEST
                NEXT,     CALL[MFSS-TEST]                              !
     (7115)  DCS[0.00.0.0.0.0]  BM[0111..00.00..10.01..110..110...0.0.0..0..0...0.0000...0..0000.0...11.100...010.011.010]


        7116:   !(FREE)
        TEST511B3:
                P3,       CSPD[17]←EMIT, EMIT/002400,                  !* TEST 511 B3 DATA *
                NEXT,     J/GOTEST511B3                                !
     (7116)  DCS[0.00.0.0.0.0]  BM[0000..10.01..01.00..000..000...0.0.0..0..0...0.0000...1..0000.0...11.000...001.001.111]

        7117:   !(FREE)
        GOTEST511B3:
                SETUP,    RETURN/TEST511B4,                            !GO DO THE TEST
                NEXT,     CALL[MFSS-TEST]                              !
     (7117)  DCS[0.00.0.0.0.0]  BM[0111..00.00..10.10..000..110...0.0.0..0..0...0.0000...0..0000.0...11.100...010.011.010]
```

```
        7120:  !(FREE)
        TEST511B4:
                P3,     CSPD[17]←EMIT, EMIT/002700,             !* TEST 511 B4 DATA *
                NEXT,   J/GOTEST511B4                           !
(7120)  DCS[0.00.0.0.0.0]  BM[0000..10.01..01.11..000..000...0.0.0..0..0...0.0000...1..0000.0...11.000...001.010.001]

        7121:  !(FREE)
        GOTEST511B4:
                SETUP,  RETURN/SCOPE511B,                       !GO DO THE TEST
                NEXT,   CALL[MFSS-TEST]                         !
(7121)  DCS[0.00.0.0.0.0]  BM[0110..00.01..10.00..101..110...0.0.0..0..0...0.0000...0..0000.0...11.100...010.011.010]


        6305:  !(FREE)
        SCOPE511B:
                P3,     CSPD[17]←EMIT, EMIT/000600,             !RESET DATA FOR TEST 511 B1
                NEXT,   BUTD[SCOPE],                            !NO ERROR:  "SETUPS12A" (+1. WORDS)
                        J/SETUPS12A                             !   ERROR:  "GOTEST511B1" (-7. WORDS)
(6305)  DCS[0.00.0.1.0.0]  BM[0000..10.00..01.10..000..000...0.0.0..0..0...0.0000...1..0000.0...11.000...101.101.101]





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        .TOC    *    TEST512:  KT SRC/DST ADDRESSING LOGIC TESTS



        !****************************************************************************************
        !*
        !*      TESTS:  512 A - E                               UWORDS:  044 + 062
        !*
        !*      FUNCTIONS:
        !*
        !*      THE FOLLOWING TEN TESTS VERIFY THE KT-SRC/DST-ADDRS ROM OUTPUT AND INPUT LINES
        !*      FUNCTION CORRECTLY, IN RESPECT TO NO STUCK ONE/ZERO CONDITIONS.
        !*
        !****************************************************************************************


        !       KT SRC/DST LOGIC EQUATIONS:        (IMPLEMENTED IN ROM)
        !
        !       KT-SRC-ADDRS-3 =          NOT-F2.AND.SR6.AND.PS15
        !                          .OR.   F2.AND.SR6.AND.NOT-SMO.AND.PS15
        !                          .OR.   F2.AND.SR6.AND.SMO.AND.PS13.AND.NOT-FLTPT
        !                          .OR.   SR6.AND.PS15.AND.FLTPT
        !
        !       KT-DST-ADDRS-3 =          NOT-F1.AND.DR6.AND.PS15
```

```
!                         .OR.     F1.AND.DR6.AND.NOT-DMO.AND.PS15
!                         .OR.     F1.AND.DR6.AND.DMO.AND.PS13.AND.NOT-FLTPT
!                         .OR.     DR6.AND.PS15.AND.FLTPT
!
!
!       SUMMARY OF KT ASP/BSP SRC/DST STACK POINTER ADDRESSING LOGIC:
!
!       TEST    PS      FLAG                                                        KT-SRC   KT-DST
!       NUMB    15:13H  2:1H       IR     FLTL     SMOH     SR6H     DMOH     DR6H     ADR-H    ADR-H    HOW READ:
!       ----    ------  ----     ------   ----     ----     ----     ----     ----     ------   ------   -----------
!
!        A1      1,0    1,1      172206    0        0        0        1        1        0                 ASPHI[SF]=(02)
!        A2                                                                                    1        BSPHI[DF]=(16)
!
!        B1      0,1    1,0      070606    1        1        1        1        1                 0        ASPHI[DF]=(06)
!        B2                                                                           1                 BSPHI[SF]=(16)
!
!        C1      0,1    1,1      134606    1        0        1        1        1                 1        ASPHI[DF]=(16)
!        C2                                                                           0                 BSPHI[SF]=(06)
!
!        D1      1,0    0,1      160612    1        1        1        0        0        1                 ASPHI[SF]=(16)
!        D2                                                                                    0        BSPHI[DF]=(02)
!
!        E1      1,0    1,1      150626    1        1        1        0        1                 1        ASPHI[DF]=(16)
!        E2                                                                           0                 BSPHI[SF]=(06)
!
!
!   - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
!
!
!       KT SRC/DST STACK POINTER ADDRESS MODE TEST SUBROUTINE:
!
!       ENTER WITH:     CSP(17) = VALUE TO GO INTO IR, TO SETUP FLTPT/SMO/SR6/DMO/DR6
!                       CSP(16) = BIT<15,13> -> PS<15,13>
!                                 BIT<10:09> -> FLAG<2:1>
!                                 ** BIT<00> IS AN INTERNAL FLAG TO INDICATE WHICH REGISTER
!                                       TO PUT IN THE SR ON EXIT:
!                                       BIT<00> = (1) -> ASPHI[DF],  BIT<00> = (0) -> ASPHI[SF]
!

     7114:  !(FREE)
     KTSRCDST01:
             P2-T,    D←CSPD(D17), D[C]←0,                    !INITIAL DATA TO GO INTO IR
             NEXT,    J/KTSRCDST02                             !
 (7114)  DCS[0.00.0.0.0.0]  BM[1010..10.00..00.00..000..000...0.1.0..0..0...0.0000...0..0000.0...11.000...001.010.011]

     7123:  !(FREE)
     KTSRCDST02:
             P2-U,    IR←DBUF-[I],                             !IGNORE FOR NOW
             P3,      DBUF←D-[I],                              !COPY IR DATA FROM D -> DBUF
             NEXT,    J/KTSRCDST03                             !
 (7123)  DCS[0.00.0.0.0.0]  BM[0100..00.00..00.01..000..100...0.0.0..0..0...1.1011...0..0000.0...11.000...001.010.100]

     7124:  !(FREE)
```

```
    KTSRCDST03:
            P2-U,     IR←DBUF,                                  !COPY IR DATA FROM DBUF -> IR
            P3-T,     D←CSPB(B16), D[C]←ALUOO,                  !GET PS/FLAGS/REGISTER SELECT DATA
            P3,       DBUF←D,                                   !D[C] = REGISTER SELECT FLAG
            NEXT,     J/KTSRCDST04                              !
 (7124)  DCS[0.00.0.0.0.0]  BM[1010..11.01..00.00..000..010...1.1.0..0..0...1.1010...0..0000.0...11.000...001.010.101]

    7125:  !(FREE)
    KTSRCDST04:
            P0,       BUSDIN←EMIT-[I],                          !KEEP IT ON
            P3,       PS[15-12]←D[15&13]-[I],                   !SETUP PS<15,13> AS REQUIRED
                      FLAG[8-0]←D[15-8]-[I],                    !SETUP FLAG<2:1> AS REQUIRED
            NEXT,     J/KTSRCDST04B                             !
 (7125)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.01..000..011...0.0.0..0..0...1.1011...0..0000.0...11.000...001.010.110]

    7126:  !(FREE)
    KTSRCDST04B:
                                                                !THIS WORD NEEDED FOR 1 UWORD DELAY FOR ROM TO SETTLE
            P2-T,     D←CSPD(C052525), SAVE-D[C],               !DATA PATTERN IN SCRATCH PAD ADDRESS [02]
            P3,       A#BSPHI[02]←D,                            !BIT<3:0> = (05)
            NEXT,     BUTR(D[C]-B),                             !KEY=(1) -> READ ASPHI[DF] -> SR
                      J/KTSRCDST05                              !KEY=(0) -> READ ASPHI[SF] -> SR
 (7126)  DCS[0.00.0.0.0.0]  BM[1010..10.10..00.00..101..111...0.1.0..0..0...0.0111...0..1011.0...10.011...011.011.101]

    !ENTER HERE IF D[C] CLEAR, SF SELECTED
    7335:
    KTSRCDST05:
            P2-T,     SR←ASPHI[SF],                             !USE ASP/SF
            NEXT,     J/BUTSR3-0                                !AND NOW GO CHECK WHOM WAS READ
 (7335)  DCS[0.00.0.0.0.0]  BM[1111..00.00..11.11..000..000...0.0.1..0..0...0.0000...0..0000.0...11.000...010.111.110]

    !ENTER HERE IF D[C] SET, DF SELECTED
    7337:
    KTSRCDST06:
            P2-T,     SR←ASPHI[DF],                             !USE ASP/DF
            NEXT,     J/BUTSR3-0                                !AND NOW GO CHECK WHOM WAS READ
 (7337)  DCS[0.00.0.0.0.0]  BM[1111..00.00..11.10..000..000...0.0.1..0..0...0.0000...0..0000.0...11.000...010.111.110]


    !* WE ALSO NEED TWO ENTRY POINTS TO READ BSP SF & DF:

    7127:  !(FREE)
    KTSRCDST07:
            P2-T,     SR←BSPHI[SF],                             !USE BSP/SF
            NEXT,     J/BUTSR3-0                                !AND NOW GO CHECK WHOM WAS READ
 (7127)  DCS[0.00.0.0.0.0]  BM[1010..01.01..00.00..000..000...0.0.1..0..0...0.0000...0..0000.0...11.000...010.111.110]


    7130:  !(FREE)
    KTSRCDST08:
            P2-T,     SR←BSPHI[DF],                             !USE BSP/DF
            NEXT,     J/BUTSR3-0                                !AND NOW GO CHECK WHOM WAS READ
 (7130)  DCS[0.00.0.0.0.0]  BM[1010..01.00..00.00..000..000...0.0.1..0..0...0.0000...0..0000.0...11.000...010.111.110]
```

```
    !-----------------------------------------------------------------

    !      ***  KT SRC/DST ENTERS HERE ***

    !-----------------------------------------------------------------


    !THESE FIRST TWO WORDS DO SOME PRELIMINAR SETUP OF SCRATCHPAD LOCATIONS (06)/(16)
    6555:
    SETUPS12A:
            P2-T,    D←CSPD(C125252), D[C]←0,                     !
            P3,      A#BSPHI[06]←D,                               !KERNAL SP LOCATION:
            NEXT,    J/SETUPS12B                                  !  BIT<3:0> = (12) = SP-ADDRESS(06)
 (6555)  DCS[0.00.0.0.0.0]  BM[1010..10.10..00.00..111..000...0.1.0..0..0...0.0110...0..1011.0...11.000...011.000.111]

    6307:   !(FREE)
    SETUPS12B:
            P2-T,    D←CSPD(C000000), D[C]←0,                     !
            P3,      A#BSPHI[16]←D,                               !USER SP LOCATION:
            NEXT,    J/TEST512A1                                  !  BIT<3:0> = (00) = SP-ADDRESS(16)
 (6307)  DCS[0.00.0.0.0.0]  BM[1010..10.10..00.00..011..000...0.1.0..0..0...0.0100...0..1011.0...11.000...101.100.010]

                                                                  !A,BSPHI[02] = (052525)
                                                                  !  BIT<3:0> = (05) = SP-ADDRESS(02)

                                                                  !A,BSPHI[12] = (000152)
                                                                  !  BIT<3:0> = (12) = SP-ADDRESS(12)
                                                                  !  (NOT USED UNLESS ERROR)


    !  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -

    !* TEST 512 A1 *

    !       TEST 512 A 1-2 SETS UP FOR:  ASP-SF-ADDRESS=(02), BSP-DF-ADDRESS=(16)
    6542:
    TEST512A1:
            P0,      LOAD-ENUA(ZTARGET405),                       !BIT<3:0> = (05) = SP-ADDRESS(02)
                     LOAD-ERROR(TEST512A1),                       !ERROR DIRECTORY KEY
                     DCS-CTR(C11.),                               !COMPARE AT TARGET
            NEXT,    J/SETIRS12A1                                 !
 (6542)  DCS[1.00.1.0.0.0]  BM[0100..00.11..11.00..000..101...0.0.0..0..0...0.0000...0..0000.0...11.000...101.110.100]

    6564:
    SETIRS12A1:
            P0,      BUMP-VERIFY,                                 !COUNT
            P3,      CSPD[17]←EMIT, EMIT/172206,                  !SETUP IR:  FLTPT/SM0/SR6/DM0/DR6
            NEXT,    J/SETPSFLAG512A1                             !
 (6564)  DCS[0.00.0.0.0.1]  BM[1111..10.01..00.10..000..110...0.0.0..0..0...0.0000...1..0000.0...11.000...011.001.000]

    6310:   !(FREE)
    SETPSFLAG512A1:
            P3,      CSPD[16]←EMIT, EMIT/103000,                  !BIT<15,13> -> PS<15,13>,
```

```
                                                        !BIT<10:9>  -> FLAGS<2:1>
           NEXT,   J/GOTEST512A1                        !BIT<00> IS REGISTER KEY (SEE SUBR)
(6310)  DCS[0.00.0.0.0.0]  BM[1000..10.01..10.00..000..000...0.0.0..0..0...0.0001...1..0000.0...11.000...011.001.001]

    6311:  !(FREE)
    GOTEST512A1:
           SETUP,  RETURN/TEST512A2,                    !GO EXEC KT SRC/DST TEST SUBR AT
           NEXT,   CALL[KTSRCDST]                       !  INITIALIZATION POINT
(6311)  DCS[0.00.0.0.0.0]  BM[0110..00.10..11.00..100..111...0.0.0..0..0...0.0000...0..0000.0...11.100...001.001.100]



    !* TEST 512A2 NOW READS THE COMPLEMENTARY REGISTER TO THAT USED IN TEST512A1, INTO THE SR
    6544:
    TEST512A2:
           PO,     LOAD-ENUA(ZTARGET400),               !BIT<3:0> = (00) = SP-ADDRESS(16)
                   LOAD-ERROR(TEST512A2),               !ERROR DIRECTORY KEY
                   DCS-CTR(C4.),                        !COMPARE AT TARGET
           NEXT,   J/GOTEST512A2                        !
(6544)  DCS[1.00.1.0.0.0]  BM[1011..00.11..11.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...011.001.010]

    6312:  !(FREE)
    GOTEST512A2:
           SETUP,  RETURN/SCOPE512A,                    !READ REGISTER BSPHI[DF] TO SR,
           NEXT,   CALL[KTDSTBSP]                       !  THEN DO BUT(SR3-0)
(6312)  DCS[0.00.0.0.0.0]  BM[0110..00.01..10.01..011..111...0.0.0..0..0...0.0000...0..0000.0...11.100...001.011.000]


    6313:  !(FREE)
    SCOPE512A:
           PO,     BUSDIN+EMIT-[I],                     !RESET PROC UCON
                   EN-CLK-IR[15-00],                    !
           NEXT,   BUTD[SCOPE],                         !NO ERROR:  "TEST512B1"  (+1. WORDS)
                   J/TEST512B1                          !   ERROR:  "SETIR512A1"  (-5. WORDS)
(6313)  DCS[0.00.0.1.0.0]  BM[0000..00.00..00.01..000..100...0.0.0..0..0...1.1001...0..0000.0...11.000...101.110.101]




    !  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -

    !* TEST 512 B1 *

    !      TEST 512 B 1-2 SETS UP FOR:  ASP-DF-ADDRESS=(06), BSP-SF-ADDRESS=(16)
    6565:
    TEST512B1:
           PO,     LOAD-ENUA(ZTARGET412),               !BIT<3:0> = (12) = SP-ADDRESS(06)
                   LOAD-ERROR(TEST512B1),               !ERROR DIRECTORY KEY
                   DCS-CTR(C11.),                       !COMPARE AT TARGET
           NEXT,   J/SETIR512B1                         !
(6565)  DCS[1.00.1.0.0.0]  BM[0100..00.11..11.00..001..010...0.0.0..0..0...0.0000...0..0000.0...11.000...101.011.110]
```

```
	6536:
	SETIRS12B1:
		PO,	BUMP-VERIFY,				!COUNT
		P3,	CSPD[17]←EMIT, EMIT/070606,		!SETUP IR:  FLTPT/SMO/SR6/DMO/DR6
		NEXT,	J/SETPSFLAGS12B1			!
(6536)	DCS[0.00.0.0.0.1]  BM[0111..10.00..01.10..000..110...0.0.0..0..0...0.0000...1..0000.0...11.000...011.001.100]

	6314:  !(FREE)
	SETPSFLAGS12B1:
		P3,	CSPD[16]←EMIT, EMIT/022001,		!BIT<15,13> -> PS<15,13>,
							!BIT<10:9>  -> FLAGS<2:1>
		NEXT,	J/GOTEST512B1				!BIT<00> IS REGISTER KEY (SEE SUBR)
(6314)	DCS[0.00.0.0.0.0]  BM[0010..10.01..00.00..000..001...0.0.0..0..0...0.0001...1..0000.0...11.000...011.001.101]

	6315:  !(FREE)
	GOTEST512B1:
		SETUP,	RETURN/TEST512B2,			!GO EXEC KT SRC/DST TEST SUBR AT
		NEXT,	CALL[KTSRCDST]				!  INITIALIZATION POINT
(6315)	DCS[0.00.0.0.0.0]  BM[0110..00.10..11.00..110..111...0.0.0..0..0...0.0000...0..0000.0...11.100...001.001.100]



	!* TEST 512B2 NOW READS THE COMPLEMENTARY REGISTER TO THAT USED IN TEST512B1, INTO THE SR
	6546:
	TEST512B2:
		PO,	LOAD-ENUA(ZTARGET400),			!BIT<3:0> = (00) = SP-ADDRESS(16)
			LOAD-ERROR(TEST512B2),			!ERROR DIRECTORY KEY
			DCS-CTR(C4.),				!COMPARE AT TARGET
		NEXT,	J/GOTEST512B2				!
(6546)	DCS[1.00.1.0.0.0]  BM[1011..00.11..11.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...011.001.110]

	6316:  !(FREE)
	GOTEST512B2:
		SETUP,	RETURN/TEST512C1,			!READ REGISTER BSPHI[SF] TO SR,
		NEXT,	CALL[KTSRCBSP]				!  THEN DO BUT(SR3-0)
(6316)	DCS[0.00.0.0.0.0]  BM[0110..00.10..11.01..110..111...0.0.0..0..0...0.0000...0..0000.0...11.100...001.010.111]






	! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

	!* TEST 512 C1 *

	!	TEST 512 C 1-2 SETS UP FOR:  ASP-DF-ADDRESS=(16), BSP-SF-ADDRESS=(06)
	6556:
	TEST512C1:
		PO,	LOAD-ENUA(ZTARGET400),			!BIT<3:0> = (00) = SP-ADDRESS(16)
			LOAD-ERROR(TEST512C1),			!ERROR DIRECTORY KEY
			DCS-CTR(C11.),				!COMPARE AT TARGET
```

```
        NEXT,   J/SETIRS12C1                          !
  (6556) DCS[1.00.1.0.0.0]  BM[0100..00.11..11.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...011.001.111]

    6317:  !(FREE)
    SETIRS12C1:
        P0,     BUMP-VERIFY,                          !COUNT
        P3,     CSPD[17]+EMIT, EMIT/134606,           !SETUP IR:  FLTPT/SM0/SR6/DM0/DR6
        NEXT,   J/SETPSFLAGS12C1                      !
  (6317) DCS[0.00.0.0.0.1]  BM[1011..10.10..01.10..000..110...0.0.0..0..0...0.0000...1..0000.0...11.000...011.010.000]

    6320:  !(FREE)
    SETPSFLAGS12C1:
        P3,     CSPD[16]+EMIT, EMIT/023001,           !BIT<15,13> -> PS<15,13>,
                                                      !BIT<10:9>  -> FLAGS<2:1>
        NEXT,   J/GOTEST512C1                         !BIT<00> IS REGISTER KEY (SEE SUBR)
  (6320) DCS[0.00.0.0.0.0]  BM[0010..10.01..10.00..000..001...0.0.0..0..0...0.0001...1..0000.0...11.000...011.010.001]

    6321:  !(FREE)
    GOTEST512C1:
        SETUP,  RETURN/TEST512C2,                     !GO EXEC KT SRC/DST TEST SUBR AT
        NEXT,   CALL[KTSRCDST]                        !  INITIALIZATION POINT
  (6321) DCS[0.00.0.0.0.0]  BM[0110..00.10..11.10..110..111...0.0.0..0..0...0.0000...0..0000.0...11.100...001.001.100]



    !* TEST 512C2 NOW READS THE COMPLEMENTARY REGISTER TO THAT USED IN TEST512C1, INTO THE SR
    6566:
    TEST512C2:
        P0,     LOAD-ENUA(ZTARGET412),                !BIT<3:0> = (12) = SP-ADDRESS(06)
                LOAD-ERROR(TEST512C2),                !ERROR DIRECTORY KEY
                DCS-CTR(C4.),                         !COMPARE AT TARGET
        NEXT,   J/GOTEST512C2                         !
  (6566) DCS[1.00.1.0.0.0]  BM[1011..00.11..11.00..001..010...0.0.0..0..0...0.0000...0..0000.0...11.000...011.010.010]

    6322:  !(FREE)
    GOTEST512C2:
        SETUP,  RETURN/SCOPE512C,                     !READ REGISTER BSPHI[SF] TO SR,
        NEXT,   CALL[KTSRCBSP]                        !  THEN DO BUT(SR3-0)
  (6322) DCS[0.00.0.0.0.0]  BM[0110..00.01..10.10..011..111...0.0.0..0..0...0.0000...0..0000.0...11.100...001.010.111]


    6323:  !(FREE)
    SCOPE512C:
        P0,     BUSDIN+EMIT-[I],                      !RESET PROC UCON
                EN-CLK-IR[15-00],
        NEXT,   BUTD[SCOPE],                          !NO ERROR:  "TEST512D1"  (+1. WORDS)
                J/TEST512D1                           !   ERROR:  "SETIRS12B1"  (-11. WORDS)
  (6323) DCS[0.00.0.1.0.0]  BM[0000..00.00..00.01..000..100...0.0.0..0..0...1.1001...0..0000.0...11.000...101.011.111]
```

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!  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -

!* TEST 512 D1 *

!       TEST 512 D 1-2 SETS UP FOR:  ASP-SF-ADDRESS=(16), BSP-DF-ADDRESS=(02)
6537:
TEST512D1:
        P0,     LOAD-ENUA(ZTARGET400),                          !BIT<3:0> = (00) = SP-ADDRESS(16)
                LOAD-ERROR(TEST512D1),                          !ERROR DIRECTORY KEY
                DCS-CTR(C11.),                                  !COMPARE AT TARGET
        NEXT,   J/SETIR512D1                                    !
(6537)  DCS[1.00.1.0.0.0]  BM[0100..00.11..11.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...110.010.110]

6626:
SETIR512D1:
        P0,     BUMP-VERIFY,                                    !COUNT
        P3,     CSPD[17]+EMIT, EMIT/160612,                     !SETUP IR:  FLTPT/SM0/SR6/DM0/DR6
        NEXT,   J/SETPSFLAGS12D1                                !
(6626)  DCS[0.00.0.0.0.1]  BM[1110..10.00..01.10..001..010...0.0.0..0..0...0.0000...1..0000.0...11.000...011.010.100]

6324:  !(FREE)
SETPSFLAG512D1:
        P3,     CSPD[16]+EMIT, EMIT/101000,                     !BIT<15,13> -> PS<15,13>,
                                                                !BIT<10:9>  -> FLAGS<2:1>
        NEXT,   J/GOTEST512D1                                   !BIT<00> IS REGISTER KEY (SEE SUBR)
(6324)  DCS[0.00.0.0.0.0]  BM[1000..10.00..10.00..000..000...0.0.0..0..0...0.0001...1..0000.0...11.000...011.010.101]

6325:  !(FREE)
GOTEST512D1:
        SETUP,  RETURN/TEST512D2,                               !GO EXEC KT SRC/DST TEST SUBR AT
        NEXT,   CALL[KTSRCDST]                                  !  INITIALIZATION POINT
(6325)  DCS[0.00.0.0.0.0]  BM[0110..00.10..11.11..110..111...0.0.0..0..0...0.0000...0..0000.0...11.100...001.001.100]



!* TEST 512D2 NOW READS THE COMPLEMENTARY REGISTER TO THAT USED IN TEST512D1, INTO THE SR
6576:
TEST512D2:
        P0,     LOAD-ENUA(ZTARGET405),                          !BIT<3:0> = (05) = SP-ADDRESS(02)
                LOAD-ERROR(TEST512D2),                          !ERROR DIRECTORY KEY
                DCS-CTR(C4.),                                   !COMPARE AT TARGET
        NEXT,   J/GOTEST512D2                                   !
(6576)  DCS[1.00.1.0.0.0]  BM[1011..00.11..11.00..000..101...0.0.0..0..0...0.0000...0..0000.0...11.000...011.010.110]

6326:  !(FREE)
GOTEST512D2:
        SETUP,  RETURN/TEST512E1,                               !READ REGISTER BSPHI[DF] TO SR,
        NEXT,   CALL[KTDSTBSP]                                  !  THEN DO BUT(SR3-0)
(6326)  DCS[0.00.0.0.0.0]  BM[0110..00.10..11.11..111..111...0.0.0..0..0...0.0000...0..0000.0...11.100...001.011.000]
```

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!  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -

!* TEST 512 E1 *

!       TEST 512 E 1-2 SETS UP FOR:  ASP-DF-ADDRESS=(16), BSP-SF-ADDRESS=(06)
6577:
TESTS12E1:
        P0,     LOAD-ENUA(ZTARGET400),                  !BIT<3:0> = (00) = SP-ADDRESS(16)
                LOAD-ERROR(TEST512E1),                  !ERROR DIRECTORY KEY
                DCS-CTR(C11.),                          !COMPARE AT TARGET
        NEXT,   J/SETIRS12E1                            !
(6577)  DCS[1.00.1.0.0.0]  BM[0100..00.11..11.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...011.010.111]

6327:  !(FREE)
SETIRS12E1:
        P0,     BUMP-VERIFY,                            !COUNT
        P3,     CSPD[17]+EMIT, EMIT/150626,             !SETUP IR:  FLTPT/SM0/SR6/DM0/DR6
        NEXT,   J/SETPSFLAGS12E1                        !
(6327)  DCS[0.00.0.0.0.1]  BM[1101..10.00..01.10..010..110...0.0.0..0..0...0.0000...1..0000.0...11.000...011.011.000]

6330:  !(FREE)
SETPSFLAGS12E1:
        P3,     CSPD[16]+EMIT, EMIT/103001,             !BIT<15,13> -> PS<15,13>,
                                                        !BIT<10:9>  -> FLAGS<2:1>
        NEXT,   J/GOTEST512E1                           !BIT<00> IS REGISTER KEY (SEE SUBR)
(6330)  DCS[0.00.0.0.0.0]  BM[1000..10.01..10.00..000..001...0.0.0..0..0...0.0001...1..0000.0...11.000...011.011.001]

6331:  !(FREE)
GOTEST512E1:
        SETUP,  RETURN/TEST512E2,                       !GO EXEC KT SRC/DST TEST SUBR AT
        NEXT,   CALL[KTSRCDST]                          !  INITIALIZATION POINT
(6331)  DCS[0.00.0.0.0.0]  BM[0110..00.10..10.11..101..111...0.0.0..0..0...0.0000...0..0000.0...11.100...001.001.100]



!* TEST 512E2 NOW READS THE COMPLEMENTARY REGISTER TO THAT USED IN TEST512E1, INTO THE SR
6535:
TEST512E2:
        P0,     LOAD-ENUA(ZTARGET412),                  !BIT<3:0> = (12) = SP-ADDRESS(06)
                LOAD-ERROR(TEST512E2),                  !ERROR DIRECTORY KEY
                DCS-CTR(C4.),                           !COMPARE AT TARGET
        NEXT,   J/GOTEST512E2                           !
(6535)  DCS[1.00.1.0.0.0]  BM[1011..00.11..11.00..001..010...0.0.0..0..0...0.0000...0..0000.0...11.000...011.011.010]

6332:  !(FREE)
GOTEST512E2:
        SETUP,  RETURN/SCOPE512E,                       !READ REGISTER BSPHI[SF] TO SR,
        NEXT,   CALL[KTSRCBSP]                          !  THEN DO BUT(SR3-0)
(6332)  DCS[0.00.0.0.0.0]  BM[0110..00.01..10.11..011..111...0.0.0..0..0...0.0000...0..0000.0...11.100...001.010.111]
```

```
6333:  !(FREE)
SCOPES12E:
       PO,     BUSDIN+EMIT-[I],                          !RESET PROC UCON
               EN-CLK-IR[15-00],                         !
       NEXT,   BUTD[SCOPE],                              !NO ERROR:  "TEST520A"  (+1. WORDS)
               J/TEST520A                                !   ERROR:  "SETIR512D1"  (-11. WORDS)
(6333)  DCS[0.00.0.1.0.0]  BM[0000..00.00..00.01..000..100...0.0.0..0..0...1.1001...0..0000.0...11.000...110.010.111]





!.PAGE=============================================================================================================

.TOC   *   TEST520A-520E:  TESTING THE "INSTR BRANCH" ROM

!****************************************************************************************
!*
!*      TESTS:  520A - 520E                                   UWORDS: 020 + 031
!*
!*      FUNCTIONS:
!*
!*      THE FOLLOWING FIVE TESTS VERIFY THE VALIDITY OF THE INSTRUCTION BRANCH ROM
!*      INPUTS AND OUTPUTS, IN REGARD TO NO STUCK ONE/ZERO CONDITIONS.
!*
!****************************************************************************************


!       SUMMARY OF INSTR BRANCH ROM TESTS:
!
!       TEST    IR<15,10:08>H   B-- ?   ON:                     PS<3:0>H        INSTR BRANCH L
!       NUMB                                                    N Z V C
!
!       520A    1 0 1 0         BHI     C.IOR.Z=0               0 1 0 0         1, NEGATED
!       520B    0 1 1 0         BGT     Z.IOR.(N.XOR.V)=0       0 0 0 0         0, ASSERTED
!       520C    0 1 0 1         BLT     N.XOR.V=1               1 1 1 0         1, NEGATED
!       520D    1 0 1 1         BLOS    C.IOR.Z=1               0 0 0 1         0, ASSERTED
!       520E    1 1 1 1         BLO     C=1                     0 1 1 0         1, NEGATED
!



!  - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

!*** TEST 520A ***
!TEST-520-A SETS UP IR<15,10:08>H="1010", PS<3:0>H="0100",
!  AND THEN BUTS ON "INSTR BRANCH L"
6627:
TEST520A:
       PO,     LOAD-ENUA(ZTARGET403),                    !NOT ASSERTED
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```
                LOAD-ERROR(TEST520A),                   !ERROR DIRECTORY KEY
                DCS-CTR(C8.),                           !COMPARE ENUA:TNUA AT TARGET
        NEXT,   J/UCON520A                              !
   (6627) DCS[1.00.1.0.0.0] BM[0111..00.11..11.00..000..011...0.0.0..0..0...0.0000...0..0000.0...11.000...110.010.100]

    6624:
    UCON520A:
        SELECT, UCON-PROC,                              !PROCESSOR UCON:
        ENABLE, BUSDIN+EMIT[15-00],                     !  EMIT ON BUSDIN
                EN-CLK-IR[15-00],                       !  AND CLOCKING IR
        P0,     BUMP-VERIFY,                            !COUNT
                SET-UCON-CONTROL,                       !WRITE CONTROLS
        NEXT,   J/SETUP520A                             !
   (6624) DCS[0.00.0.0.0.1] BM[0000..00.00..00.01..000..100...0.0.0..0..0...1.1001...0..0000.0...11.000...011.011.100]

    6334:  !(FREE)
    SETUP520A:
        P0,     BUMP-VERIFY,                            !COUNT
        EMITC,  EMIT/101004,                            !PS<3:0>H="0100"
        P2-U,   IR+EMIT,                                !
        P3,     CSPD[05]+EMIT,                          !IR<15,10:08>H="1010"
        NEXT,   J/GOTEST520A                            !
   (6334) DCS[0.00.0.0.0.1] BM[1000..10.00..10.00..000..100...0.0.0..0..0...1.1010...1..0000.0...11.000...011.011.101]

    6335:  !(FREE)
    GOTEST520A:
        SETUP,  RETURN/TEST520B,                        !RETURN TO START OF NEXT SUBTEST
        NEXT,   GOTO-PAGE(7),                           !GO TO CODE THAT LOADS PS[CC], AND
                J/SUCBRTEST01                           !  THEN BUTS ON THE "INSTR BRANCH" ROM OUTPUT
   (6335) DCS[0.00.0.0.0.0] BM[0110..00.11..11.10..100..111...0.0.0..0..0...0.0000...0..0000.0...11.100...001.010.010]




    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    !*** TEST 520B ***
    !TEST-520-B SETS UP IR<15,10:08>H="0110", PS<3:0>H="0000",
    !  AND THEN BUTS ON "INSTR BRANCH L"
    6764:
    TEST520B:
        P0,     LOAD-ENUA(ZTARGET402),                  !ASSERTED
                LOAD-ERROR(TEST520B),                   !ERROR DIRECTORY KEY
                DCS-CTR(C7.),                           !COMPARE ENUA:TNUA AT TARGET
        NEXT,   J/SETUP520B                             !
   (6764) DCS[1.00.1.0.0.0] BM[1000..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...011.011.110]

    6336:  !(FREE)
    SETUP520B:
        EMITC,  EMIT/003000,                            !PS<3:0>H="0000"
        P2-U,   IR+EMIT,                                !
        P3,     CSPD[05]+EMIT,                          !IR<15,10:08>H="0110"
        NEXT,   J/GOTEST520B                            !
```

```
(6336) DCS[0.00.0.0.0.0] BM[0000..10.01..10.00..000..000...0.0.0..0..0...1.1010...1..0000.0...11.000...011.011.111]

      6337: !(FREE)
      GOTEST520B:
              SETUP,   RETURN/TEST520C,                        !RETURN TO START OF NEXT SUBTEST
              NEXT,    GOTO-PAGE(7),                           !GO TO CODE THAT LOADS PS[CC], AND
                       J/SUCBRTEST01                           !  THEN BUTS ON THE "INSTR BRANCH" ROM OUTPUT
(6337) DCS[0.00.0.0.0.0] BM[0110..00.11..11.11..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...001.010.010]




      ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

      !*** TEST 520C ***
      !TEST-520-C SETS UP IR<15,10:08>H="0101", PS<3:0>H="1110",
      !  AND THEN BUTS ON "INSTR BRANCH L"
      6772:
      TEST520C:
              P0,      LOAD-ENUA(ZTARGET403),                  !NEGATED
                       LOAD-ERROR(TEST520C),                   !ERROR DIRECTORY KEY
                       DCS-CTR(C7.),                           !COMPARE ENUA:TNUA AT TARGET
                       BUMP-VERIFY,                            !COUNT
              NEXT,    J/SETUP520C                             !
(6772) DCS[1.00.1.0.0.1] BM[1000..00.11..11.00..000..011...0.0.0..0..0...0.0000...0..0000.0...11.000...011.100.000]

      6340: !(FREE)
      SETUP520C:
              EMITC,   EMIT/002416,                            !PS<3:0>H="1110"
              P2-U,    IR←EMIT,                                !
              P3,      CSPD[05]←EMIT,                          !IR<15,10:08>H="0101"
              NEXT,    J/GOTEST520C                            !
(6340) DCS[0.00.0.0.0.0] BM[0000..10.01..01.00..001..110...0.0.0..0..0...1.1010...1..0000.0...11.000...011.100.001]

      6341: !(FREE)
      GOTEST520C:
              SETUP,   RETURN/TEST520D,                        !RETURN TO START OF NEXT SUBTEST
              NEXT,    GOTO-PAGE(7),                           !GO TO CODE THAT LOADS PS[CC], AND
                       J/SUCBRTEST01                           !  THEN BUTS ON THE "INSTR BRANCH" ROM OUTPUT
(6341) DCS[0.00.0.0.0.0] BM[0110..00.11..11.10..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...001.010.010]




      ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

      !*** TEST 520D ***
      !TEST-520-D SETS UP IR<15,10:08>H="1011", PS<3:0>H="0001",
      !  AND THEN BUTS ON "INSTR BRANCH L"
      6762:
      TEST520D:
              P0,      LOAD-ENUA(ZTARGET402),                  !ASSERTED
```

```
                LOAD-ERROR(TEST520D),                 !ERROR DIRECTORY KEY
                DCS-CTR(C7,),                         !COMPARE ENUA:TNUA AT TARGET
        NEXT,   J/SETUP520D                           !
 (6762) DCS[1.00.1.0.0.0] BM[1000..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...011.100.010]

    6342: !(FREE)
    SETUP520D:
        EMITC,  EMIT/101401,                          !PS<3:0>H="0001"
        P2-U,   IR+EMIT,                              !
        P3,     CSPD(05)+EMIT,                        !IR<15,10:08>H="1011"
        NEXT,   J/GOTEST520D                          !
 (6342) DCS[0.00.0.0.0.0] BM[1000..10.00..11.00..000..001...0.0.0..0..0...1.1010...1..0000.0...11.000...011.100.011]

    6343: !(FREE)
    GOTEST520D:
        SETUP,  RETURN/TEST520E,                      !RETURN TO START OF NEXT SUBTEST
        NEXT,   GOTO-PAGE(7),                         !GO TO CODE THAT LOADS PS[CC], AND
                J/SUCBRTEST01                         !  THEN BUTS ON THE "INSTR BRANCH" ROM OUTPUT
 (6343) DCS[0.00.0.0.0.0] BM[0110..00.11..11.11..101..111...0.0.0..0..0...0.0000...0..0000.0...11.100...001.010.010]




    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    !*** TEST 520E ***
    !TEST-520-E SETS UP IR<15,10:08>H="1111", PS<3:0>H="0110",
    !  AND THEN BUTS ON "INSTR BRANCH L"
    6775:
    TEST520E:
        P0,     LOAD-ENUA(ZTARGET403),                !NEGATED
                LOAD-ERROR(TEST520E),                 !ERROR DIRECTORY KEY
                DCS-CTR(C7,),                         !COMPARE ENUA:TNUA AT TARGET
        NEXT,   J/SETUP520E                           !
 (6775) DCS[1.00.1.0.0.0] BM[1000..00.11..11.00..000..011...0.0.0..0..0...0.0000...0..0000.0...11.000...011.100.100]

    6344: !(FREE)
    SETUP520E:
        P0,     BUMP-VERIFY,                          !COUNT
        EMITC,  EMIT/103406,                          !PS<3:0>H="0110"
        P2-U,   IR+EMIT,                              !
        P3,     CSPD(05)+EMIT,                        !IR<15,10:08>H="1111"
        NEXT,   J/GOTEST520E                          !
 (6344) DCS[0.00.0.0.0.1] BM[1000..10.01..11.00..000..110...0.0.0..0..0...1.1010...1..0000.0...11.000...011.100.101]

    6345: !(FREE)
    GOTEST520E:
        SETUP,  RETURN/SCOPE520,                      !RETURN TO SCOPE LOOP TEST WORD
        NEXT,   GOTO-PAGE(7),                         !GO TO CODE THAT LOADS PS[CC], AND
                J/SUCBRTEST01                         !  THEN BUTS ON THE "INSTR BRANCH" ROM OUTPUT
 (6345) DCS[0.00.0.0.0.0] BM[0110..00.01..11.00..110..111...0.0.0..0..0...0.0000...0..0000.0...11.100...001.010.010]
```

```
        6346:   !(FREE)
        SCOPE520:
                PO,       BUSDIN←EMIT-[I],                          !RESET PROC UCONS
                          EN-CLK-IR[15-00],                         !
                NEXT,     BUTD[SCOPE],                              !NO ERROR:  "TEST533A"  [+4. WORDS]
                          J/TEST533A                                !    ERROR:  "UCON520A"  [-15. WORDS]
     (6346)  DCS[0.00.0.1.0.0]  BM[0000..00.00..00.01..000..100...0.0.0..0..0...1.1001...0..0000.0...11.000...110.010.101]



        ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

        !       TESTING SUBR (COMMON CODE) FOR ABOVE TESTS

        7122:   !(FREE)
        SUCBRTEST01:
                P2-T,     D←CSPD(D05), D[C]←0,                      !GET PATTERN
                NEXT,     J/SUCBRTEST02                             !
     (7122)  DCS[0.00.0.0.0.0]  BM[1010..10.00..00.00..000..000...0.1.0..0..0...0.1010...0..0000.0...11.000...001.011.010]

        7132:   !(FREE)
        SUCBRTEST02:
                P2-T,     PS[3-0]←D[3-0]-[I],                       !INTO PS[CC]
                NEXT,     J/SUCBRTEST03                             !
     (7132)  DCS[0.00.0.0.0.0]  BM[1000..00.00..00.01..000..000...0.0.0..0..0...1.1011...0..0000.0...11.000...001.011.011]

        7133:   !(FREE)
        SUCBRTEST03:
                SELECT,   UCON-PROC,                                !LEAVE WITH EMIT ON BUSDIN,
                ENABLE,   BUSDIN←EMIT[15-00],                       !  CLOCK IR ENABLED
                          EN-CLK-IR[15-00],                         !
                PO,       SET-UCON-CONTROL,                         !WRITE CONTROLS
                NEXT,     J/BUTINSTRBRANCH                          !
     (7133)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.01..000..100...0.0.0..0..0...1.1001...0..0000.0...11.000...011.101.110]




        !.PAGE=============================================================================================

        .TOC    *   TEST533-537:  SHIFT TREE

        !*****************************************************************************
        !*
        !*      TESTS:  533A - 537A                         UWORDS: 170 + 044
        !*
        !*      FUNCTIONS:          TESTS 533A - 537A VERIFY THE DATA AND CONTROL PATHS
        !*                          OF THE 3 LEVEL BARREL SHIFTER (SHIFT TREE).
        !*
```

```
!*************************************************************************






! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

!*** TEST 533A ***
!READ D DIRECTLY THRU "D[HI]*D[LO]" PORT OF AMUX[HI*LO], BMUX-CMUX/DIRECT
!IN(D)(052652), OUT(052652)
6625:
TEST533A:
        P0,     LOAD-ENUA(ZTARGET402),                         !SETUP FOR D = ZERO TEST
                LOAD-ERROR(TEST533A),                          !ERROR DIRECTORY KEY
                DCS-CTR(C6.),                                  !COMPARE AT TARGET
        NEXT,   J/INIT533A                                     !
  (6625)  DCS[1.00.1.0.0.0]  BM[1001..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...110.110.110]

6666:
INIT533A:
        P0,     BUMP-VERIFY,                                   !COUNT
        P3,     CSPD[17]+EMIT,                                 !GET INITIAL PATTERN FOR D
                EMIT/052652,                                   !"0101 0101 1010 1010"
        NEXT,   J/INITD533A                                    !
  (6666)  DCS[0.00.0.0.0.1]  BM[0101..10.01..01.10..101..010...0.0.0..0..0...0.0000...1..0000.0...11.000...011.100.111]

6347:  !(FREE)
INITD533A:
        P2-T,   D+CSPD(D17),                                   !INITIAL D =(052652)
                D[C]+ALU15,                                    !SETUP D[C] FOR SHIFT = "0"
        NEXT,   J/COMP533A                                     !
  (6347)  DCS[0.00.0.0.0.0]  BM[1010..10.00..00.00..000..100...0.1.0..0..0...0.0000...0..0000.0...11.000...011.101.000]

6350:  !(FREE)
COMP533A:
        P0,     BUMP-VERIFY,                                   !COUNT
        SETUP,  D-DIRECT,                                      !AMUX-BMUX-CMUX ALL DIRECT
        P2-T,   D+D-SHIFTED-XOR-CSPB(B17),                     !COMPARE D-SHIFTED:EXPECTED, BITWISE
        NEXT,   J/GOBUT533A                                    !EXPECTED =(052652)
  (6350)  DCS[0.00.0.0.0.1]  BM[0110..11.00..01.01..000..000...0.1.0..0..0...0.0000...0..0000.0...11.000...011.101.001]

6351:  !(FREE)
GOBUT533A:
        SETUP,  RETURN/TEST533B,                               !RETURN TO START OF NEXT SUBTEST
        NEXT,   GOTO-PAGE(7),                                  !BUT TABLE IS ON PAGE 7
                J/BUTD-IS-ZERO                                 !GO TEST D IS ALL ZERO
  (6351)  DCS[0.00.0.0.0.0]  BM[0110..00.11..00.11..011..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.001]
```

```
        ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

        !### TEST 533B ###
        !READ D DIRECTLY THRU "D[HI]#D[LO]" PORT OF AMUX[HI#LO], BMUX-CMUX/DIRECT
        !IN(D)(125125), OUT(125125)
        6633:
        TESTS33B:
                PO,       LOAD-ENUA(ZTARGET402),                     !SETUP FOR D=ZERO TEST
                          LOAD-ERROR(TEST533B),                      !ERROR DIRECTORY KEY
                          DCS-CTR(C6.),                              !COMPARE AT TARGET
                NEXT,     J/INIT533B                                 !
  (6633)  DCS[1.00.1.0.0.0]  BM[1001..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...011.101.010]

        6352:  !(FREE)
        INIT533B:
                P3,       CSPD[16]←EMIT,                             !GET INITIAL PATTERN FOR D
                          EMIT/125125,                               !"1010 1010 0101 0101"
                NEXT,     J/INITD533B                                !
  (6352)  DCS[0.00.0.0.0.0]  BM[1010..10.10..10.01..010..101...0.0.0..0..0...0.0001...1..0000.0...11.000...011.101.011]

        6353:  !(FREE)
        INITD533B:
                P0,       BUMP-VERIFY,                               !COUNT
                P2-T,     D←CSPD(D16),                               !INITIAL D=(125125)
                          D[C]←ALU07,                                !SETUP D[C] FOR SHIFT = "0"
                NEXT,     J/COMP533B                                 !
  (6353)  DCS[0.00.0.0.0.1]  BM[1010..10.00..00.00..000..011...0.1.0..0..0...0.0001...0..0000.0...11.000...011.101.100]

        6354:  !(FREE)
        COMP533B:
                SETUP,    D-DIRECT,                                  !AMUX-BMUX-CMUX ALL DIRECT
                P2-T,     D←D-SHIFTED-XOR-CSPB(B16),                 !COMPARE D-SHIFTED:EXPECTED, BITWISE
                NEXT,     J/GOBUT533B                                !EXPECTED=(125125)
  (6354)  DCS[0.00.0.0.0.0]  BM[0110..11.01..01.01..000..000...0.1.0..0..0...0.0000...0..0000.0...11.000...011.101.101]

        6355:  !(FREE)
        GOBUT533B:
                SETUP,    RETURN/SCOPE533B,                          !RETURN TO SCOPE LOOP TEST WORD
                NEXT,     GOTO-PAGE(7),                              !BUT TABLE IS ON PAGE 7
                          J/BUTD-IS-ZERO                             !GO TEST D IS ALL ZERO
  (6355)  DCS[0.00.0.0.0.0]  BM[0110..00.01..11.01..110..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.001]

        6356:  !(FREE)
        SCOPE533B:
                P3,       CSPD[14]←EMIT, EMIT/000377,                !CONSTANT FOR USE BELOW
                NEXT,     BUTD[SCOPE],                               !NO ERROR: "TEST534A" (+1.WORDS)
                          J/TEST534A                                 !   ERROR: "INIT533A" (-9.WORDS)
  (6356)  DCS[0.00.0.1.0.0]  BM[0000..10.00..00.11..111..111...0.0.0..0..0...0.0011...1..0000.0...11.000...110.110.111]




        ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
```

```

        !*** TEST 534A ***
        !READ D THRU "D[LO]#D[HI]" PORT OF AMUX[HI,LO], BMUX-CMUX/DIRECT
        !IN(D)(052652), OUT(125125)
        6667:
        TEST534A:
                PO,     LOAD-ENUA(ZTARGET402),                  !SETUP FOR D=ZERO TEST
                        LOAD-ERROR(TEST534A),                   !ERROR DIRECTORY KEY
                        DCS-CTR(CS.),                           !COMPARE AT TARGET
                P3,     BUTA(CLR-FLAG-RES-UCON),                !EMIT ON BUSDIN
                NEXT,   J/INITD534A                             !
     (6667)  DCS[1.00.1.0.0.0]  BM[1010..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.010...110.110.100]

        6664:
        INITD534A:
                PO,     BUMP-VERIFY,                            !COUNT
                P2-T,   D+CSPD(D17),                            !INITIAL D=(052652)
                        D[C]+ALU15,                             !SETUP D[C] FOR SHIFT = "0"
                NEXT,   J/COMP534A                              !
     (6664)  DCS[0.00.0.0.0.1]  BM[1010..10.00..00.00..000..100...0.1.0..0..0...0.0000...0..0000.0...11.000...011.101.111]

        6357:   !(FREE)
        COMP534A:
                SETUP,  D-SWAB,                                 !AMUX/SWAB, BMUX-CMUX/DIRECT
                P2-T,   D+D-SHIFTED-XOR-CSPB(B16),              !COMPARE D-SHIFTED:EXPECTED, BITWISE
                NEXT,   J/GOBUT534A                             !EXPECTED=(125125)
     (6357)  DCS[0.00.0.0.0.0]  BM[0110..11.01..01.01..000..000...0.1.0..0..0...0.0101...0..0000.0...11.000...011.110.000]

        6360:   !(FREE)
        GOBUT534A:
                SETUP,  RETURN/TEST534B,                        !RETURN TO START OF NEXT SUBTEST
                NEXT,   GOTO-PAGE(7),                           !BUT TABLE IS ON PAGE 7
                        J/BUTD-IS-ZERO                          !GO TEST D IS ALL ZERO
     (6360)  DCS[0.00.0.0.0.0]  BM[0110..00.11..00.11..100..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.001]




        ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

        !*** TEST 534B ***
        !READ D THRU "D[LO]#D[HI]" PORT OF AMUX[HI,LO], BMUX-CMUX/DIRECT
        !IN(D)(125125), OUT(052652)
        6634:
        TEST534B:
                PO,     LOAD-ENUA(ZTARGET402),                  !SETUP FOR D=ZERO TEST
                        LOAD-ERROR(TEST534B),                   !ERROR DIRECTORY KEY
                        DCS-CTR(CS.),                           !COMPARE AT TARGET
                        BUMP-VERIFY,                            !COUNT
                NEXT,   J/INITD534B                             !
     (6634)  DCS[1.00.1.0.0.1]  BM[1010..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...011.110.001]

        6361:   !(FREE)
```

```
    INITD534B:
            P2-T,     D←CSPD(D16),                         !INITIAL D=(125125)
                      D[C]←ALU07,                          !SETUP D[C] FOR SHIFT = "0"
            NEXT,     J/COMP534B                           !
   (6361)  DCS[0.00.0.0.0.0]  BM[1010..10.00..00.00..000..011...0.1.0..0..0...0.0001...0..0000.0...11.000...011.110.010]

    6362:  !(FREE)
    COMP534B:
            P0,       BUMP-VERIFY,                         !COUNT
            SETUP,    D-SWAB,                              !AMUX/SWAB, BMUX-CMUX/DIRECT
            P2-T,     D←D-SHIFTED-XOR-CSPB(B17),           !COMPARE D-SHIFTED:EXPECTED, BITWISE
            NEXT,     J/GOBUT534B                          !EXPECTED=(052652)
   (6362)  DCS[0.00.0.0.0.1]  BM[0110..11.00..01.01..000..000...0.1.0..0..0...0.0101...0..0000.0...11.000...011.110.011]

    6363:  !(FREE)
    GOBUT534B:
            SETUP,    RETURN/SCOPE534B,                    !RETURN TO SCOPE LOOP TEST WORD
            NEXT,     GOTO-PAGE(7),                        !BUT TABLE IS ON PAGE 7
                      J/BUTD-IS-ZERO                       !GO TEST D IS ALL ZERO
   (6363)  DCS[0.00.0.0.0.0]  BM[0110..00.01..11.10..100..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.001]

    6364:  !(FREE)
    SCOPE534B:
            P3,       CSPD[15]←EMIT, EMIT/177400,          !CONSTANT FOR USE BELOW
            NEXT,     BUTD[SCOPE],                         !NO ERROR:  "TEST534C" (+1.WORDS)
                      J/TEST534C                           !   ERROR:  "INITD534A" (-7.WORDS)
   (6364)  DCS[0.00.0.1.0.0]  BM[1111..10.11..11.00..000..000...0.0.0..0..0...0.0010...1..0000.0...11.000...110.110.101]




    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    !*** TEST 534C ***
    !READ D THRU "B*D[C]*D[HI]" PORT OF AMUX[HI*LO], BMUX-CMUX/DIRECT
    !IN(1)(000000), OUT(177400)
    6665:
    TEST534C:
            P0,       LOAD-ENUA(ZTARGET402),               !SETUP FOR D=ZERO TEST
                      LOAD-ERROR(TEST534C),                !ERROR DIRECTORY KEY
                      DCS-CTR(CS.),                        !COMPARE AT TARGET
            NEXT,     J/INITD534C                          !
   (6665)  DCS[1.00.1.0.0.0]  BM[1010..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...110.110.010]

    6662:
    INITD534C:
            P2-T,     D←ASPHI(C000000),                    !INITIAL D=(000000)
                      D[C]←1,                              !SETUP D[C] FOR SHIFT = "1"
            NEXT,     J/COMP534C                           !
   (6662)  DCS[0.00.0.0.0.0]  BM[1111..00.00..11.01..100..000...0.1.0..0..0...0.0000...0..0000.0...11.000...011.110.101]

    6365:  !(FREE)
    COMP534C:
```

```
                                                             !CSP(15)=(177400)="1111 1111 0000 0000"
           SETUP,  D-RIGHT-8,                                !AMUX/B*D[C]*D<HI>, BMUX-CMUX/DIRECT
           P2-T,   D<-D-SHIFTED-XOR-CSPB(B15),               !COMPARE D-SHIFTED:EXPECTED, BITWISE
           NEXT,   J/GOBUT534C                               !EXPECTED=(177400)
   (6365)  DCS[0.00.0.0.0.0]  BM[0110..11.10..01.01..000..000...0.1.0..0..0...0.0110...0..0000.0...11.000...011.110.110]

     6366:  !(FREE)
     GOBUT534C:
           SETUP,  RETURN/TEST534D,                          !RETURN TO START OF  NEXT SUBTEST
           NEXT,   GOTO-PAGE(7),                             !BUT TABLE IS ON PAGE 7
                   J/BUTD-IS-ZERO                            !GO TEST  D IS ALL ZERO
   (6366)  DCS[0.00.0.0.0.0]  BM[0110..00.11..00.11..101..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.001]




     ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

     !*** TEST 534D ***
     !READ D THRU "B*D[C]*D[LO]" PORT OF AMUX[HI*LO], BMUX-CMUX/DIRECT
     !IN(0)(177777), OUT(000377)
     6635:
     TEST534D:
           P0,     LOAD-ENUA(ZTARGET402),                    !SETUP FOR D=ZERO TEST
                   LOAD-ERROR(TEST534D),                     !ERROR DIRECTORY KEY
                   DCS-CTR(CS.),                             !COMPARE AT TARGET
           NEXT,   J/INITD534D                               !
   (6635)  DCS[1.00.1.0.0.0]  BM[1010..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...011.110.111]

     6367:  !(FREE)
     INITD534D:
           P2-T,   D<-BSPHI(C177777),                        !INITIAL D=(177777)
                   D[C]<-0,                                  !SETUP D[C] FOR SHIFT = "0"
           NEXT,   J/COMP534D                                !
   (6367)  DCS[0.00.0.0.0.0]  BM[1010..01.11..00.00..101..000...0.1.0..0..0...0.0000...0..0000.0...11.000...011.111.000]

     6370:  !(FREE)
     COMP534D:
                                                             !CSP(14)=(000377)="0000 0000 1111 1111"
           SETUP,  D-SIGNEXT,                                !AMUX/B*D[C]*D<LO>, BMUX-CMUX/DIRECT
           P2-T,   D<-D-SHIFTED-XOR-CSPB(B14),               !COMPARE D-SHIFTED:EXPECTED, BITWISE
           NEXT,   J/GOBUT534D                               !EXPECTED=(000377)
   (6370)  DCS[0.00.0.0.0.0]  BM[0110..11.11..01.01..000..000...0.1.0..0..0...0.0010...0..0000.0...11.000...011.111.001]

     6371:  !(FREE)
     GOBUT534D:
           P0,     BUMP-VERIFY,                              !COUNT
           SETUP,  RETURN/SCOPE534D,                         !RETURN TO SCOPE LOOP TEST WORD
           NEXT,   GOTO-PAGE(7),                             !BUT TABLE IS ON PAGE 7
                   J/BUTD-IS-ZERO                            !GO TEST D IS ALL ZERO
   (6371)  DCS[0.00.0.0.0.1]  BM[0110..00.01..11.11..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.001]
```

```
        6372:  !(FREE)
        SCOPE534D:
                NEXT,    BUTD[SCOPE],                                  !NO ERROR:  "TEST534E" (+1.WORDS)
                         J/TEST534E                                    !   ERROR:  "EXPEC534C" (-9.WORDS)
 (6372)  DCS[0.00.0.1.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...110.110.011]




        ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

        !*** TEST 534E ***
        !READ D THRU "COUNTER#D[LO]" PORT OF AMUX[HI#LO], BMUX-CMUX/DIRECT
        !IN(D)(000125), OUT(125125), CTR(252)
        6663:
        TEST534E:
                P0,      LOAD-ENUA(ZTARGET402),                        !SETUP FOR D =ZERO TEST
                         LOAD-ERROR(TEST534E),                         !ERROR DIRECTORY KEY
                         DCS-CTR(C6.),                                 !COMPARE AT TARGET
                NEXT,    J/LODCNTR534E                                 !
 (6663)  DCS[1.00.1.0.0.0]  BM[1001..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...110.110.000]

        6660:
        LODCNTR534E:
                P0,      BUMP-VERIFY,                                  !COUNT
                P2,      COUNTER+BSPHI(C125252),                       !PUT A (252) IN BM COUNTER
                NEXT,    J/INITD534E                                   !(GETS B-BUS[7:0])
 (6660)  DCS[0.00.0.0.0.1]  BM[0000..01.11..00.00..110..000...0.0.0..0..0...0.0000...0..0010.1...11.000...011.111.011]

        6373:  !(FREE)
        INITD534E:
                P0,      BUMP-VERIFY,                                  !COUNT
                P2-T,    D+CSPD[14]-AND-ASPHI(C052525),                !INITIAL D=(000125), CSP(14)=(000377)
                         D[C]+ALU15,                                   !SETUP D[C] FOR SHIFT = "0"
                NEXT,    J/COMP534E                                    !
 (6373)  DCS[0.00.0.0.0.1]  BM[1011..10.00..11.01..111..100...0.1.0..0..0...0.0011...0..0000.0...11.000...011.111.100]

        6374:  !(FREE)
        COMP534E:
                SETUP,   COUNT#D[LO],                                  !AMUX/COUNTER#D<LO> BMUX-CMUX/DIRECT
                P2-T,    D+D-SHIFTED-XOR-CSPB(B16),                    !COMPARE D-SHIFTED:EXPECTED, BITWISE
                NEXT,    J/GOBUT534E                                   !EXPECTED=(125125)
 (6374)  DCS[0.00.0.0.0.0]  BM[0110..11.01..01.01..000..000...0.1.0..0..0...0.0011...0..0000.0...11.000...011.111.101]

        6375:  !(FREE)
        GOBUT534E:
                SETUP,   RETURN/TEST534F,                              !RETURN TO START OF NEXT SUBTEST
                NEXT,    GOTO-PAGE(7),                                 !BUT TABLE IS ON PAGE 7
                         J/BUTD-IS-ZERO                                !GO TEST D IS ALL ZERO
 (6375)  DCS[0.00.0.0.0.0]  BM[0110..00.11..00.11..110..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.001]
```

```

        ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

        !*** TEST 534F ***
        !READ D THRU "COUNTER#D[HI]" PORT OF AMUX[HI#LO], BMUX-CMUX/DIRECT
        !IN(D)(125000), OUT(052652), CTR(125)
        6636:
        TESTS34F:
                PO,     LOAD-ENUA(ZTARGET402),                  !SETUP FOR D=ZERO TEST
                        LOAD-ERROR(TEST534F),                   !ERROR DIRECTORY KEY
                        DCS-CTR(C6.),                           !COMPARE AT TARGET
                NEXT,   J/LODCNTR534F                           !
   (6636)  DCS[1.00.1.0.0.0]  BM[1001..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...100.000.000]

        6400:  !(FREE)
        LODCNTR534F:
                P2,     COUNTER←BSPHI(C052525),                 !PUT A (125) IN BM COUNTER
                NEXT,   J/INITD534F                             !(GETS B-BUS[7-0])
   (6400)  DCS[0.00.0.0.0.0]  BM[0000..01.11..00.00..111..000...0.0.0..0..0...0.0000...0..0010.1...11.000...100.000.001]

        6401:  !(FREE)
        INITD534F:
                PO,     BUMP-VERIFY,                            !COUNT
                P2-T,   D←CSPD[15]-AND-ASPHI(C125252),          !INITIAL D=(125000), CSP(15)=(177400)
                        D[C]←ALU00,                             !SETUP D[C] FOR SHIFT = "0"
                NEXT,   J/COMP534F                              !
   (6401)  DCS[0.00.0.0.0.1]  BM[1011..10.00..11.01..110..010...0.1.0..0..0...0.0010...0..0000.0...11.000...100.000.010]

        6402:  !(FREE)
        COMP534F:
                SETUP,  COUNT#D[HI],                            !AMUX/COUNTER#D<HI>, BMUX-CMUX/DIRECT
                P2-T,   D←D-SHIFTED-XOR-CSPB(B17),              !COMPARE D-SHIFTED:EXPECTED, BITWISE
                P3,     BUTA(LAST),                             !CLEAR CTR TO (000) DURING P3
                NEXT,   J/GOBUT534F                             !EXPECTED=(052652)
   (6402)  DCS[0.00.0.0.0.0]  BM[0110..11.00..01.01..000..000...0.1.0..0..0...0.0111...0..0000.0...10.000...100.000.011]

        6403:  !(FREE)
        GOBUT534F:
                SETUP,  RETURN/TEST534G,                        !RETURN TO START OF NEXT SUBTEST
                NEXT,   GOTO-PAGE(7),                           !BUT TABLE IS ON PAGE 7
                        J/BUTD-IS-ZERO                          !GO TEST D IS ALL ZERO
   (6403)  DCS[0.00.0.0.0.0]  BM[0110..00.11..11.01..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.001]



        ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

        !*** TEST 534G ***
        !READ D THRU "COUNTER#D[LO]" PORT OF AMUX[HI#LO], BMUX-CMUX/DIRECT
        !COUNTER AND D SHOULD READ ALL ZERO, AFTER BEING ZAPPED IN TEST-534-F
        6752:
        TEST534G:
                PO,     LOAD-ENUA(ZTARGET402),                  !SETUP FOR D=ZERO TEST
```

```
                  LOAD-ERROR(TEST534G),                            !ERROR DIRECTORY KEY
                  DCS-CTR(C4.),                                    !COMPARE AT TARGET
          NEXT,   J/COUNTERS34G                                    !
 (6752)  DCS[1.00.1.0.0.0]  BM[1011..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...100.000.100]

     6404:  !(FREE)
     COUNTERS34G:
          P2-T,   D+COUNT#D[LO],                                   !READ THE MUX INTO D
          NEXT,   J/GOBUTS34G                                      !
 (6404)  DCS[0.00.0.0.0.0]  BM[1111..00.00..01.01..000..000...0.1.0..0..0...0.0011...0..0000.0...11.000...100.000.101]

     6405:  !(FREE)
     GOBUTS34G:
          P0,     BUMP-VERIFY,                                     !COUNT
          SETUP,  RETURN/SCOPE534G,                                !RETURN TO SCOPE LOOP TEST WORD
          NEXT,   GOTO-PAGE(7),                                    !BUT TABLE
                  J/BUTD-IS-ZERO                                   !GO TEST D IS ALL ZERO
 (6405)  DCS[0.00.0.0.0.1]  BM[0110..00.10..00.00..110..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.001]




     6406:  !(FREE)
     SCOPE534G:
          NEXT,   BUTD[SCOPE],                                     !NO ERROR:  "TEST535A" (+1.WORDS)
                  J/TEST535A                                       !   ERROR:  "LODCNTR534E"(-11.WORDS)
 (6406)  DCS[0.00.0.1.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...110.110.001]




     ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

     !*** TEST 535A ***
     !READ D THRU "4*D[C]#AMUX<15:04>" PORT OF BMUX, AMUX-CMUX/DIRECT
     !IN(1)(122645), OUT(175132)
     6661:
     TEST535A:
          P0,     LOAD-ENUA(ZTARGET402),                           !SETUP FOR D=ZERO TEST
                  LOAD-ERROR(TEST535A),                            !ERROR DIRECTORY KEY
                  DCS-CTR(C7.),                                    !COMPARE AT TARGET
                  BUMP-VERIFY,                                     !COUNT
          NEXT,   J/INIT535A                                       !
 (6661)  DCS[1.00.1.0.0.1]  BM[1000..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...110.101.110]

     6656:
     INIT535A:
          P3,     CSPD[15]+EMIT,                                   !GET INITIAL PATTERN FOR D
                  EMIT/122645,                                     !"1010 0101 1010 0101"
          NEXT,   J/EXPEC535A                                      !
 (6656)  DCS[0.00.0.0.0.0]  BM[1010..10.01..01.10..100..101...0.0.0..0..0...0.0010...1..0000.0...11.000...100.000.111]

     6407:  !(FREE)
```

```
        EXPEC535A:
                P3,     CSPD[14]←EMIT,                          !GET EXPECTED PATTERN AFTER SHIFT
                        EMIT/175132,                            !"1111 1010 0101 1010"
                NEXT,   J/INITD535                              !
   (6407)  DCS[0.00.0.0.0.0]  BM[1111..10.10..10.01..011..010...0.0.0..0..0...0.0011...1..0000.0...11.000...100.001.000]

        6410:  !(FREE)
        INITD535A:
                P0,     BUMP-VERIFY,                            !COUNT
                P2-T,   D←CSPD(D15),                            !INITIAL D=(122645)
                        D[C]←ALU15,                             !SETUP D[C] FOR SHIFT = "1"
                NEXT,   J/COMP535A                              !
   (6410)  DCS[0.00.0.0.0.1]  BM[1010..10.00..00.00..000..100...0.1.0..0..0...0.0010...0..0000.0...11.000...100.001.001]

        6411:  !(FREE)
        COMP535A:
                SETUP,  D-RIGHT-4,                              !AMUX/DIRECT, BMUX/RIGHT-4, CMUX/DIRECT
                P2-T,   D←D-SHIFTED-XOR-CSPB(B14),              !COMPARE D-SHIFTED:EXPECTED, BITWISE
                NEXT,   J/GOBUT535A                             !EXPECTED=(175132)
   (6411)  DCS[0.00.0.0.0.0]  BM[0110..11.11..01.01..000..000...0.1.0..0..0...0.1000...0..0000.0...11.000...100.001.010]

        6412:  !(FREE)
        GOBUT535A:
                SETUP,  RETURN/TEST535B,                        !RETURN TO START OF NEXT SUBTEEST
                NEXT,   GOTO-PAGE(7),                           !BUT TABLE IS ON PAGE 7
                        J/BUTD-IS-ZERO                          !GO TEST D IS ALL ZERO
   (6412)  DCS[0.00.0.0.0.0]  BM[0110..00.11..00.11..111..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.001]




        ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

        !*** TEST 535B ***
        !READ D THRU "4*D[C]#AMUX<15:04>" PORT OF BMUX, AMUX-CMUX/DIRECT
        !IN(D)(055132), OUT (002645)
        6637:
        TEST535B:
                P0,     LOAD-ENUA(ZTARGET402),                  !SETUP FOR D=ZERO TEST
                        LOAD-ERROR(TEST535B),                   !ERROR DIRECTORY KEY
                        DCS-CTR(C6.),                           !COMPARE AT TARGET
                        BUMP-VERIFY,                            !COUNT
                NEXT,   J/EXPEC535B                             !
   (6637)  DCS[1.00.1.0.0.1]  BM[1001..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...100.001.011]

        6413:  !(FREE)
        EXPEC535B:
                P3,     CSPD[14]←EMIT,                          !GET EXPECTED PATTERN AFTER SHIFT
                        EMIT/002645,                            !"0000 0101 1010 0101"
                NEXT,   J/INITD535B                             !
   (6413)  DCS[0.00.0.0.0.0]  BM[0000..10.01..01.10..100..101...0.0.0..0..0...0.0011...1..0000.0...11.000...100.001.100]

        6414:  !(FREE)
```

```
INITD535B:
        P2-T,   D←NOT-CSPB(B15),                         !INITIAL D=(055132)
                D[C]←ALU15,                              !SETUP D[C] FOR SHIFT = "0"
        NEXT,   J/COMP535B                               !
(6414)  DCS[0.00.0.0.0.0]  BM[0111..11.10..11.01..101..100...0.1.0..0..0...0.0000...0..0000.0...11.000...100.001.101]

6415:   !(FREE)
COMP535B:
        SETUP,  D-RIGHT-4,                               !AMUX/DIRECT, BMUX/RIGHT-4, CMUX/DIRECT
        P2-T,   D←D-SHIFTED-XOR-CSPB(B14),               !COMPARE D-SHIFTED:EXPECTED, BITWISE
        NEXT,   J/GOBUT535B                              !EXPECTED=(002645)
(6415)  DCS[0.00.0.0.0.0]  BM[0110..11.11..01.01..000..000...0.1.0..0..0...0.1000...0..0000.0...11.000...100.001.110]

6416:   !(FREE)
GOBUT535B:
        P0,     BUMP-VERIFY,                             !COUNT
        SETUP,  RETURN/SCOPE535B,                        !RETURN TO SCOPE LOOP TEST WORD
        NEXT,   GOTO-PAGE(7),                            !BUT TABLE IS ON PAGE 7
                J/BUTD-IS-ZERO                           !GO TEST D IS ALL ZERO
(6416)  DCS[0.00.0.0.0.1]  BM[0110..00.10..00.01..111..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.001]

6417:   !(FREE)
SCOPE535B:
        P3,     CSPD[16]←EMIT, EMIT/114631,              !CONSTANT FOR USE BELOW
        NEXT,   BUTD[SCOPE],                             !NO ERROR:  "TEST536A" (+1.WORDS)
                J/TEST536A                               !   ERROR:  "INIT535A" (-10.WORDS)
(6417)  DCS[0.00.0.1.0.0]  BM[1001..10.10..01.10..011..001...0.0.0..0..0...0.0001...1..0000.0...11.000...110.101.111]




! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

!*** TEST 536A ***
!READ D THRU "2*D[C]#BMUX<15:02>" PORT OF CMUX, AMUX-BMUX/DIRECT
!IN(1)(016161), OUT(143434)
6657:
TEST536A:
        P0,     LOAD-ENUA(ZTARGET402),                   !SETUP FOR DD=ZERO TEST
                LOAD-ERROR(TESP536A),                    !ERROR DIRECTORY KEY
                DCS-CTR(C7.),                            !COMPARE AT TARGET
        NEXT,   J/INIT536A                               !
(6657)  DCS[1.00.1.0.0.0]  BM[1000..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...110.101.100]

6654:
INIT536A:
        P3,     CSPD[15]←EMIT,                           !GET INITIAL PATTTERN FOR D
                EMIT/016161,                             !"0001 1100 0111 0001"
        NEXT,   J/EXPEC536A                              !
(6654)  DCS[0.00.0.0.0.0]  BM[0001..10.11..00.01..110..001...0.0.0..0..0...0.0010...1..0000.0...11.000...100.010.000]

6420:   !(FREE)
EXPEC536A:
```

```
                PO,     BUMP-VERIFY,                            !COUNT
                P3,     CSPD[14]←EMIT,                          !GET EXPECTED PATTERN AFTER SHIFT
                        EMIT/143434,                            !"1100 0111 0001 1100"
                NEXT,   J/INITD536A                             !
        (6420)  DCS[0.00.0.0.0.1]  BM[1100..10.01..11.00..011..100...0.0.0..0..0...0.0011...1..0000.0...11.000...100.010.001]

        6421:   !(FREE)
        INITD536A:
                P2-T,   D←CSPD(D15),                            !INITIAL D=(016161)
                        D[C]←ALU00,                             !SETUP D[C] FOR SHIFT = "1"
                NEXT,   J/COMP536A                              !
        (6421)  DCS[0.00.0.0.0.0]  BM[1010..10.00..00.00..000..010...0.1.0..0..0...0.0010...0..0000.0...11.000...100.010.010]

        6422:   !(FREE)
        COMP536A:
                SETUP,  D-RIGHT-2,                              !AMUX-BMUX/DIRECT, CMUX/RIGHT-2
                P2-T,   D←D-SHIFTED-XOR-CSPB(B14),              !COMPARE D-SHIFTED:EXPECTED, BITWISE
                NEXT,   J/GOBUT536A                             !EXPECTED =(143434)
        (6422)  DCS[0.00.0.0.0.0]  BM[0110..11.11..01.11..000..000...0.1.0..0..0...0.0000...0..0000.0...11.000...100.010.011]

        6423:   !(FREE)
        GOBUT536A:
                SETUP,  RETURN/TEST536B,                        !RETURN TO START OF NEXT SUBTEST
                NEXT,   GOTO-PAGE(7),                           !BUT TABLE IS ON PAGE 7
                        J/BUTD-IS-ZERO                          !GO TEST D IS ALL ZERO
        (6423)  DCS[0.00.0.0.0.0]  BM[0110..00.11..01.00..000..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.001]




        ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

        !*** TEST 536B ***
        !READ D THRU "2*D[C]#BMUX<15:02>" PORT OF CMUX, AMUX-BMUX/DIRECT
        !IN(D)(161616), OUT(034343)
        6640:
        TEST536B:
                PO,     LOAD-ENUA(ZTARGET402),                  !SETUP FOR D=ZERO TEST
                        LOAD-ERROR(TEST536B),                   !ERROR DIRECTORY KEY
                        DCS-CTR(C6.),                           !COMPARE AT TARGET
                NEXT,   J/EXPEC536B                             !
        (6640)  DCS[1.00.1.0.0.0]  BM[1001..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...100.010.100]

        6424:   !(FREE)
        EXPEC536B:
                PO,     BUMP-VERIFY,                            !COUNT
                P3,     CSPD[14]←EMIT,                          !GET EXPECTED PATTERN AFTER SHIFT
                        EMIT/034343,                            !"1110 0011 1000 1110"
                NEXT,   J/INITD536B                             !
        (6424)  DCS[0.00.0.0.0.1]  BM[0011..10.10..00.11..100..011...0.0.0..0..0...0.0011...1..0000.0...11.000...100.010.101]

        6425:   !(FREE)
        INITD536B:
```

```
                P2-T,    D←NOT-CSPB(B15),                          !INITIAL D=(161616)
                         D[C]←ALUDO,                               !SETUP D[C] FOR SHIFT = "0"
                NEXT,    J/COMP536B                                !
     (6425)  DCS[0.00.0.0.0.0]  BM[0111..11.10..11.01..101..010...0.1.0..0..0...0.0000...0..0000.0...11.000...100.010.110]

        6426:  !(FREE)
        COMP536B:
                P0,      BUMP-VERIFY,                              !COUNT
                SETUP,   D-RIGHT-2,                                !AMUX-BMUX/DIRECT, CMUX/RIGHT-2
                P2-T,    D←D-SHIFTED-XOR-CSPB(B14),                !COMPARE D-SHIFTED:EXPECTED, BITWISE
                NEXT,    J/GOBUT536B                               !EXPECTED=(034343)
     (6426)  DCS[0.00.0.0.0.1]  BM[0110..11.11..01.11..000..000...0.1.0..0..0...0.0000...0..0000.0...11.000...100.010.111]

        6427:  !(FREE)
        GOBUT536B:
                SETUP,   RETURN/SCOPE536B,                         !RETURN TO SCOPE LOOP TEST WORD
                NEXT,    GOTO-PAGE(7),                             !BUT TABLE IS ON PAGE 7
                         J/BUTD-IS-ZERO                            !GO TEST D IS ALL ZERO
     (6427)  DCS[0.00.0.0.0.0]  BM[0110..00.10..00.11..000..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.001]

        6430:  !(FREE)
        SCOPE536B:
                P0,      BUMP-VERIFY,                              !COUNT
                P3,      CSPD[17]←EMIT, EMIT/031463,               !CONSTANT FOR USE BELOW
                NEXT,    BUTD[SCOPE],                              !NO ERROR:  "TEST536C" (+1.WORDS)
                         J/TEST536C                                !   ERROR:  "INIT536A"(-10.WORDS)
     (6430)  DCS[0.00.0.1.0.1]  BM[0011..10.00..11.00..110..011...0.0.0..0..0...0.0000...1..0000.0...11.000...110.101.101]




        ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

        !### TEST 536C ###
        !READ D THRU "D[C]#BMUX<15:01>" PORT OF CMUX, AMUX-BMUX/DIRECT
        !IN(1)(031463), OUT(114631)
        6655:
        TEST536C:
                P0,      LOAD-ENUA(ZTARGET402),                    !SETUP FOR D=ZERO TEST
                         LOAD-ERROR(TEST536C),                     !ERROR DIRECTORY KEY
                         DCS-CTR(C5.),                             !COMPARE AT TARGET
                         BUMP-VERIFY,                              !COUNT
                NEXT,    J/INITD536C                               !
     (6655)  DCS[1.00.1.0.0.1]  BM[1010..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...110.101.010]

        6652:
        INITD536C:
                P0,      BUMP-VERIFY,                              !COUNT
                P2-T,    D←CSPD(D17),                              !INITIAL D=(031463)
                         D[C]←ALUDO,                               !SETUP D[C] FOR SHIFT = "1"
                NEXT,    J/COMP536C                                !"0011 0011 0011 0011"
     (6652)  DCS[0.00.0.0.0.1]  BM[1010..10.00..00.00..000..010...0.1.0..0..0...0.0000...0..0000.0...11.000...100.011.001]
```

```
        6431:  !(FREE)
        COMP536C:
                SETUP,   D-RIGHT-1,                              !AMUX-BMUX/DIRECT, CMUX/RIGHT-1
                P2-T,    D+D-SHIFTED-XOR-CSPB(B16),              !COMPARE D-SHIFTED:EXPECTED, BITWISE
                NEXT,    J/GOBUT536C                             !EXPECTED=(114631)
  (6431)  DCS[0.00.0.0.0.0]  BM[0110..11.01..01.10..000..000...0.1.0..0..0...0.0000...0..0000.0...11.000...100.011.010]
                                                                 !"1001 1001 1001 1001"

        6432:  !(FREE)
        GOBUT536C:
                SETUP,   RETURN/TEST536D,                        !RETURN TO START OF NEXT SUBTEST
                NEXT,    GOTO-PAGE(7),                           !BUT TABLE IS ON PAGE 7
                         J/BUTD-IS-ZERO                          !GO TEST D IS ALL ZERO
  (6432)  DCS[0.00.0.0.0.0]  BM[0110..00.11..01.00..001..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.001]




        ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

        !### TEST 536D ###
        !READ D THRU "D[C]#BMUX<15:01>" PORT OF CMUX, AMUX-BMUX/DIRECT
        !IN(D)(146314), OUT(063146)
        6641:
        TEST536D:
                P0,      LOAD-ENUA(ZTARGET402),                  !SETUP FOR D=ZERO TEST
                         LOAD-ERROR(TEST536D),                   !ERROR DIRECTORY KEY
                         DCS-CTR(C7.),                           !COMPARE AT TARGET
                NEXT,    J/INIT536D                              !
  (6641)  DCS[1.00.1.0.0.0]  BM[1000..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...100.011.011]

        6433:  !(FREE)
        INIT536D:
                P3,      CSPD[15]+EMIT,                          !GET INITIAL PATTERN FOR D
                         EMIT/146314,                            !"1100 1100 1100 1100"
                NEXT,    J/EXPEC536D                             !
  (6433)  DCS[0.00.0.0.0.0]  BM[1100..10.11..00.11..001..100...0.0.0..0..0...0.0010...1..0000.0...11.000...100.011.100]

        6434:  !(FREE)
        EXPEC536D:
                P3,      CSPD[14]+EMIT,                          !GET EXPECTED PATTERN AFTER SHIFT
                         EMIT/063146,                            !"0110 0110 0110 0110"
                NEXT,    J/INITD536D                             !
  (6434)  DCS[0.00.0.0.0.0]  BM[0110..10.01..10.01..100..110...0.0.0..0..0...0.0011...1..0000.0...11.000...100.011.101]

        6435:  !(FREE)
        INITD536D:
                P0,      BUMP-VERIFY,                            !COUNT
                P2-T,    D+CSPD(D15),                            !INITIAL D=(146314)
                         D[C]+0,                                 !SETUP D[C] FOR SHIFT = "0"
                NEXT,    J/COMP536D                              !
  (6435)  DCS[0.00.0.0.0.1]  BM[1010..10.00..00.00..000..000...0.1.0..0..0...0.0010...0..0000.0...11.000...100.011.110]

```

```
        6436:  !(FREE)
        COMP536D:
                SETUP,  D-RIGHT-1,                                  !AMUX-BMUX/DIRECT, CMUX/RIGHT-1
                P2-T,   D+D-SHIFTED-XOR-CSPB(B14),                  !COMPARE D-SHIFTED:EXPECTED, BITWISE
                NEXT,   J/GOBUT536D                                 !EXPECTED=(063146)
  (6436)  DCS[0.00.0.0.0.0]  BM[0110..11.11..01.10..000..000...0.1.0..0..0...0.0000...0..0000.0...11.000...100.011.111]

        6437:  !(FREE)
        GOBUT536D:
                SETUP,  RETURN/SCOPE536D,                           !RETURN TO SCOPE LOOP TEST WORD
                NEXT,   GOTO-PAGE(7),                               !BUT TABLE IS ON PAGE 7
                        J/BUTD-IS-ZERO                              !GO TEST D IS ALL ZERO
  (6437)  DCS[0.00.0.0.0.0]  BM[0110..00.10..01.00..000..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.001]

        6440:  !(FREE)
        SCOPE536D:
                NEXT,   BUTD[SCOPE],                                !NO ERROR:  "TEST536E" (+1.WORDS)
                        J/TEST536E                                  !   ERROR:  "INIT536C" (-11.WORDS)
  (6440)  DCS[0.00.0.1.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...110.101.011]




        ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

        !*** TEST 536E ***
        !READ D THRU BMUX<14:00>#SENDMUX(=SR15) PORT OF CMUX, AMUX-BMUX/DIRECT
        !IN(D)(146314), OUT(114631), SR=(100000)
        6653:
        TEST536E:
                P0,     LOAD-ENUA(ZTARGET402),                      !SETUP FOR D=ZERO TEST
                        LOAD-ERROR(TEST536E),                       !ERROR DIRECTORY KEY
                        DCS-CTR(C6.),                               !COMPARE AT TARGET
                P3,     BUTA(CLR-FLAG-RES-UCON),                    !SELECT SR-LOAD, SENDMUX PORTS 0123, BUSDIN+EMIT
                NEXT,   J/LOADSR536E                                !
  (6653)  DCS[1.00.1.0.0.0]  BM[1001..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.010...110.101.000]

        6650:
        LOADSR536E:
                P0,     BUMP-VERIFY,                                !COUNT
                P2-T,   SR+BSPHI(C100000),                          !(100000) IN SR<15:00>
                NEXT,   J/INITD536E                                 !
  (6650)  DCS[0.00.0.0.0.1]  BM[1010..01.11..00.00..001..000...0.0.1..0..0...0.0000...0..0000.0...11.000...100.100.001]

        6441:  !(FREE)
        INITD536E:
                P0,     BUMP-VERIFY,                                !COUNT
                P2-T,   D+CSPD(D15),                                !INITIAL D=(146314)
                        D[C]+0,                                     !SETUP D[C] FOR SHIFT = "0"
                NEXT,   J/COMP536E                                  !
  (6441)  DCS[0.00.0.0.0.1]  BM[1010..10.00..00.00..000..000...0.1.0..0..0...0.0010...0..0000.0...11.000...100.100.010]

        6442:  !(FREE)
```

```
    COMP536E:
            SETUP,  D-LEFT-1,                                        !AMUX-BMUX/DIRECT, CMUX/LEFT-1
                                                                     !BIT<00> = SR<15> = SENDMUX PORT 0 = (1)
            P2-T,   D+D-SHIFTED-XOR-CSPB(B16),                       !COMPARE D-SHIFTED:EXPECTED, BITWISE
            NEXT,   J/GOBUT536E                                      !EXPECTED=(114631)
  (6442) DCS[0.00.0.0.0.0] BM[0110..11.01..01.00..000..000...0.1.0..0..0...0.0000...0..0000.0...11.000...100.100.011]

    6443: !(FREE)
    GOBUT536E:
            SETUP,  RETURN/TEST536F,                                 !RETURN TO START OF NEXT SUBTEST
            NEXT,   GOTO-PAGE(7),                                    !BUT TABLE IS ON PAGE 7
                    J/BUTD-IS-ZERO                                   !GO TEST D IS ALL ZERO
  (6443) DCS[0.00.0.0.0.0] BM[0110..00.11..01.00..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.001]




    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    !*** TEST 536F ***
    !READ D THRU BMUX<14:00>#SENDMUX(=SR15) PORT OF CMUX, AMUX-BMUX/DIRECT
    !IN(D)(031463), (063146), SR=(077777)
    6642:
    TEST536F:
            P0,     LOAD-ENUA(ZTARGET402),                           !SETUP FOR D=ZERO TEST
                    LOAD-ERROR(TEST536F),                            !ERROR DIRECTORY KEY
                    DCS-CTR(C6.),                                    !COMPARE AT TARGET
            NEXT,   J/LOADSR536F                                     !
  (6642) DCS[1.00.1.0.0.0] BM[1001..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...100.100.100]

    6444: !(FREE)
    LOADSR536F:
            P0,     BUMP-VERIFY,                                     !COUNT
            P2-T,   SR+NOT-ASPHI(C100000),                           !(077777) IN SR <15:00>
            NEXT,   J/INITD536F                                      !
  (6444) DCS[0.00.0.0.0.1] BM[0000..00.00..11.01..001..000...0.0.1..0..0...0.0000...0..0000.0...11.000...100.100.101]

    6445: !(FREE)
    INITD536F:
            P2-T,   D+CSPD(D17),                                     !INITIAL D=(031463)
                    D[C]+0,                                          !SETUP D[C] FOR SHIFT = "0"
            NEXT,   J/COMP536F                                       !
  (6445) DCS[0.00.0.0.0.0] BM[1010..10.00..00.00..000..000...0.1.0..0..0...0.0000...0..0000.0...11.000...100.100.110]

    6446: !(FREE)
    COMP536F:
            SETUP,  D-LEFT-1,                                        !AMUX-BMUX/DIRECT, CMUX/LEFT-1
                                                                     !BIT<00> = SR<15> = SENDMUX PORT 0 = (0)
            P2-T,   D+D-SHIFTED-XOR-CSPB(B14),                       !COMPARE D-SHIFTED:EXPECTED, BITWISE
            NEXT,   J/GOBUT536F                                      !EXPECTED =(063146)
  (6446) DCS[0.00.0.0.0.0] BM[0110..11.11..01.00..000..000...0.1.0..0..0...0.0000...0..0000.0...11.000...100.100.111]

    6447: !(FREE)
```

```
	GOBUT536F:
		SETUP,	RETURN/SCOPE536F,			!RETURN TO SCOPE LOOP TEST WORD
		NEXT,	GOTO-PAGE(7),				!BUT TABLE IS ON PAGE 7
			J/BUTD-IS-ZERO				!GO TEST D IS ALL ZERO
  (6447)	DCS[0.00.0.0.0.0]  BM[0110..00.10..01.01..000..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.001]

	6450:	!(FREE)
	SCOPE536F:
		P0,	BUMP-VERIFY,				!COUNT
		P3,	CSPD[02]+EMIT,				!RES-CON #1:	(FOR USE BELOW)
		EMITC,	SENDMUX-0123-SEL,			!  SELECT SENDMUX PORTS 0-3
			SR-LEFT, GUARD-DIS,			!  SR GOES LEFT, SR<00>+D[C]
		NEXT,	BUTD[SCOPE],				!NO ERROR:  "SETEMIT537A" (+1.WORDS)
			J/SETEMIT537A				!    ERROR:  "LOADSR536E" (-9.WORDS)
  (6450)	DCS[0.00.0.1.0.1]  BM[0101..10.00..00.00..000..000...0.0.0..0..0...0.1101...1..0000.0...11.000...110.101.001]




	! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

	!*** TEST 537A ***
	!THIS TEST VALIDATES THE "SENDMUX" INPUTS TO THE SHIFT-TREE.
	!EACH 'SENDMUX' OUTPUT IS SET TO 1/0 VALUES, AND THEN READ OUT INTO THE 'SR' WHERE THEY
	!ARE ALL SAVED TO CHECK AT ONCE.
	6651:
	SETEMIT537A:
		P0,	DCS-CTR(C15.),				!HOLD UP FOR NOW
		NEXT,	GOTO-PAGE(4),				!XFER
			J/LOAD16537A				!
  (6651)	DCS[0.00.1.0.0.0]  BM[0000..00.00..00.00..000..100...0.0.0..0..0...0.0000...0..0000.0...11.100...101.111.100]

	4574:
	LOAD16537A:
		P3,	CSPD[16]+EMIT,				!BIT03 ONLY SET
			EMIT/000010,				!
			BUTA(CLR-FLAG-RES-UCON),		!BUSDIN <- EMIT, SR LOAD
		NEXT,	J/LOAD14537A				!
  (4574)	DCS[0.00.0.0.0.0]  BM[0000..10.00..00.00..001..000...0.0.0..0..0...0.0001...1..0000.0...11.010...010.111.110]

	4276:	!(FREE)
	LOAD14537A:

		P3,	CSPD[14]+EMIT,				!BIT11 ONLY SET
			EMIT/004000,				!
		NEXT,	J/LOAD03537A				!
  (4276)	DCS[0.00.0.0.0.0]  BM[0000..10.10..00.00..000..000...0.0.0..0..0...0.0011...1..0000.0...11.000...010.111.111]

	4277:	!(FREE)
	LOAD03537A:
		P3,	CSPD[03]+EMIT,				!WHAT THE 'SR' SHOULD BE
			EMIT/177252,				!AFTER THIS TEST
```

```
                NEXT,     J/LOAD01537A                          !
    (4277)  DCS[0.00.0.0.0.0]  BM[1111..10.11..10.10..101..010...0.0.0..0..0...0.1100...1..0000.0...11.000...011.000.000]

        4300:   !(FREE)
        LOAD01537A:
                P3,       CSPD[01]+EMIT,                        !RES-CON #2:
                EMITC,    SENDMUX-4567-SEL,                     !  SELECT SENDMUX PORTS 4-7
                          SR-LEFT, GUARD-DIS,                   !  SR GOES LEFT, SR<00>+D[C]
                NEXT,     GOTO-PAGE(7),                         !XFER
                          J/INITSR537A                          !
    (4300)  DCS[0.00.0.0.0.0]  BM[0001..10.00..00.00..000..111...0.0.0..0..0...0.1110...1..0000.0...11.100...001.011.001]

        7131:   !(FREE)
        INITSR537A:
                P2-T,     SR+ALL-ONES,                          !START 'SR' WITH ALL ONES
                NEXT,     J/SETRESA537A                         !
    (7131)  DCS[0.00.0.0.0.0]  BM[1111..00.00..11.01..101..000...0.0.1..0..0...0.0000...0..0000.0...11.000...001.011.101]

        7135:   !(FREE)
        SETRESA537A:
                P2,       RES+CSPD(D02),                        !LOAD RES W/ RES-CON#1 (SENDMUX-0123)
                NEXT,     GOTO-PAGE(6),                         !XFER
                          J/NEWCTR537A                          !
    (7135)  DCS[0.00.0.0.0.0]  BM[0000..10.00..00.00..000..110...0.0.0..0..0...0.1101...0..1000.1...11.100...110.100.011]

        6643:
        NEWCTR537A:
                P0,       LOAD-ENUA(SETRESB537A),               !COMPARE POINT #2
                          LOAD-ERROR(NEWCTR537A),               !ERROR DIRECTORY KEY
                          DCS-CTR(C14.),                        !COMPARE BELOW
                NEXT,     J/AR3-537A                            !
    (6643)  DCS[1.00.1.0.0.0]  BM[0001..00.11..10.11..111..000...0.0.0..0..0...0.0000...0..0000.0...11.000...100.101.001]

        6451:   !(FREE)
        AR3-537A:
                P0,       BUMP-VERIFY,                          !COUNT
                P2-T,     D+NOT-CSPD(D16),                      !D=(177767), BIT03="0"
                NEXT,     GOTO-PAGE(7),                         !XFER
                          J/BR3-537A                            !
    (6451)  DCS[0.00.0.0.0.1]  BM[0111..10.00..11.01..101..111...0.1.0..0..0...0.0001...0..0000.0...11.100...001.011.100]

        7134:   !(FREE)
        BR3-537A:
                P2-T,     D+D-RIGHT-3,                          !USE SENDMUX PORT 1 = AMUX03 = "0"
                          D[C]+ALU00,                           !INTO D[C] FOR SR
                NEXT,     J/CR3-537A                            !
    (7134)  DCS[0.00.0.0.0.0]  BM[1111..00.00..01.00..000..010...0.1.0..0..0...0.1000...0..0000.0...11.000...001.011.111]

        7137:   !(FREE)
        CR3-537A:
                P2-T,     SR+SR-LEFT-1,                         !SENDMUX OUTPUT INTO SR<00>
```

```
                        D←CSPB(B16), SAVE-D[C],                  !D=(000010), BIT03="1"
                NEXT,   J/DR3-537A                               !
     (7137)  DCS[0.00.0.0.0.0]  BM[1010..11.01..00.00..000..111...0.1.1..0..0...0.0000...0..0000.0...11.000...001.100.000]

        7140:   !(FREE)
        DR3-537A:
                P2-T,   D←D-RIGHT-3,                             !USE SENDMUX PORT 1 = AMUX03 = "1"
                        D[C]←ALU00,                              !INTO D[C] FOR SR
                NEXT,   J/AR7-537A                               !
     (7140)  DCS[0.00.0.0.0.0]  BM[1111..00.00..01.00..000..010...0.1.0..0..0...0.1000...0..0000.0...11.000...001.100.001]

        7141:   !(FREE)
        AR7-537A:
                P2-T,   SR←SR-LEFT-1,                            !SENDMUX OUTPUT INTO SR<00>
                        D←NOT-ASPHI(C000200), SAVE-D[C],         !D=(177577), BIT07="0"
                NEXT,   J/BR7-537A                               !
     (7141)  DCS[0.00.0.0.0.0]  BM[0000..00.00..11.01..010..111...0.1.1..0..0...0.0000...0..0000.0...11.000...001.100.010]

        7142:   !(FREE)
        BR7-537A:
                P2-T,   D←D-RIGHT-7,                             !USE SENDMUX PORT 2 = D07 = "0"
                        D[C]←ALU00,                              !INTO D[C] FOR SR
                NEXT,   J/CR7-537A                               !
     (7142)  DCS[0.00.0.0.0.0]  BM[1111..00.00..01.00..000..010...0.1.0..0..0...0.0110...0..0000.0...11.000...001.100.011]

        7143:   !(FREE)
        CR7-537A:
                P2-T,   SR←SR-LEFT-1,                            !SENDMUX OUTPUT INTO SR<00>
                        D←ASPHI(C000200), SAVE-D[C],             !D=(000200), BIT07="1"
                NEXT,   J/DR7-537A                               !
     (7143)  DCS[0.00.0.0.0.0]  BM[1111..00.00..11.01..010..111...0.1.1..0..0...0.0000...0..0000.0...11.000...001.100.100]

        7144:   !(FREE)
        DR7-537A:
                P2-T,   D←D-RIGHT-7,                             !USE SENDMUX PORT 2 = D07 = "1"
                        D[C]←ALU00,                              !INTO D[C] FOR SR
                NEXT,   J/AR11-537A                              !
     (7144)  DCS[0.00.0.0.0.0]  BM[1111..00.00..01.00..000..010...0.1.0..0..0...0.0110...0..0000.0...11.000...001.100.101]

        7145:   !(FREE)
        AR11-537A:
                P2-T,   SR←SR-LEFT-1,                            !SENDMUX OUTPUT INTO SR<00>
                        D←NOT-CSPB(B14), SAVE-D[C],              !D=(173777), BIT11="0"
                NEXT,   J/BR11-537A                              !
     (7145)  DCS[0.00.0.0.0.0]  BM[0111..11.11..11.01..101..111...0.1.1..0..0...0.0000...0..0000.0...11.000...001.100.110]

        7146:   !(FREE)
        BR11-537A:
                P2-T,   D←D-RIGHT-11,                            !USE SENDMUX PORT 3 = AMUX03 = "0"
                        D[C]←ALU00,                              !INTO D[C] FOR SR
                NEXT,   J/CR11-537A                              !
     (7146)  DCS[0.00.0.0.0.0]  BM[1111..00.00..01.00..000..010...0.1.0..0..0...0.1110...0..0000.0...11.000...001.100.111]

        7147:   !(FREE)
```

```
    CR11-537A:
            P2-T,   SR←SR-LEFT-1,                          !SENDMUX OUTPUT INTO SR<00>
                    D←CSPB(B14), SAVE-D[C],                !D=(004000), BIT11="1"
            NEXT,   J/DR11-537A                            !
(7147)  DCS[0.00.0.0.0.0]  BM[1010..11.11..00.00..000..111...0.1.1..0..0...0.0000...0..0000.0...11.000...001.101.000]

    7150:  !(FREE)
    DR11-537A:
            P2-T,   D←D-RIGHT-11,                          !USE SENDMUX PORT 3 = AMUX03 = "1"
                    D[C]←ALU00,                            !INTO D[C] FOR SR
            NEXT,   J/ER3-537A                             !
(7150)  DCS[0.00.0.0.0.0]  BM[1111..00.00..01.00..000..010...0.1.0..0..0...0.1110...0..0000.0...11.000...001.101.001]

    7151:  !(FREE)
    ER3-537A:
            P2-T,   SR←SR-LEFT-1,                          !SENDMUX OUTPUT INTO SR<00>
                    D←NOT-CSPB(B16), SAVE-D[C],            !D=(177767), BIT03="0"
            NEXT,   J/SETRESB537A                          !
(7151)  DCS[0.00.0.0.0.0]  BM[0111..11.01..11.01..101..111...0.1.1..0..0...0.0000...0..0000.0...11.000...011.111.000]

    7370:
    SETRESB537A:
            P2,     RES←CSPD(D01),                         !LOAD RES W/RES-CON#2 (SENDMUX-4567)
            NEXT,   J/FR3-537A                             !
(7370)  DCS[0.00.0.0.0.0]  BM[0000..10.00..00.00..000..000...0.0.0..0..0...0.1110...0..1000.1...11.000...001.101.010]

    7152:  !(FREE)
    FR3-537A:
            P2-T,   D←D-RIGHT-3,                           !USE SENDMUX PORT 5 = AMUX03 = "0"
                    D[C]←ALU00,                            !INTO D[C] FOR SR
            NEXT,   J/GR3-537A                             !
(7152)  DCS[0.00.0.0.0.0]  BM[1111..00.00..01.00..000..010...0.1.0..0..0...0.1000...0..0000.0...11.000...001.101.011]

    7153:  !(FREE)
    GR3-537A:
            P2-T,   SR←SR-LEFT-1,                          !SENDMUX OUTPUT INTO SR<00>
                    D←CSPB(B16), SAVE-D[C],                !D=(000010), BIT03="1"
            NEXT,   J/HR3-537A                             !
(7153)  DCS[0.00.0.0.0.0]  BM[1010..11.01..00.00..000..111...0.1.1..0..0...0.0000...0..0000.0...11.000...001.101.100]

    7154:  !(FREE)
    HR3-537A:
            P2-T,   D←D-RIGHT-3,                           !USE SENDMUX PORT 5 = AMUX03 = "1"
                    D[C]←ALU00,                            !INTO D[C] FOR SR
            NEXT,   J/AL1-537A                             !
(7154)  DCS[0.00.0.0.0.0]  BM[1111..00.00..01.00..000..010...0.1.0..0..0...0.1000...0..0000.0...11.000...001.101.101]

    7155:  !(FREE)
    AL1-537A:
            P2-T,   SR←SR-LEFT-1,                          !SENDMUX OUTPUT INTO SR<00>
                    D←ALL-ONES,                            !D=(177777)
            NEXT,   GOTO-PAGE(4),                          !XFER
                    J/BL1-537A                             !
```

```
(7155)  DCS[0.00.0.0.0.0]  BM[1111..00.00..11.01..101..100...0.1.1..0..0...0.0000...0..0000.0...11.100...010.100.010]

    4242:  !(FREE)
    BL1-537A:
            P2-T,    D←D-LEFT-1,                                    !USE SENDMUX PORT 4 = HARD "0"
                     D[C]←ALU00,                                    !INTO D[C] FOR SR
            NEXT,    J/TEST537A                                     !
(4242)  DCS[0.00.0.0.0.0]  BM[1111..00.00..01.00..000..010...0.1.0..0..0...0.0000...0..0000.0...11.000...101.111.010]

    4572:
    TEST537A:
            P0,      LOAD-ENUA(ZTARGET402),                         !SETUP FOR D-IS-ZERO COMPARE
                     LOAD-ERROR(TEST537A),                          !ERROR DIRECTORY KEY
                     DCS-CTR(C4.),                                  !COMPARE AT TARGET
                     BUMP-VERIFY,                                   !COUNT
            P2-T,    SR←SR-LEFT-1,                                  !SENDMUX OUTPUT INTO SR<00>
            NEXT,    J/COMP537A                                     !
(4572)  DCS[1.00.1.0.0.1]  BM[1011..00.11..11.00..000..010...0.0.1..0..0...0.0000...0..0000.0...11.000...011.000.010]

    4302:  !(FREE)
    COMP537A:
            P2-T,    D←SR-XOR-CSPD(D03),                            !COMPARE RECEIVED:EXPECTED BITWISE
            P3,      BUTA(CLR-FLAG-RES-UCON),                       !RESET SR TO LOAD/GUARD-DIS
            NEXT,    J/GOBUT537A                                    !
(4302)  DCS[0.00.0.0.0.0]  BM[0110..10.00..00.00..000..000...0.1.0..0..0...0.1100...0..0000.0...11.010...011.000.011]

    4303:  !(FREE)
    GOBUT537A:
            SETUP,   RETURN/SCOPE537A,                              !RETURN TO SCOPE LOOP TEST WORD
            NEXT,    GOTO-PAGE(7),                                  !BUT TABLE IS ON PAGE 7
                     J/BUTD-IS-ZERO                                 !GO TEST D IS ALL ZERO
(4303)  DCS[0.00.0.0.0.0]  BM[0100..00.01..10.00..100..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.001]

    4304:  !(FREE)
    SCOPE537A:
            P0,      BUMP-VERIFY,                                   !COUNT
                     BUSDIN←EMIT-[I],                               !RESET PROC UCON
                     EN-CLK-IR[15-00],                              !
            NEXT,    BUTD[SCOPE],                                   !NO ERROR:  "TEST551A" (+1.WORD)
                     J/TEST551A                                     !   ERROR:  "LOAD16537A" (-30.WORDS)
(4304)  DCS[0.00.0.1.0.1]  BM[0000..00.00..00.01..000..100...0.0.0..0..0...1.1001...0..0000.0...11.000...101.111.101]





    !.PAGE==========================================================================================


    .TOC    *   TEST551:  BASE MACHINE DATAPATH COUNTER CAN COUNT


    !*************************************************************************
```

F08


```
    !*
    !*      TESTS:  551 A - C                                   UWORDS:  015 + 035
    !*
    !*      FUNCTIONS:
    !*
    !*      THE FOLLOWING THREE TESTS USE A COMMON SUBROUTINE TO TEST THE COUNTING
    !*      ABILITY OF THE BASE MACHINE DATAPATH COUNTER;   USING THE THREE ACTIVE
    !*      BUTS THAT ENABLE COUNTING.   ADMITTEDLY THIS SEEMS LIKE OVERKILL.  BUT
    !*      THIS METHOD WAS  THE LEAST EXPENSIVE IN  TERMS OF NUMBER OF MICROWORDS
    !*      USED FOR THE TESTING.
    !*
    !*******************************************************************************



    !THE FIRST TEST USES THE ACTIVE BUT(#13) "SR<1:0>#COUNT-IS-377" TO CHECK THE COUNTER
    4575:
    TESTS551A:
            P0,     LOAD-ERROR(TEST551A),                   !ERROR DIRECTORY KEY
                    DCS-CTR(C15.),                          !HOLD UP FOR NOW
                    BUMP-VERIFY,                            !BUMP DCS COUNTER
            NEXT,   J/LOADIN551A                            !
 (4575) DCS[1.00.1.0.0.1]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...011.000.101]

    4305:  !(FREE)
    LOADIN551A:
            P3,     CSPD[17]←EMIT, EMIT/400,                !INCREMENT FOR D, TO MATCH COUNTER
            NEXT,   J/SETSR551A                             !
 (4305) DCS[0.00.0.0.0.0]  BM[0000..10.00..01.00..000..000...0.0.0..0..0...0.0000...1..0000.0...11.000...011.000.110]

    4306:  !(FREE)
    SETSR551A:
            P0,     BUMP-VERIFY,                            !COUNT
            P2-T,   SR←ZERO,                                !KEY IN SR<1:0>=(00) FOR SELECT THIS BUT
            NEXT,   J/GOTEST551A                            !
 (4306) DCS[0.00.0.0.0.1]  BM[0011..00.00..00.00..000..000...0.0.1..0..0...0.0000...0..0000.0...11.000...101.110.100]

    4564:
    GOTEST551A:
            SETUP,  RETURN/TEST551B,                        !GO TO TEST SUBROUTINE
            NEXT,   CALL[COUNT-TEST]                        !  (SEE DESCRIP, FOLLOWING)
 (4564) DCS[0.00.0.0.0.0]  BM[0100..00.10..11.11..110..100...0.0.0..0..0...0.0000...0..0000.0...11.100...011.000.001]




    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    !THE SECOND TEST USES THE ACTIVE BUT(#25) "COUNT-IS-377" TO CHECK THE COUNTER
    4576:
    TEST551B:
            P0,     LOAD-ENUA(ZTARGET400),                  !BIT<1:0> CLEAR
                    LOAD-ERROR(TEST551B),                   !ERROR DIRECTORY KEY
                    DCS-CTR(C4.),                           !COMPARE AT TARGET
```

```
         NEXT,    BUTD[SCOPE],                       !NO ERROR:  "SETSR551B" (+1. WORDS)
                  J/SETSR551B                        !   ERROR:  "GOTEST551A" (-1. WORDS) REPEAT PREV TEST
(4576) DCS[1.00.1.1.0.0] BM[1011..00.11..11.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...101.110.101]

     4565:
     SETSR551B:
         P2-T,    SR+SR-PLUS-1,                      !KEY IN SR<1:0>=(01) FOR SELECT THIS BUT
         NEXT,    J/GOTEST551B                       !
(4565) DCS[0.00.0.0.0.0] BM[1001..01.11..00.00..000..000...0.0.1..0..0...0.0000...0..0000.0...11.000...101.110.000]

     4560:
     GOTEST551B:
         SETUP,   RETURN/GOTEST551B1,                !RETURN TO START OF NEXT SUBTEST
         NEXT,    GOTO-PAGE(7),                      !BUT TABLE
                  J/BUTCOUNT-IS-377                  !FAKE A TEST
(4560) DCS[0.00.0.0.0.0] BM[0111..00.00..11.01..111..111...0.0.0..0..0...0.0000...0..0000.0...11.100...001.011.110]

     7136:  !(FREE)
     BUTCOUNT-IS-377:
         NEXT,    BUT(COUNT-IS-377),                 !SHOULD TARGET INTO *** *** *00
                  J/ZTARGET400                       !BIT<1:0> BOTH CLEAR
(7136) DCS[0.00.0.0.0.0] BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...10.101...100.000.000]


     !    -    -    -    -    -    -    -    -    -    -    -    -    -


     !  AND NOW TEST THAT THE ACTUAL BUT/COUNTER WORKS

     7157:  !(FREE)
     GOTEST551B1:
         SETUP,   RETURN/TEST551C,                   !GO TO TEST SUBROUTINE
         NEXT,    CALL[COUNT-TEST]                   !  (SEE DESCRIP, FOLLOWING)
(7157) DCS[0.00.0.0.0.0] BM[0100..00.10..11.10..110..100...0.0.0..0..0...0.0000...0..0000.0...11.100...011.000.001]




     ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

     !THE THIRD TEST USES THE ACTIVE BUT(#17) "COUNT-IS-377#D[C]" TO CHECK THE COUNTER
     4566:
     TEST551C:
         P0,      LOAD-ERROR(TEST551C),              !ERROR DIRECTORY KEY
                  DCS-CTR(C15.),                     !HOLD UP FOR NOW
         NEXT,    BUTD[SCOPE],                       !NO ERROR:  "SETSR551C" (+1. WORDS)
                  J/SETSR551C                        !   ERROR:  "GOTEST551B" (-3. WORDS) REPEAT PREV TEST
(4566) DCS[1.00.1.1.0.0] BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...101.110.001]

     4561:
     SETSR551C:
         P2-T,    SR+SR-PLUS-1,                      !KEY IN SR<1:0>=(10) FOR SELECT THIS BUT
```

```
                NEXT,   GOTO-PAGE(5),                           !XFER
                        J/GOTEST551C                            !
       (4561) DCS[0.00.0.0.0.0]  BM[1001..01.11..00.00..000..101...0.0.1..0..0...0.0000...0..0000.0...11.100...110.010.110]

        5626:
        GOTEST551C:
                SETUP,  RETURN/SCOPE551,                        !GO TO TEST SUBROUTINE
                NEXT,   CALL[COUNT-TEST]                        !  (SEE DESCRIP, FOLLOWING)
       (5626) DCS[0.00.0.0.0.0]  BM[0101..00.01..10.00..101..100...0.0.0..0..0...0.0000...0..0000.0...11.100...011.000.001]



        5305:  !(FREE)
        SCOPE551:
                P0,     BUSDIN+EMIT-[I],                        !RESET PROC UCON
                        EN-CLK-IR[15-00],                       !
                NEXT,   BUTD[SCOPE],                            !NO ERROR:   "TEST610A1"  (NEXT SECTION)
                        J/TEST610A1                             !   ERROR:   "GOTEST551C" (-1. WORDS) REPEAT PREV TEST
       (5305) DCS[0.00.0.1.0.0]  BM[0000..00.00..00.01..000..100...0.0.0..0..0...1.1001...0..0000.0...11.000...110.010.111]



        ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

        !***    B.M. COUNTER TESTING ROUTINE    ***

        !       THIS ROUTINE USES THE B.M. COUNTER TO COUNT FROM 000-377, WAITING FOR IT
        !       TO OVERFLOW AT THE RIGHT MOMENT.  AT THE SAME TIME THE D REGISTER HAS BEEN
        !       TRACKING THE PROGRESS OF THE COUNTER, WAITING FOR IT TO OVERFLOW, COMPARING
        !       COUNT FOR COUNT THE INCREMENTED VALUES, AND GUARANTEEING WE WILL EXIT THE
        !       LOOP IF THE COUNTER SOMEHOW NEVER OVERFLOWS.


        4301:  !(FREE)
        COUNTER01:
                P2,     COUNTER+BSPHI(C000000),                 !LOAD COUNTER WITH (000) TO START
                NEXT,   J/COUNTER02                             !
       (4301) DCS[0.00.0.0.0.0]  BM[0000..01.11..00.00..100..000...0.0.0..0..0...0.0000...0..0010.1...11.000...011.001.000]

        4310:  !(FREE)
        COUNTER02:
                P2-T,   D+ZERO, D[C]+ALU15,                     !ZERO D, D[C]
                P3,     A#BSPHI[17]+D,                          !ASPHI[17] WILL TRACK THE COUNTER
                NEXT,   J/COUNTER03                             !
       (4310) DCS[0.00.0.0.0.0]  BM[0011..00.11..00.01..011..100...0.1.0..0..0...0.0000...0..1011.0...11.000...101.010.110]


        !***    THE LOOP FOR THE COUNTER TEST ENTERS HERE    ***
        4526:
        COUNTER03:
                P2-T,   D+A-XOR-B, SAVE-D[C],                   !COMPARE COUNTER:TRACKER
                        BUS-A, COUNT#D[LO],                     !=(COUNTER)#(000)
```

```
                BUS-B←BSPHI(R17),                    !=(TRACKER)#(000)
        NEXT,   BUTR(D[C]-B),                        !D[C] HOLDS THE CARRYOUT FROM THE TRACKING REGISTER
                                                     !IF (0), GOTO(COUNTER04), CONTINUE TESTING
                J/COUNTER04                          !IF (1), GOTO(COUNTER11), ERROR, D OVERFLOW BEFORE COUNTER
 (4526) DCS[0.00.0.0.0.0] BM[0110..01.11..01.01..011..111...0.1.0..0..0...0.0011...0..0000.0...10.011...101.100.101]


    !ENTER HERE FOR CONTINUE TEST
    4545:
    COUNTER04:
        P0,     DCS-CTR(CS,),                        !HOLD UP ON DCS COMPARE
        NEXT,   BUTR(D14-00-EQ-0),                   !COMPARE COUNTER:TRACKER, GENERATED ABOVE
                                                     !IF  EQUAL, GOTO(COUNTER05), CONTINUE TEST
                J/COUNTER12                          !IF NOT EQUAL, GOTO(COUNTER12), COUNTER#TRACKER ERROR
 (4545) DCS[0.00.1.0.0.0] BM[1010..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...01.101...101.101.101]


    !ENTER HERE FOR CONTINUE TEST
    4557:
    COUNTER05:
        P2-T,   D←ZERO, D[C]←ALU15,                  !TRY TO FORCE EXIT
        NEXT,   BUTR(CASE),                          !DETERMINE WHO TO TEST:
                                                     !SR=0 -> COUNTER06
                                                     !SR=1 -> COUNTER07
                J/COUNTER06                          !SR=2 -> COUNTER08    (SR=3 NOT USED)
 (4557) DCS[0.00.0.0.0.0] BM[0011..00.00..00.00..000..100...0.1.0..0..0...0.0000...0..0000.0...00.000...101.011.100]

    !ENTER HERE FOR SR=0
    4534:
    COUNTER06:
        P2-T,   D←A-PLUS-B, D[C]←COUT15,             !INCREMENT TRACKING REGISTER
                BUS-A←ASPHI(R17),                    !
                BUS-B←CSPD(D17),                     !CONSTANT (400)
        P3,     A#BSPHI[17]←D,                       !SAVE NEW
        NEXT,   BUTA(SR1-0#COUNT-IS-377),            !IF SET, GOTO(COUNTER10), B.M. COUNTER OVERFLOWED
                J/COUNTER03                          !IF CLEAR, GOTO(COUNTER03), NEXT PASS THRU TEST
 (4534) DCS[0.00.0.0.0.0] BM[1001..10.11..11.01..011..110...0.1.0..0..0...0.0000...0..1011.0...01.011...101.010.110]

    !ENTER HERE FOR SR=1
    4535:
    COUNTER07:
        P2-T,   D←A-PLUS-B, D[C]←COUT15,             !INCREMENT TRACKING REGISTER
                BUS-A←ASPHI(R17),                    !
                BUS-B←CSPD(D17),                     !CONSTANT (400)
        P3,     A#BSPHI[17]←D,                       !SAVE NEW
        NEXT,   BUTA(COUNT-IS-377),                  !IF SET, GOTO(COUNTER10), B.M. COUNTER OVERFLOWED
                J/COUNTER03                          !IF CLEAR, GOTO(COUNTER03), NEXT PASS THRU TEST
 (4535) DCS[0.00.0.0.0.0] BM[1001..10.11..11.01..011..110...0.1.0..0..0...0.0000...0..1011.0...10.101...101.010.110]

    !ENTER HERE FOR SR=2
    4536:
    COUNTER08:
        P2-T,   D←A-PLUS-B, D[C]←COUT15,             !INCREMENT TRACKING REGISTER
                BUS-A←ASPHI(R17),                    !
```

```
                         BUS-B←CSPD(D17),                         !CONSTANT (400)
                 P3,     A#BSPHI[17]←D,                           !SAVE NEW
                 NEXT,   BUTA(COUNT-IS-377#D[C]),                 !IF SET, GOTO(COUNTER10), B.M. COUNTER OVERFLOWED
                         J/COUNTER09                              !IF CLEAR, GOTO(COUNTER09), NEXT PASS THRU TEST
        (4536)  DCS[0.00.0.0.0.0]  BM[1001..10.11..11.01..011..110...0.1.0..0..0...0.0000...0..1011.0...01.111...101.010.101]


    !INTERMEDIATE WORD FOR NEXT PASS
    4525:
    COUNTER09:
                 NEXT,   J/COUNTER03                              !NEXT PASS
        (4525)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...101.010.110]



    !    -    -    -    -    -    -    -    -    -    -    -    -

    !ENTER THIS SECTION WHEN HIT AN END CONDITION:

    !ENTER HERE WHEN COUNTER SIGNALS IT HAS OVERFLOWN:
    4527:
    COUNTER10:
                 P0,     DCS-CTR(C15.),                           !HOLD UP
                 NEXT,   BUTR(D[C]-B),                            !NOW TEST THAT D HAS ALSO OVERFLOWED, AT THE SAME TIME
                                                                  !IF TRUE, GOTO(COUNTER10A), ALL IS OK, END THE TEST
                         J/COUNTER10B                             !IF FALSE, GOTO(COUNTER10B), ERROR, COUNTER OVERFLOWED TOO SOON
        (4527)  DCS[0.00.1.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...10.011...101.011.001]

    4533:
    COUNTER10A:
                 P0,     DCS-CTR(C15.),                           !ALL, END THE TEST WITH NO ERRORS
                 NEXT,   BUTA(RETURN),                            !
                         J/BUTERROR4                              !
        (4533)  DCS[0.00.1.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]

    4531:
    COUNTER10B:
                 P0,     DCS-CTR(C0.),                            !FORCE ERROR NOW,
                 NEXT,   BUTA(RETURN),                            !  B.M. COUNTER OVERFLOWED TOO SOON
                         J/BUTERROR4                              !
        (4531)  DCS[0.00.1.0.0.0]  BM[1111..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]

    !ENTER HERE WHEN WE GET A "D OVERFLOWED BEFORE COUNTER" CONDITION
    4547:
    COUNTER11:
                 P0,     DCS-CTR(C0.),                            !FORCE ERROR NOW,
                 NEXT,   BUTA(RETURN),                            !  B.M. COUNTER DIDN'T OVERFLOW ON TIME
                         J/BUTERROR4                              !
        (4547)  DCS[0.00.1.0.0.0]  BM[1111..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]

    !ENTER HERE WHEN WE GET A "TRACKER : COUNTER" MISCOMPARE
    4555:
    COUNTER12:
                 P0,     DCS-CTR(C0.),                            !FORCE ERROR NOW,
```

```
        NEXT,    BUTA(RETURN),                    ! B.M. COUNTER DIDN'T INCREMENT IN STEP WITH TRACKER
                 J/BUTERROR4                      !
 (4555) DCS[0.00.1.0.0.0] BM[1111..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]





     !.PAGE=================================================================================================

     .TOC    *   TEST610:  CONDITION CODE LOGIC



     !**************************************************************************
     !*
     !*     TESTS:  610 A - D                               UWORDS:  074 + 070
     !*
     !*     FUNCTIONS:
     !*
     !*     THE FOLLOWING EIGHT TESTS EXERCISE THE PSW CC LOGIC (THE NZVC BITS)
     !*     AND THE ASSOCIATED ROMS/MUXES ETC. TO VERIFY THE ABSCENCE OF STUCK
     !*     ONE/ZERO CONDITIONS ON ALL LOGIC LINES.
     !*
     !**************************************************************************
     !
     !      SUMMARY OF CC-LOGIC TESTS:
     !
     !      TEST  ROM     IR     CC                                          MODIFY  PREV  GENERATED
     !      NUMB  ADR    DATA   CLASS BYTE-H  D[C]/D-REG A-SIDE B-SIDE       VBIT-H  NZVC    NZVC
     !      ----  ---   ------  ----- ------  ---------- ------ ------       ------  ----    ----
     !
     !       A1   665   105200  010      1     1-100000  177700 100100          1    1010    0101
     !       A2   145   105200  010      1     0-100000  077600 000200          0    1001    0110
     !
     !       B1   132   105300  101      1     1-000200  100000 000200          0    0100    1011
     !       B2   253   005300  101      0     0-000000  100200 000200          1    1001    0110
     !
     !       C1   437   072000  111      0     1-000000  000200 000200          0    1010    0111
     !       C2   037   072000  111      0     1-077776  037777 037777          0    1100    0001
     !
     !       D1   216   072000  111      0     0-177400  077600 077600          1    0101    1000
     !       D2   116   072000  111      0     0-100000  000200 100200          0    0101    1000
     !
     !


     ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

     !*** TEST 610A1 ***

     5627:
     TEST610A1:
```

```
          P0,      LOAD-ENUA(ZTARGET405),                       !NZVC AFTER = "0101"
                   LOAD-ERROR(TEST610A1),                       !ERROR DIRECTORY KEY
                   DCS-CTR(C15.),                               !COMPARE AT TARGET
                   BUMP-VERIFY,                                 !COUNT
          NEXT,    J/LOADIR610A1                                !
   (5627) DCS[1.00.1.0.0.1] BM[0000..00.11..11.00..000..101...0.0.0..0..0...0.0000...0..0000.0...11.000...101.011.010]

    5532:
    LOADIR610A1:
          P0,      BUMP-VERIFY,                                 !COUNT
          P2-U,    IR+EMIT, EMIT/105200,                        !(105200)=INCB, CC-CLASS="010", BYTE-H
          NEXT,    J/LOAD01-610A1                               !
   (5532) DCS[0.00.0.0.0.1] BM[1000..00.10..10.10..000..000...0.0.0..0..0...1.1010...0..0000.0...11.000...011.000.110]

    5306: !(FREE)
    LOAD01-610A1:
          P0,      BUMP-VERIFY,                                 !COUNT
          P3,      CSPD[01]+EMIT, EMIT/100012,                  !FOR D[C]=(1), PS[NZVC]="1010" PREVIOUSLY
          NEXT,    J/LOAD05-610A1                               !
   (5306) DCS[0.00.0.0.0.1] BM[1000..10.00..00.00..001..010...0.0.0..0..0...0.1110...1..0000.0...11.000...011.000.111]

    5307: !(FREE)
    LOAD05-610A1:
          P3,      CSPD[05]+EMIT, EMIT/177700,                  !A-SIDE DATA
          NEXT,    J/LOAD06-610A1                               !
   (5307) DCS[0.00.0.0.0.0] BM[1111..10.11..11.11..000..000...0.0.0..0..0...0.1010...1..0000.0...11.000...011.001.000]

    5310: !(FREE)
    LOAD06-610A1:
          P3,      CSPD[06]+EMIT, EMIT/100100,                  !B-SIDE DATA
          NEXT,    J/PSCC-DC610A1                               !
   (5310) DCS[0.00.0.0.0.0] BM[1000..10.00..00.01..000..000...0.0.0..0..0...0.1001...1..0000.0...11.000...011.001.001]

    5311: !(FREE)
    PSCC-DC610A1:
          SETUP,   RETURN/SETBUSA610A1,                         !EXEC SUBR WHICH:
                                                                !(1) CSP(10)<3:0> -> PS[NZVC]
          NEXT,    CALL[SETUPPSCC#DC]                           !(2) CSP(10)<15> -> D[C]
   (5311) DCS[0.00.0.0.0.0] BM[0101..00.01..10.01..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...001.101.110]

    5312: !(FREE)
    SETBUSA610A1:
          P2-T,    SR+CSPD(D05),                                !GET CONSTANT FOR A-SIDE WHEN CC SET
          NEXT,    J/DOIT610A1                                  !
   (5312) DCS[0.00.0.0.0.0] BM[1010..10.00..00.00..000..000...0.0.1..0..0...0.1010...0..0000.0...11.000...011.001.011]

    5313: !(FREE)
    DOIT610A1:
          SETUP,   SET-CC,                                      !FOR CLOCKING CC-S IN NEXT UWORD
                   MODIFY-VBIT,                                 !EXTRA CC ROM INPUT
          P2-T,    D+A-PLUS-B, SAVE-D[C],                       !D=(100000), D[C]=(1)
                   BUS-A+SR,                                    !A=(177700)
                   BUS-B+CSPD(D06),                             !B=(100100)
```

```
            NEXT,    J/GETIT610A1                              !
    (5313)  DCS[0.00.0.0.0.0]  BM[1001..10.00..00.10..000..111...0.1.0..0..1...0.1001...0..0000.0...11.000...011.001.100]

        5314:  !(FREE)
        GETIT610A1:
            P2-T,    CLK-CC,                                   !PS[NZVC] GENERATED ABOVE LATCHED HERE
            SETUP,   RETURN/TEST610A2,                         !EXEC SUBR WHICH:
            NEXT,    CALL[PSCCTOSR3-0]                         !   PS<3:0> -> SR<3:0>, J/BUT(SR3-0)
    (5314)  DCS[0.00.0.0.0.0]  BM[0101..00.11..00.10..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...001.110.010]



        ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

        !*** TEST 610A2 ***

        5622:
        TEST610A2:
            P0,      LOAD-ENUA(ZTARGET406),                    !NZVC AFTER = "0110"
                     LOAD-ERROR(TEST610A2),                    !ERROR DIRECTORY KEY
                     DCS-CTR(C13.),                            !COMPARE AT TARGET
            NEXT,    J/LOAD06-610A2                            !
    (5622)  DCS[1.00.1.0.0.0]  BM[0010..00.11..11.00..000..110...0.0.0..0..0...0.0000...0..0000.0...11.000...011.001.101]

        5315:  !(FREE)
        LOAD06-610A2:
            P0,      BUMP-VERIFY,                              !COUNT
            P3,      CSPD[06]←EMIT, EMIT/077600,               !A-SIDE DATA
            NEXT,    J/LOAD01-610A2                            !
    (5315)  DCS[0.00.0.0.0.1]  BM[0111..10.11..11.10..000..000...0.0.0..0..0...0.1001...1..0000.0...11.000...011.001.110]

        5316:  !(FREE)
        LOAD01-610A2:
            P3,      CSPD[01]←EMIT, EMIT/000011,               !FOR D[C]=(0), PS[NZVC]="1001" PREVIOUSLY
            NEXT,    J/PSCC-DC610A2                            !
    (5316)  DCS[0.00.0.0.0.0]  BM[0000..10.00..00.00..001..001...0.0.0..0..0...0.1110...1..0000.0...11.000...011.001.111]

        5317:  !(FREE)
        PSCC-DC610A2:
            SETUP,   RETURN/SETBUSA610A2,                      !EXEC SUBR WHICH:
                                                               !(1) CSP(10)<3:0> -> PS[NZVC]
            NEXT,    CALL[SETUPPSCC#DC]                        !(2) CSP(10)<15> -> D[C]
    (5317)  DCS[0.00.0.0.0.0]  BM[0101..00.01..10.10..000..111...0.0.0..0..0...0.0000...0..0000.0...11.100...001.101.110]

        5320:  !(FREE)
        SETBUSA610A2:
            P2-T,    SR←CSPD(D06),                             !GET CONSTANT FOR A-SIDE WHEN CC SET
            NEXT,    J/DOIT610A2                               !
    (5320)  DCS[0.00.0.0.0.0]  BM[1010..10.00..00.00..000..000...0.0.1..0..0...0.1001...0..0000.0...11.000...011.010.001]

        5321:  !(FREE)
        DOIT610A2:
```

```
          SETUP,   SET-CC,                                   !FOR CLOCKING CC-S IN NEXT UWORD
                   NOT-MODIFY-VBIT,                          !EXTRA CC ROM INPUT
          P2-T,    D←A-PLUS-B, SAVE-D[C],                    !D=(100000), D[C]=(0)
                   BUS-A←SR,                                 !A=(077600)
                   BUS-B←BSPHI(C000200),                     !B=(000200)
          NEXT,    J/GETIT610A2                              !
   (5321)  DCS[0.00.0.0.0.0]  BM[1001..01.11..00.00..010..111...0.1.0..0..1...0.0000...0..0000.0...11.000...011.010.010]

      5322:  !(FREE)
      GETIT610A2:
          P2-T,    CLK-CC,                                   !PS[NZVC] GENERATED ABOVE LATCHED HERE
          SETUP,   RETURN/SCOPE610A,                         !EXEC SUBR WHICH:
          NEXT,    CALL[PSCCTOSR3-0]                         !  PS<3:0> -> SR<3:0>, J/BUT(SR3-0)
   (5322)  DCS[0.00.0.0.0.0]  BM[0101..00.01..10.10..011..111...0.0.0..0..0...0.0000...0..0000.0...11.100...001.110.010]



      5323:  !(FREE)
      SCOPE610A:
          P0,      BUMP-VERIFY,                              !COUNT
          NEXT,    BUTD[SCOPE],                              !NO ERROR:  "TEST610B1" (+1. WORDS)
                   J/TEST610B1                               !   ERROR:  "LOADIR610A1" (-15. WORDS)
   (5323)  DCS[0.00.0.1.0.1]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...101.011.011]








      ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

      !*** TEST 610B1 ***

      5533:
      TEST610B1:
          P0,      LOAD-ENUA(ZTARGET413),                    !NZVC AFTER = "1011"
                   LOAD-ERROR(TEST610B1),                    !ERROR DIRECTORY KEY
                   DCS-CTR(C13.),                            !COMPARE AT TARGET
          NEXT,    J/LOADIR610B1                             !
   (5533)  DCS[1.00.1.0.0.0]  BM[0010..00.11..11.00..001..011...0.0.0..0..0...0.0000...0..0000.0...11.000...101.011.100]

      5534:
      LOADIR610B1:
          P0,      BUMP-VERIFY,                              !COUNT
          P2-U,    IR←EMIT, EMIT/105300,                     !(105300)=DECB, CC-CLASS="101", BYTE-H
          NEXT,    J/LOAD01-610B1                            !
   (5534)  DCS[0.00.0.0.0.1]  BM[1000..00.10..10.11..000..000...0.0.0..0..0...1.1010...0..0000.0...11.000...011.010.100]

      5324:  !(FREE)
      LOAD01-610B1:
          P3,      CSPD[01]←EMIT, EMIT/100004,               !FOR D[C]=(1), PS[NZVC]="0100" PREVIOUSLY
```

```
             NEXT,    J/PSCC-DC61081                          !
      (5324)  DCS[0.00.0.0.0.0]  BM[1000..10.00..00.00..000..100...0.0.0..0..0...0.1110...1..0000.0...11.000...011.010.101]

       5325:  !(FREE)
       PSCC-DC61081:
             SETUP,   RETURN/SETBUSA61081,                    !EXEC SUBR WHICH:
                                                              !(1) CSP(10)<3:0> -> PS[NZVC]
             NEXT,    CALL[SETUPPSCC#DC]                      !(2) CSP(10)<15> -> D[C]
      (5325)  DCS[0.00.0.0.0.0]  BM[0101..00.01..10.10..110..111...0.0.0..0..0...0.0000...0..0000.0...11.100...001.101.110]

       5326:  !(FREE)
       SETBUSA61081:
             P2-T,    SR+BSPHI(C100000),                      !GET CONSTANT FOR A-SIDE WHEN CC SET
             NEXT,    J/DOIT61081                             !
      (5326)  DCS[0.00.0.0.0.0]  BM[1010..01.11..00.00..001..000...0.0.1..0..0...0.0000...0..0000.0...11.000...011.010.111]

       5327:  !(FREE)
       DOIT61081:
             SETUP,   SET-CC,                                 !FOR CLOCKING CC-S IN NEXT UWORD
                      NOT-MODIFY-VBIT,                        !EXTRA CC ROM INPUT
             P2-T,    D+NOT-A-AND-B, SAVE-D[C],               !D=(000200), D[C]=(1)
                      BUS-A+SR,                               !A=(100000)
                      BUS-B+BSPHI(C000200),                   !B=(000200)
             NEXT,    J/GETIT61081                            !
      (5327)  DCS[0.00.0.0.0.0]  BM[0010..01.11..00.00..010..111...0.1.0..0..1...0.0000...0..0000.0...11.000...011.011.000]

       5330:  !(FREE)
       GETIT61081:
             P2-T,    CLK-CC,                                 !PS[NZVC] GENERATED ABOVE LATCHED HERE
             SETUP,   RETURN/TEST61082,                       !EXEC SUBR WHICH:
             NEXT,    CALL[PSCCTOSR3-0]                       !  PS<3:0> -> SR<3:0>, J/BUT(SR3-0)
      (5330)  DCS[0.00.0.0.0.0]  BM[0101..00.11..00.01..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...001.110.010]



       ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

       !*** TEST 61082 ***

       5612:
       TEST61082:
             P0,      LOAD-ENUA(ZTARGET406),                  !NZVC AFTER = "0110"
                      LOAD-ERROR(TEST61082),                  !ERROR DIRECTORY KEY
                      DCS-CTR(C14.),                          !COMPARE AT TARGET
             NEXT,    J/LOADIR61082                           !
      (5612)  DCS[1.00.1.0.0.0]  BM[0001..00.11..11.00..000..110...0.0.0..0..0...0.0000...0..0000.0...11.000...011.011.001]

       5331:  !(FREE)
       LOADIR61082:
             P0,      BUMP-VERIFY,                            !COUNT
             P2-U,    IR+EMIT, EMIT/005300,                   !(005300)=DEC, CC-CLASS="101", NOT-BYTE-H
             NEXT,    J/LOAD07-61082                          !
```

```
     (5331)  DCS[0.00.0.0.0.1]  BM[0000..00.10..10.11..000..000...0.0.0..0..0...1.1010...0..0000.0...11.000...011.011.010]

        5332:  !(FREE)
        LOAD07-610B2:
                P3,       CSPD[07]+EMIT, EMIT/100200,            !A-SIDE DATA
                NEXT,     J/LOAD01-610B2                          !
     (5332)  DCS[0.00.0.0.0.0]  BM[1000..10.00..00.10..000..000...0.0.0..0..0...0.1000...1..0000.0...11.000...011.011.011]

        5333:  !(FREE)
        LOAD01-610B2:
                P3,       CSPD[01]+EMIT, EMIT/000011,            !FOR D[C]=(0), PS[NZVC]="1001" PREVIOUSLY
                NEXT,     J/PSCC-DC610B2                          !
     (5333)  DCS[0.00.0.0.0.0]  BM[0000..10.00..00.00..001..001...0.0.0..0..0...0.1110...1..0000.0...11.000...011.011.100]

        5334:  !(FREE)
        PSCC-DC610B2:
                SETUP,    RETURN/SETBUSA610B2,                   !EXEC SUBR WHICH:
                                                                  !(1) CSP(10)<3:0> -> PS[NZVC]
                NEXT,     CALL[SETUPPSCC#DC]                     !(2) CSP(10)<15> -> D[C]
     (5334)  DCS[0.00.0.0.0.0]  BM[0101..00.01..10.11..101..111...0.0.0..0..0...0.0000...0..0000.0...11.100...001.101.110]

        5335:  !(FREE)
        SETBUSA610B2:
                P2-T,     SR+CSPD(D07),                          !GET CONSTANT FOR A-SIDE WHEN CC SET
                NEXT,     J/DOIT610B2                             !
     (5335)  DCS[0.00.0.0.0.0]  BM[1010..10.00..00.00..000..000...0.0.1..0..0...0.1000...0..0000.0...11.000...011.011.110]

        5336:  !(FREE)
        DOIT610B2:
                SETUP,    SET-CC,                                !FOR CLOCKING CC-S IN NEXT UWORD
                          MODIFY-VBIT,                           !EXTRA CC ROM INPUT
                P2-T,     D+NOT-A-AND-B, SAVE-D[C],              !D=(000000), D[C]=(0)
                          BUS-A+SR,                              !A=(100200)
                          BUS-B+BSPHI(C000200),                  !B=(000200)
                NEXT,     J/GETIT610B2                            !
     (5336)  DCS[0.00.0.0.0.0]  BM[0010..01.11..00.10..010..111...0.1.0..0..1...0.0000...0..0000.0...11.000...011.011.111]

        5337:  !(FREE)
        GETIT610B2:
                P2-T,     CLK-CC,                                !PS[NZVC] GENERATED ABOVE LATCHED HERE
                SETUP,    RETURN/SCOPE610B,                      !EXEC SUBR WHICH:
                NEXT,     CALL[PSCCTOSR3-0]                      !  PS<3:0> -> SR<3:0>, J/BUT(SR3-0)
     (5337)  DCS[0.00.0.0.0.0]  BM[0101..00.01..11.00..000..111...0.0.0..0..0...0.0000...0..0000.0...11.100...001.110.010]



        5340:  !(FREE)
        SCOPE610B:
                P0,       BUMP-VERIFY,                           !COUNT
                NEXT,     BUTD[SCOPE],                           !NO ERROR:  "TEST610C1" (+1. WORDS)
                          J/TEST610C1                            !   ERROR:  "LOADIR610B1" (-14. WORDS)
     (5340)  DCS[0.00.0.1.0.1]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...101.011.101]
```

D09


```
        ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

        !*** TEST 610C1 ***

        5535:
        TEST610C1:
                P0,     LOAD-ENUA(ZTARGET407),                  !NZVC AFTER = "0111"
                        LOAD-ERROR(TEST610C1),                  !ERROR DIRECTORY KEY
                        DCS-CTR(C13.),                          !COMPARE AT TARGET
                NEXT,   J/LOADIR610C1                           !
(5535)  DCS[1.00.1.0.0.0]  BM[0010..00.11..11.00..000..111...0.0.0..0..0...0.0000...0..0000.0...11.000...101.100.100]

        5544:
        LOADIR610C1:
                P0,     BUMP-VERIFY,                            !COUNT
                P2-U,   IR←EMIT, EMIT/072000,                   !(072000)=ASH, CC-CLASS="111", NOT-BYTE-H
                NEXT,   J/LOAD01-610C1                          !
(5544)  DCS[0.00.0.0.0.1]  BM[0111..00.01..00.00..00C..000...0.0.0..0..0...1.1010...0..0000.0...11.000...011.100.001]

        5341:  !(FREE)
        LOAD01-610C1:
                P3,     CSPD[01]←EMIT, EMIT/100012,             !FOR D[C]=(1), PS[NZVC]="1010" PREVIOUSLY
                NEXT,   J/PSCC-DC610C1                          !
(5341)  DCS[0.00.0.0.0.0]  BM[1000..10.00..00.00..001..010...0.0.0..0..0...0.1110...1..0000.0...11.000...011.100.010]

        5342:  !(FREE)
        PSCC-DC610C1:
                SETUP,  RETURN/SETBUSA610C1,                    !EXEC SUBR WHICH:
                                                                !(1) CSP(10)<3:0> -> PS[NZVC]
                NEXT,   CALL[SETUPPSCC#DC]                      !(2) CSP(10)<15> -> D[C]
(5342)  DCS[0.00.0.0.0.0]  BM[0101..00.01..11.00..011..111...0.0.0..0..0...0.0000...0..0000.0...11.100...001.101.110]

        5343:  !(FREE)
        SETBUSA610C1:
                P2-T,   SR←BSPHI(C000200),                      !GET CONSTANT FOR A-SIDE WHEN CC SET
                NEXT,   J/DOIT610C1                             !
(5343)  DCS[0.00.0.0.0.0]  BM[1010..01.11..00.00..010..000...0.0.1..0..0...0.0000...0..0000.0...11.000...011.100.100]

        5344:  !(FREE)
        DOIT610C1:
                SETUP,  SET-CC,                                 !FOR CLOCKING CC-S IN NEXT UWORD
                        NOT-MODIFY-VBIT,                        !EXTRA CC ROM INPUT
                P2-T,   D←A-XOR-B, SAVE-D[C],                   !D=(000000), D[C]=(1)
                        BUS-A←SR,                               !A=(000200)
                        BUS-B←BSPHI(C000200),                   !B=(000200)
```

```
                NEXT,   J/GETIT610C1                            !
        (5344)  DCS[0.00.0.0.0.0]  BM[0110..01.11..00.00..010..111...0.1.0..0..1...0.0000...0..0000.0...11.000...011.100.101]

        5345:  !(FREE)
        GETIT610C1:
                P2-T,   CLK-CC,                                 !PS[NZVC] GENERATED ABOVE LATCHED HERE
                SETUP,  RETURN/TEST610C2,                       !EXEC SUBR WHICH:
                NEXT,   CALL[PSCCTOSR3-0]                       !  PS<3:0> -> SR<3:0>, J/BUT(SR3-0)
        (5345)  DCS[0.00.0.0.0.0]  BM[0101..00.11..00.00..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...001.110.010]




        !  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -

        !*** TEST 610C2 ***

        5602:
        TEST610C2:
                P0,     LOAD-ENUA(ZTARGET401),                  !NZVC AFTER = "0001"
                        LOAD-ERROR(TEST610C2),                  !ERROR DIRECTORY KEY
                        DCS-CTR(C13.),                          !COMPARE AT TARGET
                NEXT,   J/LOAD05-610C2                          !
        (5602)  DCS[1.00.1.0.0.0]  BM[0010..00.11..11.00..000..001...0.0.0..0..0...0.0000...0..0000.0...11.000...011.100.110]

        5346:  !(FREE)
        LOAD05-610C2:
                P0,     BUMP-VERIFY,                            !COUNT
                P3,     CSPD[05]+EMIT, EMIT/037777,             !A AND B SIDE DATA
                NEXT,   J/LOAD01-610C2                          !
        (5346)  DCS[0.00.0.0.0.1]  BM[0011..10.11..11.11..111..111...0.0.0..0..0...0.1010...1..0000.0...11.000...011.100.111]

        5347:  !(FREE)
        LOAD01-610C2:
                P3,     CSPD[01]+EMIT, EMIT/100014,             !FOR D[C]=(1), PS[NZVC]="1100" PREVIOUSLY
                NEXT,   J/PSCC-DC610C2                          !
        (5347)  DCS[0.00.0.0.0.0]  BM[1000..10.00..00.00..001..100...0.0.0..0..0...0.1110...1..0000.0...11.000...011.101.000]

        5350:  !(FREE)
        PSCC-DC610C2:
                SETUP,  RETURN/SETBUSA610C2,                    !EXEC SUBR WHICH:
                                                                !(1) CSP(10)<3:0> -> PS[NZVC]
                NEXT,   CALL[SETUPPSCC#DC]                      !(2) CSP(10)<15> -> D[C]
        (5350)  DCS[0.00.0.0.0.0]  BM[0101..00.01..11.01..001..111...0.0.0..0..0...0.0000...0..0000.0...11.100...001.101.110]

        5351:  !(FREE)
        SETBUSA610C2:
                P2-T,   SR+CSPD(D05),                           !GET CONSTANT FOR A-SIDE WHEN CC SET
                NEXT,   J/DOIT610C2                             !
        (5351)  DCS[0.00.0.0.0.0]  BM[1010..10.00..00.00..000..000...0.0.1..0..0...0.1010...0..0000.0...11.000...011.101.010]

        5352:  !(FREE)
```

```
        DOIT610C2:
                SETUP,  SET-CC,                                    !FOR CLOCKING CC-S IN NEXT UWORD
                        NOT-MODIFY-VBIT,                           !EXTRA CC ROM INPUT
                P2-T,   D+A-PLUS-B, SAVE-D[C],                     !D=(077776), D[C]=(1)
                        BUS-A+SR,                                  !A=(037777)
                        BUS-B+CSPD(D05),                           !B=(037777)
                NEXT,   J/GETIT610C2                               !
     (5352) DCS[0.00.0.0.0.0] BM[1001..10.00..00.00..000..111...0.1.0..0..1...0.1010...0..0000.0...11.000...011.101.011]

        5353:  !(FREE)
        GETIT610C2:
                P2-T,   CLK-CC,                                    !PS[NZVC] GENERATED ABOVE LATCHED HERE
                SETUP,  RETURN/SCOPE610C,                          !EXEC SUBR WHICH:
                NEXT,   CALL[PSCCTOSR3-0]                          !  PS<3:0> -> SR<3:0>, J/BUT(SR3-0)
     (5353) DCS[0.00.0.0.0.0] BM[0101..00.01..11.01..100..111...0.0.0..0..0...0.0000...0..0000.0...11.100...001.110.010]



        5354:  !(FREE)
        SCOPE610C:
                P0,     BUMP-VERIFY,                               !COUNT
                NEXT,   BUTD[SCOPE],                               !NO ERROR:  "TEST610D1" (+1. WORDS)
                        J/TEST610D1                                !   ERROR:  "LOADIR610C1" (-13. WORDS)
     (5354) DCS[0.00.0.1.0.1] BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...101.100.101]








        ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

        !*** TEST 610D1 ***

        5545:
        TEST610D1:
                P0,     LOAD-ENUA(ZTARGET410),                     !NZVC AFTER = "1000"
                        LOAD-ERROR(TEST610D1),                     !ERROR DIRECTORY KEY
                        DCS-CTR(C12.),                             !COMPARE AT TARGET
                NEXT,   J/LOAD01-610D1                             !
     (5545) DCS[1.00.1.0.0.0] BM[0011..00.11..11.00..001..000...0.0.0..0..0...0.0000...0..0000.0...11.000...101.001.000]

        5510:
        LOAD01-610D1:
                P3,     CSPD[01]+EMIT, EMIT/000005,                !FOR D[C]=(0), PS[NZVC]="0101" PREVIOUSLY
                NEXT,   J/PSCC-DC610D1                             !
     (5510) DCS[0.00.0.0.0.0] BM[0000..10.00..00.00..000..101...0.0.0..0..0...0.1110...1..0000.0...11.000...011.101.101]

        5355:  !(FREE)
        PSCC-DC610D1:
                SETUP,  RETURN/SETBUSA610D1,                       !EXEC SUBR WHICH:
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```
                                                          !(1) CSP(10)<3:0> -> PS[NZVC]
              NEXT,    CALL[SETUPPSCC#DC]                 !(2) CSP(10)<15> -> D[C]
      (5355)  DCS[0.00.0.0.0.0]  BM[0101..00.01..11.01..110..111...0.0.0..0..0...0.0000...0..0000.0...11.100...001.101.110]

        5356:  !(FREE)
        SETBUSA61001:
              P2-T,    SR←CSPD(D06),                      !GET CONSTANT FOR A-SIDE WHEN CC SET
              NEXT,    J/DOIT61001                        !
      (5356)  DCS[0.00.0.0.0.0]  BM[1010..10.00..00.00..000..000...0.0.1..0..0...0.1001...0..0000.0...11.000...011.101.111]

        5357:  !(FREE)
        DOIT61001:
              SETUP,   SET-CC,                            !FOR CLOCKING CC-S IN NEXT UWORD
                       MODIFY-VBIT,                       !EXTRA CC ROM INPUT
              P2-T,    D←A-PLUS-B, SAVE-D[C],             !D=(177400), D[C]=(0)
                       BUS-A←SR,                          !A=(077600)
                       BUS-B←CSPD(D06),                   !B=(077600)
              NEXT,    J/GETIT61001                       !
      (5357)  DCS[0.00.0.0.0.0]  BM[1001..10.00..00.10..000..111...0.1.0..0..1...0.1001...0..0000.0...11.000...011.110.000]

        5360:  !(FREE)
        GETIT61001:
              P2-T,    CLK-CC,                            !PS[NZVC] GENERATED ABOVE LATCHED HERE
              SETUP,   RETURN/TEST61002,                  !EXEC SUBR WHICH:
              NEXT,    CALL[PSCCTOSR3-0]                  !  PS<3:0> -> SR<3:0>, J/BUT(SR3-0)
      (5360)  DCS[0.00.0.0.0.0]  BM[0101..00.11..00.10..100..111...0.0.0..0..0...0.0000...0..0000.0...11.100...001.110.010]



        ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

        !*** TEST 61002 ***

        5624:
        TEST61002:
              P0,      LOAD-ENUA(ZTARGET410),             !NZVC AFTER = "1000"
                       LOAD-ERROR(TEST61002),             !ERROR DIRECTORY KEY
                       DCS-CTR(C11.),                     !COMPARE AT TARGET
              NEXT,    J/PSCC-DC61002                     !
      (5624)  DCS[1.00.1.0.0.0]  BM[0100..00.11..11.00..001..000...0.0.0..0..0...0.0000...0..0000.0...11.000...011.110.001]

        5361:  !(FREE)
        PSCC-DC61002:
              SETUP,   RETURN/SETBUSA61002,               !EXEC SUBR WHICH:
                                                          !(1) CSP(10)<3:0> -> PS[NZVC]
              NEXT,    CALL[SETUPPSCC#DC]                 !(2) CSP(10)<15> -> D[C]
      (5361)  DCS[0.00.0.0.0.0]  BM[0101..00.01..11.10..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...001.101.110]

        5362:  !(FREE)
        SETBUSA61002:
              P2-T,    SR←BSPHI(C000200),                 !GET CONSTANT FOR A-SIDE WHEN CC SET
```

```
                NEXT,   J/DOIT610D2                                     !
       (5362)  DCS[0.00.0.0.0.0]  BM[1010..01.11..00.00..010..000...0.0.1..0..0...0.0000...0..0000.0...11.000...011.110.011]

        5363:  !(FREE)
        DOIT610D2:
                SETUP,  SET-CC,                                         !FOR CLOCKING CC-S IN NEXT UWORD
                        NOT-MODIFY-VBIT,                                !EXTRA CC ROM INPUT
                P2-T,   D+NOT-A-AND-B, SAVE-D[C],                       !D=(100000), D[C]=(0)
                        BUS-A+SR,                                       !A=(000200)
                        BUS-B+CSPD(D07),                                !B=(100200)
                NEXT,   J/GETIT610D2                                    !
       (5363)  DCS[0.00.0.0.0.0]  BM[0010..10.00..00.00..000..111...0.1.0..0..1...0.1000...0..0000.0...11.000...011.110.100]

        5364:  !(FREE)
        GETIT610D2:
                P2-T,   CLK-CC,                                         !PS[NZVC] GENERATED ABOVE LATCHED HERE
                SETUP,  RETURN/SCOPE610D,                               !EXEC SUBR WHICH:
                NEXT,   CALL[PSCCTOSR3-0]                               !  PS<3:0> -> SR<3:0>, J/BUT(SR3-0)
       (5364)  DCS[0.00.0.0.0.0]  BM[0101..00.01..11.10..101..111...0.0.0..0..0...0.0000...0..0000.0...11.100...001.110.010]



        5365:  !(FREE)
        SCOPE610D:
                P0,     BUSDIN+EMIT-[I],                                !RESET PROC UCONS
                        EN-CLK-IR[15-00],                               !
                NEXT,   BUTD[SCOPE],                                    !NO ERROR:  "TEST620A" (+6. WORDS)
                        J/TEST620A                                      !   ERROR:  "LOAD01-610D1" (-10. WORDS)
       (5365)  DCS[0.00.0.1.0.0]  BM[0000..00.00..00.01..000..100...0.0.0..0..0...1.1001...0..0000.0...11.000...101.001.001]







        ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

        !       THESE TWO SUBROUTINES ARE USED IN THE ABOVE CC-LOGIC TESTS:

        7156:  !(FREE)
        SETUPPSCC#DC:
                P2-T,   D+CSPD(D01), D[C]+ALU15,                        !SET D[C] FROM BIT<15>
                NEXT,   J/SETUPPSCC#DC02                                !
       (7156)  DCS[0.00.0.0.0.0]  BM[1010..10.00..00.00..000..100...0.1.0..0..0...0.1110...0..0000.0...11.000...001.110.001]

        7161:  !(FREE)
        SETUPPSCC#DC02:
                P2,     PS[3-0]+D[3-0]-[I],                             !SET PS[CC] FROM BIT<03:00>
                        BUSDIN+PS-[I],                                  !SETUP BUSDIN TO READ PS
                NEXT,   BUTA(RETURN),                                   !AND RETURN
                        J/BUTERROR7                                     !ERROR IF HERE
       (7161)  DCS[0.00.0.0.0.0]  BM[1000..00.00..10.01..000..000...0.0.0..0..0...1.1011...0..0000.0...11.111...011.111.110]
```

```
     7162:  !(FREE)
     PSCCTOSR3-0:
             P3,       CSPD[03]+BUSDIN,                          !GET ENABLED PS INTO CSP
             NEXT,     J/PSCCTOSR3-0AA                           !
(7162) DCS[0.00.0.0.0.0] BM[0000..10.00..00.00..000..000...0.0.0..0..0...0.1100...1..0000.0...11.000...001.110.011]

     7163:  !(FREE)
     PSCCTOSR3-0AA:
             P2-T,     SR+CSPD(D03),                             !MOVE PS[CC] TO SR<3:0>
             NEXT,     J/PSCCTOSR3-0BB                           !
(7163) DCS[0.00.0.0.0.0] BM[1010..10.00..00.00..000..000...0.0.1..0..0...0.1100...0..0000.0...11.000...001.110.100]

     7164:  !(FREE)
     PSCCTOSR3-0BB:
             P0,       BUSDIN+EMIT-[I],                          !RESET EMIT FOR CONSTANTS
                       EN-CLK-IR[15-00],                         !AND IR LOADING
             NEXT,     J/BUTSR3-0                                !AND GO TEST THE BITS
(7164) DCS[0.00.0.0.0.0] BM[0000..00.00..00.01..000..100...0.0.0..0..0...1.1001...0..0000.0...11.000...010.111.110]





     !.PAGE=============================================================================================


     .TOC   *   TEST620-624:  TESTING UBREAK AND JAMUPP

     !*************************************************************************
     !*
     !*     TESTS:  620 - 624                              UWORDS: 101 + 133
     !*
     !*     FUNCTIONS:
     !*
     !*     THE FOLLOWING GROUP OF TEST FORCES A JAMUPP CONDITION VIA THE UBREAK FACILITY.
     !*     TESTS ARE THEN PERFORMED ON JAMUPP RELATED SIDE EFFECTS:
     !*
     !*     ALL JAM CONDITION BITS CAN BE RESET; ACTIVE BUT ROM, CSP WRITE BIT ARE CLEARED
     !*     IN WORD WHICH JAM OCCURS; NON-INTERNAL-JAM IS SET; CUA IS LOCKED, UNLOCKED BY
     !*     BUTA(TRACK); PREFETCH*JAM SET/CLEARED.
     !*
     !*************************************************************************



     ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

     !*** TEST 620 ***

     ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
```

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        !* PART A ***
        !TEST-620-A DOES A 'CLR-JAM-ERRORS' UCON-I-O FUNCTION, THEN CHECKS 'INIT JAM'=0
        5511:
        TEST620A:
                PO,     LOAD-ENUA(ZTARGET406),                  !EXPECTED ADDRESS AFTER 'BUT'
                        LOAD-ERROR(TEST620A),                   !ERROR DIRECTORY KEY
                        DCS-CTR(CS.),                           !COMPARE AT TARGET
                NEXT,   J/BCERC620A                             !
   (5511) DCS[1.00.1.0.0.0] BM[1010..00.11..11.00..000..110...0.0.0..0..0...0.0000...0..0000.0...11.000...101.111.000]

        5570:
        BCERC620A:
                PO,     BUMP-VERIFY,                            !COUNT
                P2,     CLR-JAM-ERRORS-[I],                     !CLEAR OUT ERROR REGISTERS
                NEXT,   J/GOBUT620A                             !
   (5570) DCS[0.00.0.0.0.1] BM[0100..00.00..10.00..000..000...0.0.0..0..0...1.1011...0..0000.0...11.000...011.110.110]

        5366:   !(FREE)
        GOBUT620A:
                SETUP,  RETURN/TEST620B,                        !RETURN TO START OF NEXT SUBTEST
                NEXT,   GOTO-PAGE(7),                           !BUT TABLE IS ON PAGE 7,
                        J/BUTMINITJAM                           !GO DO MULTIPLE 'BUT' ON INIT JAM
   (5366) DCS[0.00.0.0.0.0] BM[0101..00.11..00.10..011..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.011.110]


        ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

        !* PART B *
        !TEST-620-B CHECKS THAT 'OTHER-JAM-H'=0 ALSO
        5623:
        TEST620B:
                PO,     LOAD-ENUA(ZTARGET401),                  !BIT<01> CLEAR
                        LOAD-ERROR(TEST620B),                   !ERROR DIRECTORY KEY
                        DCS-CTR(C3.),                           !COMPARE AT TARGET
                NEXT,   J/GOBUT620B                             !
   (5623) DCS[1.00.1.0.0.0] BM[1100..00.11..11.00..000..001...0.0.0..0..0...0.0000...0..0000.0...11.000...011.110.111]

        5367:   !(FREE)
        GOBUT620B:
                SETUP,  RETURN/TEST620C,                        !RETURN TO START OF NEXT SUBTEST
                NEXT,   GOTO-PAGE(7),                           !BUT TABLE IS ON PAGE 7
                        J/BUTOTHERJAM                           !GO DO BUT ON OTHER-JAM-H SIGNAL
   (5367) DCS[0.00.0.0.0.0] BM[0101..00.11..00.10..001..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.101.010]


        ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

        !* PART C *
        !TEST-620-C CHECKS THAT STATUS MUX PORT 2 (JAM REG) READS (001000) WHEN RESET
        !       "CLEAR-JAM-ERRORS" FUNCTION CLEARS BITS<15,13,11,8-2,0> OF JAM-REG
        !       "CLR-YELLOW-ZONE" FUNCTION CLEARS BIT<12> OF JAM-REG
```

```
    !       BIT<9> IS ACTIVE LOW, READS AS "1"H
    !       BITS<10,1> READ "0" SINCE NO WCS PRESENT
    !       BIT<14> IS "0" ALWAYS
    5621:
    TEST620C:
            P0,     LOAD-ENUA(ZTARGET402),                  !SETUP FOR D<15:00>=0 TEST RESULT
                    LOAD-ERROR(TEST620C),                   !ERROR DIRECTORY KEY
                    DCS-CTR(C11.),                          !COMPARE AT TARGET
            P3,     BUTA(CLR-FLAG-RES-UCON),                !PUT EMIT ONTO BUSDIN, CLEAR OUT I-O UCON
            NEXT,   J/MASK620C                              !
 (5621) DCS[1.00.1.0.0.0] BM[0100..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.010...011.111.000]

    5370: !(FREE)
    MASK620C:
            P0,     BUMP-VERIFY,                            !COUNT
            P3,     CSPD[04]+EMIT,                          !DON'T NEED TO MASK ANYTHING
            EMITC,  EMIT/177777,                            !
            NEXT,   J/GETJAM620C                            !
 (5370) DCS[0.00.0.0.0.1] BM[1111..10.11..11.11..111..111...0.0.0..0..0...0.1011...1..0000.0...11.000...011.111.001]

    5371: !(FREE)
    GETJAM620C:
            SETUP,  RETURN/TEST621A,                        !GO EXECUTE SUBR WHICH:
            P0,     BUMP-VERIFY,                            !COUNT
            NEXT,   CALL[CLRJAMTOD]                         !  (JAMREG)-XOR-CSP(02)/(001000) -> D, BUT(D=ZERO)
 (5371) DCS[0.00.0.0.0.1] BM[0101..00.11..00.01..111..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.101.101]





    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    !*** TEST 621 ***
    !CAUSE A MICROBREAK JAM, AND CHECK ALL THE APPROPRIATE SIGNALS ARE SET

    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    !* PART A *
    !TEST-621-A CAUSES A MICROBREAK JAM AT A SPECIFIC MICROADDRESS, AND CHECKS
    !THAT THE MICROCODE JAMS TO LOCATION (4777) IMMEDIATELY
    5617:
    TEST621A:
            P0,     LOAD-ENUA(4777),                        !SETUP JAMUPP ADDRESS
                    LOAD-ERROR(TEST621A),                   !ERROR DIRECTORY KEY
                    DCS-CTR(C9.),                           !COMPARE AT JAMUPP WORD
            P3,     BUTA(CUA-TRACK),                        !RESET CUA TRACKING IF HASN'T BEEN
            NEXT,   J/CSP1L621A                             !
 (5617) DCS[1.00.1.0.0.0] BM[0110..00.10..01.11..111..111...0.0.0..0..0...0.0000...0..0000.0...11.001...011.111.010]

    5372: !(FREE)
    CSP1L621A:
            P0,     BUMP-VERIFY,                            !COUNT
```

```
            EMITC,  EMIT/100377,                                        !
            P2-U,   IR←EMIT,                                            !A BRANCH INSTR, SO 'PREFETCH H' = "0"
            P3,     CSPD[D5]←EMIT,                                      !FLAG<8>="1", FOR UBREAK EN; EXFLAG<2:1>="11", FOR ACTIVE BUT TEST
            NEXT,   J/SETBRK621A                                        !BIT00="1", FOR JAMUPP ROUTINE
    (5372)  DCS[0.00.0.0.0.1]  BM[1000..10.00..00.11..111..111...0.0.0..0..0...1.1010...1..0000.0...11.000...011.111.011]
                                                                        !NOTE CSPADDR(D5)/UCON-OPERATION BIT OVERLAP

        5373:   !(FREE)
        SETBRK621A:
            SELECT, UCON-PROC,                                          !PROCESSOR UCON:
            ENABLE, EN-CLK-UBREAK[11-00],                               !  FOR UBREAK REG LOAD
                    BUSDIN←EMIT[15-00],                                 !  AND KEEP EMIT ON BUSDIN
            P0,     SET-UCON-CONTROL,                                   !WRITE UCON REGISTER
            NEXT,   J/LODBRK621A
    (5373)  DCS[0.00.0.0.0.0]  BM[0000..01.00..00.01..000..000...0.0.0..0..0...1.1001...0..0000.0...11.000...011.111.100]

        5374:   !(FREE)
        LODBRK621A:
            P2-T,   SR←ZERO,                                            !ZERO SR<00>, TO PREVENT SPURIOUS UBREAKS FROM GETTING THRU
                    UBREAK←BUSDIN[11-00],                               !LOAD MICROBREAK REGISTER
                    EMITML/5522,                                        !  WITH SELECTED ADDRESS FROM EMIT
            NEXT,   J/SETRET621A                                        !
    (5374)  DCS[0.00.0.0.0.0]  BM[0011..00.10..11.01..010..010...0.0.1..0..0...1.1010...0..0000.0...11.000...011.111.101]

        5375:   !(FREE)
        SETRET621A:
            P0,     BUMP-VERIFY,                                        !COUNT
            P3,     CSPD[D0]←EMIT, RETURN/TEST621B,                     !RETURN ADDRESS FOR AFTER JAMUPP
            NEXT,   J/SETFLG621A                                        !
    (5375)  DCS[0.00.0.0.0.1]  BM[0101..10.11..00.01..011..000...0.0.0..0..0...0.1111...1..0000.0...11.000...011.111.111]

        5377:   !(FREE)
        SETFLG621A:
            P2-T,   D←CSPD(D05), D[C]←0,                                !GET VALUES TO LOAD INTO FLAGS
            P3,     ASPHI[16]←D,                                        !  AND SAVE IN ASP FOR COMPARE LATER
            NEXT,   J/LODFLG621A                                        !
    (5377)  DCS[0.00.0.0.0.0]  BM[1010..10.00..00.00..011..000...0.1.0..0..0...0.1010...0..1001.0...11.000...100.000.000]

        5400:   !(FREE)
        LODFLG621A:
            P0,     BUSDIN←EMIT-[I],                                    !KEEP IT ON
                    BUMP-VERIFY,                                        !COUNT
            P3,     FLAG[8-0]←D[15-8]-[I],                              !ENABLE U-BREAK, FLAG 8; SET EXFLAGS FOR LATER
            NEXT,   J/SETSR621A                                         !
    (5400)  DCS[0.00.0.0.0.1]  BM[0000..00.00..00.01..000..001...0.0.0..0..0...1.1011...0..0000.0...11.000...100.000.001]

        5401:   !(FREE)
        SETSR621A:
            P2-T,   SR←CSPD(D05),                                       !MAKE SR<00>=1, FOR JAMUPP EXPECTED
            NEXT,   J/UBRK621A                                          !(FOR UBREAK JAM EXPECTED)
    (5401)  DCS[0.00.0.0.0.0]  BM[1010..10.00..00.00..000..000...0.0.1..0..0...0.1010...0..0000.0...11.000...101.010.010]

        5522:
        UBRK621A:                                                       !*** MICROBREAK HERE ***
```

```
            P3-T,   D←ZERO, D[C]←ALU15,                    !UWORD LATCH FOR CLK-D NOT CLEARED, CLK-D SHOULD HAPPEN
                    BUTA(CLR-FLAG-RES-UCON),               !JAMUPP CLEAR SHOULD ZAP ACTIVE BUT LATCH, BUTA(CLR-...) SHOULDN'T HA
                                                           !CUA GETS LOCKED WITH UADDR OF THIS UWORD (5522) ON JAMUPP
                                                           !PREFETCH*JAM(I)H GETS PREFETCH-H (="0") AT JAMUPP
            P3,     CSPD[05]←EMIT, EMIT/030004,            !LATCH HOLDING "WRCSP" BIT SHOULD GET ZAPPED ON JAMUPP,
                                                           !  THIS WRITE SHOULDN'T HAPPEN
            NEXT,   J/ERROR621A                            !THIS UPF SHOULD NOT BE USED
  (5522) DCS[0.00.0.0.0.0] BM[0011..10.00..00.00..000..100...1.1.0..0..0...0.1010...1..0000.0...11.010...110.001.101]


    !(4777)  JAMUPP001:  ***COMPARE ENABLED ABOVE DONE HERE***
    !                THIS WORD TESTS SR<00>, WHICH SHOULD BE SET
    !                IF SR<00>=1, GOTO(JAMUPP002B), IF SR<00>=0, GOTO(JAMUPP003) [ERROR]
    !                P3-T,   SR←D    SAVE OLD D IN SR, FOR NOW
    !
    !(4757)  JAMUPP002B:  P2-T,  D←CSPD(00)      GET RETURN ADDRESS INTO D
    !
    !(4XXX)  JAMUPP002C:  P0,     RETURN←D  LOAD RETURN ADDRESS
    !                     P2-T,  D←SR       RESTORE OLD D FROM SR
    !
    !(7XXX)  JAMUPP002D:  P2-T,  SR←ZERO,  ZERO OUT SR, JAMUPPS NOW ILLEGAL
    !                     NEXT,  BUTA(RETURN)       AND NOW RETURN
    !

    !EXECUTE THE FOLLOWING WORD ONLY IF NO JAMUPP OCCURRED:
    5615:
    ERROR621A:
            P0,     LOAD-ENUA(0000),                       !FORCE ERROR
                    LOAD-ERROR(ERROR621A),                 !ERROR DIRECTORY KEY
                    DCS-CTR(C0.),                          !FORCE COMPARE AT P3-T
                    BUMP-VERIFY,                           !COUNT
            NEXT,   J/TEST621B                             !
  (5615) DCS[1.00.1.0.0.1] BM[1111..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...110.001.011]



    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    !* PART B *
    !TEST-621-B CHECKS THAT D WAS ZEROED; IE, P3 PULSE WAS SUPPRESSED IN JAM WORD,
    !  BUT UWORD LATCH FOR CLK-D BIT NOT ZAPPED, SO BIT WAS SAVED FOR EXECUTE LATER
    5613:
    TEST621B:
            P0,     LOAD-ENUA(ZTARGET402),                 !SETUP FOR D = ZERO TEST
                    LOAD-ERROR(TEST621B),                  !ERROR DIRECTORY KEY
                    DCS-CTR(C3.),                          !COMPARE AT TARGET
            NEXT,   J/GOBUT621B                            !
  (5613) DCS[1.00.1.0.0.0] BM[1100..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...100.000.010]

    5402:  !(FREE)
    GOBUT621B:
            SETUP,  RETURN/TEST621C,                       !RETURN TO START OF NEXT SUBTEST
            NEXT,   GOTO-PAGE(7),                          !BUT TABLE ON PAGE 7
                    J/BUTD-IS-ZERO                         !BUT ON D CONTENTS
```

```
(5402) DCS[0.00.0.0.0.0] BM[0101..00.11..00.01..001..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.001]


	! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

	!* PART C *
	!TEST-621-C CHECKS THAT 'INIT JAM' STILL OFF
	5611:
	TEST621C:
		PO,	LOAD-ENUA(ZTARGET406),			!BIT<00> CLEAR
			LOAD-ERROR(TEST621C),			!ERROR DIRECTORY KEY
			DCS-CTR(C4.),				!COMPARE AT TARGET
		NEXT,	J/GOBUT621C				!
(5611) DCS[1.00.1.0.0.0] BM[1011..00.11..11.00..000..110...0.0.0..0..0...0.0000...0..0000.0...11.000...100.000.011]

	5403:	!(FREE)
	GOBUT621C:
		SETUP,	RETURN/TEST621D,			!RETURN TO START OF NEXT SUBTEST
		NEXT,	GOTO-PAGE(7),				!BUT TABLE ON PAGE 7
			J/BUTMINITJAM				!GO TEST INIT JAM
(5403) DCS[0.00.0.0.0.0] BM[0101..00.11..00.00..111..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.011.110]


	! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

	!* PART D *
	!TEST-621-D CHECKS THAT 'OTHER-JAM-H'=1, WAS SET FOR UBREAK
	5607:
	TEST621D:
		PO,	LOAD-ENUA(ZTARGET403),			!BIT<01> SET
			LOAD-ERROR(TEST621D),			!ERROR DIRECTORY KEY
			DCS-CTR(C3.),				!COMPARE AT TARGET
		NEXT,	J/GOBUT621D				!
(5607) DCS[1.00.1.0.0.0] BM[1100..00.11..11.00..000..011...0.0.0..0..0...0.0000...0..0000.0...11.000...100.000.100]

	5404:	!(FREE)
	GOBUT621D:
		SETUP,	RETURN/TEST621E,			!RETURN TO START OF NEXT SUBTEST
		PO,	BUMP-VERIFY,				!COUNT
		NEXT,	GOTO-PAGE(7),				!BUT TABLE ON PAGE 7
			J/BUTOTHERJAM				!GO TEST 'OTHER-JAM-H' IS SET
(5404) DCS[0.00.0.0.0.1] BM[0101..00.11..00.00..101..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.101.010]


	! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

	!* PART E *
	!TEST-621-E CHECKS UBREAK ONLY BIT SET FROM UBREAK JAMUPP IN STATUS MUX PORT 2 (JAM REG)
	5605:
	TEST621E:
		PO,	LOAD-ENUA(ZTARGET402),			!SETUP FOR D = ZERO COMPARE
			LOAD-ERROR(TEST621E),			!ERROR DIRECTORY KEY
```

```
                DCS-CTR(C10.),                          !COMPARE AT TARGET
        NEXT,   J/EXPEC621E                             !
(5605)  DCS[1.00.1.0.0.0]  BM[0101..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...100.000.101]

    5405:  !(FREE)
    EXPEC621E:
        P3,     CSPD[02]+EMIT,                          !WHAT WE EXPECT TO SEE IN JAM IS:
        EMITC,  EMIT/001001,                            !  (001001),  UBREAK H IN BIT00
        NEXT,   J/GETJAM621E                            !
(5405)  DCS[0.00.0.0.0.0]  BM[0000..10.00..10.00..000..001...0.0.0..0..0...0.1101...1..0000.0...11.000...100.000.110]

    5406:  !(FREE)
    GETJAM621E:
        SETUP,  RETURN/TEST621F,                        !GO TO SUBR WHICH:
        NEXT,   CALL[JAMTOD]                            !  (JAMREG)-XOR-CSP(02) -> D, BUT(D=ZERO)
(5406)  DCS[0.00.0.0.0.0]  BM[0101..00.11..00.00..011..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.101.110]



    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    !* PART F *
    !TEST-621-F CHECKS THAT THE RIGHT CUA WAS LOCKED, AND SHORT TERM FLAGS NOT CLEARED (IE,
    !  BUTA(CLR-FLAG-...) IN UBREAK WORD DIDN'T CLEAR EXFLAG1), INDICATING JAMUPP CLEAR L
    !  DID IN FACT ZAP THE ACTIVE BUT ROM LATCH.  ALSO PREFETCH*JAM(1)H GETS PREFETCH-H="0".
    5603:
    TEST621F:
        P0,     LOAD-ENUA(ZTARGET402),                  !SETUP FOR D = ZERO COMPARE
                LOAD-ERROR(TEST621F),                   !ERROR DIRECTORY KEY
                DCS-CTR(C10.),                          !COMPARE AT TARGET
        NEXT,   J/EXPEC621F                             !
(5603)  DCS[1.00.1.0.0.0]  BM[0101..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...100.000.111]

    5407:  !(FREE)
    EXPEC621F:
        P0,     BUMP-VERIFY,                            !COUNT
        P3,     CSPD[02]+EMIT,                          !(USE MASK OF ALL 1'S FROM BEFORE)
        EMITC,  EMIT/055226,                            !WHAT THE CUA-EXFLAG-FOVP PORT OF HBMUX SHOULD BE
        NEXT,   J/GETCUA621F                            !CUA=(5522), EXFLAG(2:1)="11", PREFETCH*JAM(1)H="0"
(5407)  DCS[0.00.0.0.0.1]  BM[0101..10.10..10.10..010..110...0.0.0..0..0...0.1101...1..0000.0...11.000...100.001.000]

    5410:  !(FREE)
    GETCUA621F:
        SETUP,  RETURN/TEST621G,                        !GO TO SUBR WHICH:
        P0,     BUMP-VERIFY,                            !COUNT
        NEXT,   CALL[CUATOD]                            !  (CUA)-XOR-CSP(02) -> D, BUT(D=ZERO)
(5410)  DCS[0.00.0.0.0.1]  BM[0101..00.11..11.10..110..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.101.111]
```

```
        ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

        !* PART G *
        !TEST-621-G CHECKS THAT 'PREFETCH*JAM(1)H' GOT 'PREFETCH-H'="O" AFTER JAMUPP
        5766:
        TEST621G:
                PO,     LOAD-ENUA(ZTARGET401),                  !BIT01 CLEAR
                        LOAD-ERROR(TEST621G),                   !ERROR DIRECTORY KEY
                        DCS-CTR(C3.),                           !COMPARE AT TARGET
                NEXT,   J/GOBUT621G                             !
   (5766) DCS[1.00.1.0.0.0]  BM[1100..00.11..11.00..000..001...0.0.0..0..0...0.0000...0..0000.0...11.000...100.001.001]

        5411:   !(FREE)
        GOBUT621G:
                SETUP,  RETURN/TEST621H,                        !RETURN TO START OF NEXT SUBTEST
                PO,     BUMP-VERIFY,                            !COUNT
                NEXT,   GOTO-PAGE(7),                           !BUT TABLE ON PAGE 7
                        J/BUTPREFETCHJAM                        !PREFETCH*JAM(1)H IN BIT01
   (5411) DCS[0.00.0.0.0.1]  BM[0101..00.11..11.01..100..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.110.000]




        ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

        !* PART H *
        !TEST-G21-H CHECKS THAT CSP(05) DID NOT GET WRITTEN IN THE JAMMED WORD ABOVE,
        !  AND IS IN FACT, EQUAL TO THE SAVED COPY OF ITS CONTENTS, IN ASPHI[16]
        5754:
        TEST621H:
                PO,     LOAD-ENUA(ZTARGET402),                  !SETUP FOR D=ZERO COMPARE
                        LOAD-ERROR(TEST621H),                   !ERROR DIRECTORY KEY
                        DCS-CTR(C4.),                           !COMPARE AT TARGET
                        BUMP-VERIFY,                            !COUNT
                NEXT,   J/COMP621H                              !
   (5754) DCS[1.00.1.0.0.1]  BM[1011..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...100.001.010]

        5412:   !(FREE)
        COMP621H:
                P2-T,   D+CSPD[05]-XOR-ASPHI(R16),              !COMPARE CURRENT:SAVED, SHOUL BE SAME
                NEXT,   GOTO-PAGE(7),                           !XFER
                        J/GOBUT621H                             !
   (5412) DCS[0.00.0.0.0.0]  BM[0110..10.00..11.00..011..111...0.1.0..0..0...0.1010...0..0000.0...11.100...001.110.000]

        7160:   !(FREE)
        GOBUT621H:
                SETUP,  RETURN/TEST622A,                        !RETURN TO START OF NEXT SUBTEST
                NEXT,   GOTO-PAGE(7),                           !BUT TABLE ON PAGE 7
                        J/BUTD-IS-ZERO                          !TEST FOR EQUALITY
   (7160) DCS[0.00.0.0.0.0]  BM[0101..00.11..00.00..001..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.001]
```

```
    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    !*** TEST 622 ***
    !DO A 'CLR-JAM-ERRORS' FUNCTION TO CLEAR OUT SET BITS
    !MAKE SURE THAT 'START-DELAY', 'CLR-NPR-TIMEOUT' DON'T CLEAR THEM

    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    !* PART A *
    !TEST-622-A CHECKS THAT 'START-DELAY', 'CLR-NPR-TIMEOUT' DON'T AFFECT
    !THE 'CLR-JAM-ERRORS' FUNCTION'
    5601:
    TEST622A:
            P0,     LOAD-ENVA(ZTARGET403),                   !SETUP FOR BUT ON 'OTHER-JAM-H'= (1)
                    LOAD-ERROR(TEST622A),                    !ERROR DIRECTORY KEY
                    DCS-CTR(C5.),                            !COMPARE AT TARGET
            NEXT,   J/BC1FCN622A                             !
(5601) DCS[1.00.1.0.0.0] BM[1010..00.11..11.00..000..011...0.0.0..0..0...0.0000...0..0000.0...11.000...100.001.011]

    5413: !(FREE)
    BC1FCN622A:
            P0,     BUMP-VERIFY,                             !COUNT
            P2,     START-DELAY-[I],                         !DO A 'START-DELAY'
            NEXT,   J/CNST0622A                              !
(5413) DCS[0.00.0.0.0.1] BM[0100..00.00..01.00..000..000...0.0.0..0..0...1.1011...0..0000.0...11.000...100.001.100]

    5414: !(FREE)
    CNST0622A:
            P2,     CLR-NPR-TIMEOUT-[I],                     !DO A 'CLR-NPR-TIMEOUT'
            NEXT,   J/GOBUT622A                              !NEITHER OF THESE SHOULD ASSERT 'CLR-JAM-ERRORS'
(5414) DCS[0.00.0.0.0.0] BM[0100..00.00..11.00..000..000...0.0.0..0..0...1.1011...0..0000.0...11.000...100.001.101]

    5415: !(FREE)
    GOBUT622A:
            SETUP,  RETURN/TEST622B,                         !RETURN TO START OF NEXT SUBTEST
            NEXT,   GOTO-PAGE(7),                            !BUT TABLE ON PAGE 7
                    J/BUTOTHERJAM                            !TEST 'OTHER-JAM-H' STILL SET
(5415) DCS[0.00.0.0.0.0] BM[0101..00.10..11.11..111..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.101.010]


    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    !* PART B*
    !TEST-622-B NOW CHECKS THAT 'CLR-JAM-ERRORS' DOES JUST THAT
    5577:
    TEST622B:
            P0,     LOAD-ENVA(ZTARGET401),                   !SETUP FOR BUT ON 'OTHER-JAM-H'=(0)
                    LOAD-ERROR(TEST622B),                    !ERROR DIRECTORY KEY
                    DCS-CTR(C4.),                            !COMPARE AT TARGET
            NEXT,   J/BCERC622B                              !
(5577) DCS[1.00.1.0.0.0] BM[1011..00.11..11.00..000..001...0.0.0..0..0...0.0000...0..0000.0...11.000...100.001.110]
```

```

    5416:  !(FREE)
    BCERC622B:
            P2,     CLR-JAM-ERRORS-[I],                       !DO IT
            NEXT,   J/GOBUT622B                               !
 (5416)  DCS[0.00.0.0.0.0]  BM[0100..00.00..10.00..000..000...0.0.0..0..0...1.1011...0..0000.0...11.000...100.001.111]

    5417:  !(FREE)
    GOBUT622B:
            SETUP,  RETURN/TEST622C,                          !RETURN TO START OF NEXT SUBTEST
            NEXT,   GOTO-PAGE(7),                             !BUT TABLE ON PAGE 7,
                    J/BUTOTHERJAM                             !TEST 'OTHER-JAM-H' NOW CLEAR
 (5417)  DCS[0.00.0.0.0.0]  BM[0101..00.10..11.11..101..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.101.010]


    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    !* PART C *
    !TEST-622-C TESTS THAT STATUS MUX PORT 2 (JAM REG) READS (001000) WHEN RESET
    5575:
    TEST622C:
            P0,     LOAD-ENUA(ZTARGET402),                    !SETUP FOR D = ZERO TEST
                    LOAD-ERROR(TEST622C),                     !ERROR DIRECTORY KEY
                    DCS-CTR(C10.),                            !COMPARE AT TARGET
            P3,     BUTA(CLR-FLAG-RES-UCON),                  !PUT EMIT ON BUSDIN, CLEAR SHORT TERM FLAGS
            NEXT,   J/GETJAM622C                              !
 (5575)  DCS[1.00.1.0.0.0]  BM[0101..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.010...100.010.000]

    5420:  !(FREE)
    GETJAM622C:
            SETUP,  RETURN/TEST623,                           !GO TO SUBR WHICH:
            NEXT,   CALL[CLRJAMTOD]                           !  (JAMREG)-XOR-CSP(02)/(001000) -> D, BUT(D=ZERO)
 (5420)  DCS[0.00.0.0.0.0]  BM[0101..00.10..11.11..011..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.101.101]







    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    !*** TEST 623 ***
    !TEST-623 CHECKS THAT BUTA(CUA-TRACK) RESTARTS CUA TRACKING
    5573:
    TEST623:
            P0,     LOAD-ENUA(ZTARGET402),                    !SETUP FOR D = ZERO TEST
                    LOAD-ERROR(TEST623),                      !ERROR DIRECTORY KEY
                    DCS-CTR(C10.),                            !COMPARE AT TARGET
            P3,     BUTA(CUA-TRACK),                          !RESET TO TRACKING CUA MODE
            NEXT,   J/EXPEC623                                !
 (5573)  DCS[1.00.1.0.0.0]  BM[0101..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.001...100.010.001]
```

```
    5421:  !(FREE)
    EXPEC623:
            P0,      BUMP-VERIFY,                               !COUNT
            P3,      CSPD[02]←EMIT,                             !(PREV MASK)
            EMITC,   EMIT/073734,                               !CUA IS WORD WHICH LOADS CUA INTO CSP, ONLY
            NEXT,    J/GETCUA623                                !  EXFLAG<1> CLEARED FROM BUTA(CLR-FLAG-...), ABOVE
(5421)  DCS[0.00.0.0.0.1]  BM[0111..10.01..11.11..011..100...0.0.0..0..0...0.1101...1..0000.0...11.000...100.010.010]

    5422:  !(FREE)
    GETCUA623:
            SETUP,   RETURN/SCOPE623,                           !GO TO SUBR WHICH:
                                                                !  CUA=(WORD WHICH READS CUA), SINCE TRACKING RESET
            NEXT,    CALL[CUATOD]                               !  (CUA)-XOR-CSP(02) -> D, BUT(D=ZERO)
(5422)  DCS[0.00.0.0.0.0]  BM[0101..00.10..00.10..011..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.101.111]


    5423:  !(FREE)
    SCOPE623:
            P0,      BUSDIN←EMIT-[I],                           !RESET PROC UCONS
                     EN-CLK-IR[15-00],                          !IR GETS JUNK, BUT DON'T CARE
            P3,      FLAG[8-0]←D[15-8]-[I],                     !RESET FLAGS TO ALL ZERO
            NEXT,    BUTD[SCOPE],                               !NO ERROR:  "TEST624A" [+1. WORDS]
                     J/TEST624A                                 !   ERROR:  "BCERC620A" [-48. WORDS]
(5423)  DCS[0.00.0.1.0.0]  BM[0000..00.00..00.01..000..101...0.0.0..0..0...1.1011...0..0000.0...11.000...101.111.001]





    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    !*** TEST 624 ***
    !DO ANOTHER UBREAK JAM, CHECK JAM OCCURS, AND THAT P2 IS SEEN IN JAM WORD

    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    !* PART A *
    !TEST-624-A CAUSES A UBREAK JAM, AND CHECKS TO SEE IT OCCURS

    5571:
    TEST624A:
            P0,      LOAD-ENUA(4777),                           !SETUP JAMUPP ADDRESS
                     LOAD-ERROR(TEST624A),                      !ERROR DIRECTORY KEY
                     DCS-CTR(C9.),                              !COMPARE AT JAMUPP WORD
            NEXT,    J/LODIR624A                                !
(5571)  DCS[1.00.1.0.0.0]  BM[0110..00.10..01.11..111..111...0.0.0..0..0...0.0000...0..0000.0...11.000...101.110.010]

    5562:
    LODIR624A:
            P2-U,    IR←EMIT,                                   !IR PATTERN ASSERTS PREFETCH-H:
                     EMIT/030603,                               !  PREFETCH-H=(DOPH*MOVBL*SMOH*SR7L*DMOH*DR7L)
            P3,      FLAG[8-0]←D[15-8],                         !FLAGS GET D, WHICH IS ZERO
```

```
          NEXT,     J/SETBRK624A                      !         + (SOPH*NEGL*SBCL*RORL*ASRL*DMOH*DR7L)
  (5562)  DCS[0.00.0.0.0.0]  BM[0011..00.00..01.10..000..011...0.0.0..0..0...1.1010...0..0000.0...11.000...100.010.100]

    5424: !(FREE)
    SETBRK624A:
          SELECT, UCON-PROC,                          !ENABLE PROCESSOR UCON:
          ENABLE, EN-CLK-UBREAK[11-00],               !  EN UBREAK LOAD,
                  BUSDIN+EMIT[15-00],                 !  KEEP EMIT ON BUSDIN
          P0,     SET-UCON-CONTROL,                   !WRITE CONTROLS
                  BUMP-VERIFY,                        !COUNT
          NEXT,   J/LODBRK624A                        !
  (5424)  DCS[0.00.0.0.0.1]  BM[0000..01.00..00.01..000..000...0.0.0..0..0...1.1001...0..0000.0...11.000...100.010.101]

    5425: !(FREE)
    LODBRK624A:
          P0,     BUMP-VERIFY,                        !COUNT
          P2-T,   UBREAK+BUSDIN[11-00],               !LOAD UBREAK REGISTER
                  EMITML/6255,                        !  WITH SELECTED ADDRESS FROM EMIT
          NEXT,   J/SETRET624A                        !
  (5425)  DCS[0.00.0.0.0.1]  BM[0000..00.11..00.10..101..101...0.0.0..0..0...1.1010...0..0000.0...11.000...100.010.110]

    5426: !(FREE)
    SETRET624A:
          P3,     CSPD[00]+EMIT, RETURN/TEST624B,     !RETURN ADDRESS FOR AFTER JAMUPP
          NEXT,   GOTO-PAGE(6),                       !  RETURN TO START OF NEXT SUBTEST
                  J/SETD624A                          !
  (5426)  DCS[0.00.0.0.0.0]  BM[0101..10.10..11.10..101..110...0.0.0..0..0...0.1111...1..0000.0...11.100...011.000.110]

    6306: !(FREE)
    SETD624A:
          P2-T,   D+CSPD(D05), D[C]+ALU15,            !SETUP D WITH VALUE TO GO INTO FLAGS<8:0>
          NEXT,   J/SETFLG624A                        !
  (6306)  DCS[0.00.0.0.0.0]  BM[1010..10.00..00.00..000..100...0.1.0..0..0...0.1010...0..0000.0...11.000...100.101.011]

    6453: !(FREE)
    SETFLG624A:
          P0,     BUSDIN+EMIT-[I],                    !KEEP IT ON
          P3,     FLAG[8-0]+D[15-8]-[I],              !SET UBRK FLAG<8>
          NEXT,   J/SETSR624A                         !
  (6453)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.01..000..001...0.0.0..0..0...1.1011...0..0000.0...11.000...100.101.100]

    6454: !(FREE)
    SETSR624A:
          P2-T,   SR+CSPD(D05),                       !SET SR<00>=1 FOR UBRK JAMUPP EXPECTED
          NEXT,   J/UBRK624A                          !
  (6454)  DCS[0.00.0.0.0.0]  BM[1010..10.00..00.00..000..000...0.0.1..0..0...0.1010...0..0000.0...11.000...010.101.101]

    6255:
    UBRK624A:                                         !*** MICROBREAK HERE ***
          P2-T,   D+ZERO, D[C]+ALU15,                 !P2 PULSE SHOULD OCCUR, SO D SHOULD BE ZEROED.
                                                      !CUA GETS LOCKED WITH UADDR OF THIS UWORD (6255) ON JAMUPP
                                                      !PREFETCH*JAM(1)H GETS PREFETCH-H (="1") AT JAMUPP
```

```
          P3,     FLAG[8-0]←D[15-8],                      !ZERO ALL THE FLAGS IN THIS UWORD.  THE UBREAK SHOULD
                                                          !STILL OCCUR, HOWEVER, AS IT LOOKS AT THE 'NUA'.
          NEXT,   J/ERROR624A                             !UPF SHOULD NOT BE USED.
  (6255) DCS[0.00.0.0.0.0] BM[0011..00.00..00.00..000..100...0.1.0..0..0...1.1010...0..0000.0...11.000...101.110.111]


     !(4777) JAMUPP001:  ***COMPARE ENABLED ABOVE DONE HERE***
     !                THIS WORD TESTS SR<00>, WHICH SHOULD BE SET
     !                IF SR<00>=1, GOTO(JAMUPP002B), IF SR<00>=0, GOTO(JAMUPP003) [ERROR]
     !                P3-T,   SR←D    SAVE OLD D IN SR, FOR NOW
     !
     !(4757) JAMUPP002B:  P2-T,  D←CSPD(00)          GET RETURN ADDRESS INTO D
     !
     !(4XXX) JAMUPP002C:  P0,    RETURN←D  LOAD RETURN ADDRESS
     !                    P2-T,  D←SR      RESTORE OLD D FROM SR
     !
     !(7XXX) JAMUPP002D:  P2-T,  SR←ZERO,  ZERO OUT SR, JAMUPPS NOW ILLEGAL
     !                    NEXT,  BUTA(RETURN)        AND NOW RETURN
     !



     !EXECUTE THE FOLLOWING WORD ONLY IF NO JAMUPP OCCURRED:
     6567:
     ERROR624A:
          P0,     LOAD-ENUA(0005),                        !FORCE ERROR
                  LOAD-ERROR(ERROR624A),                  !ERROR DIRECTORY KEY
                  DCS-CTR(C0.),                           !FORCE COMPARE AT P3-T
                  BUMP-VERIFY,                            !COUNT
          NEXT,   GOTO-PAGE(5),                           !XFER TO 5
                  J/TEST624B                              !
  (6567) DCS[1.00.1.0.0.1] BM[1111..00.00..00.00..000..101...0.0.0..0..0...0.0000...0..0000.0...11.100...101.110.101]


     ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

     !* PART B *
     !TEST-624-B CHECKS THAT D WAS ZEROED, IE, P2 DID OCCUR IN JAM WORD
     5565:
     TEST624B:
          P0,     LOAD-ENUA(ZTARGET434),                  !SETUP FOR IR=ZERO TEST
                  LOAD-ERROR(TEST624B),                   !ERROR DIRECTORY KEY
                  DCS-CTR(C6.),                           !COMPARE AT TARGET
          NEXT,   J/ZEROIR624B                            !
  (5565) DCS[1.00.1.0.0.0] BM[1001..00.11..11.00..011..100...0.0.0..0..0...0.0000...0..0000.0...11.000...100.010.111]

     5427:  !(FREE)
     ZEROIR624B:
          SETUP,  RETURN/TEST624C,                        !PUT THE ZEROES IN D INTO THE IR,
          NEXT,   CALL[DINTOIR-5]                         !  TO NEGATE PREFETCH-H  (000000)=HALT
  (5427) DCS[0.00.0.0.0.0] BM[0101..00.11..11.11..110..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.111.011]
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	! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

	!* PART C *
	!TEST-624-C CHECKS THAT THE RIGHT CUA WAS LOCKED,
	!THAT THE EXFLAGS<2:1>H READ AS "00", AND
	!THAT PREFETCH*JAM(1)H = "1", FROM TEST-624-A, EVEN THOUGH TEST-624-B
	!  RESET THE IR SO THAT PREFETCH-H="0"
	5776:
	TEST624C:
		P0,	LOAD-ENUA(ZTARGET402),		!SETUP FOR D = ZERO COMPARE
			LOAD-ERROR(TEST624C),		!ERROR DIRECTORY KEY
			DCS-CTR(C10.),			!COMPARE AT TARGET
		NEXT,	J/EXPEC624C			!
(5776)	DCS[1.00.1.0.0.0]  BM[0101..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...100.011.000]

	5430:	!(FREE)
	EXPEC624C:
		P3,	CSPD[02]←EMIT,			!(USE MASK OF ALL 1'S FROM BEFORE)
			EMIT/062551,			!WHAT THE CUA-EXFLAG-FOVP PORT OF HBMUX SHOULD BE
		NEXT,	J/GETCUA624C			!CUA=(6255), EXFLAG="00", PREFETCH*JAM(1)H="1"
(5430)	DCS[0.00.0.0.0.0]  BM[0110..10.01..01.01..101..001...0.0.0..0..0...0.1101...1..0000.0...11.000...100.011.001]

	5431:	!(FREE)
	GETCUA624C:
		SETUP,	RETURN/TEST624D,		!GO TO SUBR WHICH:
		P0,	BUMP-VERIFY,			!COUNT
		NEXT,	CALL[CUATOD]			!  (CUA)-XOR-CSP(02) -> D, BUT(D=ZERO)
(5431)	DCS[0.00.0.0.0.1]  BM[0101..00.11..11.01..110..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.101.111]



	! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

	!* PART D *
	!TEST-624-D CHECKS THAT 'PREFETCH*JAM(1)H' GOT 'PREFETCH-H'="1" AFTER JAMUPP
	5756:
	TEST624D:
		P0,	LOAD-ENUA(ZTARGET403),		!BIT01 SET
			LOAD-ERROR(TEST624D),		!ERROR DIRECTORY KEY
			DCS-CTR(C3.),			!COMPARE AT TARGET
		NEXT,	J/GOBUT624D			!
(5756)	DCS[1.00.1.0.0.0]  BM[1100..00.11..11.00..000..011...0.0.0..0..0...0.0000...0..0000.0...11.000...100.011.010]

	5432:	!(FREE)
	GOBUT624D:
		SETUP,	RETURN/CLEAR624,		!RETURN TO SCOPE LOOP TEST WORD
		NEXT,	GOTO-PAGE(7),			!BUT TABLE ON PAGE 7
			J/BUTPREFETCHJAM		!PREFETCH*JAM(1)H IN BIT01
(5432)	DCS[0.00.0.0.0.0]  BM[0111..00.00..11.10..101..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.110.000]
```

```
        7165:  !(FREE)
        CLEAR624:
                SETUP,   RETURN/SCOPE624,                        !RETURN FOR SCOPE LOOP TEST
                NEXT,    CALL[CLEAR-I-O-B]                       !CLEAR OUT WHAT I'VE DONE
 (7165) DCS[0.00.0.0.0.0]  BM[0101..00.01..00.10..100..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.011.000]


        5224:  !(FREE)
        SCOPE624:
                P0,      BUMP-VERIFY,                            !COUNT
                         BUSDIN←EMIT-[I],                        !RESET PROC UCON
                         EN-CLK-IR[15-00],                       !
                P3,      BUTA(CUA-TRACK),                        !AND START CUA TRACKING AGAIN
                NEXT,    BUTD[SCOPE],                            !NO ERROR:  "TEST701A" [+1. WORDS]
                         J/TEST701A                              !   ERROR:  "SETIR624A" [-18. WORDS]
 (5224) DCS[0.00.0.1.0.1]  BM[0000..00.00..00.01..000..100...0.0.0..0..0...1.1001...0..0000.0...11.001...101.110.011]







        !.PAGE=================================================================================================


        .TOC    *   TEST701-702:  LOAD/READ THE BA, FULL 18. BITS

        !**************************************************************************
        !*
        !*      TESTS:  701A - 702B                             UWORDS:  033 + 042
        !*
        !*      FUNCTIONS:
        !*
        !*      THIS NEXT SET OF SIX TESTS CHECKS THE "BA" REGISTER RELATED FUNCTIONS:
        !*              SPECIFICALLY,
        !*              1) LOAD/READ OF BA<15:00>, FROM BUS-A -> BA -> STATUS-MUX/PBA-PORT
        !*              2) BUT ON "BA<00>"
        !*              3) LOAD READ OF BA<17:16>, FROM BUS-B -> BA -> STATUS-MUX/SERVICE-PORT
        !*                      THE EFFECT OF PARTICULAR KT-UCON-FUNCTIONS/CONSOLE-18.-BIT-MODE
        !*                      IN THIS SITUATION IS ALSO EXAMINED FOR FUNCTIONALITY.
        !*
        !**************************************************************************



        ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

        !TEST-701-A CHECKS THAT BA<15:00> CAN BE LOADED, AND READ BACK WITH (052525)
        5563:
        TEST701A:
                P0,      LOAD-ENUA(ZTARGET402),                  !SETUP FOR D=ZERO COMPARE
```

```
                 LOAD-ERROR(TEST701A),                     !ERROR DIRECTORY KEY
                 DCS-CTR(C12.),                            !COMPARE AT TARGET
                 BUMP-VERIFY,                              !COUNT
          NEXT,  J/MASK701A                                !
  (5563)  DCS[1.00.1.0.0.1]  BM[0011..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...100.111.110]

    5476:
    MASK701A:
          P3,    CSPD[04]+EMIT, EMIT/177777,               !MASK TO READ ALL THE BITS
          NEXT,  GOTO-PAGE(7),                             !XFER
                 J/EXPEC701A                               !
  (5476)  DCS[0.00.0.0.0.0]  BM[1111..10.11..11.11..111..111...0.0.0..0..0...0.1011...1..0000.0...11.100...001.110.110]

    7166:  !(FREE)
    EXPEC701A:
          P3,    CSPD[02]+EMIT, EMIT/052525,               !EXPECTED DATA TO BE READ OUT OF PBA AFTER LOAD:
          NEXT,  J/LOADBA701A                              !"0101 0101 0101 0101"
  (7166)  DCS[0.00.0.0.0.0]  BM[0101..10.01..01.01..010..101...0.0.0..0..0...0.1101...1..0000.0...11.000...001.111.000]

    7170:  !(FREE)
    LOADBA701A:
          P1,    BA+ASPHI(C052525),                        !LOAD BA<15:00> WITH PATTERN
          NEXT,  J/GOTEST701A                              !
  (7170)  DCS[0.00.0.0.0.0]  BM[0000..00.00..11.01..111..000...0.0.0..1..0...0.0000...0..0000.0...11.000...001.111.001]

    7171:  !(FREE)
    GOTEST701A:
          SETUP, RETURN/TEST701B,                          !GO TO SUBR THAT:
          NEXT,  CALL[PBATOD]                              !  (PBA)-XOR-CSP(02)->D, BUT(D-IS-ZERO)
  (7171)  DCS[0.00.0.0.0.0]  BM[0101..00.10..10.10..011..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.101.001]






    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    !TEST-701-B CHECKS THAT BA<00> WAS LOADED WITH A (1)
    5523:
    TEST701B:
          P0,    LOAD-ENUA(ZTARGET403),                    !BIT<00> SET
                 LOAD-ERROR(TEST701B),                     !ERROR DIRECTORY KEY
                 DCS-CTR(C3.),                             !COMPARE AT TARGET
          NEXT,  J/GOBUT701B                               !
  (5523)  DCS[1.00.1.0.0.0]  BM[1100..00.11..11.00..000..011...0.0.0..0..0...0.0000...0..0000.0...11.000...100.011.100]

    5434:  !(FREE)
    GOBUT701B:
          SETUP, RETURN/TEST701C,                          !RETURN TO START OF NEXT SUBTEST
          NEXT,  GOTO-PAGE(7),                             !BUT TABLE
                 J/BUTBA00                                 !BA<00>H IN BIT<00>
```

```
    (5434)  DCS[0.00.0.0.0.0]  BM[0110..00.11..11.11..000..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.101.001]




        ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

        !TEST-701-C CHECKS THAT BA<15:00> CAN BE LOADED, AND READ BACK WITH (125252)
        6770:
        TEST701C:
                PO,     LOAD-ENUA(ZTARGET402),                  !SETUP FOR D=ZERO COMPARE
                        LOAD-ERROR(TEST701C),                   !ERROR DIRECTORY KEY
                        DCS-CTR(C11.),                          !COMPARE AT TARGET
                NEXT,   J/EXPEC701C                             !
    (6770)  DCS[1.00.1.0.0.0]  BM[0100..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...100.101.101]

        6455:  !(FREE)
        EXPEC701C:
                P3,     CSPD[02]+EMIT, EMIT/125252,             !EXPECTED DATA TO BE READ OUT OF PBA AFTER LOAD:
                NEXT,   J/LOADBA701C                            !"1010 1010 1010 1010"
    (6455)  DCS[0.00.0.0.0.0]  BM[1010..10.10..10.10..101..010...0.0.0..0..0...0.1101...1..0000.0...11.000...100.101.110]

        6456:  !(FREE)
        LOADBA701C:
                P1,     BA+ASPHI(C125252),                      !LOAD BA<15:00> WITH PATTERN
                NEXT,   J/GOTEST701C                            !
    (6456)  DCS[0.00.0.0.0.0]  BM[0000..00.00..11.01..110..000...0.0.0..1..0...0.0000...0..0000.0...11.000...100.101.111]

        6457:  !(FREE)
        GOTEST701C:
                SETUP,  RETURN/TEST701D,                        !GO TO SUBR THAT:
                NEXT,   CALL[PBATOD]                            !  (PBA)-XOR-CSP(02)->D, BUT(D-IS-ZERO)
    (6457)  DCS[0.00.0.0.0.0]  BM[0101..00.10..10.01..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.101.001]






        ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

        !TEST-701-D CHECKS THAT BA<00> WAS LOADED WITH A (0)
        5512:
        TEST701D:
                PO,     LOAD-ENUA(ZTARGET402),                  !BIT<00> CLEAR
                        LOAD-ERROR(TEST701D),                   !ERROR DIRECTORY KEY
                        DCS-CTR(C3.),                           !COMPARE AT TARGET
                NEXT,   J/GOBUT701D                             !
    (5512)  DCS[1.00.1.0.0.0]  BM[1100..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...100.011.101]

        5435:  !(FREE)
        GOBUT701D:
                SETUP,  RETURN/SCOPE701,                        !RETURN TO SCOPE LOOP TEST WORD
```

M10


```
               NEXT,    GOTO-PAGE(7),                          !BUT TABLE
                        J/BUTBA00                              !BA<00>H IN BIT<00>
       (5435)  DCS[0.00.0.0.0.0]  BM[0101..00.10..00.11..110..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.101.001]




          5436:  !(FREE)
          SCOPE701:
               P0,      BUMP-VERIFY,                           !COUNT
               NEXT,    BUTD[SCOPE],                           !NO ERROR:  "TEST702A" (+1. WORDS)
                        J/TEST702A                             !   ERROR:  "MASK701A"  (-12. WORDS)
       (5436)  DCS[0.00.0.1.0.1]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...100.111.111]




          ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

          !TEST-702-A CHECKS THAT BA<17:16> CAN BE LOADED, AND READ BACK WITH "01"
          !  WHEN IN 18. BIT CONSOLE MODE AND KT-NO-RELOCATE MODE
          5477:
          TEST702A:
               P0,      LOAD-ENUA(ZTARGET402),                 !SETUP FOR D=ZERO COMPARE
                        LOAD-ERROR(TEST702A),                  !ERROR DIRECTORY KEY
                        DCS-CTR(C13.),                         !COMPARE AT TARGET
               NEXT,    J/MASK702A                             !
       (5477)  DCS[1.00.1.0.0.0]  BM[0010..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...100.111.100]

          5474:
          MASK702A:
               P3,      CSPD[04]+EMIT, EMIT/001400,            !MASK TO READ ONLY BITS<9:8>
               NEXT,    J/EXPEC702A                            !
       (5474)  DCS[0.00.0.0.0.0]  BM[0000..10.00..11.00..000..000...0.0.0..0..0...0.1011...1..0000.0...11.000...100.011.111]

          5437:  !(FREE)
          EXPEC702A:
               P3,      CSPD[02]+EMIT, EMIT/000400,            !EXPECTED DATA TO BE READ OUT OF SERVICE<9:8> AFTER LOAD:
               NEXT,    J/SETLED702A                           !"0000 0001 0000 0000"
       (5437)  DCS[0.00.0.0.0.0]  BM[0000..10.00..01.00..000..000...0.0.0..0..0...0.1101...1..0000.0...11.000...100.100.001]

          5441:  !(FREE)
          SETLED702A:
               P3,      SET-CONSOLE-LED,                       !ENTER INTO 18. BIT MODE FOR PBA<17:16> READ
               NEXT,    J/SETKT702A                            !
       (5441)  DCS[0.00.0.0.0.0]  BM[0100..00.00..00.00..100..001...0.0.0..0..0...1.1011...0..0000.0...11.000...100.100.010]

          5442:  !(FREE)
          SETKT702A:
               P0,      BUMP-VERIFY,                           !COUNT
                        BUSDIN+SERVICE-[I],                    !READ SERVICE PORT BITS<9:8>
                        KT-NO-RELOCATE-[I],                    !SETUP KT FOR BA<17:16> LOADABILITY
               NEXT,    J/LOADBA702A                           !
```

```
(5442)  DCS[0.00.0.0.0.1]  BM[0101..01.00..00.00..000..010...0.0.0..0..0...1.1001...0..0000.0...11.000...100.100.011]

        5443:  !(FREE)
        LOADBA702A:
                P1,     BA+BSPHI(C052525),                      !LOAD BA<17:16> WITH PATTERN "01"
                NEXT,   J/GOTEST702A                            !
(5443)  DCS[0.00.0.0.0.0]  BM[0000..01.11..00.00..111..000...0.0.0..1..0...0.0000...0..0000.0...11.000...100.100.100]

        5444:  !(FREE)
        GOTEST702A:
                SETUP,  RETURN/TEST702B,                        !GO TO SUBR THAT:
                NEXT,   CALL[GETPROCDAT]                        !  (SERVICE<9:8>)-XOR-CSP(02)->D, BUT(D-IS-ZERO)
(5444)  DCS[0.00.0.0.0.0]  BM[0110..00.11..11.10..001..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.111.011]








        ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

        !TEST-702-B CHECKS THAT BA<17:16> CAN BE LOADED, AND READ BACK WITH "10"
        !  WHEN IN 18. BIT CONSOLE MODE AND KT-NO-RELOCATE MODE
        6761:
        TEST702B:
                P0,     LOAD-ENUA(ZTARGET402),                  !SETUP FOR D=ZERO COMPARE
                        LOAD-ERROR(TEST702B),                   !ERROR DIRECTORY KEY
                        DCS-CTR(C11.),                          !COMPARE AT TARGET
                NEXT,   J/EXPEC702B                             !
(6761)  DCS[1.00.1.0.0.0]  BM[0100..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...100.110.000]

        6460:  !(FREE)
        EXPEC702B:
                P3,     CSPD[02]+EMIT, EMIT/001000,             !EXPECTED DATA TO BE READ OUT OF SERVICE<9:8> AFTER LOAD:
                NEXT,   J/SETKT702B                             !"0000 0010 0000 0000"
(6460)  DCS[0.00.0.0.0.0]  BM[0000..10.00..10.00..000..000...0.0.0..0..0...0.1101...1..0000.0...11.000...100.110.001]

        6461:  !(FREE)
        SETKT702B:
                P0,     BUSDIN+SERVICE-[I],                     !READ SERVICE PORT BITS<9:8>
                        KT-NO-RELOCATE-[I],                     !SETUP KT FOR BA<17:16> LOADABILITY
                NEXT,   J/LOADBA702B                            !
(6461)  DCS[0.00.0.0.0.0]  BM[0101..01.00..00.00..000..010...0.0.0..0..0...1.1001...0..0000.0...11.000...100.110.010]

        6462:  !(FREE)
        LOADBA702B:
                P0,     BUMP-VERIFY,                            !COUNT
                P1,     BA+BSPHI(C125252),                      !LOAD BA<17:16> WITH PATTERN "10"
                NEXT,   J/GOTEST702B                            !
(6462)  DCS[0.00.0.0.0.1]  BM[0000..01.11..00.00..110..000...0.0.0..1..0...0.0000...0..0000.0...11.000...100.110.011]

        6463:  !(FREE)
```

```
GOTEST702B:
        SETUP,  RETURN/SCOPE702,                        !GO TO SUBR THAT:
        NEXT,   CALL[GETPROCDAT]                        !  (SERVICE<9:8>)-XOR-CSP(02)->D, BUT(D-IS-ZERO)
 (6463) DCS[0.00.0.0.0.0] BM[0101..00.10..00.11..011..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.111.011]



5433:  !(FREE)
SCOPE702:
        P3,     CSPD[04]+EMIT, EMIT/177777,             !RESET MASK FOR SUBSEQUENT TESTS
        NEXT,   BUTD[SCOPE],                            !NO ERROR:  "TEST710A"  (+1. WORDS)
                J/TEST710A                              !   ERROR:  "MASK702A"  (-11. WORDS)
 (5433) DCS[0.00.0.1.0.0] BM[1111..10.11..11.11..111..111...0.0.0..0..0...0.1011...1..0000.0...11.000...100.111.101]




!.PAGE===================================================================================================

.TOC   *   TEST710-722:  BUS FUNCTION DECODE, BUS ERROR CONDITIONS

!*********************************************************************************
!*
!*      TESTS:  710A - 722C                             UWORDS:  133 + 274
!*
!*      FUNCTIONS:
!*
!*      WE GET SNEAKY HERE AND TEST THE FULL BUS DECODE/STATUS MUX LOGIC, AND THE BUS  ERROR
!*      CONDITIONS (ODD ADDRESS, INTERNAL ADDRESS, ETC) ALMOST WITHOUT EVER GOING OUT ON THE
!*      BUS (WE DO ONCE, FOR SSYN TIMEOUT).
!*
!*********************************************************************************



! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

!TESTING 'DATO', 'ODD-ADDRESS' JAMUPP, 18./16. BIT IO-PAGE DECODE

! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

!TEST-710-A FIRST ATTEMPTS TO DO A BUS "DATO" FUNCTION, TRYING TO FORCE AN "ODD ADDRESS"
!  ABORT/JAMUPP
5475:
TEST710A:
        P0,     LOAD-ENUA(4777),                        !JAMUPP ADDRESS
                LOAD-ERROR(TEST710A),                   !ERROR DIRECTORY KEY
                DCS-CTR(C6.)                            !COMPARE JUST AFTER BUS CYCLE UWORD, AT JAM
        NEXT,   J/LOADRET710A                           !
 (5475) DCS[1.00.1.0.0.0] BM[1001..00.10..01.11..111..111...0.0.0..0..0...0.0000...0..0000.0...11.000...100.111.010]
```

```
	5472:
	LOADRET710A:
		P3,	CSPD[00]←EMIT, RETURN/TEST710B,		!RETURN AFTER SUCCESSFUL JAM TO NEXT TEST
		NEXT,	GOTO-PAGE(4),				!XFER
			J/LOADADR710A				!
 (5472)	DCS[0.00.0.0.0.0]  BM[0110..10.11..01.00..100..100...0.0.0..0..0...0.1111...1..0000.0...11.100...011.000.111]

	4307:	!(FREE)
	LOADADR710A:
		P3,	CSPD[16]←EMIT, EMIT/160001,		!"DIAGNOSTIC" UNIBUS I/O PAGE ADDRESS; ODD BYTE
		NEXT,	J/SETJAM710A				!
 (4307)	DCS[0.00.0.0.0.0]  BM[1110..10.00..00.00..000..001...0.0.0..0..0...0.0001...1..0000.0...11.000...011.001.010]

	4312:	!(FREE)
	SETJAM710A:
		P2-T,	SR←CSPD(D16),				!SET BIT<00>=(1) FOR JAMUPP EXPECTED
		NEXT,	J/BUSFCN710A				!
 (4312)	DCS[0.00.0.0.0.0]  BM[1010..10.00..00.00..000..000...0.0.1..0..0...0.0001...0..0000.0...11.000...011.001.011]

	4313:	!(FREE)
	BUSFCN710A:
		P1,	BA←SR, BSPHI(C177777),			!SET BA<17:00>=(760001), ALTERED TO(160001)
								!  SINCE WE'VE LEFT 18. BIT MODE (IN LOADING BA, THAT IS)
		P2-T,	D←ZERO,					!
		P3,	DATO,					!DO A BUS "DATO", SHOULD GET ODD ADDRESS ABORTED
		NEXT,	J/NEXT710A				!GO DELAY
 (4313)	DCS[0.00.0.0.0.0]  BM[0011..01.11..00.00..101..000...0.1.0..1..0...1.0010...0..0000.0...11.000...100.100.101]

	!** AT THIS POINT JAMUPP SHOULD OCCUR **
	!** CLASSIC FLOW (4777) -> (4757) -> (7XXX) -> (4XXX), AND THEN WE'RE BACK HERE **
	!**  RETURN TO ADDRESS LEFT IN CSP(00) **

	!*** END UP HERE IF NO JAMUPP ***
	4445:
	NEXT710A:
		SETUP,	RETURN/TEST710A,			!FORCE A SCOPE LOOP ON THIS TEST, BUT FIRST
		NEXT,	GOTO-PAGE(7),				!  MUST DELAY A FEW MICROWORDS FOR BUS
			J/BUTD-IS-ZERO				!  ERROR TO TAKE EFFECT  (IGNORE "BUT" OUTCOME HERE)
 (4445)	DCS[0.00.0.0.0.0]  BM[0101..00.10..01.11..101..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.001]


	!*** END UP HERE IF JAMUPP ***


	! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

	!TEST-710-B CHECKS THAT THE RIGHT JAM (ODD ADDRESS) IS INDICATED IN THE JAMREG:
	!
	!	BIT:	  15   14   13   12   11   10   09   08   07   06   05   04   03   02   01   00
	!	FCN:	 ODD    0 SSYN  YEL  RED  WCS  POW  MEM SSYN CACH  ILL  MGT  RED  ODD  WCS UBRK
	!		 ADR      TIME  ZON  ZON  PAR  DIS  PAR TIME  ERR  ADR  ABT  ZON  ADR  PAR TRAP
	!	(101004)   1    0    0    0    0    0    1    0    0    0    0    0    0    1    0    0
```

```

     6644:
     TEST710B:
             P0,      LOAD-ENUA(ZTARGET402),                   !SETUP FOR D=ZERO COMPARE
                      LOAD-ERROR(TEST710B),                    !ERROR DIRECTORY KEY
                      DCS-CTR(C10.),                           !COMPARE AT TARGET
             NEXT,    J/GOTEST710B                             !
 (6644)  DCS[1.00.1.0.0.0]  BM[0101..00.11..11.00..000..010...0.0.0.0..0..0...0.0000...0..0000.0...11.000...100.110.100]

     6464:  !(FREE)
     GOTEST710B:
             SETUP,   RETURN/TEST710C,                         !GO TO SUBR WHICH:
             NEXT,    CALL[ODDJAMTOD]                          !  (JAMREG)-XOR-(101004) -> D, BUT(D=ZERO)  [ODD-ADDRESS]
 (6464)  DCS[0.00.0.0.0.0]  BM[0110..00.11..01.00..101..111...0.0.0.0..0..0...0.0000...0..0000.0...11.100...010.101.100]



     ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

     !TEST-710-C CHECKS THAT THE RIGHT BUS FUNCTION DECODE / PBA<17:16> ARE INDICATED IN SERVICE REG:
     !  NOTE PBA<17:16> READ "TRUE" (OUT OF BA) WHEN IN 18. BIT CONSOLE MODE
     !
     !       BIT:       15   14   13   12   11    10   09   08   07   06   05   04   03   02   01   00
     !       FCN:     DATI   BG    0  NPR DATOB DATO  PBA  PBA  HIB  LOB  TAG  CON  FLT  POW CACH  YEL
     !                     SERV      TIME             17   16  ERR  ERR  ERR SERV SERV FAIL  ERR  ZON
     !       (002340)    0    0    0    0    0     1    0    0    1    1    1    0    0    0    0    0

     6645:
     TEST710C:
             P0,      LOAD-ENUA(ZTARGET402),                   !SETUP FOR D=ZERO COMPARE
                      LOAD-ERROR(TEST710C),                    !ERROR DIRECTORY KEY
                      DCS-CTR(C10.),                           !COMPARE AT TARGET
             NEXT,    J/EXPEC710C                              !
 (6645)  DCS[1.00.1.0.0.0]  BM[0101..00.11..11.00..000..010...0.0.0.0..0..0...0.0000...0..0000.0...11.000...100.110.101]

     6465:  !(FREE)
     EXPEC710C:
             P3,      CSPD[02]+EMIT, EMIT/002340,              !DATO(1)H SET, PBA<17:16>="00" IN 18. BIT CONSOLE MODE
             NEXT,    J/GOTEST710C                             !  IN SERVICE REG
 (6465)  DCS[0.00.0.0.0.0]  BM[0000..10.01..00.11..100..000...0.0.0.0..0..0...0.1101...1..0000.0...11.000...100.110.110]

     6466:  !(FREE)
     GOTEST710C:
             SETUP,   RETURN/TEST710D,                         !GO TO SUBR WHICH:
             NEXT,    CALL[SERVICETOD]                         !  (SERVICE)-XOR-CSP(02) -> D, BUT(D-IS-ZERO)
 (6466)  DCS[0.00.0.0.0.0]  BM[0110..00.10..11.11..100..111...0.0.0.0..0..0...0.0000...0..0000.0...11.100...010.101.000]



     ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

     !TEST-710-D CHECKS THAT PBA<17:16> ARE INDICATED IN SERVICE REG:
```

```
    !  NOTE PBA<17:16> READ AS BA<15:13>="111" WHEN IN 16. BIT MODE
    !
    !     BIT:        15    14    13    12    11    10   09   08   07   06   05   04   03   02   01   00
    !     FCN:       DATI   BG     0   NPR DATOB DATO PBA  PBA  HIB  LOB  TAG  CON  FLT  POW  CACH YEL
    !                      SERV         TIME               17   16  ERR  ERR  ERR SERV SERV FAIL  ERR ZON
    !     (003740)    0     0     0     0     0     1    1    1    1    1    1    0    0    0    0    0

    6574:
    TEST710D:
            PO,     LOAD-ENUA(ZTARGET402),                       !SETUP FOR D=ZERO COMPARE
                    LOAD-ERROR(TEST710D),                        !ERROR DIRECTORY KEY
                    DCS-CTR(C11.),                               !COMPARE AT TARGET
            NEXT,   J/EXPEC710D                                  !
 (6574)  DCS[1.00.1.0.0.0]  BM[0100..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...100.110.111]

    6467:  !(FREE)
    EXPEC710D:
            PO,     BUMP-VERIFY,                                 !COUNT
            P3,     CSPD[02]<-EMIT, EMIT/003740,                 !DATO(1)H SET, PBA<17:16>="11" IN 16. BIT MODE
            NEXT,   J/CLEAR710D                                  !  IN SERVICE REG
 (6467)  DCS[0.00.0.0.0.1]  BM[0000..10.01..11.11..100..000...0.0.0..0..0...0.1101...1..0000.0...11.000...100.111.000]

    6470:  !(FREE)
    CLEAR710D:
            P3,     CLR-JAM-ERRORS-[I],                          !CLEAR OUT JAM-REG, FOR USE IN NEXT TEST
                    CLEAR-CONSOLE-LED,                           !BACK TO 16. BIT MODE
            NEXT,   J/GOTEST710D                                 !
 (6470)  DCS[0.00.0.0.0.0]  BM[0100..00.00..10.00..010..001...0.0.0..0..0...1.1011...0..0000.0...11.000...100.111.001]

    6471:  !(FREE)
    GOTEST710D:
            SETUP,  RETURN/TEST710E,                             !GO TO SUBR WHICH:
            NEXT,   CALL[SERVICETOD]                             !  (SERVICE)-XOR-CSP(02) -> D, BUT(D-IS-ZERO)
 (6471)  DCS[0.00.0.0.0.0]  BM[0110..00.10..11.11..101..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.101.000]



    !  - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    !TEST-710-E CHECKS THAT THE CLEAR-JAM-ERRORS CLEARED THE JAM REG TO (001000)
    6575:
    TEST710E:
            PO,     LOAD-ENUA(ZTARGET402),                       !SETUP FOR D=ZERO COMPARE
                    LOAD-ERROR(TEST710E),                        !ERROR DIRECTORY KEY
                    DCS-CTR(C10.),                               !COMPARE AT TARGET
            NEXT,   J/GOTEST710E                                 !
 (6575)  DCS[1.00.1.0.0.0]  BM[0101..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...100.111.010]

    6472:  !(FREE)
    GOTEST710E:
            PO,     BUMP-VERIFY,                                 !COUNT
            SETUP,  RETURN/SCOPE710,                             !GO TO SUBR WHICH:
                                                                 !  CSP(02) <- (001000)
```

```
        NEXT,   CALL[CLRJAMTOD]                            !  (JAMREG)-XOR-CSP(02) -> D, BUT(D-IS-ZERO)
 (6472) DCS[0.00.0.0.0.1] BM[0101..00.10..01.00..101..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.101.101]



   5445: !(FREE)
   SCOPE710:
        P2-U,   IR+EMIT, EMIT/123456,                      !A "CMP-BYTE" INSTR, FOR NEXT TEST SERIES
        NEXT,   BUTD[SCOPE],                               !NO ERROR:  "TEST711A"  (+1. WORDS)
                J/TEST711A                                 !   ERROR:  "LOADRET710A"  (-17. WORDS)
 (5445) DCS[0.00.0.1.0.0] BM[1010..00.01..11.00..101..110...0.0.0..0..0...1.1010...0..0000.0...11.000...100.111.011]






   ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

   !TESTING 'DATOB*BYTE', 'SSYN TIMEOUT' JAMUPP

   ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

   !TEST-711-A DOES A BUS "DATOB*BYTE" FUNCTION, TRYING TO FORCE AN "SSYN TIMEOUT" ABORT/JAMUPP
   5473:
   TEST711A:
        P0,     LOAD-ENUA(4777),                           !JAMUPP ADDRESS
                LOAD-ERROR(TEST711A),                      !ERROR DIRECTORY KEY
                DCS-CTR(C4.),                              !COMPARE JUST AFTER BUS CYCLE UWORD, AT JAM
        NEXT,   J/LOADRET711A                              !
 (5473) DCS[1.00.1.0.0.0] BM[1011..00.10..01.11..111..111...0.0.0..0..0...0.0000...0..0000.0...11.000...100.111.000]

   5470:
   LOADRET711A:
        P0,     BUMP-VERIFY,                               !COUNT
        P3,     CSPD[00]+EMIT, RETURN/TEST711B,            !RETURN AFTER SUCCESSFUL JAM TO NEXT TEST
        NEXT,   GOTO-PAGE(4),                              !XFER
        NEXT,   J/BUSFCN711A                               !
 (5470) DCS[0.00.0.0.0.1] BM[0110..10.10..10.11..100..100...0.0.0..0..0...0.1111...1..0000.0...11.100...011.001.001]

   4311: !(FREE)
   BUSFCN711A:
        !NOTE:  BA=(160001) FROM PREVIOUS TEST
        P2-T,   SR+CSPB(B16),                              !SET BIT<00>=(1) FOR JAMUPP EXPECTED
        P3,     DATOB,                                     !DO A BUS "DATOB*BYTE", SHOULD GET SSYN TIMEOUT ABORTED
                                                           !  SINCE WERE USING THE "DIAGNOSTIC" UNIBUS TIMEOUT ADDR
        NEXT,   J/NEXT711A                                 !GO DELAY
 (4311) DCS[0.00.0.0.0.0] BM[1010..11.01..00.00..000..000...0.0.1..0..0...1.0101...0..0000.0...11.000...100.100.110]

   !** AT THIS POINT JAMUPP SHOULD OCCUR **
   !** CLASSIC FLOW (4777) -> (4757) -> (7XXX) -> (4XXX), AND THEN WE'RE BACK HERE **
   !**  RETURN TO ADDRESS LEFT IN CSP(00) **
```

```
     !*** END UP HERE IF NO JAMUPP ***
     4446:
     NEXT711A:
             SETUP,   RETURN/TEST711A,                     !FORCE A SCOPE LOOP ON THIS TEST, BUT FIRST
             NEXT,    GOTO-PAGE(7),                        !  MUST DELAY A FEW MICROWORDS FOR BUS
                      J/BUTD-IS-ZERO                       !  ERROR TO TAKE EFFECT  (IGNORE "BUT" OUTCOME HERE)
 (4446)  DCS[0.00.0.0.0.0]  BM[0101..00.10..01.11..011..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.001]


     !*** END UP HERE IF JAMUPP ***


     ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

     !TEST-711-B CHECKS THAT THE RIGHT JAM (SSYN TIMEOUT) IS INDICATED IN THE JAMREG:
     !
     !       BIT:       15   14   13   12   11   10   09   08   07   06   05   04   03   02   01   00
     !       FCN:       ODD   0  SSYN  YEL  RED  WCS  POW  MEM SSYN CACH  ILL  MGT  RED  ODD  WCS UBRK
     !                  ADR      TIME  ZON  ZON  PAR  DIS  PAR TIME  ERR  ADR  ABT  ZON  ADR  PAR TRAP
     !       (021200)    0    0    1    0    0    0    1    0    1    0    0    0    0    0    0    0

     6534:
     TEST711B:
             PO,      LOAD-ENUA(ZTARGET402),               !SETUP FOR D=ZERO COMPARE
                      LOAD-ERROR(TEST711B),                !ERROR DIRECTORY KEY
                      DCS-CTR(C10.),                       !COMPARE AT TARGET
             NEXT,    J/EXPEC711B                          !
 (6534)  DCS[1.00.1.0.0.0]  BM[0101..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...100.111.011]

     6473:  !(FREE)
     EXPEC711B:
             PO,      BUMP-VERIFY,                         !COUNT
             P3,      CSPD[02]+EMIT, EMIT/021200,          !"SSYN TIMEOUT(1)H" SET
             NEXT,    J/GOTEST711B                         !  IN JAMREG
 (6473)  DCS[0.00.0.0.0.1]  BM[0010..10.00..10.10..000..000...0.0.0..0..0...0.1101...1..0000.0...11.000...100.111.100]

     6474:  !(FREE)
     GOTEST711B:
             SETUP,   RETURN/TEST711C,                     !GO TO SUBR WHICH:
             NEXT,    CALL[JAMTOD]                         !  (JAMREG)-XOR-CSP(02) -> D, BUT(D-IS-ZERO)
 (6474)  DCS[0.00.0.0.0.0]  BM[0110..00.10..10.11..000..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.101.110]



     ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

     !TEST-711-C CHECKS THAT THE RIGHT BUS FUNCTION DECODE / PBA<17:16> ARE INDICATED IN SERVICE REG:
     !  BACK IN 16. BIT MODE, SINCE I-O PAGE, PBA<17:16> READ AS "11"
     !
     !       BIT:       15   14   13   12    11    10   09   08   07   06   05   04   03   02   01   00
     !       FCN:      DATI  BG    0  NPR DATOB DATO  PBA  PBA  HIB  LOB  TAG  CON  FLT  POW CACH  YEL
```

```
!                   SERV       TIME                    17   16  ERR  ERR  ERR SERV SERV FAIL   ERR ZON
!       (005740)  0    0    0    0    1    0    1    1    1    1    1    0    0    0    0    0

6530:
TEST711C:
        P0,     LOAD-ENUA(ZTARGET402),                  !SETUP FOR D=ZERO COMPARE
                LOAD-ERROR(TEST711C),                   !ERROR DIRECTORY KEY
                DCS-CTR(C11.),                          !COMPARE AT TARGET
        NEXT,   J/EXPEC711C                             !
(6530)  DCS[1.00.1.0.0.0]  BM[0100..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...100.111.101]

6475:   !(FREE)
EXPEC711C:
        P3,     CSPD[02]+EMIT, EMIT/005740,             !DATOB(1)H SET, PBA<17:16>="11"
        NEXT,   J/GOTEST711C                            !  IN SERVICE REG
(6475)  DCS[0.00.0.0.0.0]  BM[0000..10.10..11.11..100..000...0.0.0..0..0...0.1101...1..0000.0...11.000...100.111.110]

6476:   !(FREE)
GOTEST711C:
        SETUP,  RETURN/TEST711D,                        !GO TO SUBR WHICH:
                                                        !  CLR-JAM-ERRORS-[I], FOR NEXT TEST
        NEXT,   CALL[CJESERVICETOD]                     !  (SERVICE)-XOR-CSP(02) -> D, BUT(D-IS-ZERO)
(6476)  DCS[0.00.0.0.0.0]  BM[0110..00.10..10.10..110..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.100.111]



!  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -

!TEST-711-D CHECKS THAT THE CLEAR-JAM-ERRORS CLEARED THE JAM REG TO (001000)
6526:
TEST711D:
        P0,     LOAD-ENUA(ZTARGET402),                  !SETUP FOR D=ZERO COMPARE
                LOAD-ERROR(TEST711D),                   !ERROR DIRECTORY KEY
                DCS-CTR(C10.),                          !COMPARE AT TARGET
                BUMP-VERIFY,                            !COUNT
        NEXT,   J/GOTEST711D                            !
(6526)  DCS[1.00.1.0.0.1]  BM[0101..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...100.111.111]

6477:   !(FREE)
GOTEST711D:
        SETUP,  RETURN/SCOPE711,                        !GO TO SUBR WHICH:
                                                        !  CSP(02) <- (001000)
        NEXT,   CALL[CLRJAMTOD]                         !  (JAMREG)-XOR-CSP(02) -> D, BUT(D-IS-ZERO)
(6477)  DCS[0.00.0.0.0.0]  BM[0101..00.10..01.00..110..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.101.101]



5446:   !(FREE)
SCOPE711:
        NEXT,   BUTD[SCOPE],                            !NO ERROR:  "TEST712A"  (+1. WORDS)
                J/TEST712A                              !   ERROR:  "LOADRET711A"  (-11. WORDS)
(5446)  DCS[0.00.0.1.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...100.111.001]
```

```
	!- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

	!TESTING 'DATI', 'INTERNAL ADDRESS' JAMUPP

	! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

	!TEST-712-A DOES A BUS "DATI" FUNCTION TO AN INTERNAL ADDRESS, TRYING TO FORCE AN "INTERNAL ADDRESS" ABORT/JAMUPP
	5471:
	TEST712A:
		P0,	LOAD-ENUA(4777),			!JAMUPP ADDRESS
			LOAD-ERROR(TEST712A),			!ERROR DIRECTORY KEY
			DCS-CTR(CS.),				!COMPARE JUST AFTER BUS CYCLE UWORD, AT JAM
		NEXT,	J/LOADRET712A				!
(5471)	DCS[1.00.1.0.0.0]  BM[1010..00.10..01.11..111..111...0.0.0..0..0...0.0000...0..0000.0...11.000...100.110.110]

	5466:
	LOADRET712A:
		P0,	BUMP-VERIFY,				!COUNT
		P3,	CSPD[00]+EMIT, RETURN/TEST712B,		!RETURN AFTER SUCCESSFUL JAM TO NEXT TEST
		NEXT,	GOTO-PAGE(4),				!XFER
			J/GENADR712A				!
(5466)	DCS[0.00.0.0.0.1]  BM[0101..10.10..10.00..101..100...0.0.0..0..0...0.1111...1..0000.0...11.100...011.001.100]

	4314:	!(FREE)
	GENADR712A:
		P2-T,	D+NOT-ASPHI(C000001),			!MAKE D=(177776), INTERNAL ADDRESS OF PSW
		P3,	ASPLO[11]+D,				!  AND SAVE IT
		NEXT,	J/BUSFCN712A				!
(4314)	DCS[0.00.0.0.0.0]  BM[0000..00.00..11.01..000..000...0.1.0..0..0...0.0000...0..0001.0...11.000...011.001.110]

	4316:	!(FREE)
	BUSFCN712A:
		P1,	BA+ASPLO(R11),				!BA=(177776)
		P2-T,	SR+BSPHI(C000001),			!SET BIT(00)=(1) FOR JAMUPP EXPECTED
		P3,	DATI,					!DO A BUS "DATI", SHOULD GET INTERNAL ADDR ABORTED
		NEXT,	J/NEXT712A				!GO DELAY
(4316)	DCS[0.00.0.0.0.0]  BM[1010..01.11..10.01..000..000...0.0.1..1..0...1.0110...0..0000.0...11.000...100.100.111]

	!** AT THIS POINT JAMUPP SHOULD OCCUR **
	!** CLASSIC FLOW (4777) -> (4757) -> (7XXX) -> (4XXX), AND THEN WE'RE BACK HERE **
	!**  RETURN TO ADDRESS LEFT IN CSP(00) **

	!*** END UP HERE IF NO JAMUPP ***
	4447:
	NEXT712A:
		SETUP,	RETURN/TEST712A,			!FORCE A SCOPE LOOP ON THIS TEST, BUT FIRST
		NEXT,	GOTO-PAGE(7),				!  MUST DELAY A FEW MICROWORDS FOR BUS
```

```
              J/BUTD-IS-ZERO                                 ! ERROR TO TAKE EFFECT  (IGNORE "BUT" OUTCOME HERE)
(4447)  DCS[0.00.0.0.0.0]  BM[0101..00.10..01.11..001..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.001]


   !*** END UP HERE IF JAMUPP ***


   ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

   !TEST-712-B CHECKS THAT THE RIGHT JAM (INTERNAL ADDRESS) IS INDICATED IN THE JAMREG:
   !  FOR THIS JAM, THE JAMREG SHOULD REMAIN CLEAR
   !
   !       BIT:       15   14   13   12   11   10   09   08   07   06   05   04   03   02   01   00
   !       FCN:      ODD    0 SSYN  YEL  RED  WCS  POW  MEM SSYN CACH  ILL  MGT  RED  ODD  WCS UBRK
   !                 ADR      TIME  ZON  ZON  PAR  DIS  PAR TIME  ERR  ADR  ABT  ZON  ADR  PAR TRAP
   !       (001000)    0    0    0    0    0    0    1    0    0    0    0    0    0    0    0    0

   5505:
   TEST712B:
        PO,      LOAD-ENUA(ZTARGET402),                     !SETUP FOR D=ZERO COMPARE
                 LOAD-ERROR(TEST712B),                      !ERROR DIRECTORY KEY
                 DCS-CTR(C10.),                             !COMPARE AT TARGET
        NEXT,    J/GOTEST712B                               !
(5505)  DCS[1.00.1.0.0.0]  BM[0101..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...100.101.000]

   5450:  !(FREE)
   GOTEST712B:
        SETUP,   RETURN/TEST712C,                           !GO TO SUBR WHICH:
                                                            !  (001000) -> CSP(02)
        NEXT,    CALL[CLRJAMTOD]                            !  (JAMREG)-XOR-CSP(02) -> D, BUT(D-IS-ZERO)
(5450)  DCS[0.00.0.0.0.0]  BM[0110..00.10..10.10..100..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.101.101]



   ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

   !TEST-712-C CHECKS THAT THE "OTHER-JAM-H" SIGNAL IS LOW, INDICATING AN INTERNAL ADDRESS JAM
   6524:
   TEST712C:
        PO,      LOAD-ENUA(ZTARGET401),                     !BIT<01> CLEAR
                 LOAD-ERROR(TEST712C),                      !ERROR DIRECTORY KEY
                 DCS-CTR(C3.),                              !COMPARE AT TARGET
        NEXT,    J/GOBUT712C                                !
(6524)  DCS[1.00.1.0.0.0]  BM[1100..00.11..11.00..000..001...0.0.0..0..0...0.0000...0..0000.0...11.000...101.000.000]

   6500:  !(FREE)
   GOBUT712C:
        SETUP,   RETURN/TEST712D,                           !RETURN TO START OF NEXT SUBTEST
        NEXT,    GOTO-PAGE(7),                              !BUT TABLE
                 J/BUTOTHERJAM                              !"OTHER JAM H" IN BIT<01>
(6500)  DCS[0.00.0.0.0.0]  BM[0110..00.10..10.10..011..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.101.010]
```

```
    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    !TEST-712-D CHECKS THAT THE RIGHT BUS FUNCTION DECODE / PBA<17:16> ARE INDICATED IN SERVICE REG:
    !  BACK IN 16. BIT MODE, SINCE I-O PAGE, PBA<17:16> READ AS "11"
    !
    !      BIT:      15   14   13   12    11    10   09   08   07   06   05   04   03   02   01   00
    !      FCN:    DATI   BG    0  NPR DATOB DATO  PBA  PBA  HIB  LOB  TAG  CON  FLT  POW CACH  YEL
    !                   SERV      TIME              17   16  ERR  ERR  ERR SERV SERV FAIL  ERR  ZON
    !      (101740)   1    0    0    0     0     0    1    1    1    1    1    0    0    0    0    0

    6523:
    TEST712D:
            P0,       LOAD-ENUA(ZTARGET402),                          !SETUP FOR D=ZERO COMPARE
                      LOAD-ERROR(TEST712D),                           !ERROR DIRECTORY KEY
                      DCS-CTR(C11.),                                  !COMPARE AT TARGET
            NEXT,     J/EXPEC712D                                     !
  (6523)  DCS[1.00.1.0.0.0]  BM[0100..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...101.000.001]

    6501:  !(FREE)
    EXPEC712D:
            P3,       CSPD[02]+EMIT, EMIT/101740,                     !DATI(1)H SET, PBA<17:16>="11"
            NEXT,     J/GOTEST712D                                    !  IN SERVICE REG
  (6501)  DCS[0.00.0.0.0.0]  BM[1000..10.00..11.11..100..000...0.0.0..0..0...0.1101...1..0000.0...11.000...101.000.010]

    6502:  !(FREE)
    GOTEST712D:
            SETUP,    RETURN/SCOPE712,                                !GO TO SUBR WHICH:
                                                                      !  CLR-JAM-ERRORS-[I], FOR NEXT TEST
            NEXT,     CALL[CJESERVICETOD]                             !  (SERVICE)-XOR-CSP(02) -> D, BUT(D-IS-ZERO)
  (6502)  DCS[0.00.0.0.0.0]  BM[0101..00.10..01.00..111..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.100.111]




    5447:  !(FREE)
    SCOPE712:
            NEXT,     BUTD[SCOPE],                                    !NO ERROR:  "TEST713A"  (+1. WORDS)
                      J/TEST713A                                      !   ERROR:  "LOADRET712A"  (-12. WORDS)
  (5447)  DCS[0.00.0.1.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...100.110.111]






    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    !TESTING 'DATI-NOINT', 'ILLEGAL INTERNAL ADDRESS' JAMUPP

    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
```

```

	!TEST-713-A DOES A BUS "DATI-NOINT" FUNCTION TO AN INTERNAL ADDRESS, TRYING TO FORCE
	!  AN "ILLEGAL INTERNAL ADDRESS" ABORT/JAMUPP
	5467:
	TEST713A:
		P0,	LOAD-ENUA(4777),			!JAMUPP ADDRESS
			LOAD-ERROR(TEST713A),			!ERROR DIRECTORY KEY
			DCS-CTR(C4.),				!COMPARE JUST AFTER BUS CYCLE UWORD, AT JAM
			BUMP-VERIFY,				!COUNT
		NEXT,	J/LOADRET713A				!
(5467)	DCS[1.00.1.0.0.1]	BM[1011..00.10..01.11..111..111...0.0.0..0..0...0.0000...0..0000.0...11.000...100.110.100]

	5464:
	LOADRET713A:
		P3,	CSPD[00]+EMIT, RETURN/TEST713B,		!RETURN AFTER SUCCESSFUL JAM TO NEXT TEST
		NEXT,	GOTO-PAGE(7),				!XFER
			J/BUSFCN713A				!
(5464)	DCS[0.00.0.0.0.0]	BM[0101..10.11..00.01..110..111...0.0.0..0..0...0.1111...1..0000.0...11.100...001.110.111]

	7167:	!(FREE)
	BUSFCN713A:
		P1,	BA+ASPLO(R11),				!BA=(177776), GENERATED IN PREVIOUS SET OF TESTS
		P2-T,	SR+BSPHI(C000001),			!SET BIT<00>=(1) FOR JAMUPP EXPECTED
		P3,	DATI-NOINT,				!DO A BUS "DATI-NOINT"
								! SHOULD GET "ILLEGAL INTERNAL ADDR" ABORTED
		NEXT,	J/NEXT713A				!GO DELAY
(7167)	DCS[0.00.0.0.0.0]	BM[1010..01.11..10.01..000..000...0.0.1..1..0...1.0001...0..0000.0...11.000...011.110.101]

	!** AT THIS POINT JAMUPP SHOULD OCCUR **
	!** CLASSIC FLOW (4777) -> (4757) -> (7XXX) -> (4XXX), AND THEN WE'RE BACK HERE **
	!**  RETURN TO ADDRESS LEFT IN CSP(00) **

	!*** END UP HERE IF NO JAMUPP ***
	7365:
	NEXT713A:
		SETUP,	RETURN/TEST713A,			!FORCE A SCOPE LOOP ON THIS TEST, BUT FIRST
		NEXT,	GOTO-PAGE(7),				!  MUST DELAY A FEW MICROWORDS FOR BUS
			J/BUTD-IS-ZERO				!  ERROR TO TAKE EFFECT  (IGNORE "BUT" OUTCOME HERE)
(7365)	DCS[0.00.0.0.0.0]	BM[0101..00.10..01.10..111..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.001]


	!*** END UP HERE IF JAMUPP ***


	! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

	!TEST-713-B CHECKS THAT THE RIGHT JAM (ILLEGAL INTERNAL ADDRESS) IS INDICATED IN THE JAMREG:
	!
	!	BIT:	  15   14   13   12   11   10   09   08   07   06   05   04   03   02   01   00
	!	FCN:	 ODD    0 SSYN  YEL  RED  WCS  POW  MEM SSYN CACH  ILL  MGT  RED  ODD  WCS UBRK
	!		 ADR      TIME  ZON  ZON  PAR  DIS  PAR TIME  ERR  ADR  ABT  ZON  ADR  PAR TRAP
	!	(001040)   0    0    0    0    0    0    1    0    0    0    1    0    0    0    0    0

```

```
        5616:
        TEST713B:
                PO,     LOAD-ENUA(ZTARGET402),                          !SETUP FOR D=ZERO COMPARE
                        LOAD-ERROR(TEST713B),                           !ERROR DIRECTORY KEY
                        DCS-CTR(C10.),                                  !COMPARE AT TARGET
                        BUMP-VERIFY,                                    !COUNT
                NEXT,   J/EXPEC713B                                     !
  (5616) DCS[1.00.1.0.0.1] BM[0101..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...100.101.010]

        5452:  !(FREE)
        EXPEC713B:
                P3,     CSPD[02]+EMIT, EMIT/001040,                     !"ILLEGAL INTERNAL ADDRESS(1)H" SET
                NEXT,   J/GOTEST713B                                    !
  (5452) DCS[0.00.0.0.0.0] BM[0000..10.00..10.00..100..000...0.0.0..0..0...0.1101...1..0000.0...11.000...100.101.011]

        5453:  !(FREE)
        GOTEST713B:
                SETUP,  RETURN/TEST713C,                                !GO TO SUBR WHICH:
                NEXT,   CALL[JAMTOD]                                    !  (JAMREG)-XOR-CSP(D2) -> D, BUT(D-IS-ZERO)
  (5453) DCS[0.00.0.0.0.0] BM[0110..00.10..10.10..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.101.110]



        ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

        !TEST-713-C CHECKS THAT THE "OTHER-JAM-H" SIGNAL IS HIGH, INDICATING A JAM PRESENT OTHER
        !   THAN ONLY A VALID "INTERNAL ADDRESS" JAM
        6522:
        TEST713C:
                PO,     LOAD-ENUA(ZTARGET403),                          !BIT<01> SET
                        LOAD-ERROR(TEST713C),                           !ERROR DIRECTORY KEY
                        DCS-CTR(C3.),                                   !COMPARE AT TARGET
                NEXT,   J/GOBUT713C                                     !
  (6522) DCS[1.00.1.0.0.0] BM[1130..00.11..11.00..000..011...0.0.0..0..0...0.0000...0..0000.0...11.000...101.000.011]

        6503:  !(FREE)
        GOBUT713C:
                SETUP,  RETURN/TEST713D,                                !RETURN TO START OF NEXT SUBTEST
                NEXT,   GOTO-PAGE(7),                                   !BUT TABLE
                        J/BUTOTHERJAM                                   !"OTHER JAM H" IN BIT<01>
  (6503) DCS[0.00.0.0.0.0] BM[0110..00.10..10.10..001..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.101.010]



        ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

        !TEST-713-D CHECKS THAT THE RIGHT BUS FUNCTION DECODE / PBA<17:16> ARE INDICATED IN SERVICE REG:
        !  BACK IN 16. BIT MODE, SINCE I-O PAGE, PBA<17:16> READ AS "11"
        !
        !       BIT:      15   14    13   12    11    10   09   08   07   06   05   04   03   02   01   00
        !       FCN:    DATI   BG     D  NPR DATOB DATO  PBA  PBA  HIB  LOB  TAG  CON  FLT  POW CACH  YEL
        !                    SERV       TIME              17   16  ERR  ERR  ERR SERV SERV FAIL  ERR  ZON
```

```
        !       (101740)  1   0   0   0   0   0   1   1   1   1   1   0   0   0   0   0

        6521:
        TEST713D:
                PO,     LOAD-ENUA(ZTARGET402),                  !SETUP FOR D=ZERO COMPARE
                        LOAD-ERROR(TEST713D),                   !ERROR DIRECTORY KEY
                        DCS-CTR(C11.),                          !COMPARE AT TARGET
                        BUMP-VERIFY,                            !COUNT
                NEXT,   J/EXPEC713D                             !
   (6521)  DCS[1.00.1.0.0.1]  BM[0100..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...101.000.100]

        6504:   !(FREE)
        EXPEC713D:
                P3,     CSPD[02]+EMIT, EMIT/101740,             !DATI(1)H SET, PBA<17:16>="11"
                NEXT,   J/GOTEST713D                            !  IN SERVICE REG
   (6504)  DCS[0.00.0.0.0.0]  BM[1000..10.00..11.11..100..000...0.0.0..0..0...0.1101...1..0000.0...11.000...101.000.101]

        6505:   !(FREE)
        GOTEST713D:
                SETUP,  RETURN/SCOPE713,                        !GO TO SUBR WHICH:
                                                                !  CLR-JAM-ERRORS-[I], FOR NEXT TEST
                NEXT,   CALL[CJESERVICETOD]                     !  (SERVICE)-XOR-CSP(02) -> D, BUT(D-IS-ZERO)
   (6505)  DCS[0.00.0.0.0.0]  BM[0101..00.10..01.01..001..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.100.111]




        5451:   !(FREE)
        SCOPE713:
                NEXT,   BUTD[SCOPE],                            !NO ERROR:  "TEST720A"  (+1. WORDS)
                        J/TEST720A                              !   ERROR:  "LOADRET713A"  (-11. WORDS)
   (5451)  DCS[0.00.0.1.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...100.110.101]







        ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

        !TESTING 'DATIB*-BYTE', 'ODD-ADDRESS' JAMUPP, I/O-PAGE-PBA<17:16> DECODE

        ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

        !TEST-720-A ATTEMPTS TO DO A BUS "DATIB*-BYTE" FUNCTION, TRYING TO FORCE AN "ODD ADDRESS"
        !  ABORT/JAMUPP, ALSO CHECKING THAT ALL SERVICE / JAM STATUS BITS SET CORRECTLY
        5465:
        TEST720A:
                PO,     LOAD-ENUA(4777),                        !JAMUPP ADDRESS
                        LOAD-ERROR(TEST720A),                   !ERROR DIRECTORY KEY
                        DCS-CTR(C7.),                           !COMPARE JUST AFTER BUS CYCLE UWORD, AT JAM
                NEXT,   J/LOADRET720A                           !
```

```
(5465) DCS[1.00.1.0.0.0] BM[1000..00.10..01.11..111..111...0.0.0..0..0...0.0000...0..0000.0...11.000...100.110.010]

       5462:
       LOADRET720A:
              P3,       CSPD[00]+EMIT, RETURN/TEST720B,       !RETURN AFTER SUCCESSFUL JAM TO NEXT TEST
              NEXT,     GOTO-PAGE(7),                         !XFER
                        J/LOADIR720A                          !
(5462) DCS[0.00.0.0.0.0] BM[0110..10.10..10.10..000..111...0.0.0..0..0...0.1111...1..0000.0...11.100...001.111.010]

       7172:  !(FREE)
       LOADIR720A:
              P2-U,     IR+EMIT, EMIT/000000,                 !"HALT" INSTRUCTION IS -BYTE
              NEXT,     J/SETADR720A                          !
(7172) DCS[0.00.0.0.0.0] BM[0000..00.00..00.00..000..000...0.0.0..0..0...1.1010...0..0000.0...11.000...001.111.100]

       7174:  !(FREE)
       SETADR720A:
              P3,       CSPD[16]+EMIT, EMIT/060001,           !BIT<15:13>="011", -IOPAGE; ODD-ADDRESS
              NEXT,     J/SETJAM720A                          !
(7174) DCS[0.00.0.0.0.0] BM[0110..10.00..00.00..000..001...0.0.0..0..0...0.0001...1..0000.0...11.000...001.111.101]

       7175:  !(FREE)
       SETJAM720A:
              P2-T,     SR+CSPD(D16),                         !SET BIT<00>=(1) FOR JAMUPP EXPECTED
              NEXT,     J/BUSFCN720A                          !
(7175) DCS[0.00.0.0.0.0] BM[1010..10.00..00.00..000..000...0.0.1..0..0...0.0001...0..0000.0...11.000...001.111.110]

       7176:  !(FREE)
       BUSFCN720A:
              P1,       BA+SR,                                !SET BA<17:00>=(060001)
              P3,       DATIB,                                !DO A BUS "DATIB*-BYTE", SHOULD GET ODD ADDRESS ABORTED
              NEXT,     J/NEXT720A                            !GO DELAY
(7176) DCS[0.00.0.0.0.0] BM[0000..00.00..00.00..000..000...0.0.0..1..0...1.0011...0..0000.0...11.000...011.110.100]

       !** AT THIS POINT JAMUPP SHOULD OCCUR **
       !** CLASSIC FLOW (4777) -> (4757) -> (7XXX) -> (4XXX), AND THEN WE'RE BACK HERE **
       !**  RETURN TO ADDRESS LEFT IN CSP(00) **

       !*** END UP HERE IF NO JAMUPP ***
       7364:
       NEXT720A:
              SETUP,    RETURN/TEST720A,                      !FORCE A SCOPE LOOP ON THIS TEST, BUT FIRST
              NEXT,     GOTO-PAGE(7),                         !  MUST DELAY A FEW MICROWORDS FOR BUS
                        J/BUTD-IS-ZERO                        !  ERROR TO TAKE EFFECT  (IGNORE "BUT" OUTCOME HERE)
(7364) DCS[0.00.0.0.0.0] BM[0101..00.10..01.10..101..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.001]


       !*** END UP HERE IF JAMUPP ***


       ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

       !TEST-720-B CHECKS THAT THE RIGHT JAM (ODD ADDRESS) IS INDICATED IN THE JAMREG:
```

```
        !
        !       BIT:      15    14   13   12   11   10   09   08   07   06   05   04   03   02   01   00
        !       FCN:      ODD    0  SSYN YEL  RED  WCS  POW  MEM  SSYN CACH ILL  MGT  RED  ODD  WCS  UBRK
        !                 ADR       TIME ZON  ZON  PAR  DIS  PAR  TIME  ERR ADR  ABT  ZON  ADR  PAR  TRAP
        !       (101004)   1     0    0    0    0    0    1    0    0    0    0    0    0    1    0    0

        6520:
        TEST720B:
                PO,      LOAD-ENUA(ZTARGET402),                  !SETUP FOR D=ZERO COMPARE
                         LOAD-ERROR(TEST720B),                   !ERROR DIRECTORY KEY
                         DCS-CTR(C10.),                          !COMPARE AT TARGET
                         BUMP-VERIFY,                            !COUNT
                NEXT,    J/GOTEST720B                            !
  (6520)  DCS[1.00.1.0.0.1]  BM[0101..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...101.000.110]

        6506:   !(FREE)
        GOTEST720B:
                SETUP,   RETURN/TEST720C,                        !GO TO SUBR WHICH:
                NEXT,    CALL[ODDJAMTOD]                         !  (JAMREG)-XOR-(101004) -> D, BUT(D=ZERO)  [ODD-ADDRESS]
  (6506)  DCS[0.00.0.0.0.0]  BM[0100..00.11..11.10..000..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.101.100]



        ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

        !TEST-720-C CHECKS THAT THE RIGHT BUS FUNCTION DECODE / PBA<17:16> ARE INDICATED IN SERVICE REG:
        !  NOTE:  PBA<17:16> SHOULD NOT BE FORCED TO "11", IN 16. BIT MODE, WHEN BA<15:13>="011"
        !
        !       BIT:      15    14   13   12    11    10   09   08   07   06   05   04   03   02   01   00
        !       FCN:     DATI   BG    0  NPR DATOB DATO  PBA  PBA  HIB  LOB  TAG  CON  FLT  POW  CACH YEL
        !                      SERV      TIME              17   16  ERR  ERR  ERR SERV SERV FAIL  ERR ZON
        !       (100340)   1     0    0    0     0     0    0    0    1    1    1    0    0    0    0    0

        4760:
        TEST720C:
                PO,      LOAD-ENUA(ZTARGET402),                  !SETUP FOR D=ZERO COMPARE
                         LOAD-ERROR(TEST720C),                   !ERROR DIRECTORY KEY
                         DCS-CTR(C11.),                          !COMPARE AT TARGET
                NEXT,    J/GOTEST720C                            !
  (4760)  DCS[1.00.1.0.0.0]  BM[0100..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...011.001.111]

        4317:   !(FREE)
        GOTEST720C:
                SETUP,   RETURN/TEST721A,                        !GO TO SUBR WHICH:
                                                                 !  CLR-JAM-ERRORS, TO RESET FOR NEXT TEST
                NEXT,    CALL[DATISERVICETOD]                    !  (SERVICE)-XOR-(100340) -> D, BUT(D=ZERO)  (DATI[1]H)
  (4317)  DCS[0.00.0.0.0.0]  BM[0100..00.10..11.11..001..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.100.101]
```

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    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    !TESTING 'DATOB*-BYTE', 'ODD-ADDRESS' JAMUPP, I/O-PAGE-PBA<17:16> DECODE

    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    !TEST-721-A ATTEMPTS TO DO A BUS "DATOB*-BYTE" FUNCTION, TRYING TO FORCE AN "ODD ADDRESS"
    !  ABORT/JAMUPP, ALSO CHECKING THAT ALL SERVICE / JAM STATUS BITS SET CORRECTLY
    4571:
    TEST721A:
            P0,       LOAD-ENUA(4777),                          !JAMUPP ADDRESS
                      LOAD-ERROR(TEST721A),                     !ERROR DIRECTORY KEY
                      DCS-CTR(C6.),                             !COMPARE JUST AFTER BUS CYCLE UWORD, AT JAM
            NEXT,     J/LOADRET721A                             !
 (4571)  DCS[1.00.1.0.0.0]  BM[1001..00.10..01.11..111..111...0.0.0..0..0...0.0000...0..0000.0...11.000...011.010.000]

    4320:  !(FREE)
    LOADRET721A:
            P3,       CSPD[00]+EMIT, RETURN/TEST721B,           !RETURN AFTER SUCCESSFUL JAM TO NEXT TEST
            NEXT,     GOTO-PAGE(7),                             !XFER
            NEXT,     J/SETADR721A                              !
 (4320)  DCS[0.00.0.0.0.0]  BM[0100..10.10..11.11..011..111...0.0.0..0..0...0.1111...1..0000.0...11.100...001.111.011]

    7173:  !(FREE)
    SETADR721A:
            P3,       CSPD[16]+EMIT, EMIT/120001,               !BIT<15:13>="101", -IOPAGE; ODD-ADDRESS
            NEXT,     J/SETJAM721A                              !
 (7173)  DCS[0.00.0.0.0.0]  BM[1010..10.00..00.00..000..001...0.0.0..0..0...0.0001...1..0000.0...11.000...010.000.000]

    7200:  !(FREE)
    SETJAM721A:
            P2-T,     SR+CSPD(D16),                             !SET BIT<00>=(1) FOR JAMUPP EXPECTED
            NEXT,     J/BUSFCN721A                              !
 (7200)  DCS[0.00.0.0.0.0]  BM[1010..10.00..00.00..000..000...0.0.1..0..0...0.0001...0..0000.0...11.000...010.000.001]

    7201:  !(FREE)
    BUSFCN721A:
                                                                !NOTE:  "IR"=(000000)=-BYTE FROM PREV TEST
            P1,       BA+SR,                                    !SET BA<17:00>=(120001)
            P3,       DATOB,                                    !DO A BUS "DATOB*-BYTE", SHOULD GET ODD ADDRESS ABORTED
            NEXT,     J/NEXT721A                                !GO DELAY
 (7201)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..1..0...1.0101...0..0000.0...11.000...011.110.010]

    !** AT THIS POINT JAMUPP SHOULD OCCUR **
    !** CLASSIC FLOW (4777) -> (4757) -> (7XXX) -> (4XXX), AND THEN WE'RE BACK HERE **
    !**  RETURN TO ADDRESS LEFT IN CSP(00) **

    !*** END UP HERE IF NO JAMUPP ***
    7362:
    NEXT721A:
            SETUP,    RETURN/TEST721A,                          !FORCE A SCOPE LOOP ON THIS TEST, BUT FIRST
```

```
        NEXT,   GOTO-PAGE(7),                           ! MUST DELAY A FEW MICROWORDS FOR BUS
                J/BUTD-IS-ZERO                          ! ERROR TO TAKE EFFECT  (IGNORE "BUT" OUTCOME HERE)
 (7362) DCS[0.00.0.0.0.0] BM[0100..00.10..11.11..001..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.001]


   !*** END UP HERE IF JAMUPP ***


   ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

   !TEST-721-B CHECKS THAT THE RIGHT JAM (ODD ADDRESS) IS INDICATED IN THE JAMREG:
   !
   !    BIT:      15   14   13   12   11   10   09   08   07   06   05   04   03   02   01   00
   !    FCN:     ODD    0 SSYN  YEL  RED  WCS  POW  MEM SSYN CACH  ILL  MGT  RED  ODD  WCS UBRK
   !             ADR      TIME  ZON  ZON  PAR  DIS  PAR TIME  ERR  ADR  ABT  ZON  ADR  PAR TRAP
   !    (101004)   1    0    0    0    0    0    1    0    0    0    0    0    0    1    0    0

   4573:
   TEST721B:
        PO,     LOAD-ENUA(ZTARGET402),                  !SETUP FOR D=ZERO COMPARE
                LOAD-ERROR(TEST721B),                   !ERROR DIRECTORY KEY
                DCS-CTR(C10.),                          !COMPARE AT TARGET
        NEXT,   J/GOTEST721B                            !
 (4573) DCS[1.00.1.0.0.0] BM[0101..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...011.010.001]

   4321: !(FREE)
   GOTEST721B:
        SETUP,  RETURN/TEST721C,                        !GO TO SUBR WHICH:
        NEXT,   CALL[ODDJAMTOD]                         !  (JAMREG)-XOR-(101004) -> D, BUT(D=ZERO)  [ODD-ADDRESS]
 (4321) DCS[0.00.0.0.0.0] BM[0100..00.10..11.11..111..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.101.100]



   ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

   !TEST-721-C CHECKS THAT THE RIGHT BUS FUNCTION DECODE / PBA<17:16> ARE INDICATED IN SERVICE REG:
   !  NOTE:  PBA<17:16> SHOULD NOT BE FORCED TO "11", IN 16. BIT MODE, WHEN BA<15:13>="101"
   !
   !    BIT:      15   14   13   12   11   10   09   08   07   06   05   04   03   02   01   00
   !    FCN:    DATI   BG    0  NPR DATOB DATO PBA  PBA  HIB  LOB  TAG  CON  FLT  POW CACH  YEL
   !                 SERV      TIME            17   16  ERR  ERR  ERR SERV SERV FAIL  ERR  ZON
   !    (002340)   0    0    0    0    0    1    0    0    1    1    1    0    0    0    0    0

   4577:
   TEST721C:
        PO,     LOAD-ENUA(ZTARGET402),                  !SETUP FOR D=ZERO COMPARE
                LOAD-ERROR(TEST721C),                   !ERROR DIRECTORY KEY
                DCS-CTR(C11.),                          !COMPARE AT TARGET
        NEXT,   J/GOTEST721C                            !
 (4577) DCS[1.00.1.0.0.0] BM[0100..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...011.010.010]

   4322: !(FREE)
   GOTEST721C:
```

```
        SETUP,  RETURN/SCOPE721,                        !GO TO SUBR WHICH:
                                                        !  CLR-JAM-ERRORS, TO RESET FOR NEXT TEST
        NEXT,   CALL[DATOSERVICETOD]                    !  (SERVICE)-XOR-(002340) -> D, BUT(D=ZERO)  (DATO[1]H)
 (4322) DCS[0.00.0.0.0.0] BM[0101..00.10..01.01..100..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.100.110]




    5454: !(FREE)
    SCOPE721:
        NEXT,   BUTD[SCOPE],                            !NO ERROR:  "TEST722A"  (+1. WORDS)
                J/TEST722A                              !   ERROR:  "LOADRET720A"  (-24. WORDS)
 (5454) DCS[0.00.0.1.0.0] BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...100.110.011]





    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    !TESTING 'INVALIDATE', 'ODD-ADDRESS' JAMUPP, I/O-PAGE-PBA<17:16> DECODE

    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    !TEST-722-A ATTEMPTS TO DO A BUS "INVALIDATE" FUNCTION, TRYING TO FORCE AN "ODD ADDRESS"
    !  ABORT/JAMUPP, ALSO CHECKING THAT ALL SERVICE / JAM STATUS BITS SET CORRECTLY
    5463:
    TEST722A:
        P0,     LOAD-ENVA(4777),                        !JAMUPP ADDRESS
                LOAD-ERROR(TEST722A),                   !ERROR DIRECTORY KEY
                DCS-CTR(C6.),                           !COMPARE JUST AFTER BUS CYCLE UWORD, AT JAM
        NEXT,   J/LOADRET722A                           !
 (5463) DCS[1.00.1.0.0.0] BM[1001..00.10..01.11..111..111...0.0.0..0..0...0.0000...0..0000.0...11.000...100.101.110]

    5456: !(FREE)
    LOADRET722A:
        P3,     CSPD[00]+EMIT, RETURN/TEST722B,         !RETURN AFTER SUCCESSFUL JAM TO NEXT TEST
        NEXT,   GOTO-PAGE(4),                           !XFER
        NEXT,   J/SETADR722A                            !
 (5456) DCS[0.00.0.0.0.0] BM[0100..10.10..01.10..100..100...0.0.0..0..0...0.1111...1..0000.0...11.100...100.111.000]

    4470:
    SETADR722A:
        P3,     CSPD[16]+EMIT, EMIT/140001,             !BIT<15:13>="110", -IOPAGE; ODD-ADDRESS
        NEXT,   J/SETJAM722A                            !
 (4470) DCS[0.00.0.0.0.0] BM[1100..10.00..00.00..000..001...0.0.0..0..0...0.0001...1..0000.0...11.000...011.010.011]

    4323: !(FREE)
    SETJAM722A:
        P2-T,   SR+CSPD(D16),                           !SET BIT<00>=(1) FOR JAMUPP EXPECTED
        NEXT,   J/BUSFCN722A                            !
 (4323) DCS[0.00.0.0.0.0] BM[1010..10.00..00.00..000..000...0.0.1..0..0...0.0001...0..0000.0...11.000...011.010.100]
```

```
     4324:  !(FREE)
     BUSFCN722A:
            P1,     BA+SR,                                          !SET BA<17:00>=(140001)
            P3,     INVALIDATE,                                     !DO A BUS "INVALIDATE", SHOULD GET ODD ADDRESS ABORTED
            NEXT,   J/NEXT722A                                      !GO DELAY
(4324)  DCS[0.00.0.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..1..0...1.0111...0..0000.0...11.000...101.010.100]

     !** AT THIS POINT JAMUPP SHOULD OCCUR **
     !** CLASSIC FLOW (4777) -> (4757) -> (7XXX) -> (4XXX), AND THEN WE'RE BACK HERE **
     !**  RETURN TO ADDRESS LEFT IN CSP(00) **

     !*** END UP HERE IF NO JAMUPP ***
     4524:
     NEXT722A:
            SETUP,  RETURN/TEST722A,                                !FORCE A SCOPE LOOP ON THIS TEST, BUT FIRST
            NEXT,   GOTO-PAGE(7),                                   !  MUST DELAY A FEW MICROWORDS FOR BUS
                    J/BUTD-IS-ZERO                                  !  ERROR TO TAKE EFFECT  (IGNORE "BUT" OUTCOME HERE)
(4524)  DCS[0.00.0.0.0.0.0]  BM[0101..00.10..01.10..011..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.001]


     !*** END UP HERE IF JAMUPP ***


     ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

     !TEST-722-B CHECKS THAT THE RIGHT JAM (ODD ADDRESS) IS INDICATED IN THE JAMREG:
     !
     !      BIT:      15   14   13   12   11   10   09   08   07   06   05   04   03   02   01   00
     !      FCN:     ODD    0  SSYN YEL  RED  WCS  POW  MEM  SSYN CACH ILL  MGT  RED  ODD  WCS  UBRK
     !               ADR       TIME ZON  ZON  PAR  DIS  PAR  TIME  ERR ADR  ABT  ZON  ADR  PAR  TRAP
     !      (101004)  1    0    0    0    0    0    1    0    0    0    0    0    0    1    0    0

     4464:
     TEST722B:
            P0,     LOAD-ENUA(ZTARGET402),                          !SETUP FOR D=ZERO COMPARE
                    LOAD-ERROR(TEST722B),                           !ERROR DIRECTORY KEY
                    DCS-CTR(C11.),                                  !COMPARE AT TARGET
                    BUMP-VERIFY,                                    !COUNT
            NEXT,   J/GOTEST722B                                    !
(4464)  DCS[1.00.1.0.0.1]  BM[0100..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...011.010.101]

     4325:  !(FREE)
     GOTEST722B:
            SETUP,  RETURN/TEST722C,                                !GO TO SUBR WHICH:
            NEXT,   CALL[ODDJAMTOD]                                 !  (JAMREG)-XOR-(101004) -> D, BUT(D=ZERO)  [ODD-ADDRESS]
(4325)  DCS[0.00.0.0.0.0.0]  BM[0100..00.10..01.10..101..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.101.100]



     ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
```

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    !TEST-722-C CHECKS THAT THE RIGHT BUS FUNCTION DECODE / PBA<17:16> ARE INDICATED IN SERVICE REG:
    !  NOTE:  PBA<17:16> SHOULD NOT BE FORCED TO "11", IN 16. BIT MODE, WHEN BA<15:13>="110"
    !
    !       BIT:        15    14    13    12    11     10    09   08   07   06   05   04   03   02   01   00
    !       FCN:      DATI    BG     0   NPR  DATOB  DATO   PBA  PBA  HIB  LOB  TAG  CON  FLT  POW  CACH YEL
    !                       SERV          TIME                17   16  ERR  ERR  ERR SERV SERV FAIL  ERR ZON
    !       (002340)    0     0     0     0     0      1     0    0    1    1    1    0    0    0    0    0

    4465:
    TEST722C:
            PO,      LOAD-ENUA(ZTARGET402),                          !SETUP FOR D=ZERO COMPARE
                     LOAD-ERROR(TEST722C),                           !ERROR DIRECTORY KEY
                     DCS-CTR(C11.),                                  !COMPARE AT TARGET
            NEXT,    J/GOTEST722C                                    !
(4465)  DCS[1.00.1.0.0.0]  BM[0100..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...011.010.110]

    4326:  !(FREE)
    GOTEST722C:
            SETUP,   RETURN/SCOPE722,                                !GO TO SUBR WHICH:
                                                                     !  CLR-JAM-ERRORS, TO RESET FOR NEXT TEST
            NEXT,    CALL[DATOSERVICETOD]                            !  (SERVICE)-XOR-(002340) -> D, BUT(D=ZERO)  (DATO[1]H)
(4326)  DCS[0.00.0.0.0.0]  BM[0100..00.01..10.10..111..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.100.110]




    4327:  !(FREE)
    SCOPE722:
            NEXT,    BUTD[SCOPE],                                    !NO ERROR:  "TEST730A"  (+1. WORDS)
                     J/TEST730A                                      !   ERROR:  "SETADR720A"  (-11. WORDS)
(4327)  DCS[0.00.0.1.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...100.111.001]





    !.PAGE===================================================================================================


    .TOC   *   TEST730-731:  BUS CYCLES TO/FROM MEMORY

    !****************************************************************************************
    !*
    !*      TESTS:  730A - 731E                               UWORDS:  063 + 057
    !*
    !*      FUNCTIONS:
    !*
    !*      THESE TESTS CHECK THAT ACTUAL BUS CYCLES CAN BE CORRECTLY EXECUTED.
    !*
    !****************************************************************************************
```

```



        ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

        !THIS FIRST SERIES OF TESTS DOES A DATO/DATIP/DATO/DATIB SEQUENCE, CHECKING THAT
        !EACH FUNCTION OPERATES AS EXPECTED.

        ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

        !TEST-730-A DOES A DATO, AND THEN CHECKS THAT THE DBUF LATCH (DS) ALSO GETS LOADED WITH THE
        !  DATA, AND THAT IT IS ENABLED ON BUSDIN IN THE MICROWORD AFTER THE BUS CYCLE (IE, EMIT
        !  IS TEMPORARILY DISABLED)
        4471:
        TEST730A:
                P0,     LOAD-ENVA(ZTARGET402),                  !SETUP FOR D=ZERO COMPARE
                        LOAD-ERROR(TEST730A),                   !ERROR DIRECTORY KEY
                        DCS-CTR(C9.),                           !COMPARE AT TARGET
                NEXT,   J/LOADIR730A                            !
  (4471)  DCS[1.00.1.0.0.0]  BM[0110..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...111.101.100]

        4754:
        LOADIR730A:
                P2-U,   IR+EMIT, EMIT/125200,                   !"CMP-BYTE" INSTR; INSTRS-E88(412) DECODE
                NEXT,   J/LOADDATA730A                          !
  (4754)  DCS[0.00.0.0.0.0]  BM[1010..00.10..10.10..000..000...0.0.0..0..0...1.1010...0..0000.0...11.000...011.011.000]

        4330:  !(FREE)
        LOADDATA730A:
                P3,     CSPD[16]+EMIT, EMIT/125252,             !PATTERN (125252) IN BASCON AREA
                NEXT,   J/BUSFCN730A                            !
  (4330)  DCS[0.00.0.0.0.0]  BM[1010..10.10..10.10..101..010...0.0.0..0..0...0.0001...1..0000.0...11.000...011.011.001]

        4331:  !(FREE)
        BUSFCN730A:
                P0,     BUMP-VERIFY,                            !COUNT
                P1,     BA+ASPHI(C000000),                      !USE MEMORY ADDR(000000)
                P2-T,   D+CSPB(B16), D[C]+D,                    !USE DATA (125252)
                P3,     DATO,                                   !FOR A BUS "DATO" CYCLE
                NEXT,   J/GETDBUF730A                           !
  (4331)  DCS[0.00.0.0.0.1]  BM[1010..11.01..11.01..100..000...0.1.0..1..0...1.0010...0..0000.0...11.000...011.011.010]

        4332:  !(FREE)
        GETDBUF730A:
                P0,     BUMP-VERIFY,                            !COUNT
                P3,     CSPD[17]+BUSDIN, EMIT/037777,           !DBUF SHOULD BE ENABLED; EMIT IS NOISE
                P3-T,   D+JUNK, SAVE-D[C],                      !MANGLE DATA IN D, DONT CARE WHAT RESULTS
                NEXT,   J/COMP730A                              !
  (4332)  DCS[0.00.0.0.0.1]  BM[0011..10.11..11.11..111..111...1.1.0..0..0...0.0000...1..0000.0...11.000...011.011.011]

        4333:  !(FREE)
        COMP730A:
                P0,     BUMP-VERIFY,                            !COUNT
                P2-T,   D+CSPD[17]-XOR-ASPHI(C125252),          !COMPARE RECEIVED:EXPECTED
```

```
                NEXT,   J/ZAPDBUF730A                           !
        (4333)  DCS[0.00.0.0.0.0.1]  BM[0110..10.00..11.01..110..000...0.1.0..0..0...0.0000...0..0000.0...11.000...011.011.100]

        4334:   !(FREE)
        ZAPDBUF730A:
                P3,     DBUF+D-[I],                             !COPY ZEROED(?) D-REG INTO DBUF
                NEXT,   J/GOBUT730A                             !
        (4334)  DCS[0.00.0.0.0.0.0]  BM[0100..00.00..00.00..000..100...0.0.0..0..0...1.1011...0..0000.0...11.000...011.011.101]

        4335:   !(FREE)
        GOBUT730A:
                SETUP,  RETURN/TEST730B,                        !RETURN TO START OF NEXT SUBTEST
                NEXT,   GOTO-PAGE(7),                           !BUT TABLE
                        J/BUTD-IS-ZERO                          !CHECK FOR EQUALITY
        (4335)  DCS[0.00.0.0.0.0.0]  BM[0100..00.10..01.10..110..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.001]







        ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

        !TEST-730-B DOES A DATIP, AND THEN CHECKS THAT:
        !   1) NO ODD ADDRESS ERROR RESULTS
        !   2) THE RIGHT DATA (OUTPUT ABOVE) IS RETRIEVED  (NOTE DBUF LATCH WAS ZEROED
        !      TO ALTER ITS COPY OF THE DATA)
        !   3) THE BUS HOLDING FUNCTION OF THE 'DATIP' SHOULD BE EMPLOYED; 'BBSY' SHOULD REMAIN ASSERTED
        !      WELL PAST THE 'NORMAL' 1 MICROWORD AFTER THE BUS CYCLE.  IN FACT, IT SHOULD REMAIN ASSERTED
        !      (HOLDING BUSDIN=UNIBUS-DATA-BUFFER, NOT EMIT, ETC) UNTIL CLEARED BY ANOTHER BUS CYCLE
        !      (NOT A DATIP), OR A BUTA(LAST) [DONE HERE].
        4466:
        TEST730B:
                P0,     LOAD-ENUA(ZTARGET402),                  !SETUP FOR D=ZERO COMPARE
                        LOAD-ERROR(TEST730B),                   !ERROR DIRECTORY KEY
                        DCS-CTR(C7.),                           !COMPARE AT TARGET
                NEXT,   J/EXPEC730B                             !
        (4466)  DCS[1.00.1.0.0.0.0]  BM[1000..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...011.011.110]

        4336:   !(FREE)
        EXPEC730B:
                P3,     CSPD[02]+EMIT, EMIT/000340,             !SERVICE PORT BITS FOR A "DATIP"
                NEXT,   J/BUSFCN730B                            !
        (4336)  DCS[0.00.0.0.0.0.0]  BM[0000..10.00..00.11..100..000...0.0.0..0..0...0.1101...1..0000.0...11.000...011.011.111]

        4337:   !(FREE)
        BUSFCN730B:
                P1,     BA+ASPHI(C000001),                      !USE MEMORY ADDR(000001), ODD BYTE
                P2-T,   D+ZERO, D[C]+ALU15,                     !ZAP D
                P3,     DATIP,                                  !FOR A BUS "DATIP" CYCLE
                        BUTA(CLR-FLAG-RES-UCON),                !RESET BUSDIN TO EMIT/ZAP DBUF+D UCON
                NEXT,   J/GETIT730B                             !
```

```
    (4337) DCS[0.00.0.0.0.0] BM[0011..00.00..11.01..000..100...0.1.0..1..0...1.0100...0..0000.0...11.010...011.100.000]

        4340: !(FREE)
        GETIT730B:
                PO,     BUMP-VERIFY,                            !COUNT
                P3,     CSPD[17]←BUSDIN, EMIT/052525,           !UNIBUS DATA SHOULD BE ENABLED; EMIT IS NOISE
                NEXT,   J/GOBUT730B                             !
    (4340) DCS[0.00.0.0.0.1] BM[0101..10.01..01.01..010..101...0.0.0..0..0...0.0000...1..0000.0...11.000...011.100.001]

        4341: !(FREE)
        GOBUT730B:
                SETUP,  RETURN/TEST730C,                        !EXEC SUBR WHICH:
                NEXT,   CALL[CSP17XOR125252]                    !  CSP(17)-XOR-(125252) -> D, BUT(D=ZERO)
    (4341) DCS[0.00.0.0.0.0] BM[0100..00.10..01.10..000..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.000.011]



        ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

        !TEST-730-C NOW CHECKS THAT THE 'DATIP' FUNCTION IS STILL HOLDING THE BUS BY
        !  VERIFYING THAT THE UNIBUS DATA BUFFER IS STILL ENABLED ON BUSDIN, DATA=(125252)
        4460:
        TEST730C:
                PO,     LOAD-ENWA(ZTARGET402),                  !SETUP FOR D=ZERO COMPARE
                        LOAD-ERROR(TEST730C),                   !ERROR DIRECTORY KEY
                        DCS-CTR(CS.),                           !COMPARE AT TARGET
                        BUMP-VERIFY,                            !COUNT
                NEXT,   J/GOBUT730C                             !
    (4460) DCS[1.00.1.0.0.1] BM[1010..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...011.100.010]

        4342: !(FREE)
        GOBUT730C:
                SETUP,  RETURN/TEST730C1,                       !EXEC SUBR WHICH:
                                                                !  1) BUSDIN -> CSP(17), EMIT=(052525)
                NEXT,   CALL[BUSDINXOR125252]                   !  2) CSP(17)-XOR-(125252) -> D, BUT(D=ZERO)
    (4342) DCS[0.00.0.0.0.0] BM[0100..00.10..01.01..000..111...0.0.0..0..0...0.0000...0..0000.0...11.100...001.111.111]



        ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

        !TEST-730-C1 NOW CHECKS THAT THE 'DATIP' FUNCTION WILL RELEASE THE BUS BY
        !  VERIFYING THAT THE UNIBUS DATA BUFFER IS NOT ENABLED ON BUSDIN, DATA=(125252),
        !  AFTER ISSUING BUTA(LAST), WHICH SHOULD CLEAR THE DATIP/BBSY FLOP
        4450:
        TEST730C1:
                PO,     LOAD-ENWA(ZTARGET402),                  !SETUP FOR D=ZERO COMPARE
                        LOAD-ERROR(TEST730C1),                  !ERROR DIRECTORY KEY
```

```
                DCS-CTR(C5.),                           !COMPARE AT TARGET
         P3,    BUTA(LAST),                             !ACTIVE BUT EFFECT:  CLEAR OUT DATIP
         NEXT,  J/GOBUT730C1                            !
  (4450) DCS[1.00.1.0.0.0] BM[1010..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...10.000...100.100.011]

    4443:
    GOBUT730C1:
         SETUP, RETURN/TEST730D,                        !EXEC SUBR WHICH:
                                                        !  1) BUSDIN -> CSP(17), EMIT=(052525)
         NEXT,  CALL[BUSDINXOR052525]                   !  2) CSP(17)-XOR-(052525) -> D, BUT(D=ZERO)
  (4443) DCS[0.00.0.0.0.0] BM[0100..00.10..01.10..001..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.000.100]




    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    !TEST-730-D DOES A DATO FOLLOWED BY A DATIB*BYTE*ODD, AND THEN CHECKS THAT THE RIGHT DATA
    !  IS WRITTEN/RETRIEVED FROM MEMORY LOCATIONS (000000)/(000001)
    !  AND THAT THE EMIT-DISABLE/UNIBUS DATA BUFFER ENABLE IS HANDLED CORRECTLY
    4461:
    TEST730D:
         P0,    LOAD-ENUA(ZTARGET402),                  !SETUP FOR D=ZERO COMPARE
                LOAD-ERROR(TEST730D),                   !ERROR DIRECTORY KEY
                DCS-CTR(C15.),                          !HOLD UP FOR NOW
         NEXT,  J/LOADDATA730D                          !
  (4461) DCS[1.00.1.0.0.0] BM[0000..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...011.100.011]

    4343:  !(FREE)
    LOADDATA730D:
         P3,    CSPD[16]+EMIT, EMIT/052525,             !PATTERN (052525) IN BASCON AREA
         NEXT,  J/SETZER730D                            !
  (4343) DCS[0.00.0.0.0.0] BM[0101..10.01..01.01..010..101...0.0.0..0..0...0.0001...1..0000.0...11.000...011.100.100]

    4344:  !(FREE)
    SETZER730D:
         P1,    BA+ASPHI(C000000),                      !USE MEMORY ADDR(000000)
         P2-T,  D+CSPB(B16), D[C]+0,                    !USE DATA (052525)
         P3,    DATO,                                   !FOR A BUS "DATO" CYCLE
         NEXT,  J/MANGLED730D                           !
  (4344) DCS[0.00.0.0.0.0] BM[1010..11.01..11.01..100..000...0.1.0..1..0...1.0010...0..0000.0...11.000...011.100.101]

    4345:  !(FREE)
    MANGLED730D:
         P3-T,  D+ASPHI(C125252), SAVE-D[C],            !MANGLE D CONTENTS, AFTER/AT P3-T
         NEXT,  J/BUSFCN730D                            !
  (4345) DCS[0.00.0.0.0.0] BM[1111..00.00..11.01..110..111...1.1.0..0..0...0.0000...0..0000.0...11.000...011.100.110]

    4346:  !(FREE)
    BUSFCN730D:
         P0,    BUMP-VERIFY,                            !COUNT
                DCS-CTR(C12.),                          !COMPARE AT TARGET
         P1,    BA+ASPHI(C000001),                      !ADDRESS ODD BYTE
```

```
                P3,     DATIB,                                  !BYTE READ -> PLAIN DATI; NO ODD ADDRESS ERROR
                NEXT,   J/GETIT730D                             !
        (4346)  DCS[0.00.1.0.0.1]  BM[0011..00.00..11.01..000..000...0.0.0..1..0...1.0011...0..0000.0...11.000...011.100.111]

        4347:   !(FREE)
        GETIT730D:
                P3,     CSPD[17]←BUSDIN, EMIT/000000,           !UNIBUS DATA SHOULD BE ENABLED; EMIT IS NOISE
                NEXT,   J/GOBUT730D                             !
        (4347)  DCS[0.00.0.0.0.0]  BM[0000..10.00..00.00..000..000...0.0.0..0..0...0.0000...1..0000.0...11.000...011.101.000]

        4350:   !(FREE)
        GOBUT730D:
                SETUP,  RETURN/TEST730E,                        !GO TO SUBR WHICH:
                NEXT,   CALL[CLRSERVICETOD]                     !  (SERVICE)-XOR-(000340) -> D, BUT(D=ZERO)
        (4350)  DCS[0.00.0.0.0.0]  BM[0100..00.10..01.10..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.100.100]







        ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -


        !TEST-730-E NOW CHECKS THAT THE BUS FUNCTION ABOVE ACTUALLY RETRIEVED THE RIGHT DATA:
        !  THE (052525) WRITTEN TO MEMORY LOCATION (000000) IN TEST730D
        4462:
        TEST730E:
                P0,     LOAD-ENVA(ZTARGET402),                  !SETUP FOR D=ZERO COMPARE
                        LOAD-ERROR(TEST730E),                   !ERROR DIRECTORY KEY
                        DCS-CTR(C4.),                           !COMPARE AT TARGET
                NEXT,   J/GOBUT730E                             !
        (4462)  DCS[1.00.1.0.0.0]  BM[1011..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...011.101.001]

        4351:   !(FREE)
        GOBUT730E:
                SETUP,  RETURN/SCOPE730,                        !EXEC SUBR WHICH:
                NEXT,   CALL[CSP17XOR052525]                    !  CSP(17)-XOR-(052525) -> D, BUT(D=ZERO)
        (4351)  DCS[0.00.0.0.0.0]  BM[0100..00.01..11.01..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.000.101]


        4352:   !(FREE)
        SCOPE730:
                NEXT,   BUTD[SCOPE],                            !NO ERROR:  "TEST731A"   (+1. WORDS)
                        J/TEST731A                              !   ERROR:  "LOADIR730A"  (-24. WORDS)
        (4352)  DCS[0.00.0.1.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...111.101.101]
```

```
    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    !THIS SECOND SERIES OF TESTS DOES A DATOB/DATI/DATI-CLKIR SEQUENCE, CHECKING THAT
    !EACH FUNCTION OPERATES AS EXPECTED.

    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    !TEST-731-A DOES A DATOB*BYTE*ODD, AND THEN CHECKS THAT THE DBUF LATCH (DS) ALSO GETS LOADED WITH THE
    !  DATA, AND THAT IT IS ENABLED ON BUSDIN IN THE MICROWORD AFTER THE BUS CYCLE (IE, EMIT
    !  IS TEMPORARILY DISABLED)
    4755:
    TEST731A:
            P0,     LOAD-ENUA(ZTARGET402),                  !SETUP FOR D=ZERO COMPARE
                    LOAD-ERROR(TEST731A),                   !ERROR DIRECTORY KEY
                    DCS-CTR(C6.),                           !COMPARE AT TARGET
            NEXT,   J/BUSFCN731A                            !
 (4755)  DCS[1.00.1.0.0.0]  BM[1001..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...111.110.100]

    4764:
    BUSFCN731A:
            P1,     BA←ASPHI(C000001),                      !USE MEMORY ADDR(000001), ODD BYTE
            P2-T,   D←ZERO, D[C]←ALU15,                     !USE DATA (000), ONE BYTE (ODD) ONLY
            P3,     DATOB,                                  !FOR A BUS "DATOB*BYTE*ODD" CYCLE
            NEXT,   J/GETDBUF731A                           !
 (4764)  DCS[0.00.0.0.0.0]  BM[0011..00.00..11.01..000..100...0.1.0..1..0...1.0101...0..0000.0...11.000...011.101.011]

    4353:  !(FREE)
    GETDBUF731A:
            P0,     BUMP-VERIFY,                            !COUNT
            P3,     CSPD[17]←BUSDIN,                        !DBUF SHOULD BE ENABLED; EMIT IS NOISE
            P3-T,   D←ASPHI(C177777), SAVE-D[C],            !MANGLE DATA IN D, DONT CARE WHAT RESULTS
            NEXT,   J/COMP731A                              !
 (4353)  DCS[0.00.0.0.0.1]  BM[1111..10.00..11.01..101..111...1.1.0..0..0...0.0000...1..0000.0...11.000...011.101.100]

    4354:  !(FREE)
    COMP731A:
            P2-T,   D←CSPD(D17), SAVE-D[C],                 !COMPARE RECEIVED:(000000)
            NEXT,   J/GOBUT731A                             !
 (4354)  DCS[0.00.0.0.0.0]  BM[1010..10.00..00.00..000..111...0.1.0..0..0...0.0000...0..0000.0...11.000...011.101.101]

    4355:  !(FREE)
    GOBUT731A:
            SETUP,  RETURN/TEST731B,                        !RETURN TO START OF NEXT SUBTEST
            NEXT,   GOTO-PAGE(7),                           !BUT TABLE
                    J/BUTD-IS-ZERO                          !CHECK FOR EQUALITY
 (4355)  DCS[0.00.0.0.0.0]  BM[0100..00.10..01.01..111..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.001]
```

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        ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

        !TEST-731-B NOW CHECKS THAT NONE OF THE ABOVE BUS FUNCTIONS HAS ALTERED THE IR FROM WHEN
        !  IT WAS LOADED IN TEST730A, WITH THE VALUE (125200), INSTRS-E88(412) DECODE
        4457:
        TEST731B:
                PO,       LOAD-ENUA(ZTARGET412),                     !SETUP FOR INSTRS/E88 DECODE
                          LOAD-ERROR(TEST731B),                      !ERROR DIRECTORY KEY
                          DCS-CTR(CS.),                              !COMPARE AT TARGET
                NEXT,     J/BUSFCN731B                               !
 (4457)  DCS[1.00.1.0.0.0]  BM[1010..00.11..11.00..001..010...0.0.0..0..0...0.0000...0..0000.0...11.000...011.101.110]

        4356:  !(FREE)
        BUSFCN731B:
                P1,       BA←ASPHI(C000000),                         !USE MEMORY ADDR(000000)
                P3,       DATI,                                      !FOR A BUS "DATI" CYCLE
                NEXT,     J/GETIT731B                                !
 (4356)  DCS[0.00.0.0.0.0]  BM[0000..00.00..11.01..100..000...0.0.0..1..0...1.0110...0..0000.0...11.000...011.101.111]

        4357:  !(FREE)
        GETIT731B:
                PO,       BUMP-VERIFY,                               !COUNT
                P3,       CSPD[17]←BUSDIN, EMIT/152500,              !UNIBUS DATA SHOULD BE ENABLED; EMIT IS NOISE
                NEXT,     J/GOBUT731B                                !  THIS DATA IS INSTRS-E88(405) DECODE
 (4357)  DCS[0.00.0.0.0.1]  BM[1101..10.01..01.01..000..000...0.0.0..0..0...0.0000...1..0000.0...11.000...011.110.000]

        4360:  !(FREE)
        GOBUT731B:
                SETUP,    RETURN/TEST731C,                           !RETURN TO START OF NEXT SUBTEST
                NEXT,     GOTO-PAGE(7),                              !BUT TABLE
                          J/BUTINSTRS                                !CHECK THAT IR STILL HAS DATA (125200)
 (4360)  DCS[0.00.0.0.0.0]  BM[0100..00.10..01.01..110..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.000.001]







        ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

        !TEST-731-C NOW CHECKS THAT THE BUS FUNCTION ABOVE ACTUALLY RETRIEVED THE RIGHT DATA:
        !  THE (052525) WRITTEN TO MEMORY LOCATION (001)/(000) IN TEST730D
        !  AND THE (000) WRITTEN TO MEMORY LOCATION (001) IN TEST731A
        !  TOGETHER THESE FORM A (000125) IN MEMORY LOCATION (001)#(000):  INSTRS-E78(432) DECODE
        4456:
        TEST731C:
                PO,       LOAD-ENUA(ZTARGET432),                     !SETUP FOR INSTRS-E78(432) DECODE
                          LOAD-ERROR(TEST731C),                      !ERROR DIRECTORY KEY
```

```
                        DCS-CTR(C7.),                                   !COMPARE AT TARGET
                        BUMP-VERIFY,                                    !COUNT
                NEXT,   J/COMP731C                                      !
       (4456)  DCS[1.00.1.0.0.1]  BM[1000..00.11..11.00..011..010...0.0.0..0..0...0.0000...0..0000.0...11.000...011.110.001]

        4361:  !(FREE)
        COMP731C:
                P2-T,   D←CSPD(D17), D[C]←0,                            !GET DATA READ FROM DATI, ABOVE
                NEXT,   J/GOBUT731C                                     !
       (4361)  DCS[0.00.0.0.0.0]  BM[1010..10.00..00.00..000..000...0.1.0..0..0...0.0000...0..0000.0...11.000...011.110.010]

        4362:  !(FREE)
        GOBUT731C:
                SETUP,  RETURN/TEST731D,                                !RETURN TO START OF NEXT SUBTEST
                NEXT,   CALL[DINTOIR-5]                                 !SUBR FOR:  D -> IR, BUT(INSTRS)
       (4362)  DCS[0.00.0.0.0.0]  BM[0100..00.10..01.01..101..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.111.011]





        ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

        !TEST-731-D DOES A DATI-CLKIR, AND THEN CHECKS THAT THE RIGHT DATA
        !  IS WRITTEN/RETRIEVED FROM MEMORY LOCATIONS (000000)/(000001)
        !  AND THAT THE EMIT-DISABLE/UNIBUS DATA BUFFER ENABLE IS HANDLED CORRECTLY
        4455:
        TEST731D:
                P0,     LOAD-ENUA(ZTARGET402),                          !SETUP FOR D=ZERO COMPARE
                        LOAD-ERROR(TEST731D),                           !ERROR DIRECTORY KEY
                        DCS-CTR(C14.),                                  !COMPARE AT TARGET
                NEXT,   J/LOADIR731D                                    !
       (4455)  DCS[1.00.1.0.0.0]  BM[0001..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...011.110.011]

        4363:  !(FREE)
        LOADIR731D:
                P2-U,   IR←EMIT, EMIT/125200,                           !PREV DATA IN IR FOR INSTRS-E88(412)
                NEXT,   J/BUSFCN731D                                    !
       (4363)  DCS[0.00.0.0.0.0]  BM[1010..00.10..10.10..000..000...0.0.0..0..0...1.1010...0..0000.0...11.000...011.110.100]

        4364:  !(FREE)
        BUSFCN731D:
                P1,     BA←ASPHI(C000000),                              !FROM LOCATION (000000)
                P3,     DATI-CLKIR,                                     !DO A DATI, AND CLKIR
                NEXT,   J/MANGLED731D                                   !
       (4364)  DCS[0.00.0.0.0.0]  BM[0000..00.00..11.01..100..000...0.0.0..1..0...1.0000...0..0000.0...11.000...011.110.101]

        4365:  !(FREE)
        MANGLED731D:
                P2-U,   !IR←DATA,                                       !IR SHOULD GET DATA HERE
                        EMIT/152500,                                    !NOISE ON EMIT:  INSTRS-E88(405)
                NEXT,   J/GOBUT731D                                     !
       (4365)  DCS[0.00.0.0.0.0]  BM[1101..00.01..01.01..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...011.110.110]
```

```
	4366:	!(FREE)
	GOBUT731D:
		SETUP,	RETURN/TEST731E,			!GO TO SUBR WHICH:
		NEXT,	CALL[CLRSERVICETOD]			!  (SERVICE)-XOR-(000340) -> D, BUT(D=ZERO)
(4366)	DCS[0.00.0.0.0.0]  BM[0100..00.10..01.01..100..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.100.100]







	! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -


	!TEST-731-E NOW CHECKS THAT THE BUS FUNCTION ABOVE ACTUALLY RETRIEVED THE RIGHT DATA:
	4454:
	TEST731E:
		P0,	LOAD-ENVA(ZTARGET432),			!SETUP FOR INSTRS-E78(432) DECODE
			LOAD-ERROR(TEST731E),			!ERROR DIRECTORY KEY
			DCS-CTR(C3.),				!COMPARE AT TARGET
		NEXT,	J/GOBUT731E				!
(4454)	DCS[1.00.1.0.0.0]  BM[1100..00.11..11.00..011..010...0.0.0..0..0...0.0000...0..0000.0...11.000...011.110.111]

	4367:	!(FREE)
	GOBUT731E:
		SETUP,	RETURN/SCOPE731,			!RETURN TO SCOPE LOOP TEST WORD
		NEXT,	GOTO-PAGE(7),				!BUT TABLE
			J/BUTINSTRS				!CHECK FOR RIGHT DATA
(4367)	DCS[0.00.0.0.0.0]  BM[0100..00.01..11.11..000..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.000.001]


	4370:	!(FREE)
	SCOPE731:
		P2-U,	IR←EMIT, EMIT/125200,			!RESET IR FOR SCOPE LOOP
		NEXT,	BUTD[SCOPE],				!NO ERROR:  "LOADIR740A"  (+5. WORDS)
			J/LOADIR740A				!   ERROR:  "BUSFCN731A"  (-18. WORDS)
(4370)	DCS[0.00.0.1.0.0]  BM[1010..00.10..10.10..000..000...0.0.0..0..0...1.1010...0..0000.0...11.000...111.110.101]


	!	-	-	-	-	-	-	-	-	-	-	-	-	-

	!	THESE SUBROUTINES ARE USED IN THE PREVIOUS TESTS:

	7177:	!(FREE)
	BDX12:
		P3,	CSPD[17]←BUSDIN, EMIT/052525,		!ENTRY FOR "BUSDINXOR125252"
		NEXT,	J/C17X12				!
(7177)	DCS[0.00.0.0.0.0]  BM[0101..10.01..01.01..010..101...0.0.0..0..0...0.0000...1..0000.0...11.000...010.000.011]

	7203:	!(FREE)
```

```
      C17X12:
              P2-T,    D+CSPD[17]-XOR-ASPHI(C125252),            !ENTRY FOR "CSP17XOR125252"
                       SAVE-D[C],                                !
              NEXT,    J/BUTD-IS-ZERO                            !FINISH OUT BY TESTING RESULT OF COMPARISON
  (7203) DCS[0.00.0.0.0.0]  BM[0110..10.00..11.01..110..111...0.1.0..0..0...0.0000...0..0000.0...11.000...011.100.001]


      7204:   !(FREE)
      BDX05:
              P3,      CSPD[17]+BUSDIN, EMIT/052525,             !ENTRY FOR "BUSDINXOR052525"
              NEXT,    J/C17X05                                  !
  (7204) DCS[0.00.0.0.0.0]  BM[0101..10.01..01.01..010..101...0.0.0..0..0...0.0000...1..0000.0...11.000...010.000.101]

      7205:   !(FREE)
      C17X05:
              P2-T,    D+CSPD[17]-XOR-ASPHI(C052525),            !ENTRY FOR "CSP17XOR052525"
                       SAVE-D[C],                                !
              NEXT,    J/BUTD-IS-ZERO                            !FINISH OUT BY TESTING RESULT OF COMPARISON
  (7205) DCS[0.00.0.0.0.0]  BM[0110..10.00..11.01..111..111...0.1.0..0..0...0.0000...0..0000.0...11.000...011.100.001]


      !       -       -       -       -       -       -       -       -       -       -       -       -




      !.PAGE=============================================================================================


      .TOC    *    TEST740:  BUS CYCLE MODIFICATION - PREFETCH ALTERATION, OVERLAP YANK

      !*******************************************************************************
      !*
      !*      TESTS:  740A - 740D                             UWORDS:  020 + 043
      !*
      !*      FUNCTIONS:
      !*
      !*      THESE FOUR TESTS CHECK THAT LOGIC CONCERNED WITH:
      !*
      !*              1) BCO/PREFETCH = BCO[1] * NOT(PREFETCH*BUT[INSTR1])
      !*                      IE, ALTER BUS CODE (**1) -> (**0), IN A PREFETCH SITUATION
      !*
      !*      AND     2) BEGIN-DATA-XFER = BEGIN[BUS/UCON] * NOT(PULSE-SUPPRESS[0]) * NOT(INH-SPLO)
      !*                      IE, 'YANK' [STOP] A BUS CYCLE IN A NON-OVERLAP SITUATION
      !*
      !*******************************************************************************







      ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
```

```
        !TEST-740-A CHECKS THAT BC[0]-H DOES NOT GET ALTERED FROM (1) -> (0) WHEN:
        !  BUTA[INSTR1]-H IS ASSERTED, BUT PREFETCH-H IS NEGATED
        4765:
        LOADIR740A:
                P2-U,   IR←EMIT, EMIT/056000,                   !(OVERLAP,-PREFETCH), (-BYTE,DOP,-SMO)
                NEXT,   J/TEST740A                              !
   (4765)  DCS[0.00.0.0.0.0]  BM[0101..00.11..00.00..000..000...0.0.0..0..0...1.1010...0..0000.0...11.000...111.100.100]

        4744:
        TEST740A:
                P0,     LOAD-ENUA(ZTARGET402),                  !SETUP FOR D=ZERO COMPARE
                        LOAD-ERROR(TEST740A),                   !ERROR DIRECTORY KEY
                        DCS-CTR(C12.),                          !COMPARE AT TARGET
                NEXT,   J/BUSFCN740A                            !
   (4744)  DCS[1.00.1.0.0.0]  BM[0011..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...011.111.001]

        4371:  !(FREE)
        BUSFCN740A:
                P0,     BUMP-VERIFY,                            !COUNT
                P1,     BA←ASPHI(C000000),                      !USE MEMORY ADDR (000000)
                P2-T,   SR←ZERO,                                !SR<00>=(0), FOR UNEXPECTED JAMUPPS
                P3,     DATIB,                                  !CODE=(3)/DATIB, POSSIBLY ALTERED TO (2)/DATO
                        BUTA(INSTR-1),                          !ACTIVE EFFECT ONLY - BRANCH MASKED
                NEXT,   J/GOBUT740A                             !(056000) TARGETS TO (316), MASKED UNDER (776)
   (4371)  DCS[0.00.0.0.0.1]  BM[0011..00.00..11.01..100..000...0.0.1..1..0...1.0011...0..0000.0...00.110...111.111.110]

        4776:
        GOBUT740A:
                SETUP,  RETURN/LOADIR740B,                      !GO TO SUBR WHICH:
                                                                !  CLR-JAM-ERRORS, FOR INSURANCE
                NEXT,   CALL[DATISERVICETOD]                    !  (SERVICE)-XOR-(100340) -> D, BUT(D=ZERO)
   (4776)  DCS[0.00.0.0.0.0]  BM[0100..00.01..11.11..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.100.101]





        ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

        !TEST-740-B CHECKS THAT BC[0]-H DOES GET ALTERED FROM (1) -> (0) WHEN:
        !  BUTA[INSTR1]-H IS ASSERTED, AND PREFETCH-H IS ASSERTED
        4372:  !(FREE)
        LOADIR740B:
                P2-U,   IR←EMIT, EMIT/020606,                   !(OVERLAP,PREFETCH), (-BYTE,DOP,SMO)
                NEXT,   J/TEST740B                              !
   (4372)  DCS[0.00.0.0.0.0]  BM[0010..00.00..01.10..000..110...0.0.0..0..0...1.1010...0..0000.0...11.000...100.101.011]

        4453:
        TEST740B:
                P0,     LOAD-ENUA(ZTARGET402),                  !SETUP FOR D=ZERO COMPARE
                        LOAD-ERROR(TEST740B),                   !ERROR DIRECTORY KEY
                        DCS-CTR(C12.),                          !COMPARE AT TARGET
                NEXT,   J/BUSFCN740B                            !
```

```
(4453) DCS[1.00.1.0.0.0]  BM[0011..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...011.111.011]

      4373:  !(FREE)
      BUSFCN740B:
              P1,      BA+ASPHI(C000000),                       !USE MEMORY ADDR (000000)
              P3,      DATIB,                                   !CODE=(3)/DATIB, POSSIBLY ALTERED TO (2)/DATO
                       BUTA(INSTR-1),                           !ACTIVE EFFECT ONLY - BRANCH MASKED
              NEXT,    J/GOBUT740B                              !(020606) TARGETS TO (042), MASKED UNDER (766)
(4373) DCS[0.00.0.0.0.0]  BM[0000..00.00..11.01..100..000...0.0.0..1..0...1.0011...0..0000.0...00.110...111.110.110]

      4766:
      GOBUT740B:
              SETUP,   RETURN/TEST740C,                         !GO TO SUBR WHICH:
                                                                !  CLR-JAM-ERRORS, FOR INSURANCE
              NEXT,    CALL[DATOSERVICETOD]                     !  (SERVICE)-XOR-(002340) -> D, BUT(D=ZERO)
(4766) DCS[0.00.0.0.0.0]  BM[0100..00.10..01.01..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.100.110]





      ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

      !TEST-740-C CHECKS THAT BC[0]-H DOES NOT GET ALTERED FROM (1) -> (0) WHEN:
      !   BUTA[INSTR1]-H IS NEGATED, BUT PREFETCH-H IS ASSERTED
      4452:
      TEST740C:
              P0,      LOAD-ENUA(ZTARGET402),                   !SETUP FOR D=ZERO COMPARE
                       LOAD-ERROR(TEST740C),                    !ERROR DIRECTORY KEY
                       DCS-CTR(C12.),                           !COMPARE AT TARGET
                       BUMP-VERIFY,                             !COUNT
              NEXT,    J/BUSFCN740C                             !IR AS ABOVE:  (OVERLAP,PREFETCH), (-BYTE,DOP,SMO)
(4452) DCS[1.00.1.0.0.1]  BM[0011..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...011.111.100]

      4374:  !(FREE)
      BUSFCN740C:
              P1,      BA+ASPHI(C000000),                       !USE MEMORY ADDR (000000)
              P3,      DATIB,                                   !CODE=(3)/DATIB, POSSIBLY ALTERED TO (2)/DATO
              NEXT,    J/GOBUT740C                              !(020606) TARGETS TO (042), MASKED UNDER (766)
(4374) DCS[0.00.0.0.0.0]  BM[0000..00.00..11.01..100..000...0.0.0..1..0...1.0011...0..0000.0...11.000...011.111.101]

      4375:  !(FREE)
      GOBUT740C:
              SETUP,   RETURN/LOADIR740D,                       !GO TO SUBR WHICH:
                                                                !  CLR-JAM-ERRORS, FOR INSURANCE
              NEXT,    CALL[DATISERVICETOD]                     !  (SERVICE)-XOR-(100340) -> D, BUT(D=ZERO)
(4375) DCS[0.00.0.0.0.0]  BM[0100..00.10..00.00..000..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.100.101]
```

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        ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

        !TEST-740-D CHECKS THAT WHEN BUTA[INSTR1]-H IS ASSERTED, AND OVERLAP-L IS
        !   NEGATED, THEN THE BUS CYCLE IS NOT EVEN ALLOWED TO BEGIN
        4400:  !(FREE)
        LOADIR7400:
                P0,      BUMP-VERIFY,                              !COUNT
                P2-U,    IR←EMIT, EMIT/076000,                     !(-OVERLAP,-PREFETCH), (-BYTE,-DOP,-SOP)
                NEXT,    J/TEST7400                                !
(4400)  DCS[0.00.0.0.0.1]  BM[0111..00.11..00.00..000..000...0.0.0..0..0...1.1010...0..0000.0...11.000...100.101.001]

        4451:
        TEST7400:
                P0,      LOAD-ENUA(ZTARGET402),                    !SETUP FOR D=ZERO COMPARE
                         LOAD-ERROR(TEST740D),                     !ERROR DIRECTORY KEY
                         DCS-CTR(C11.),                            !COMPARE AT TARGET
                NEXT,    J/BUSFCN7400                              !
(4451)  DCS[1.00.1.0.0.0]  BM[0100..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...100.000.001]

        4401:  !(FREE)
        BUSFCN7400:
                P1,      BA←ASPHI(C000001),                        !USE MEMORY ADDR (000001), TRY TO FORCE ODD ADDR
                P3,      DATO,                                     !TRY TO ALTER SERVICE FROM (100340)/DATI TO (002340)/DATO
                         BUTA(INSTR-1),                            !ACTIVE EFFECT ONLY - BRANCH MASKED
                NEXT,    J/GOBUT7400                               !(076000) TARGETS TO (047), MASKED UNDER (767)
(4401)  DCS[0.00.0.0.0.0]  BM[0000..00.00..11.01..000..000...0.0.0..1..0...1.0010...0..0000.0...00.110...111.110.111]

        4767:
        GOBUT7400:
                SETUP,   RETURN/SCOPE740,                          !GO TO SUBR WHICH:
                                                                   !  [CSP(02) LOADED IN LAST TEST; SAME VALUE= (100340)]
                NEXT,    CALL[CJESERVICETOD]                       !  (SERVICE)-XOR-CSP(02) -> D, BUT(D=ZERO)
(4767)  DCS[0.00.0.0.0.0]  BM[0100..00.10..00.00..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.100.111]



        4402:  !(FREE)
        SCOPE740:
                P2-U,    IR←EMIT, EMIT/056000,                     !RELOAD IR FOR TEST740A
                NEXT,    BUT0[SCOPE],                              !NO ERROR:  "TEST761A"  (+1. WORDS)
                         J/TEST761A                                !   ERROR:  "LOADIR740A"  (-16. WORDS)
(4402)  DCS[0.00.0.1.0.0]  BM[0101..00.11..00.00..000..000...0.0.0..0..0...1.1010...0..0000.0...11.000...111.100.101]





        !.PAGE=======================================================================================

        .TOC   *   TEST761-763:  TESTING UNIBUS INTERRUPT SERVICE WITH DL11-W LINE CLOCK

        !*****************************************************************************
```

```
!*
!*      TESTS:  761A - 763D                                   UWORDS: 060 + 045
!*
!*      FUNCTIONS:       TESTS 761A - 763D CAUSE AN INTERRUPT ON THE UNIBUS AT
!*                          LEVEL BR6, USING THE DL11-W LINE CLOCK AS A GENERATOR,
!*                          THEN TEST TO SEE THAT ALL THE APPROPRIATE BELLS AND
!*                          WHISTLES AND PARAPHERNALEAXJAISQQURE ALSO RESPOND.
!*
!*****************************************************************************







! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

!THIS FIRST SET OF THREE TESTS CLEAR OUT ALL THE I-O UCON REGISTERS:
!CLR-JAM-ERRORS, CLR-YELLOW-ZONE, CLEAR-CONSOLE-SERVICE, CLR-NPR-TIMEOUT, CLR-PWR-FAIL, AND
!ALSO THIS TIME DO AN "INIT" ON THE UNIBUS, VIA THE BUS-INIT-UCON FUNCTION.
!ALSO SET ALL THE FLAGS<8:0>H=ZERO, AND THE FULL PS<15:00>H=ZERO,
!(IE, PROCESSOR PRIO=0, T-BIT=0).
!
!THEN CHECK TO SEE THAT ALL THE RELEVANT BUS CONTROL INTERRUPT LOGIC IS RESET.





! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

!TEST 761A CHECKS THAT SERVICE-H=NOT(INTR-HIGH-H*FLAG7(0)H*BG-SERVICE(0)H) IS LOW,
!  WHEN INTR-HIGH-H=HIGH, FLAG7(0)H=HIGH, AND BG-SERVICE(0)H=HIGH
!  IE, AFTER UNIBUS-INIT, AND CLEAR SERVICE CONDITIONS, W/ PSW PRIO=000,
!  THERE SHOULD BE NOTHING PENDING
4745:
TEST761A:
        P0,      LOAD-ENUA(ZTARGET402),                  !BIT<00> CLEAR
                 LOAD-ERROR(TEST761A),                   !ERROR DIRECTORY KEY
                 DCS-CTR(C12.),                          !COMPARE AT TARGET
        P3,      BUTA(CLR-FLAG-RES-UCON),                !SET SR/LOAD, BUSDIN/EMIT
        NEXT,    J/ZERODSR761A                           !
(4745) DCS[1.00.1.0.0.0] BM[0011..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.010...111.111.010]

4772:
ZERODSR761A:
        P2-T,    D+ZERO, SR+ZERO, D[C]+ALU15,            !ZERO FOR FLAGS/PS/JAMUPP FLAG
        NEXT,    J/ZEROIT761A                            !
(4772) DCS[0.00.0.0.0.0] BM[0011..00.00..00.00..000..100...0.1.1..0..0...0.0000...0..0000.0...11.000...100.000.011]

4403:  !(FREE)
ZEROIT761A:
        P0,      BUMP-VERIFY,                            !COUNT
                 BUSDIN+EMIT-[I],                        !KEEP IT ON
```

```
        P3,     FLAG[8-0]←D[15-8]-[I],                  !ZERO THE FLAGS
                PS←D-[I],                               !ZERO ALL OF THE PS
        NEXT,   J/CLEAR761A                             !
  (4403) DCS[0.00.0.[illegible].0.1]  BM[1000..00.00..00.01..010..011...0.0.0..0..0...1.1011...0..0000.0...11.000...100.000.100]

    4404:  !(FREE)
    CLEAR761A:
        SETUP,  RETURN/GOBUT761A,                       !GO TO SUBR WHICH DOES THE CLEARS AND BUS-INIT
        NEXT,   CALL[CLEAR-I-O-A]                       !
  (4404) DCS[0.00.0.0.0.0]  BM[0100..00.10..00.00..101..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.010.111]

    4405:  !(FREE)
    GOBUT761A:
        SETUP,  RETURN/TEST761B,                        !RETURN TO START OF NEXT SUBTEST
        NEXT,   GOTO-PAGE(7),                           !BUT TABLE
                J/BUTSERVICE                            !SERVICE-H IN BIT<00>
  (4405) DCS[0.00.0.0.0.0]  BM[0100..00.11..11.11..001..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.101]





    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    !TEST 761B CHECKS THAT VECTOR-LOAD[1]H=-(UNIBUS-INTR-L) IS LOW
    4771:
    TEST761B:
        P0,     LOAD-ENUA(ZTARGET401),                  !BIT<01> CLEAR
                LOAD-ERROR(TEST761B),                   !ERROR DIRECTORY KEY
                DCS-CTR(C3.),                           !COMPARE AT TARGET
                BUMP-VERIFY,                            !COUNT
        NEXT,   J/GOBUT761B                             !
  (4771) DCS[1.00.1.0.0.1]  BM[1100..00.11..11.00..000..001...0.0.0..0..0...0.0000...0..0000.0...11.000...100.000.110]

    4406:  !(FREE)
    GOBUT761B:
        SETUP,  RETURN/TEST761C,                        !RETURN TO START OF NEXT SUBTEST
        NEXT,   GOTO-PAGE(7),                           !BUT TABLE
                J/BUTVECTLOAD                           !VECTOR-LOAD[1]H IN BIT<01>
  (4406) DCS[0.00.0.0.0.0]  BM[0100..00.11..11.11..100..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.110]





    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    !TEST 761C CHECKS THAT BG-SERVICE(0)H=BR>PS-L IS HIGH WHEN NO DEVICES REQUEST INTR ON UNIBUS
    4774:
    TEST761C:
        P0,     LOAD-ENUA(ZTARGET407),                  !BIT<02> SET  (ACTIVE LOW)
```

```
                LOAD-ERROR(TEST761C),                      !ERROR DIRECTORY KEY
                DCS-CTR(C3.),                              !COMPARE AT TARGET
        NEXT,   J/GOBUT761C                                !
 (4774) DCS[1.00.1.0.0.0] BM[1100..00.11..11.00..000..111...0.0.0..0..0...0.0000...0..0000.0...11.000...100.000.111]

    4407:  !(FREE)
    GOBUT761C:
        SETUP,  RETURN/SCOPE761,                           !RETURN TO SCOPE LOOP TEST WORD
        NEXT,   GOTO-PAGE(7),                              !BUT TABLE
                J/BUTBGSERVL                               !BG-SERVICE[0]H IN BIT<02>
 (4407) DCS[0.00.0.0.0.0] BM[0100..00.10..00.01..000..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.001.110]



    4410:  !(FREE)
    SCOPE761:
        P0,     BUMP-VERIFY,                               !COUNT
        P3,     CSPD[05]←EMIT, EMIT/177546,                !(177546) IS UNIBUS ADDR OF CSR FOR DL11-W
        NEXT,   BUTD[SCOPE],                               !NO ERROR:  "TEST762A" (+1. WORDS)
                J/TEST762A                                 !   ERROR:  "ZERODSR761A"  (-8. WORDS)
 (4410) DCS[0.00.0.1.0.1] BM[1111..10.11..11.01..100..110...0.0.0..0..0...0.1010...1..0000.0...11.000...111.111.011]





    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    !THE FOLLOWING FIVE TESTS NOW CAUSE AN INTERRUPT ON THE UNIBUS, AND THEN
    !CHECK THAT THE BUS CONTROL LOGIC RESPONDS CORRECTLY.
    !FIRST THE LINE CLOCK INTR ENABLE BIT<06> IS SET, AND THE PROCESSOR PRIORITY IS SET TO (6).
    !SINCE THE DL11-W IS A BR6 DEVICE, THE INTERRUPT SHOULD NOT COME THRU UNTIL THE PRIORITY IS
    !LOWERED TO LEVEL (5) OR LOWER.  NOTE THAT THE MICROCODE MUST GO IN TO A WAIT LOOP FOR A
    !MINIMUM OF 16.7 MILLISEC @ 60 HZ, OR 20 MILLISEC @ 50 HZ TO GUARANTEE THAT AN INTERRUPT WILL
    !BE PENDING.  THE DELAY, BASED UPON  UP3-UP3 = 170 NS, WILL BE 22.3 MILLISEC; AN ADEQUATE MARGIN.





    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    !TEST 762A ENABLES THE INTERRUPT, THEN WAITS FOR THE DELAY PERIOD.
    4773:
    TEST762A:
        P0,     LOAD-ENUA(ZAPD762A),                       !COMPARE JUST AFTER BUS CYCLE INVOKED
                LOAD-ERROR(TEST762A),                      !ERROR DIRECTORY KEY
                DCS-CTR(C5.),                              !COMPARE JUST AFTER "DATO" INITIATED, BELOW
        NEXT,   J/DW11L762A                                !
 (4773) DCS[1.00.1.0.0.0] BM[1010..00.10..00.11..001..101...0.0.0..0..0...0.0000...0..0000.0...11.000...100.001.001]

    4411:  !(FREE)
    DW11L762A:
```

```
            P2-T,   SR+CSPD(D05),                          !GET SR=(177546), ADDR OF DL11-W CSR
            NEXT,   GOTO-PAGE(7),                          !XFER
                    J/MASK762A                             !
    (4411)  DCS[0.00.0.0.0.0]  BM[1010..10.00..00.00..000..111...0.0.1..0..0...0.1010...0..0000.0...11.100...010.000.010]

    7202:  !(FREE)
    MASK762A:
            P3,     CSPD[04]+EMIT, EMIT/177777,             !READ ALL BITS IN REGISTERS READ
            NEXT,   J/PRIO6762A                            !
    (7202)  DCS[0.00.0.0.0.0]  BM[1111..10.11..11.11..111..111...0.0.0..0..0...0.1011...1..0000.0...11.000...010.000.111]

    7207:  !(FREE)
    PRIO6762A:
            P3,     CSPD[15]+EMIT,                         !EMITCON FOR:  PS<7:5>="110"=(6), T-BIT=0
                    EMIT/000300,                           !  AND BIT<06> SET FOR DL11-W INTR ENABLE
            NEXT,   J/GETIT762A                            !
    (7207)  DCS[0.00.0.0.0.0]  BM[0000..10.00..00.11..000..000...0.0.0..0..0...0.0010...1..0000.0...11.000...010.001.000]

    7210:  !(FREE)
    GETIT762A:
            P1,     BA+SR,                                 !BA <- (177546), BITS<17:16> FORCED TO "11" ON IO-PAGE ADDRESS
            P2-T,   D+CSPB(B15),                           !(000300) INTO D  ** NOTE:  BIT<1:0> = 00 FOR BA LOAD **
            P3,     DATO,                                  !WRITE IT OUT
            NEXT,   GOTO-PAGE(4),                          !XFER FOR DCS XTN BITS
                    J/ZAPD762A                             !
    (7210)  DCS[0.00.0.0.0.0]  BM[1010..11.10..00.00..000..100...0.1.0..1..0...1.0010...0..0000.0...11.100...011.001.101]

    4315:  !(FREE)
    ZAPD762A:
            P3-T,   D+ZERO, D[C]+ALU15,                    !ZERO D, D[C] FOR LOOP; MUST DO AFTER P3-T
            NEXT,   J/NEXTD762A                            !ENTER AT 2ND WORD OF LOOP; LET D SETTLE
    (4315)  DCS[0.00.0.0.0.0]  BM[0011..00.00..00.00..000..100...1.1.0..0..0...0.0000...0..0000.0...11.000...100.110.111]

    !***    THE FOLLOWING TWO WORDS NOW GO INTO A COUNT LOOP TO WAIT FOR THE LINE CLOCK TO INTERRUPT
    !***    THE WAIT WILL BE A MAXIMUM DELAY, DEPENDING UPON THE PROCESSOR UP3-UP3 CYCLE TIME:
    !***
    !***            PROCESSOR         TIME DELAY
    !***            CYCLE TIME        (MILLISEC)
    !***            (NANOSEC)
    !***            ----------        ----------
    !***               150               19.7
    !***               160               21.0
    !***             * 170 *           * 22.3 *        <NOMINAL VALUE>
    !***               180               23.6
    !***               190               24.9
    !***
    !***    NOTE THAT THE ABOVE LOOP TIME IS A MAXIMUM VALUE; WE WILL EXIT EARLY IF THE INTERRUPT COMES
    !***    THROUGH BEFORE WE OVERFLOW THE COUNTER.  IF NO INTERRUPT COMES THROUGH BY THE TIME THE COUNT
    !***    HAS OVERFLOWN, IT WILL BE CONSIDERED AN ERROR.
    !***

    !* ENTER HERE FOR ANOTHER LOOP *
```

```
        4551:
        BUMPD762A:
                P3-T,   D←D-PLUS-1, D[C]←COUT15,              !BUMP D, SAVE CARRYOUT
                NEXT,   BUTR(BG-SERVCE-L),                    !NEGATED:  "NEXTD762A"
                        J/SETPR6-762A                         !ASSERTED: "SETPR6-762A"
  (4551)  DCS[0.00.0.0.0.0]  BM[1001..01.11..01.01..000..110...1.1.0..0..0...0.0000...0..0000.0...01.100...100.110.011]

        4467:
        NEXTD762A:
                P0,     DCS-CTR(C15.),                        !STALL; NOTE: NO BUMP-VERIFIES IN THIS LOOP
                NEXT,   BUTR(D[C]-B),                         !SET:    "TEST762A1"  D OVERFLOWN, ERROR
                        J/BUMPD762A                           !CLEAR:  "BUMPD762A"  GO FOR NEXT LOOP
  (4467)  DCS[0.00.1.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...10.011...101.101.001]


        !* COME HERE IF D OVERFLOWN *
        4553:
        TEST762A1:
                P0,     LOAD-ERROR(TEST762A1),                !ERROR DIRECTORY KEY
                        DCS-CTR(C0.),                         !SIGNAL ERROR NOW
                NEXT,   J/TEST762A                            !FORCE A SCOPE LOOP
  (4553)  DCS[1.00.1.0.0.0]  BM[1111..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...111.111.011]


        !*** COME HERE IF EXIT LOOP OK:  D NOT OVERFLOWED, INTERRUPT PENDING ***
        4463:
        SETPR6-762A:
                P2-T,   D←CSPD(D15), D[C]←0,                  !GET D<7:5>=(6), D<4>=(0)
                NEXT,   J/SETPRI762A                          !
  (4463)  DCS[0.00.0.0.0.0]  BM[1010..10.00..00.00..000..000...0.1.0..0..0...0.0010...0..0000.0...11.000...100.001.011]

        4413:  !(FREE)
        SETPRI762A:
                P0,     BUSDIN←EMIT-[I],                      !KEEP IT ON
                P2,     PS[3-0]←D[3-0]-[I],                   !FOR USE IN TEST763A, PS[CC]="0000" HERE
                P3,     PS[7-4]←D[7-4]-[I],                   !PRIO=6, T-BIT=0
                NEXT,   J/TEST762B                            !NOTE:  THE BR6 PENDING INTR SHOULD NOW HIDE UNDER PROCESSOR PRIO(6)
  (4413)  DCS[0.00.0.0.0.0]  BM[1000..00.00..00.01..010..000...0.0.0..0..0...1.1011...0..0000.0...11.000...111.101.001]


        ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

        !TEST 762B CHECKS THAT BG-SERVICE(0)H=BR>PS-L IS HIGH WHEN THE PROCESSOR PRIORITY(=6) IS AS HIGH
        !AS THE ONLY DEVICE WISHING TO REQUEST AN INTERRUPT (AT BR6).
        4751:
        TEST762B:
                P0,     LOAD-ENUA(ZTARGET407),                !BIT<02> SET  (ACTIVE LOW)
                        LOAD-ERROR(TEST762B),                 !ERROR DIRECTORY KEY
                        DCS-CTR(C3.),                         !COMPARE AT TARGET
                        BUMP-VERIFY,                          !
                NEXT,   J/GOBUT762B                           !
  (4751)  DCS[1.00.1.0.0.1]  BM[1100..00.11..11.00..000..111...0.0.0..0..0...0.0000...0..0000.0...11.000...111.110.010]

        4762:
```

```
	GOBUT762B:
		SETUP,	RETURN/TEST762C,				!RETURN TO START OF NEXT SUBTEST
		NEXT,	GOTO-PAGE(7),					!BUT TABLE
			J/BUTBGSERVL					!BG-SERVICE[0]H IN BIT<02>
  (4762)  DCS[0.00.0.0.0.0]  BM[0100..00.11..11.00..000..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.001.110]





	! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

	!TEST 762C CHECKS THAT BG-SERVICE[0]H=BR>PS-L IS LOW WHEN A BR6 DEVICE (DL11-W) IS REQUESTING AN INTR,
	!AND THE PROCESSOR PRIORITY(=5) IS < THE BR LEVEL(=6).  NO OTHER DEVICES PRESENT.
	4740:
	TEST762C:
		P0,	LOAD-ENUA(ZTARGET403),				!BIT<02> CLEAR  (ACTIVE LOW)
			LOAD-ERROR(TEST762C),				!ERROR DIRECTORY KEY
			DCS-CTR(C7.),					!COMPARE AT TARGET
		NEXT,	J/FILL762C					!
  (4740)  DCS[1.00.1.0.0.0]  BM[1000..00.11..11.00..000..011...0.0.0..0..0...0.0000...0..0000.0...11.000...100.001.100]

	4414:  !(FREE)
	FILL762C:
		P2-T,	D+ASPHI(C125252), D[C]+ALU00,			!BIT<7:5>="101"=(5), BIT<4>=0
		NEXT,	J/DELAY762C					!
  (4414)  DCS[0.00.0.0.0.0]  BM[1111..00.00..11.01..110..010...0.1.0..0..0...0.0000...0..0000.0...11.000...100.001.101]

	4415:  !(FREE)
	DELAY762C:
		SETUP,	RETURN/SETPRI762C,				!EXEC 3. UWORDS AFTER SETTING PRIO, FOR DELAY
		P2,	PS[3-0]+D[3-0],					!FOR USE IN TEST763A, PS[CC]="1010"
		P3,	PS[7-4]+D[7-4],					!SET PRIO=(5), AT P3-T OF THIS UWORD
		NEXT,	GOTO-PAGE(7),					!GO DO A JUMP, AND A BUTA(RETURN)
			J/BUTD-IS-ZERO					!DON'T REALLY CARE ABOUT THE RESULT OF THIS
  (4415)  DCS[0.00.0.0.0.0]  BM[0111..00.01..00.00..110..111...0.0.0..0..0...1.1010...0..0000.0...11.100...011.100.001]

	7206:  !(FREE)
	SETPRI762C:
									!BG-SERVICE(0)H SHOULD BE ASSERTED BY NOW
		SETUP,	RETURN/TEST762D,				!RETURN TO START OF NEXT SUBTEST
		NEXT,	GOTO-PAGE(7),					!BUT TABLE
			J/BUTBGSERVL					!BG-SERVICE[0]H IN BIT<02>
  (7206)  DCS[0.00.0.0.0.0]  BM[0100..00.11..11.00..001..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.001.110]





	! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

	!TEST 762D CHECKS THAT BG-SERVICE[1]H+FLTPT-SERVICE-H IS HIGH, WHEN BG-SERVICE[1]H IS SET
```

```
        4741:
        TEST762D:
                PO,     LOAD-ENUA(ZTARGET417),                  !BIT<03> SET
                        LOAD-ERROR(TEST762D),                   !ERROR DIRECTORY KEY
                        DCS-CTR(C3.),                           !COMPARE AT TARGET
                NEXT,   J/GOBUT762D                             !
   (4741)  DCS[1.00.1.0.0.0]  BM[1100..00.11..11.00..001..111...0.0.0..0..0...0.0000...0..0000.0...11.000...100.001.110]

        4416:  !(FREE)
        GOBUT762D:
                SETUP,  RETURN/TEST762E,                        !RETURN TO START OF NEXT SUBTEST
                NEXT,   GOTO-PAGE(7),                           !BUT TABLE
                        J/BUTBGFPSERV                           !BG-SERVICE[1]H+FLTPT-SERVICE-H IN BIT<03>
   (4416)  DCS[0.00.0.0.0.0]  BM[0100..00.11..10.11..000..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.000.111]





        ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

        !TEST 762E NOW READS THE "SERVICE" PORT OF THE STATUS MUX TO SEE:
        !SERVICE<15:00>H = "0 100 011 111 100 000"
        !
        !       IMPORTANT BITS ARE:
        !       B15 = DATI(1)H = 0              B14 = BG-SERVICE(1)H = 1        B11 = DATOB(1)H = 0
        !       B10 = DATO(1)H = 1              B09 = PBA<17>H = 1              B08 = PBA<16>H = 1
        !
        4730:
        TEST762E:
                PO,     LOAD-ENUA(ZTARGET402),                  !SETUP FOR D=ZERO TEST
                        LOAD-ERROR(TEST762E),                   !ERROR DIRECTORY KEY
                        DCS-CTR(C10.),                          !COMPARE AT TARGET
                NEXT,   J/EXPEC762E                             !
   (4730)  DCS[1.00.1.0.0.0]  BM[0101..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...100.001.111]

        4417:  !(FREE)
        EXPEC762E:
                P3,     CSPD[02]←EMIT,                          !EXPECTED VALUE OUT OF SERVICE PORT:
                        EMIT/043740,                            !"0100 0111 1110 0000"
                NEXT,   J/GOGET762E                             !
   (4417)  DCS[0.00.0.0.0.0]  BM[0100..10.01..11.11..100..000...0.0.0..0..0...0.1101...1..0000.0...11.000...100.010.000]

        4420:  !(FREE)
        GOGET762E:
                PO,     BUMP-VERIFY,                            !
                SETUP,  RETURN/TEST762F,                        !GO TO SUBR WHICH:
                NEXT,   CALL[SERVICETOD]                        !CSP(02).XOR.SERVICE -> D, BUT(D=ZERO)
   (4420)  DCS[0.00.0.0.0.1]  BM[0100..00.11..10.01..001..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.101.000]
```

```
!  - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

!TEST 762F CHECKS THAT SERVICE-H=NOT(INTR-HIGH-H*FLAG7(0)H*BG-SERVICE(0)H) IS HIGH,
!  WHEN INTR-HIGH-H=HIGH, FLAG7(0)H=HIGH, AND BG-SERVICE(0)H=LOW
4711:
TEST762F:
        P0,     LOAD-ENUA(ZTARGET403),                  !BIT<00> SET
                LOAD-ERROR(TEST762F),                   !ERROR DIRECTORY KEY
                DCS-CTR(C3.),                           !COMPARE AT TARGET
        NEXT,   J/GOBUT762F                             !
(4711)  DCS[1.00.1.0.0.0]  BM[1100..00.11..11.00..000..011...0.0.0..0..0...0.0000...0..0000.0...11.000...100.010.001]

4421:  !(FREE)
GOBUT762F:
        SETUP,  RETURN/TEST763A,                        !RETURN TO START OF NEXT SUBTEST
        NEXT,   GOTO-PAGE(7),                           !BUT TABLE
                J/BUTSERVICE                            !SERVICE-H IN BIT<00>
(4421)  DCS[0.00.0.0.0.0]  BM[0100..00.11..11.10..001..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.101]





!  - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

!THIS NEXT SEQUENCE OF TWO TESTS RESPONDS TO THE BUS INTERRUPT REQUEST BY:
!(1) ASSERTING "ALLOW-BG[1]H", THUS ALLOWING THE BUS GRANT TO THE DL11-W, SO THAT
!(2) "VECTOR-LOAD[1]H" WILL BE ASSERTED, INDICATING THAT THE DEVICE HAS PUT ITS
!       VECTOR ON UNIBUS DATA<8:0>L, AND THEN
!(3) ACTUALLY READING THE VECTOR FOR THE DL11-W (100)(8), AND VALIDATING ITS CORRECTNESS.



!  - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

!TEST 763A CHECKS THAT AFTER "ALLOW-BG[1]H" IS GIVEN TO THE INTERRUPTING DEVICE,
!THEN "VECTOR-LOAD[1]H" IS ASSERTED
4761:
TEST763A:
        P0,     LOAD-ENUA(VECTLOAD763A),                !COMPARE AT "VECTOR-LOAD[1]H" IN BIT<01> SET
                LOAD-ERROR(TEST763A),                   !ERROR DIRECTORY KEY
                DCS-CTR(C5.),                           !COMPARE AT TARGET
        NEXT,   J/EXPEC763A                             !
(4761)  DCS[1.00.1.0.0.0]  BM[1010..00.10..01.11..011..011...0.0.0..0..0...0.0000...0..0000.0...11.000...100.010.010]

4422:  !(FREE)
EXPEC763A:
        P0,     BUMP-VERIFY,                            !COUNT
        P3,     CSPD[01]←EMIT, EMIT/100,                !DL11-W VECTOR IS (100)8
        NEXT,   J/ALLOW763A                             !
(4422)  DCS[0.00.0.0.0.1]  BM[0000..10.00..00.01..000..000...0.0.0..0..0...0.1110...1..0000.0...11.000...111.011.001]

4731:                                                   !*** *** *01
```

```
    ALLOW763A:
            P0,     BUSDIN+PS-[I],                          !NOISE BITS ON BUSDIN TO IMPEDE READING VECTOR
                                                            !AT THIS POINT PS=(000252)
            P2,     ALLOW-BG[1]H-[I],                       !GIVE BUS GRANT TO PENDING INTERRUPT
            NEXT,   J/READVECT763A                          !
  (4731) DCS[0.00.0.0.0.0.0]  BM[0100..00.01..10.01..000..000...0.0.0..0..0...1.1011...0..0000.0...11.000...100.010.011]

    4423:   !(FREE)
    READVECT763A:
            P3,     CSPD[07]+BUSDIN,                        !MUST READ BUSDIN=VECTOR RITE HERE, OR
                                                            !WE WILL LOSE IT
                    EMIT/052525,                            !NOISE ON EMIT
            NEXT,   J/TESTVECT763A                          !
  (4423) DCS[0.00.0.0.0.0.0]  BM[0101..10.01..01.01..010..101...0.0.0..0..0...0.1000...1..0000.0...11.000...100.010.100]

    4424:   !(FREE)
    TESTVECT763A:
            P2-T,   SR+CSPD(D01),                           !SR=(000100), EXPECTED VECTOR
            NEXT,   BUTR(VECTOR-LOAD),                      !IF SET, "VECTLOAD763A", THIS IS EXPECTED
                    J/ALLOW763A                             !IF CLR, "ALLOW763A", VECTOR-LOAD[1]H NOT SET, ERROR
  (4424) DCS[0.00.0.0.0.0.0]  BM[1010..10.00..00.00..000..000...0.0.1..0..0...0.1110...0..0000.0...10.001...111.011.001]




    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    !IF VECTOR-LOAD[1]H="1", COME TO HERE.
    !
    !TEST 763B NOW CHECKS THAT THE CORRECT VECTOR FOR THE DL11-W = 100(8) WAS READ
    4733:                                                   !*** ***
    VECTLOAD763A:
            P2-T,   D+SR-XOR-CSPD(D07),                     !COMPARE EXPECTED VECTOR:RECEIVED VECTOR
            NEXT,   J/TEST763B                              !
  (4733) DCS[0.00.0.0.0.0.0]  BM[0110..10.00..00.00..000..000...0.1.0..0..0...0.1000...0..0000.0...11.000...111.010.000]

    4720:
    TEST763B:
            P0,     LOAD-ENUA(ZTARGET402),                  !SETUP FOR D=ZERO TEST
                    LOAD-ERROR(TEST763B),                   !ERROR DIRECTORY KEY
                    DCS-CTR(C3.),                           !COMPARE AT TARGET
            NEXT,   J/GOBUT763B                             !
  (4720) DCS[1.00.1.0.0.0.0]  BM[1100..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...100.010.101]

    4425:   !(FREE)
    GOBUT763B:
            SETUP,  RETURN/TEST763C,                        !RETURN TO START OF NEXT SUBTEST
            NEXT,   GOTO-PAGE(7),                           !BUT TABLE
                    J/BUTD-IS-ZERO                          !CHECK EQUALITY
  (4425) DCS[0.00.0.0.0.0.0]  BM[0100..00.11..10.10..001..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.001]
```

E14


```


    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    !TEST 763C CHECKS THAT VECTOR-LOAD[1]H=-(UNIBUS-INTR-L) IS AGAIN LOW
    4721:
    TEST763C:
            P0,      LOAD-ENVA(ZTARGET401),                   !BIT<01> CLEAR
                     LOAD-ERROR(TEST763C),                    !ERROR DIRECTORY KEY
                     DCS-CTR(C3.),                            !COMPARE AT TARGET
                     BUMP-VERIFY,                             !COUNT
            NEXT,    J/GOBUT763C                              !
(4721)  DCS[1.00.1.0.0.1]  BM[1100..00.11..11.00..000..001...0.0.0..0..0...0.0000...0..0000.0...11.000...100.010.110]

    4426:  !(FREE)
    GOBUT763C:
            SETUP,   RETURN/TEST763D,                         !RETURN TO START OF NEXT SUBTEST
            NEXT,    GOTO-PAGE(7),                            !BUT TABLE
                     J/BUTVECTLOAD                            !VECTOR-LOAD[1]H IN BIT<01>
(4426)  DCS[0.00.0.0.0.0]  BM[0100..00.11..10.01..000..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.110]




    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    !TEST 763D CHECKS THAT BG-SERVICE(0)H=BR>PS-L IS HIGH WHEN UNIBUS INTR REQUEST HAS BEEN SATISFIED
    4710:
    TEST763D:
            P0,      LOAD-ENVA(ZTARGET407),                   !BIT<02> SET  (ACTIVE LOW)
                     LOAD-ERROR(TEST763D),                    !ERROR DIRECTORY KEY
                     DCS-CTR(C3.),                            !COMPARE AT TARGET
            NEXT,    J/GOBUT763D                              !
(4710)  DCS[1.00.1.0.0.0]  BM[1100..00.11..11.00..000..111...0.0.0..0..0...0.0000...0..0000.0...11.000...100.010.111]

    4427:  !(FREE)
    GOBUT763D:
            SETUP,   RETURN/SCOPE763,                         !RETURN TO SCOPE LOOP TEST WORD
            NEXT,    GOTO-PAGE(7),                            !BUT TABLE
                     J/BUTBGSERVL                             !BG-SERVICE[0]H IN BIT<02>
(4427)  DCS[0.00.0.0.0.0]  BM[0100..00.10..00.11..000..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.001.110]



    4430:  !(FREE)
    SCOPE763:
            P0,      BUSDIN←EMIT-[I],                         !RESET PROC UCON FOR EMIT
            P2,      PS←D-[I],                                !ZAP THE PS TO ZERO
            NEXT,    BUTD[SCOPE],                             !NO ERROR:  "KILL764A"  (+1. WORDS)
                     J/KILL764A                               !   ERROR:  "EXPEC763A"  (-11. WORDS)
(4430)  DCS[0.00.0.1.0.0]  BM[1000..00.00..00.01..010..010...0.0.0..0..0...1.1011...0..0000.0...11.000...111.110.011]

```

```

        !----------------------------------------------------------------


        !*** ALL DONE WITH LINE CLOCK, DISABLE IT FROM FURTHER INTERRUPTS BEFORE LEAVING FOR EOP ***

        4763:
        KILL764A:
                P2-T,   D←ZERO, D[C]←ALUDO,                     !NOW MUST GO KILL THE LINE CLOCK
                P3,     DATO,                                   !BA=(177546), DL11-W CSR
                        BUTA(CLR-FLAG-RES-UCON),                !ZAP UCON, RES-CONTROL FOR EOP ROUTINE (MUST BE DONE)
                NEXT,   J/EOP001                                !
     (4763) DCS[0.00.0.0.0.0] BM[0011..00.00..00.00..000..010...0.1.0..0..0...1.0010...0..0000.0...11.010...100.011.001]







        !.PAGE=========================================================================================


        .TOC   *   END OF PASS CODE

        !****************************************************************************
        !
        !       FINAL ENTRY HERE TO TEST FOR MULTIPLE PASSES, VERIFY MODE, ET AL
        !
        !
        !       *** INDICATIONS ON CONSOLE DISPLAY ***
        !
        !               0.0.0.0.0.0.    DCS IS RUNNING; REQUIRES APPROX 8. SECONDS/64. PASSES
        !                               "RUN"     "PROC"     "USER"     "CONSOLE"     "BATTERY"
        !                               (ON)      (BLINK)    (BLINK)    (OFF)          (OFF)
        !
        !               0 0 0 0 0 0     ERROR DETECTED / PASS=1 / SCOPE LOOPING
        !       OR      2 1 2 1 2 1
        !
        !               0.0.0.0.0.0.    ERROR DETECTED / 1<PASS<64. / SCOPE LOOPING
        !       OR      2.1.2.1.2.1.
        !
        !               1.2.3.3.2.1.    SUCCESSFUL 64. PASSES COMPLETED
        !
        !
        !       AT END OF PASS, THE GENERAL REGISTERS (BASE MACHINE R0-R7)
        !         CONTAIN THE FOLLOWING INFORMATION:
        !
        !               R0  =  (NU)
        !               R1  =  (NU)
        !               R2  =  (NU)
        !               R3  =  (NU)
        !               R4  =  (NU)
        !               R5  =  REVISION NUMBER OF DCS MICROCODE, WITH
```

```
!                   BIT15 SET TO INDICATE END OF PASS
!           R6  =  (NU)
!           R7  =  (123321), END OF PASS INDICATION CONSTANT
!
!*****************************************************************************************


    4431:  !(FREE)
    EOP001:
           P0,      DCS-CTR(C15.),                         !HOLD UP ERROR COMPARE
           NEXT,    GOTO-PAGE(6),                          !XFER
                    J/EOP002                               !
(4431)  DCS[0.00.1.0.0.0]  BM[0000..00.00..00.00..000..110...0.0.0..0..0...0.0000...0..0000.0...11.100...100.101.010]


    6452:  !(FREE)
    EOP002:
           P3,      CSPD[01]←EMIT, EMIT/123321,            !SETUP SUCCESSFUL END OF PASS CONSTANT
           NEXT,    J/EOP003                               !
(6452)  DCS[0.00.0.0.0.0]  BM[1010..10.01..10.11..010..001...0.0.0..0..0...0.1110...1..0000.0...11.000...101.001.000]


    6510:  !(FREE)
    EOP003:
           P2-T,    D←CSPD(D01), D[C]←0,                   !GET EOP CONSTANT INTO
           P3,      PC←D,                                  !  GPR PC, ON BOTH SP SIDES
           NEXT,    J/EOP004                               !  FOR DISPLAY FROM "CONSOLE HALT" ROUTINE
(6510)  DCS[0.00.0.0.0.0]  BM[1010..10.00..10.01..111..000...0.1.0..0..0...0.1110...0..0011.0...11.000...101.001.001]


    6511:  !(FREE)
    EOP004:
           SETUP,   RETURN/EOP005,                         !GO TO DISPLAY-D-IN-LIGHTS ROUTINE
           NEXT,    CALL[DISPLAY]                          !  WHICH SHOULD PUT (212121) INTO DISPLAY
(6511)  DCS[0.00.0.0.0.0]  BM[0111..00.01..00.01..001..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.010.001]
                                                           !  FOR INTERMEDIATE EOP INDICATION

    7211:  !(FREE)
    EOP005:
           P0,      SIGNAL-EOP,                            !TRY TO SIGNAL EOP
           P2-T,    SR←ALL-ONES,                           !SET SR TO ALL ONES, FOR FULL BASE MACHINE INIT
           NEXT,    GOTO-PAGE(6),                          !XFER TO 6
                    BUTD[VERIFY-MODE],                     !IF TRUE,   "VFY001"  (NEXT PAGE FOLLOWING)
                    J/EOP006                               !IF FALSE,  "EOP006"  (NEXT MICROWORD)
(7211)  DCS[0.00.0.0.1.0]  BM[1111..00.00..11.01..101..110...0.0.1..0..0...0.0000...0..0000.0...11.100...111.111.110]


    6776:
    EOP006:
           P0,      DCS-CTR(C11.),                         !HOLD UP ERROR COMPARE
           P3-U,    SET-CONSOLE-DP-LEDS,                   !UCON SET DP LEDS, INDICATING >=1 SUCCESSFUL PASSES
```

```
        NEXT,   BUTD[EOP-OVERFLOW],                     !IF TRUE,   "EOP007" FOLLOWING, DONE 64. PASSES
                J/EOP007                                !IF FALSE,  "TEST001", GO FOR NEXT PASS AT (4000)
 (6776) DCS[0.00.1.0.0.0]  BM[0100..00.00..00.00..110..001...0.0.0..0..0...1.1011...0..0000.0...11.000...101.001.010]
                                                        !BEGIN COUNTDOWN
                                                        !  3 ... 2 ... 1 .



    6512:  !(FREE)
    EOP007:
        SETUP,  RETURN/EOP010,                          !GO TO SUBR THAT PUTS REV-NUMBER, WITH
        NEXT,   GOTO-PAGE(7),                           !  B<15>=(1), INTO B.M. GPR "RS"
                J/INSERTEOPREVNO                        !
 (6512) DCS[0.00.0.0.0.0]  BM[0111..00.01..00.01..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.001.100]


    7212:  !(FREE)
    EOP010:
        SETUP,  RETURN/CON99,                           !RETURN TO "FORCE CONSOLE-MODE HALT" ROUTINE IN BASE MACHINE
        NEXT,   GOTO-PAGE(3),                           !GOTO "INIT---" ROUTINE FOR FULL BASE MACHINE
                J/INIT01                                !  MICROCODE INITIALIZATION, BUTA(RETURN) AT END TO "CON99"
 (7212) DCS[0.00.0.0.0.0]  BM[0001..00.00..01.00..000..011...0.0.0..0..0...0.0000...0..0000.0...11.100...100.001.010]





    !.PAGE==========================================================================================================


    .TOC    *   VERIFY MODE CODE

    !
    !       VERIFY MODE ENTERS HERE:
    !

    6774:
    VFY001:
        P0,     DCS-CTR(C4.),                           !LOAD COUNTER FOR COMPARE IN 4. MICROWORDS
        NEXT,   GOTO-PAGE(4),                           !ZFER
                J/VFY002                                !
 (6774) DCS[0.00.1.0.0.0]  BM[1011..00.00..00.00..000..100...0.0.0..0..0...0.0000...0..0000.0...11.100...100.001.010]


    4412:  !(FREE)
    VFY002:
        P3,     CLEAR-CONSOLE-LED,                      !MAKE "CONSOLE" LED BLINK, JUST FOR FUN
        NEXT,   J/VFY003                                !
 (4412) DCS[0.00.0.0.0.0]  BM[0100..00.00..00.00..010..001...0.0.0..0..0...1.1011...0..0000.0...11.000...010.101.101]

    4255:
```

```
        VFY003:
                PO,     LOAD-ENUA(ZTARGET523),                  !ERROR CODE = [4255], ENUA = [7523]
                        LOAD-ERROR(VFY003),                     !ERROR DIRECTORY KEY
                        BUMP-VERIFY,                            !GIVE A VERIFY PULSE
                NEXT,   J/VFY004                                !
    (4255)  DCS[1.00.0.0.0.1]  BM[0000..00.11..11.01..010..011...0.0.0..0..0...0.0000...0..0000.0...11.000...100.011.011]


        4433:   !(FREE)
        VFY004:
                SETUP,  RETURN/VFY005,                          !RETURN TO INLINE
                NEXT,   GOTO-PAGE(7),                           !BUT'S ARE ON PAGE 7
                        J/ZTARGET522                            !TNUA = [7522], NOT EQUAL TO ENUA
    (4433)  DCS[0.00.0.0.0.0]  BM[0111..00.01..11.11..101..111...0.0.0..0..0...0.0000...0..0000.0...11.100...101.010.010]


        !       NEXT MICROWORD COMES FROM ZTARGET522, AT WHICH THE ENABLED COMPARE
        !       TAKES PLACE.  ENUA WAS SETUP NOT EQUAL TO TNUA, SO ERROR SHOULD BE SIGNALED



        7375:
        VFY005:
                PO,     SET-CONSOLE-LED,                        !THE OTHER HALF OF MAKING IT BLINK
                NEXT,   BUTD[SCOPE],                            !NO ERROR:  "VFY005"  [SELF LOOP, SHOULDN'T HAPPEN]
                        J/VFY005                                !   ERROR:  "VFY006"  [SHOULD HAPPEN]
    (7375)  DCS[0.00.0.1.0.0]  BM[0100..00.00..00.00..100..001...0.0.0..0..0...1.1011...0..0000.0...11.000...011.111.101]


        7374:
        VFY006:
                PO,     SIGNAL-EOP,                             !GIVE AN EOP PULSE, AFTER ERROR SIGNALED
                NEXT,   GOTO-PAGE(6),                           !LOOP BACK
                        J/VFY001                                !  ON CONTINUOUS VERIFY
    (7374)  DCS[0.00.0.0.1.0]  BM[0000..00.00..00.00..000..110...0.0.0..0..0...0.0000...0..0000.0...11.100...111.111.100]





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        .TOC    *       DCS MICROCODE REVISION NUMBER

        !       THE FOLLOWING ROUTINE WILL PUT THE CURRENT DCS MICROCODE REVISION NUMBER
        !       INTO B.M. GPR "RS", FROM THE EMIT FIELD OF THE MICROWORD.
        !
        !       THE ENTRY "INSERTREVNO" IS USED, EXCEPT AT END OF PASS; IE B<15>=(0)
        !       THE ENTRY "INSERTEOPREVNO" IS USED ONLY AT END OF PASS; IE, B<15>=(1)
```

```
        7214:  !(FREE)
        INSERTEOPREVNO:
                P0,     BUSDIN←EMIT-[I],                        !SELECT EMIT
                NEXT,   J/INSERT02                              !
  (7214)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.01..000..000...0.0.0..0..0...1.1001...0..0000.0...11.000...010.001.101]

        7215:  !(FREE)
        INSERT02:
                P3,     CSPD[17]←EMIT, EMIT/REV-NUMBER-AND-B15, !DCS REVISION NUMBER, B15 SET
                NEXT,   J/INSERT04                              !
  (7215)  DCS[0.00.0.0.0.0]  BM[1000..10.00..00.01..000..001...0.0.0..0..0...0.0000...1..0000.0...11.000...010.010.000]


        7216:  !(FREE)
        INSERTREVNO:
                P0,     BUSDIN←EMIT-[I],                        !SELECT EMIT
                NEXT,   J/INSERT03                              !
  (7216)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.01..000..000...0.0.0..0..0...1.1001...0..0000.0...11.000...010.001.111]

        7217:  !(FREE)
        INSERT03:
                P3,     CSPD[17]←EMIT, EMIT/REV-NUMBER,         !DCS REVISION NUMBER, B15 CLEAR
                NEXT,   J/INSERT04                              !
  (7217)  DCS[0.00.0.0.0.0]  BM[0000..10.00..00.01..000..001...0.0.0..0..0...0.0000...1..0000.0...11.000...010.010.000]


        7220:  !(FREE)
        INSERT04:
                P2-T,   D←CSPD(D17), D[C]←0,                    !GET IT
                P3,     R5←D,                                   !  AND STUFF IT
                NEXT,   J/RESETUCONP                            !    AND RETURN
  (7220)  DCS[0.00.0.0.0.0]  BM[1010..10.00..10.01..110..000...0.1.0..0..0...0.0000...0..0011.0...11.000...010.111.001]



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        .TOC    *    COMMON SUBROUTINES

        .TOC    *      CONSOLE DISPLAY SUBROUTINE

        !
        !       DISPLAYS NUMBER REPRESENTED BY D<05:00>*D<05:00>*D<05:00>
        !       AS SIX OCTAL DIGITS IN CONSOLE 7 SEGMENT DISPLAY
        !

        7221:  !(FREE)
        DISPLAY:
                P3-U,   CLEAR-CONSOLE-COUNTER,                  !POINT TO DIGITS ....XX
                NEXT,   J/DISP002                               !
  (7221)  DCS[0.00.0.0.0.0]  BM[0100..00.00..00.00..010..000...0.0.0..0..0...1.1011...0..0000.0...11.000...010.010.010]
```

```
7222:  !(FREE)
DISP002:
        P3-U,   STROBE-CONSOLE-DISPLAY,                          !WRITE OUT DIGITS ....XX
        NEXT,   J/DISP003                                        !
(7222)  DCS[0.00.0.0.0.0]  BM[0100..00.00..00.00..000..001...0.0.0..0..0...1.1011...0..0000.0...11.000...010.010.011]


7223:  !(FREE)
DISP003:
        P3-U,   INCREMENT-CONSOLE-COUNTER,                       !POINT TO DIGITS ..XX..
        NEXT,   J/DISP004                                        !
(7223)  DCS[0.00.0.0.0.0]  BM[0100..00.00..00.00..100..000...0.0.0..0..0...1.1011...0..0000.0...11.000...010.010.100]


7224:  !(FREE)
DISP004:
        P3-U,   STROBE-CONSOLE-DISPLAY,                          !WRITE OUT DIGITS ..XX..
        NEXT,   J/DISP005                                        !
(7224)  DCS[0.00.0.0.0.0]  BM[0100..00.00..00.00..000..001...0.0.0..0..0...1.1011...0..0000.0...11.000...010.010.101]


7225:  !(FREE)
DISP005:
        P3-U,   INCREMENT-CONSOLE-COUNTER,                       !POINT TO DIGITS XX....
        NEXT,   J/DISP006                                        !
(7225)  DCS[0.00.0.0.0.0]  BM[0100..00.00..00.00..100..000...0.0.0..0..0...1.1011...0..0000.0...11.000...010.010.110]


7226:  !(FREE)
DISP006:
        P3-U,   STROBE-CONSOLE-DISPLAY,                          !WRITE OUT DIGITS XX....
        NEXT,   J/RESETUCONP                                     !GO RESET PROC UCON/EMIT, DO A (RETURN)
(7226)  DCS[0.00.0.0.0.0]  BM[0100..00.00..00.00..000..001...0.0.0..0..0...1.1011...0..0000.0...11.000...010.111.001]





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.TOC    *     CLEAR I-O / BUS CONTROL / SERVICE AREA STATUS LATCHES SUBR


!
!       THIS SUBR CLEARS OUT, VIA I-O UCON COMMANDS, THOSE STATUS LATCHES
!       CONCERNED WITH SERVICE CONDITIONS, UNIBUS ERROR CONDITIONS, ETC.
!

7227:  !(FREE)
CLEAR-I-O-A:
        P3,     BUS-INIT-UCON-[I],                               !DO A 10 MILLISEC UNIBUS INIT
        NEXT,   J/CLEAR-I-O-B                                    !
(7227)  DCS[0.00.0.0.0.0]  BM[0100..00.01..11.00..000..000...0.0.0..0..0...1.1011...0..0000.0...11.000...010.011.000]
```

```
        7230:  !(FREE)
        CLEAR-I-O-B:
                P3,       CLR-JAM-ERRORS-[I],                         !RESET CACHE ERROR STATUS
                NEXT,     J/CLEARIO02                                 !
  (7230)  DCS[0.00.0.0.0.0]  BM[0100..00.00..10.00..000..000...0.0.0..0..0...1.1011...0..0000.0...11.000...010.011.001]

        7231:  !(FREE)
        CLEARIO02:
                P3,       CLEAR-CONSOLE-SERVICE,                      !CLEAR OUT CONSOLE SRVC(1)H
                P3,       CLR-NPR-TIMEOUT-[I],                        !RESET NPR/SACK TIME OUT STATUS
                NEXT,     J/CLEARIO04                                 !
  (7231)  DCS[0.00.0.0.0.0]  BM[0100..00.00..11.00..110..000...0.0.0..0..0...1.1011...0..0000.0...11.000...010.011.010]

        7232:  !(FREE)
        CLEARIO04:
                P3,       CLEAR-CONSOLE-LED,                          !SETUP FOR 16. BIT ADDRESS MODE ON UNIBUS
                P3,       CLR-PWR-FAIL-[I],                           !RESET POWER FAIL STATUS
                NEXT,     J/CLEARIO05                                 !
  (7232)  DCS[0.00.0.0.0.0]  BM[0100..00.01..00.00..010..001...0.0.0..0..0...1.1011...0..0000.0...11.000...010.011.011]

        7233:  !(FREE)
        CLEARIO05:
                P3,       CLR-YELLOW-ZONE-[I],                        !RESET YELLOW ZONE STATUS
                NEXT,     J/RESETUCONP                                !
  (7233)  DCS[0.00.0.0.0.0]  BM[0100..00.01..01.00..000..000...0.0.0..0..0...1.1011...0..0000.0...11.000...010.111.001]

        !"RESETUCONP" IS AT END OF "DINTOIR" SUBROUTINE
        !THIS WORD  (1) ENABLES BUSDIN←EMIT,  (2) ENABLES PROC EN-CLK-IR,
        !AND EXITS WITH A BUTA(RETURN)





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        .TOC    *     SUBR FOR PUTTING SELECTED PORTIONS OF D[15-00] INTO IR

        !
        !       THESE SUBR(S) ARE USED IN TESTING THE ALU/LOGIC FUNCTIONS.
        !
        !       NOTE:  ENTRY POINTS "D[15-12]", "D[11-06]", "D[05-00]" EXPECT THAT:
        !              (1) 'IR←DBUF', 'DBUF←D' FUNCTIONS ARE ALREADY ENABLED
        !              (2) THE FOLLOWING CONSTANTS ARE IN CSP(17:14):
        !                      CSP(17) = (007700);     CSP(16) = (170000);
        !                      CSP(15) = (000077);     CSP(14) = (000100);
        !
        !       FURTHERMORE:
        !              (1) ENTRY POINT "DZERO" SETS UP THE UCONS:
        !                      'IR←DBUF', 'DBUF←D'
        !              (2) ENTRY POINT "D[15-12]" COPIES THE ORIGINAL PATTERN, LEFT IN
        !                      D, INTO ASPHI[17] FOR SAFEKEEPING, AND REUSE LATER
```

```
        !


        7234:  !(FREE)
        D[15-12]:
                P2-U,    IR←DBUF,                                 !JUST HAPPENS, DONT CARE NOW
                P3,      DBUF←D,                                  !PATTERN IN D -> DBUF
                         A#BSPHI[17]←D,                           !SAVE IN ASPHI, TOO
                NEXT,    J/D1512A                                 !
     (7234)  DCS[0.00.0.0.0.0]  BM[0000..00.11..00.01..011..000...0.0.0..0..0...1.1010...0..1011.0...11.000...010.011.101]

        7235:  !(FREE)
        D1512A:
                P2-U,    IR←DBUF,                                 !SEND DBUF -> IR
                P3,      DBUF←D,                                  !JUST HAPPENS, DONT CARE NOW
                NEXT,    J/BUTIR15-12                             !IR<15:12>H IN BIT<03:00> "BUT"
     (7235)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...1.1010...0..0000.0...11.000...011.000.000]

        7236:  !(FREE)
        D[11-06]:
                P2-T,    SR←ASPHI[17]-AND-007700,                 !MASK ALL BITS EXCEPT D<11:06> TO ZEROES
                NEXT,    J/D1106A                                 !
     (7236)  DCS[0.00.0.0.0.0]  BM[1011..11.00..11.01..011..000...0.0.1..0..0...0.0000...0..0000.0...11.000...010.011.111]

        7237:  !(FREE)
        D1106A:
                P2-T,    D←SR-IOR-170000, SAVE-D[C],              !FORCE BITS D<15:12> TO ONES
                                                                  !THIS MANUVER SHOULD FORCE INSTRS DIAGNOSTIC (E78)
                                                                  !ROM ADDRESSES (752), (725) WHEN PATTERN GOES INTO IR
                P2-U,    IR←DBUF,                                 !JUST HAPPENS, DONT CARE NOW
                P3,      DBUF←D,                                  !PUT PATTERN JUST SET IN D INTO DBUF
                NEXT,    J/DTOIRB                                 !
     (7237)  DCS[0.00.0.0.0.0]  BM[1110..11.01..00.00..000..111...0.1.0..0..0...1.1010...0..0000.0...11.000...010.100.011]

        7240:  !(FREE)
        D[05-00]:
                P2-T,    SR←ASPHI[17]-AND-000077,                 !MASK ALL BITS EXCEPT D<05:00> TO ZEROES
                NEXT,    J/D0500A                                 !
     (7240)  DCS[0.00.0.0.0.0]  BM[1011..11.10..11.01..011..000...0.0.1..0..0...0.0000...0..0000.0...11.000...010.100.001]

        7241:  !(FREE)
        D0500A:
                P2-T,    D←SR-IOR-000100, SAVE-D[C],              !FORCE BIT D<06> TO A ONE
                                                                  !THIS MANUVER SHOULD FORCE INSTRS DIAGNOSTIC (E88)
                                                                  !ROM ADDRESSES (152), (125) WHEN PATTERN GOES INTO IR
                P2-U,    IR←DBUF,                                 !JUST HAPPENS, DONT CARE NOW
                P3,      DBUF←D,                                  !PUT PATTERN JUST SET IN D INTO DBUF
                NEXT,    J/DTOIRB                                 !
     (7241)  DCS[0.00.0.0.0.0]  BM[1110..11.11..00.00..000..111...0.1.0..0..0...1.1010...0..0000.0...11.000...010.100.011]

        7242:  !(FREE)
        DZERO:
                P2-U,    IR←DBUF-[I],                             !JUST HAPPENS, DONT CARE
                P3,      DBUF←D-[I],                              !COPY PATTERN IN D TO DBUF
```

```
        NEXT,   J/DTOIRB                                          !
(7242)  DCS[0.00.0.0.0.0]  BM[0100..00.00..00.01..000..100...0.0.0..0..0...1.1011...0..0000.0...11.000...010.100.011]

    7243:   !(FREE)
    DTOIRB:
        P2-U,   IR←DBUF,                                         !NOW COPY PATTERN IN DBUF TO IR
        P3,     DBUF←D,                                          !JUST HAPPENS, DONT CARE
        NEXT,   J/BUTINSTRS                                      !GO DO INSTRS "BUT" ON PATTERN IN IR
(7243)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...1.1010...0..0000.0...11.000...011.000.001]





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    .TOC    *     UCON SUBROUTINES (FLAGS, PS, FPS, CUA, SERVICE, JAM, PBA)

    !
    !       THESE SUBROUTINES MANIPULATE THE PROCESSOR UCONS, AND VARIOUS OTHER BUSDIN DRIVERS
    !
    !               ASPLO(17) = A TEMPORARY LOCATION, DESTROYED
    !
    !               CSP(02) = VALUE EXPECTED TO BE READ
    !               CSP(03) = ACTUAL VALUE READ
    !               CSP(04) = MASK VALUE
    !
    !               AT RETURN, D = (BUSDINSELECT.AND.MASKVALUE).XOR.EXPECTEDVALUE
    !

    7244:   !(FREE)
    CLRSERVICETOD:
        P3,     CSPD[02]←EMIT, EMIT/000340,                      !SERVICE PORT OF STATUS:  ALL BITS RESET
        NEXT,   J/CJESERVICETOD                                  !
(7244)  DCS[0.00.0.0.0.0]  BM[0000..10.00..00.11..100..000...0.0.0..0..0...0.1101...1..0000.0...11.000...010.100.111]

    7245:   !(FREE)
    DATISERVICETOD:
        P3,     CSPD[02]←EMIT, EMIT/100340,                      !SERVICE PORT OF STATUS:  ONLY DATI[1]H SET
        NEXT,   J/CJESERVICETOD                                  !
(7245)  DCS[0.00.0.0.0.0]  BM[1000..10.00..00.11..100..000...0.0.0..0..0...0.1101...1..0000.0...11.000...010.100.111]

    7246:   !(FREE)
    DATOSERVICETOD:
        P3,     CSPD[02]←EMIT, EMIT/002340,                      !SERVICE PORT OF STATUS:  ONLY DATO[1]H SET
        NEXT,   J/CJESERVICETOD                                  !
(7246)  DCS[0.00.0.0.0.0]  BM[0000..10.01..00.11..100..000...0.0.0..0..0...0.1101...1..0000.0...11.000...010.100.111]

    7247:   !(FREE)
    CJESERVICETOD:
        P3,     CLR-JAM-ERRORS-[I],                              !SPECIAL ENTRY POINT TO CLEAR OUT JAM
        NEXT,   J/SERVICETOD                                     !  PORT OF STATUS MUX, BEFORE READ SERVICE
(7247)  DCS[0.00.0.0.0.0]  BM[0100..00.00..10.00..000..000...0.0.0..0..0...1.1011...0..0000.0...11.000...010.101.000]
```

```
        7250:   !(FREE)
        SERVICETOD:
                P0,      BUSDIN←SERVICE-[I],                           !SERVICE (PORT 1) OF STATUS MUX
                NEXT,    J/GETPROCDAT                                  !
  (7250)  DCS[0.00.0.0.0.0.0]  BM[0100..01.00..00.00..000..000...0.0.0..0..0...1.1001...0..0000.0...11.000...011.111.011]

        !      -     -     -     -     -     -     -     -     -     -     -

        7251:   !(FREE)
        PBATOD:
                P0,      BUSDIN←PBA-[I],                               !PBA (PORT 3) OF STATUS MUX
                NEXT,    J/GETPROCDAT                                  !
  (7251)  DCS[0.00.0.0.0.0.0]  BM[1100..01.00..00.00..000..000...0.0.0..0..0...1.1001...0..0000.0...11.000...011.111.011]

        !      -     -     -     -     -     -     -     -     -     -     -

        7252:   !(FREE)
        FLAGFPSTOD:
                P0,      BUSDIN←FLAGS#FPS-[I],                         !PUT FLAGS, FPS ON BUSDIN
                NEXT,    J/GETPROCDAT                                  !
  (7252)  DCS[0.00.0.0.0.0.0]  BM[0000..00.00..11.01..000..000...0.0.0..0..0...1.1001...0..0000.0...11.000...011.111.011]

        !      -     -     -     -     -     -     -     -     -     -     -

        7253:   !(FREE)
        PSTOD:
                P0,      BUSDIN←PS-[I],                                !PUT PS ON BUSDIN
                NEXT,    J/GETPROCDAT                                  !
  (7253)  DCS[0.00.0.0.0.0.0]  BM[0000..00.00..10.01..000..000...0.0.0..0..0...1.1001...0..0000.0...11.000...011.111.011]

        !      -     -     -     -     -     -     -     -     -     -     -

        7254:   !(FREE)
        ODDJAMTOD:
                P3,      CSPD[02]←EMIT, EMIT/101004,                   !JAM PORT OF STATUS:  ONLY ODD-ADDR[1]H SET
                NEXT,    J/JAMTOD                                      !
  (7254)  DCS[0.00.0.0.0.0.0]  BM[1000..10.00..10.00..000..100...0.0.0..0..0...0.1101...1..0000.0...11.000...010.101.110]

        7255:   !(FREE)
        CLRJAMTOD:
                P3,      CSPD[02]←EMIT, EMIT/001000,                   !JAM PORT OF STATUS:  ALL BITS RESET
                NEXT,    J/JAMTOD                                      !
  (7255)  DCS[0.00.0.0.0.0.0]  BM[0000..10.00..10.00..000..000...0.0.0..0..0...0.1101...1..0000.0...11.000...010.101.110]

        7256:   !(FREE)
        JAMTOD:
                P0,      BUSDIN←JAM-[I],                               !PUT JAM REG (STATUS MUX PORT 2)
                NEXT,    J/GETPROCDAT                                  !ONTO BUSDIN
  (7256)  DCS[0.00.0.0.0.0.0]  BM[1100..00.00..00.00..000..000...0.0.0..0..0...1.1001...0..0000.0...11.000...011.111.011]

        !      -     -     -     -     -     -     -     -     -     -     -

        7257:   !(FREE)
```

```
CUATOD:
        P0,     BUSDIN+CUA-[I],                         !PUT CUA REG (HBMUX PORT 2)
        NEXT,   J/GETPROCDAT                            !ONTO BUSDIN
(7257)  DCS[0.00.0.0.0.0]  BM[0000..00.00..01.01..000..000...0.0.0..0..0...1.1001...0..0000.0...11.000...011.111.011]

!   -   -   -   -   -   -   -   -   -   -   -   -   -

7373:
GETPROCDAT:
        P3,     CSPD[03]+BUSDIN,                        !GET PREVIOUSLY ENABLED PROC DATA
        NEXT,   J/GETMSKPROCDAT                         !
(7373)  DCS[0.00.0.0.0.0]  BM[0000..10.00..00.00..000..000...0.0.0..0..0...0.1100...1..0000.0...11.000...010.110.000]

7260:   !(FREE)
GETMSKPROCDAT:
        P2-T,   D+CSPD(D04), D[C]+0,                    !GET MASK VALUE
        P3,     ASPLO[17]+D,                            !INTO A-SIDE
        NEXT,   J/MSKPROCDAT                            !
(7260)  DCS[0.00.0.0.0.0]  BM[1010..10.00..00.01..011..000...0.1.0..0..0...0.1011...0..0001.0...11.000...010.110.001]

7261:   !(FREE)
MSKPROCDAT:
        P2-T,   D+ASPLO[17]-AND-CSPD(D03), SAVE-D[C],   !MASK OUT UNWANTED BITS
        P3,     ASPLO[17]+D,                            !AND WRITE BACK
        NEXT,   J/CMPPROCDAT                            !
(7261)  DCS[0.00.0.0.0.0]  BM[1011..10.00..10.01..011..111...0.1.0..0..0...0.1100...0..0001.0...11.000...010.110.010]

7262:   !(FREE)
CMPPROCDAT:
        P2-T,   D+ASPLO[17]-XOR-CSPD(D02), SAVE-D[C],   !COMPARE OBTAINED, EXPECTED BITWISE
        NEXT,   J/RESETPROCDAT                          !
(7262)  DCS[0.00.0.0.0.0]  BM[0110..10.00..10.01..011..111...0.1.0..0..0...0.1101...0..0000.0...11.000...010.110.011]

7263:   !(FREE)
RESETPROCDAT:
        P0,     BUSDIN+EMIT-[I],                        !RESET PROC UCON
                EN-CLK-IR[15-00],                       !
        NEXT,   J/BUTD-IS-ZERO                          !AND GO TEST D<15:00>
(7263)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.01..000..100...0.0.0..0..0...1.1001...0..0000.0...11.000...011.100.001]





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.TOC    *     SUBR FOR LOADING FPS<3:0> [VIA BUTA(DIAGNOSE)]

!
!       THIS SUBROUTINE LOADS CSP(16)<3:0> -> FPS<3:0> VIA THE BUTA(DIAGNOSE) FUNCTION.
!
!       REQUIREMENTS FOR ENTRY:
!
```

```
!               (1)  LOADING SR MUST BE SETUP
!               (2)  CSP(16) SETUP WITH BITS TO LOAD
!               (3)  CSP(00) CONTAINS RETURN MICROADDRESS IN BITS<14:03>
!

    7264:  !(FREE)
    LOADFPSCC:
            P2-T,   SR←ALL-ONES,                        !SET BIT<00> FOR JAMUPP EXPECTED
            P3,     BUTA(DIAGNOSE),                     !START THE XFR TO BM SEQUENCE
            NEXT,   J/LOADFPSCC02                       !
 (7264)  DCS[0.00.0.0.0.0.0]  BM[1111..00.00..11.01..101..000...0.0.1..0..0...0.0000...0..0000.0...11.011...010.110.101]

    7265:  !(FREE)
    LOADFPSCC02:
            NEXT,   XFR-TO-BM[LOADNZW4]                 !LOAD PAGE, POINT UPF AT BM CODE
 (7265)  DCS[0.00.0.0.0.0.0]  BM[0000..00.00..00.00..000..100...0.0.0..0..0...0.0000...0..0000.0...11.100...011.011.000]

    !LOADNZW4:                                          !(THIS WORD ACTUALLY COMES OUT OF BM ROMS)
    !       P2-T,   D←CSPB(16),                         !PUT "MD" = CSP(16) INTO D
    !       NEXT,   J/LOADNZW5                          !
    !
    !LOADNZW5:
    !       P2,     FPS[CC]←D[3-0],                     !LOAD FPS<3:0>
    !       P3,     BUTA(DIAGNOSE),                     !BEGIN XFR SEQUENCE BACK TO DCS ROMS
    !       NEXT,   J/NZERO2                            !
    !
    !NZERO2:
    !       NEXT,   GOTO-PAGE(4),                       !
    !               J/XXXXXX                            !
    !
    !(CONTROL NOW RETURNS TO DCS AT "JAMUPP001" WORD)
    !4777:
    !JAMUPP001:
    !       *** SEE FLOWS ON SUBSEQUENT PAGE ***




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    .TOC    *       SUBR TO COPY D-REGISTER TO DBUF TO IR

    !
    !       SUBROUTINE TO COPY D-REGISTER TO DBUF TO IR
    !               AND LEAVE PROCESSOR UCON "CLK IR" AND "BUSDIN←EMIT" ACTIVE
    !


    7266:  !(FREE)
    SRINTOIR:
            P2-T,   D←SR, SAVE-D[C],                    !COPY SR TO D
```

```
                NEXT,   J/DINTOIR                                    !
        (7266)  DCS[0.00.0.0.0.0]  BM[1111..00.00..00.00..000..111...0.1.0..0..0...0.0000...0..0000.0...11.000...010.110.111]

        7267:   !(FREE)
        DINTOIR:
                P2-U,   IR←DBUF-[I],                                 !JUST HAPPENS - DON'T CARE
                P3-U,   DBUF←D-[I],                                  !TRANSFER D -> DBUF
                NEXT,   J/DBUFINTOIR                                 !
        (7267)  DCS[0.00.0.0.0.0]  BM[0100..00.00..00.01..000..100...0.0.0..0..0...1.1011...0..0000.0...11.000...010.111.000]

        7270:   !(FREE)
        DBUFINTOIR:
                EMITC,  EMIT/125200,                                 !JUNK ON EMIT:  INSTRS/E88/405 PATTERN
                P2-U,   IR←DBUF,                                     !TRANSFER DBUF -> BUSDIN -> IR
                P3-U,   DBUF←D,                                      !JUST HAPPENS - DON'T CARE
                NEXT,   J/RESETUCONP                                 !
        (7270)  DCS[0.00.0.0.0.0]  BM[1010..00.10..10.10..000..000...0.0.0..0..0...1.1010...0..0000.0...11.000...010.111.001]

        7271:   !(FREE)
        RESETUCONP:
                SELECT, UCON-PROC,                                   !RESET TO PROCESSOR UCON:
                ENABLE, EN-CLK-IR[15-00],                            !  ENABLE CLOCKING IR
                        BUSDIN←EMIT[15-00],                          !  PUT EMIT ONTO BUSDIN
                P0,     SET-UCON-CONTROL,                            !WRITE CONTROLS
                NEXT,   BUTA(RETURN),                                !RETURN TO CALLER
                        J/BUTERROR7                                  !FATAL ERROR IF GO HERE
        (7271)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.01..000..100...0.0.0..0..0...1.1001...0..0000.0...11.111...011.111.110]


        ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

        7272:   !(FREE)
        SRINTOIRS:
                P2-T,   D←SR, SAVE-D[C],                             !COPY SR TO D
                NEXT,   J/DINTOIRS                                   !
        (7272)  DCS[0.00.0.0.0.0]  BM[1111..00.00..00.00..000..111...0.1.0..0..0...0.0000...0..0000.0...11.000...010.111.011]

        7273:   !(FREE)
        DINTOIRS:
                P2-U,   IR←DBUF-[I],                                 !JUST HAPPENS - DON'T CARE
                P3-U,   DBUF←D-[I],                                  !TRANSFER D -> DBUF
                NEXT,   J/DBUFINTOIRS                                !
        (7273)  DCS[0.00.0.0.0.0]  BM[0100..00.00..00.01..000..100...0.0.0..0..0...1.1011...0..0000.0...11.000...010.111.100]

        7274:   !(FREE)
        DBUFINTOIRS:
                EMITC,  EMIT/125200,                                 !JUNK ON EMIT:  INSTRS/E88/405 PATTERN
                P2-U,   IR←DBUF,                                     !TRANSFER DBUF -> BUSDIN -> IR
                P3-U,   DBUF←D,                                      !JUST HAPPENS - DON'T CARE
                NEXT,   J/RESETUCONPS                                !
        (7274)  DCS[0.00.0.0.0.0]  BM[1010..00.10..10.10..000..000...0.0.0..0..0...1.1010...0..0000.0...11.000...010.111.101]

        7275:   !(FREE)
        RESETUCONPS:
```

```
        SELECT, UCON-PROC,                              !RESET TO PROCESSOR UCON:
        ENABLE, EN-CLK-IR[15-00],                       !  ENABLE CLOCKING IR
                BUSDIN←EMIT[15-00],                     !  PUT EMIT ONTO BUSDIN
        P0,     SET-UCON-CONTROL,                       !WRITE CONTROLS
        NEXT,   J/BUTINSTR5                             !AND EXIT TO DO INSTR-5 BUT INTO TARGET AREA
 (7275) DCS[0.00.0.0.0.0]  BM[0000..00.00..00.01..000..100...0.0.0..0..0...1.100]...0..0000.0...11.000...011.000.001]






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    .TOC    *       JAM UPP SERVICE SUBROUTINE

    !
    !       IF A JAMUPP TO 0777/4777 OCCURS, ACTION DEPENDS UPON SR<00> CONTENTS:
    !
    !               SR<00>=1 -> RESET SR TO (000000), DO A BUTA[RETURN] TO ADDRESS IN CSP(00)
    !
    !               SR<00>=0 -> SIGNAL ERROR, LOG STATUS, RETURN VIA "CUA" CONTENTS
    !                       ERROR-CODE ::= INDICATES LAST TEST EXECUTED
    !

    4777:
    JAMUPP001:
        P3-T,   SR←D,                                   !SAVE CURRENT D CONTENTS IN SR
        NEXT,   BUTR(SR00),                             !TEST SR<00> FLAG  (PREV SR00 CONTENTS)
                !IF SR<00>=1, EXPECTED JAM, GOTO "JAMUPP002B"
                !IF SR<00>=0, NO JAM WAS EXPECTED, FORCE ERROR AT "JAMUPP003"
                J/JAMUPP003                             !
 (4777) DCS[0.00.0.0.0.0]  BM[1111..00.00..01.01..000..000...1.0.1..0..0...0.0000...0..0000.0...00.000...111.101.110]

    4757:
    JAMUPP002B:
        P2-T,   D←CSPD(D00), SAVE-D[C],                 !GET RETURN ADDRESS
        NEXT,   J/JAMUPP002C                            !
 (4757) DCS[0.00.0.0.0.0]  BM[1010..10.00..00.00..000..111...0.1.0..0..0...0.1111...0..0000.0...11.000...100.011.100]

    4434:  !(FREE)
    JAMUPP002C:
        P0,     RETURN←D[14-03], PAGE(7),               !PUT RETURN ADDRESS INTO REG
        P2-T,   D←SR, SAVE-D[C],                        !RESTORE OLD D
        NEXT,   J/JAMUPP002D                            !
 (4434) DCS[0.00.0.0.0.0]  BM[1111..00.00..00.00..000..111...0.1.0..0..0...0.0000...0..0000.0...11.101...010.001.011]

    7213:  !(FREE)
    JAMUPP002D:
        P2-T,   SR←ZERO,                                !ZERO OUT SR FOR RETURN
        NEXT,   BUTA(RETURN),                           !NOW RETURN
                J/BUTERROR7                             !ERROR IF GO HERE
```

```
(7213)  DCS[0.00.0.0.0.0]  BM[0011..00.00..00.00..000..000...0.0.1..0..0...0.0000...0..0000.0...11.111...011.111.110]

        4756:
        JAMUPP003:
                SELECT, BUSDIN+CUA-[I],                 !ENABLE READ JAMUPP MICROADDR
                NEXT,   BUTD[ERROR],                    !WAS ERROR PREVIOUSLY SET ?
                        J/JAMUPP005                     !  YES/JAMUPP004, NO/JAMUPP005
(4756)  DCS[0.00.0.1.0.0]  BM[0000..00.00..01.01..000..000...0.0.0..0..0...1.1001...0..0000.0...11.000...111.100.111]

        !* ENTER HERE IF "ERROR" WAS PREVIOUSLY SET (INHIBIT LOG)
        4746:
        JAMUPP004:
                P3,     CSPD[00]+LOG-CUA,               !GET RETURN LOC <- SAVED CUA
                P3-T,   BUTA(CUA-TRACK),                !START CUA GOING AGAIN
                NEXT,   J/JAMUPP002B                    !INHIBIT LOG IF PREV ERROR
(4746)  DCS[0.00.0.0.0.0]  BM[0000..10.00..00.00..000..000...1.0.0..0..0...0.1111...1..0000.0...11.001...111.101.111]

        !* ENTER HERE IF "ERROR" NOT YET SET (LOG FIRST MODE)
        4747:
        JAMUPP005:
                P0,     DCS-CTR(CO.),                   !FORCE ERROR WITH PREV ERROR-CODE/ENUA, TNUA=(4747)
                P3,     CSPD[00]+LOG-CUA,               !RETURN LOC <- RETURN ADDR FROM CUA
                NEXT,   J/JAMUPP006                     !AND GO LOG REGISTERS THIS TIME
(4747)  DCS[0.00.1.0.0.0]  BM[1111..10.00..00.00..000..000...0.0.0..0..0...0.1111...1..0000.0...11.000...100.011.101]

        4435:  !(FREE)
        JAMUPP006:
                SELECT, BUSDIN+SERVICE-[I],             !SERVICE REGISTER
                NEXT,   J/JAMUPP007                     !
(4435)  DCS[0.00.0.0.0.0]  BM[0100..01.00..00.00..000..000...0.0.0..0..0...1.1001...0..0000.0...11.000...100.011.110]

        4436:  !(FREE)
        JAMUPP007:
                P3,     CSPD[01]+LOG-SERVICE,           !LOG SERVICE INFO REGISTER
                NEXT,   J/JAMUPP010                     !
(4436)  DCS[0.00.0.0.0.0]  BM[0000..10.00..00.00..000..000...0.0.0..0..0...0.1110...1..0000.0...11.000...100.011.111]

        4437:  !(FREE)
        JAMUPP010:
                SELECT, BUSDIN+JAM-[I],                 !JAM REGISTER
                NEXT,   J/JAMUPP011                     !
(4437)  DCS[0.00.0.0.0.0]  BM[1100..00.00..00.00..000..000...0.0.0..0..0...1.1001...0..0000.0...11.000...100.100.000]

        4440:  !(FREE)
        JAMUPP011:
                P3,     CSPD[02]+LOG-JAM,               !LOG JAMUPP CAUSE INFO
                        BUTA(CUA-TRACK),                !RESET CUA TO TRACK, IN CASE ANOTHER JAM COMES
                NEXT,   J/JAMUPP002B                    !GO TO TOP OF THIS PAGE, AND RETURN INLINE
(4440)  DCS[0.00.0.0.0.0]  BM[0000..10.00..00.00..000..000...0.0.0..0..0...0.1101...1..0000.0...11.001...111.101.111]
```

```
!.PAGE==========================================================================================================


.TOC   *   MICROBRANCH [BUT] TAKEOFF WORDS

!****************************************************************************************
!*                                                                                      *
!*                                                        UWORDS: 000 + 056             *
!*                                                                                      *
!*      FUNCTION:          THESE WORDS ARE THE INACTIVE-"BUT" [BRANCHING TYPE]          *
!*                         "TAKEOFF" OR SUBROUTINE MICROWORDS.  ANY TEST WHICH          *
!*                         REQUIRES A SPECIFIC "BUT" CONDITION TO BE TESTED WILL USE    *
!*                         ONE OF THESE MICROWORDS AS A TAKEOFF POINT INTO THE "BUT     *
!*                         TARGET TABLE" [DESCRIBED NEXT], WHERE AN ENUA:TNUA           *
!*                         COMPARISON WILL HAVE BEEN PREVIOUSLY ENABLED [VIA SET-       *
!*                         TING THE DIAGNOSTIC COUNTER TO THE APPROPRIATE VALUE.        *
!*                                                                                      *
!****************************************************************************************




!*** BUT 00 ***
!FULL WIDTH IS BUT[SR<3:0>]
7276:  !(FREE)
BUTSR3-0:
        NEXT,    BUT(SR3-0),                                !TO (400)-(417), W4
                 J/ZTARGET400                               !NO MASK
(7276)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...00.000...100.000.000]


!*** BUT 01 ***
!FULL WIDTH IS BUT[IR<15:12>]
7300:  !(FREE)
BUTIR15-12:
        NEXT,    BUT(IR15-12),                              !TO (400)-(417), W4
                 J/ZTARGET400                               !NO MASK
(7300)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...00.001...100.000.000]


!*** BUT 02 ***
!FULL WIDTH IS BUT[INSTR 5]
7301:  !(FREE)
BUTINSTR5:
        NEXT,    BUT(INSTR5),                               !TO (400)-(437), W5
                 J/ZTARGET400                               !NO MASK
(7301)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...00.010...100.000.000]


!*** BUT 03 ***
!FULL WIDTH IS BUT[IR11#FLTPT<3:0>]
7302:  !(FREE)
BUTIR11FLTPT3-0:
        NEXT,    BUT(IR11#FLTPT3-0),                        !TO (400)-(437), W5
```

```
                        J/ZTARGET400                                    !NO MASK
        (7302)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...00.011...100.000.000]


        !*** BUT 04 ***
        !FULL WIDTH IS BUT[IR<9:6>]
        7304:  !(FREE)
        BUTIR9-6:
                NEXT,   BUT(IR9-6),                                     !TO (400)-(417), W4
                        J/ZTARGET400                                    !NO MASK
        (7304)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...00.100...100.000.000]


        !*** BUT 05 ***
        !FULL WIDTH IS BUT[MOV-DR7#IR<5:3>]
        7305:  !(FREE)
        BUTMOVDR7IR5-3:
                NEXT,   BUT(MOV-DR7#IR5-3),                             !TO (400)-(417), W4
                        J/ZTARGET400                                    !NO MASK
        (7305)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...00.101...100.000.000]


        !*** BUT 06 ***
        !FULL WIDTH IS BUT[INSTR 1]             *** N.B.:  THIS BUT IS ALSO ACTIVE ***
        7306:  !(FREE)
        BUTINSTR1:
                NEXT,   BUTA(INSTR1),                                   !TO (400)-(777), W8
                        J/ZTARGET400                                    !NO MASK
        (7306)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...00.110...100.000.000]


        !*** BUT 07 ***
        !FULL WIDTH IS BUT[BG-SERV-H+FP-SERV-H#D[C]#FPRET<1:0>]
        7307:  !(FREE)
        BUTBGFPSERV:
                NEXT,   BUT(BGSERV-FPSERV#D[C]#FPRET),                  !TO (407),(417), W1
                        J/ZTARGET407                                    !MASK OUT D[C], FPRET<1:0>
        (7307)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...00.111...100.000.111]

        7310:  !(FREE)
        BUTD[C]C:
                NEXT,   BUT(BGSERV-FPSERV#D[C]#FPRET),                  !TO (413),(417), W1
                        J/ZTARGET413                                    !MASK OUT BG-SERV-H+FP-SERV-H, FPRET<1:0>
        (7310)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...00.111...100.001.011]


        !*** BUT10 ***
        !FULL WIDTH IS BUT[COUT07#DOUT07#FPS05]
        7311:  !(FREE)
        BUTCOUT7DOUT7:
                NEXT,   BUT(COUT07#DOUT07#FPS05),                       !TO (401),(403),(405),(407), W2
                        J/ZTARGET401                                    !MASK OUT FPS05
        (7311)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...01.000...100.000.001]
```

```
     7312:  !(FREE)
     BUTFPS05:
             NEXT,    BUT(COUT07*DOUT07*FPS05),               !TO (406),(407), W1
                      J/ZTARGET406                            !MASK OUT COUT7, DOUT7
(7312)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...01.000...100.000.110]


     !*** BUT 11 ***
     !FULL WIDTH IS BUT[DMO*SMO*BYTE]
     7313:  !(FREE)
     BUTDMSMBYTE:
             NEXT,    BUT(DMO*SMO*BYTE),                      !TO (400)-(407), W3
                      J/ZTARGET400                            !NO MASK
(7313)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...01.001...100.000.000]


     !*** BUT 12 ***
     !FULL WIDTH IS BUT[GD<3:2>]
     7314:  !(FREE)
     BUTGD3-2:
             NEXT,    BUT(GD3-2),                             !TO (400)-(403), W2
                      J/ZTARGET400                            !NO MASK
(7314)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...01.010...100.000.000]


     !*** BUT 13 ***
     !FULL WIDTH IS BUT[SR<1:0>*COUNT-IS-377]                 *** N.B.:  THIS BUT IS ALSO ACTIVE  ***
     7315:  !(FREE)
     BUTSR1-0:
             NEXT,    BUTA(SR1-0*COUNT-IS-377),               !TO (401),(403),(405),(407), W2
                      J/ZTARGET401                            !MASK OUT COUNT-IS-377
(7315)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...01.011...100.000.001]


     !*** BUT 14 ***
     !FULL WIDTH IS BUT[BG-SERVCE-L*MFSS*MULTIPLE]
     7316:  !(FREE)
     BUTBGSERVL:
             NEXT,    BUT(BG-SERVCE-L*MFSS*MULTIPLE),         !TO (403),(407), W1
                      J/ZTARGET403                            !MASK OUT MFSS, MULTIPLE
(7316)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...01.100...100.000.011]

     7317:  !(FREE)
     BUTMMASKPS[T]:
             SETUP,   TEST(MASKED-PS[T]),                     !SELECT MULTIPLE BUT
             NEXT,    J/BUTMNXT000                            !NEXT
(7317)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...011.010.000]

     7320:  !(FREE)
     BUTMNXT000:
             SETUP,   TEST(MASKED-PS[T]),                     !SELECT MULTIPLE BUT
             NEXT,    BUT(BG-SERVCE-L*MFSS*MULTIPLE),         !TO (406),(407), W1
                      J/ZTARGET406                            !MASK OUT BG-SERVCE-L, MFSS
(7320)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...01.100...100.000.110]
```

```

     7321:  !(FREE)
     BUTMD00:
              SETUP,   TEST(D00),                                    !SELECT MULTIPLE BUT
              NEXT,    J/BUTMNXT001                                  !NEXT
  (7321)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..001...0.0.0..0..0...0.0000...0..0000.0...11.000...011.010.010]

     7322:  !(FREE)
     BUTMNXT001:
              SETUP,   TEST(D00),                                    !SELECT MULTIPLE BUT
              NEXT,    BUT(BG-SERVCE-L#MFSS#MULTIPLE),               !TO (406),(407), W1
                       J/ZTARGET406                                  !MASK OUT BG-SERVCE-L, MFSS
  (7322)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..001...0.0.0..0..0...0.0000...0..0000.0...01.100...100.000.110]

     7323:  !(FREE)
     BUTMPS[N]:
              SETUP,   TEST(PS[N]),                                  !SELECT MULTIPLE BUT
              NEXT,    J/BUTMNXT002                                  !NEXT
  (7323)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...011.010.100]

     7324:  !(FREE)
     BUTMNXT002:
              SETUP,   TEST(PS[N]),                                  !SELECT MULTIPLE BUT
              NEXT,    BUT(BG-SERVCE-L#MFSS#MULTIPLE),               !TO (406),(407), W1
                       J/ZTARGET406                                  !MASK OUT BG-SERVCE-L, MFSS
  (7324)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..010...0.0.0..0..0...0.0000...0..0000.0...01.100...100.000.110]

     7325:  !(FREE)
     BUTMFLAG7:
              SETUP,   TEST(FLAG7),                                  !SELECT MULTIPLE BUT
              NEXT,    J/BUTMNXT003                                  !NEXT
  (7325)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..011...0.0.0..0..0...0.0000...0..0000.0...11.000...011.010.110]

     7326:  !(FREE)
     BUTMNXT003:
              SETUP,   TEST(FLAG7),                                  !SELECT MULTIPLE BUT
              NEXT,    BUT(BG-SERVCE-L#MFSS#MULTIPLE),               !TO (406),(407), W1
                       J/ZTARGET406                                  !MASK OUT BG-SERVCE-L, MFSS
  (7326)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..011...0.0.0..0..0...0.0000...0..0000.0...01.100...100.000.110]

     7327:  !(FREE)
     BUTMEXFLAG1:
              SETUP,   TEST(EXFLAG1),                                !SELECT MULTIPLE BUT
              NEXT,    J/BUTMNXT004                                  !NEXT
  (7327)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..100...0.0.0..0..0...0.0000...0..0000.0...11.000...011.011.000]

     7330:  !(FREE)
     BUTMNXT004:
              SETUP,   TEST(EXFLAG1),                                !SELECT MULTIPLE BUT
              NEXT,    BUT(BG-SERVCE-L#MFSS#MULTIPLE),               !TO (406),(407), W1
                       J/ZTARGET406                                  !MASK OUT BG-SERVCE-L, MFSS
  (7330)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..100...0.0.0..0..0...0.0000...0..0000.0...01.100...100.000.110]

     7331:  !(FREE)
```

```
      BUTMFLTPTS:
              SETUP,  TEST(FLTPTS),                               !SELECT MULTIPLE BUT
              NEXT,   J/BUTMNXT005                                !NEXT
  (7331) DCS[0.00.0.0.0.0] BM[0000..00.00..00.00..000..101...0.0.0..0..0...0.0000...0..0000.0...11.000...011.011.010]

      7332:  !(FREE)
      BUTMNXT005:
              SETUP,  TEST(FLTPTS),                               !SELECT MULTIPLE BUT
              NEXT,   BUT(BG-SERVCE-L#MFSS#MULTIPLE),             !TO (406),(407), W1
                      J/ZTARGET406                                !MASK OUT BG-SERVCE-L, MFSS
  (7332) DCS[0.00.0.0.0.0] BM[0000..00.00..00.00..000..101...0.0.0..0..0...0.0000...0..0000.0...01.100...100.000.110]

      7333:  !(FREE)
      BUTMEXFLAG2:
              SETUP,  TEST(EXFLAG2),                              !SELECT MULTIPLE BUT
              NEXT,   J/BUTMNXT006                                !NEXT
  (7333) DCS[0.00.0.0.0.0] BM[0000..00.00..00.00..000..110...0.0.0..0..0...0.0000...0..0000.0...11.000...011.011.100]

      7334:  !(FREE)
      BUTMNXT006:
              SETUP,  TEST(EXFLAG2),                              !SELECT MULTIPLE BUT
              NEXT,   BUT(BG-SERVCE-L#MFSS#MULTIPLE),             !TO (406),(407), W1
                      J/ZTARGET406                                !MASK OUT BG-SERVCE-L, MFSS
  (7334) DCS[0.00.0.0.0.0] BM[0000..00.00..00.00..000..110...0.0.0..0..0...0.0000...0..0000.0...01.100...100.000.110]


      7336:  !(FREE)
      BUTMINITJAM:
              SETUP,  TEST(INIT-JAM),                             !SELECT MULTIPLE BUT
              NEXT,   J/BUTMNXT007                                !NEXT
  (7336) DCS[0.00.0.0.0.0] BM[0000..00.00..00.00..000..111...0.0.0..0..0...0.0000...0..0000.0...11.000...011.100.000]

      7340:  !(FREE)
      BUTMNXT007:
              SETUP,  TEST(INIT-JAM),                             !SELECT MULTIPLE BUT
              NEXT,   BUT(BG-SERVCE-L#MFSS#MULTIPLE),             !TO (406),(407), W1
                      J/ZTARGET406                                !MASK OUT BG-SERVCE-L, MFSS
  (7340) DCS[0.00.0.0.0.0] BM[0000..00.00..00.00..000..111...0.0.0..0..0...0.0000...0..0000.0...01.100...100.000.110]

      !*** BUT 15 ***
      !FULL WIDTH IS BUT[D<14:00>=0#D15]
      7341:  !(FREE)
      BUTD-IS-ZERO:
              NEXT,   BUT(D14-00EQ0#D15),                         !TO (400)-(403),W2
                      J/ZTARGET400                                !NO MASK
  (7341) DCS[0.00.0.0.0.0] BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...01.101...100.000.000]


      !*** BUT 16 ***
      !FULL WIDTH IS BUT[IR11#PS15]
      7342:  !(FREE)
      BUTIR11B:
              NEXT,   BUT(IR11#PS15),                             !TO (401),(403), W1
                      J/ZTARGET401                                !MASK OUT PS15
```

```
(7342)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...01.110...100.000.001]

    7343:  !(FREE)
    BUTPS15:
            NEXT,    BUT(IR11#PS15),                          !TO (402),(403), W1
                     J/ZTARGET402                             !MASK OUT IR11
(7343)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...01.110...100.000.010]


    !*** BUT 17 ***
    !FULL WIDTH IS BUT[COUNT-IS-377#D[C]]            *** N.B.:  THIS BUT IS ALSO ACTIVE  ***
    7344:  !(FREE)
    BUTD[C]A:
            NEXT,    BUTA(COUNT-IS-377#D[C]),                 !TO (402),(403), W1
                     J/ZTARGET402                             !MASK OUT COUNT-IS-377
(7344)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...01.111...100.000.010]


    !*** BUT 20 ***
    !FULL WIDTH IS BUT[PREFETCH-L#SERVICE]           *** N.B.:  THIS BUT IS ALSO ACTIVE ***
    7345:  !(FREE)
    BUTSERVICE:
            NEXT,    BUTA(PREFETCH-L#SERVICE),                !TO (402),(403), W1
                     J/ZTARGET402                             !MASK OUT PREFETCH-L
(7345)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...10.000...100.000.010]


    !*** BUT 21 ***
    !FULL WIDTH IS BUT[VECTOR-LOAD#DR6/7L]
    7346:  !(FREE)
    BUTVECTLOAD:
            NEXT,    BUT(VECTOR-LOAD#DR6-7L),                 !TO (401), (403), W1
                     J/ZTARGET401                             !MASK OUT DR6/7-L
(7346)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...10.001...100.000.001]

    7347:  !(FREE)
    BUTDR6-7L:
            NEXT,    BUT(VECTOR-LOAD#DR6-7L),                 !TO (402), (403), W1
                     J/ZTARGET402                             !MASK OUT VECTOR-LOAD
(7347)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...10.001...100.000.010]


    !*** BUT 22 ***
    !THIS IS AN ACTIVE BUT - NO BRANCH MODIFICATION
    !(THIS BUT IS NOT USED WITH THE TARGET TABLE)


    !*** BUT 23 ***
    !FULL WIDTH IS BUT[D[C]#BA00]
    7350:  !(FREE)
    BUTD[C]B:
            NEXT,    BUT(D[C]#BA00),                          !TO (401),(403), W1
                     J/ZTARGET401                             !MASK OUT BA00
(7350)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...10.011...100.000.001]
```

```

     7351:  !(FREE)
     BUTBADD:
            NEXT,    BUT(D[C]#BADD),                         !TO (402),(403), W1
                     J/ZTARGET402                            !MASK OUT D[C]
(7351)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...10.011...100.000.010]


     !*** BUT 24 ***
     !FULL WIDTH IS BUT[OTHER-JAM#FP-PROC]
     7352:  !(FREE)
     BUTOTHERJAM:
            NEXT,    BUT(OTHER-JAM#FP-PROC),                 !TO (401),(403), W1
                     J/ZTARGET401                            !MASK OUT FLTPT-PROC-H
(7352)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...10.100...100.000.001]

     7354:  !(FREE)
     BUTFPPROC:
            NEXT,    BUT(OTHER-JAM#FP-PROC),                 !TO (402),(403), W1
                     J/ZTARGET402                            !MASK OUT OTHER-JAM
(7354)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...10.100...100.000.010]


     !*** BUT 25 ***
     !FULL WIDTH IS BUT[COUNT-IS-377]                 *** N.B.:  THIS BUT IS ALSO ACTIVE ***
     !(THIS BUT IS NOT USED WITH THE TARGET TABLE)


     !*** BUT 26 ***
     !FULL WIDTH IS BUT[INTR-HIGH#INSTR-BRANCH-L]
     7355:  !(FREE)
     BUTINTRHIGH:
            NEXT,    BUT(INTR-HIGH#INSTR-BRANCH-L),          !TO (401),(403), W1
                     J/ZTARGET401                            !MASK OUT INSTR-BRANCH-L
(7355)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...10.110...100.000.001]

     7356:  !(FREE)
     BUTINSTRBRANCH:
            NEXT,    BUT(INTR-HIGH#INSTR-BRANCH-L),          !TO (402),(403), W1
                     J/ZTARGET402                            !MASK OUT INTR-HIGH-H
(7356)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...10.110...100.000.010]


     !*** BUT 27 ***
     !FULL WIDTH IS BUT[PREFETCH-JAM#FP-FD]
     7360:  !(FREE)
     BUTPREFETCHJAM:
            NEXT,    BUT(PREFETCH-JAM#FP-FD),                !TO (401),(403), W1
                     J/ZTARGET401                            !MASK OUT FLTPT-FD-H
(7360)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...10.111...100.000.001]

     7371:  !(FREE)
     BUTFPFD:
            NEXT,    BUT(PREFETCH-JAM#FP-FD),                !TO (402),(403), W1
```

```
                     J/ZTARGET402                             !MASK OUT PREFETCH-JAM-H
   (7371)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...10.111...100.000.010]





        !.PAGE==================================================================================================


        .TOC    *    MICROBRANCH [BUT] TARGET WORDS

        !*****************************************************************************
        !*                                                                           *
        !*                                               UWORDS: 000 + 400           *
        !*                                                                           *
        !*      FUNCTION:          TARGET BUT TABLE                                  *
        !*                         ALL THE ABOVE BUTS TARGET INTO THIS TABLE OF MICROWORDS,   *
        !*                         ALL OF WHICH DO A BUTA(RETURN).  IN THIS MANNER, ANY OF    *
        !*                         THE ABOVE BRANCHES MAY BE EXECUTED, AND CONTROL WILL ALWAYS *
        !*                         RETURN TO WHERE THE "BUT TES" SUBROUTINE WAS CALLED.       *
        !*                                                                           *
        !*****************************************************************************



        !*** THE TARGET BUT TABLE ***

        7400:
        ZTARGET400:     NEXT,    BUTA(RETURN), J/BUTERROR7        !COMPARE MICROADDRESS, THEN RETURN
   (7400)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
        7401:
        ZTARGET401:     NEXT,    BUTA(RETURN), J/BUTERROR7        !COMPARE MICROADDRESS, THEN RETURN
   (7401)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
        7402:
        ZTARGET402:     NEXT,    BUTA(RETURN), J/BUTERROR7        !COMPARE MICROADDRESS, THEN RETURN
   (7402)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
        7403:
        ZTARGET403:     NEXT,    BUTA(RETURN), J/BUTERROR7        !COMPARE MICROADDRESS, THEN RETURN
   (7403)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
        7404:
        ZTARGET404:     NEXT,    BUTA(RETURN), J/BUTERROR7        !COMPARE MICROADDRESS, THEN RETURN
   (7404)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
        7405:
        ZTARGET405:     NEXT,    BUTA(RETURN), J/BUTERROR7        !COMPARE MICROADDRESS, THEN RETURN
   (7405)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
        7406:
        ZTARGET406:     NEXT,    BUTA(RETURN), J/BUTERROR7        !COMPARE MICROADDRESS, THEN RETURN
   (7406)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
        7407:
        ZTARGET407:     NEXT,    BUTA(RETURN), J/BUTERROR7        !COMPARE MICROADDRESS, THEN RETURN
   (7407)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
        7410:
        ZTARGET410:     NEXT,    BUTA(RETURN), J/BUTERROR7        !COMPARE MICROADDRESS, THEN RETURN
```

C16


```
        (7410)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
        7411:
        ZTARGET411:   NEXT,   BUTA(RETURN), J/BUTERROR7        !COMPARE MICROADDRESS, THEN RETURN
        (7411)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
        7412:
        ZTARGET412:   NEXT,   BUTA(RETURN), J/BUTERROR7        !COMPARE MICROADDRESS, THEN RETURN
        (7412)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
        7413:
        ZTARGET413:   NEXT,   BUTA(RETURN), J/BUTERROR7        !COMPARE MICROADDRESS, THEN RETURN
        (7413)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
        7414:
        ZTARGET414:   NEXT,   BUTA(RETURN), J/BUTERROR7        !COMPARE MICROADDRESS, THEN RETURN
        (7414)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
        7415:
        ZTARGET415:   NEXT,   BUTA(RETURN), J/BUTERROR7        !COMPARE MICROADDRESS, THEN RETURN
        (7415)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
        7416:
        ZTARGET416:   NEXT,   BUTA(RETURN), J/BUTERROR7        !COMPARE MICROADDRESS, THEN RETURN
        (7416)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
        7417:
        ZTARGET417:   NEXT,   BUTA(RETURN), J/BUTERROR7        !COMPARE MICROADDRESS, THEN RETURN
        (7417)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
        7420:
        ZTARGET420:   NEXT,   BUTA(RETURN), J/BUTERROR7        !COMPARE MICROADDRESS, THEN RETURN
        (7420)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
        7421:
        ZTARGET421:   NEXT,   BUTA(RETURN), J/BUTERROR7        !COMPARE MICROADDRESS, THEN RETURN
        (7421)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
        7422:
        ZTARGET422:   NEXT,   BUTA(RETURN), J/BUTERROR7        !COMPARE MICROADDRESS, THEN RETURN
        (7422)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
        7423:
        ZTARGET423:   NEXT,   BUTA(RETURN), J/BUTERROR7        !COMPARE MICROADDRESS, THEN RETURN
        (7423)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
        7424:
        ZTARGET424:   NEXT,   BUTA(RETURN), J/BUTERROR7        !COMPARE MICROADDRESS, THEN RETURN
        (7424)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
        7425:
        ZTARGET425:   NEXT,   BUTA(RETURN), J/BUTERROR7        !COMPARE MICROADDRESS, THEN RETURN
        (7425)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
        7426:
        ZTARGET426:   NEXT,   BUTA(RETURN), J/BUTERROR7        !COMPARE MICROADDRESS, THEN RETURN
        (7426)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
        7427:
        ZTARGET427:   NEXT,   BUTA(RETURN), J/BUTERROR7        !COMPARE MICROADDRESS, THEN RETURN
        (7427)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
        7430:
        ZTARGET430:   NEXT,   BUTA(RETURN), J/BUTERROR7        !COMPARE MICROADDRESS, THEN RETURN
        (7430)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
        7431:
        ZTARGET431:   NEXT,   BUTA(RETURN), J/BUTERROR7        !COMPARE MICROADDRESS, THEN RETURN
        (7431)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
        7432:
        ZTARGET432:   NEXT,   BUTA(RETURN), J/BUTERROR7        !COMPARE MICROADDRESS, THEN RETURN
```

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        (7432) DCS[0.00.0.0.0.0] BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
                7433:
                ZTARGET433:     NEXT,   BUTA(RETURN), J/BUTERROR7           !COMPARE MICROADDRESS, THEN RETURN
        (7433) DCS[0.00.0.0.0.0] BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
                7434:
                ZTARGET434:     NEXT,   BUTA(RETURN), J/BUTERROR7           !COMPARE MICROADDRESS, THEN RETURN
        (7434) DCS[0.00.0.0.0.0] BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
                7435:
                ZTARGET435:     NEXT,   BUTA(RETURN), J/BUTERROR7           !COMPARE MICROADDRESS, THEN RETURN
        (7435) DCS[0.00.0.0.0.0] BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
                7436:
                ZTARGET436:     NEXT,   BUTA(RETURN), J/BUTERROR7           !COMPARE MICROADDRESS, THEN RETURN
        (7436) DCS[0.00.0.0.0.0] BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
                7437:
                ZTARGET437:     NEXT,   BUTA(RETURN), J/BUTERROR7           !COMPARE MICROADDRESS, THEN RETURN
        (7437) DCS[0.00.0.0.0.0] BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
                7440:
                ZTARGET440:     NEXT,   BUTA(RETURN), J/BUTERROR7           !COMPARE MICROADDRESS, THEN RETURN
        (7440) DCS[0.00.0.0.0.0] BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
                7441:
                ZTARGET441:     NEXT,   BUTA(RETURN), J/BUTERROR7           !COMPARE MICROADDRESS, THEN RETURN
        (7441) DCS[0.00.0.0.0.0] BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
                7442:
                ZTARGET442:     NEXT,   BUTA(RETURN), J/BUTERROR7           !COMPARE MICROADDRESS, THEN RETURN
        (7442) DCS[0.00.0.0.0.0] BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
                7443:
                ZTARGET443:     NEXT,   BUTA(RETURN), J/BUTERROR7           !COMPARE MICROADDRESS, THEN RETURN
        (7443) DCS[0.00.0.0.0.0] BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
                7444:
                ZTARGET444:     NEXT,   BUTA(RETURN), J/BUTERROR7           !COMPARE MICROADDRESS, THEN RETURN
        (7444) DCS[0.00.0.0.0.0] BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
                7445:
                ZTARGET445:     NEXT,   BUTA(RETURN), J/BUTERROR7           !COMPARE MICROADDRESS, THEN RETURN
        (7445) DCS[0.00.0.0.0.0] BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
                7446:
                ZTARGET446:     NEXT,   BUTA(RETURN), J/BUTERROR7           !COMPARE MICROADDRESS, THEN RETURN
        (7446) DCS[0.00.0.0.0.0] BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
                7447:
                ZTARGET447:     NEXT,   BUTA(RETURN), J/BUTERROR7           !COMPARE MICROADDRESS, THEN RETURN
        (7447) DCS[0.00.0.0.0.0] BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
                7450:
                ZTARGET450:     NEXT,   BUTA(RETURN), J/BUTERROR7           !COMPARE MICROADDRESS, THEN RETURN
        (7450) DCS[0.00.0.0.0.0] BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
                7451:
                ZTARGET451:     NEXT,   BUTA(RETURN), J/BUTERROR7           !COMPARE MICROADDRESS, THEN RETURN
        (7451) DCS[0.00.0.0.0.0] BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
                7452:
                ZTARGET452:     NEXT,   BUTA(RETURN), J/BUTERROR7           !COMPARE MICROADDRESS, THEN RETURN
        (7452) DCS[0.00.0.0.0.0] BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
                7453:
                ZTARGET453:     NEXT,   BUTA(RETURN), J/BUTERROR7           !COMPARE MICROADDRESS, THEN RETURN
        (7453) DCS[0.00.0.0.0.0] BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
                7454:
                ZTARGET454:     NEXT,   BUTA(RETURN), J/BUTERROR7           !COMPARE MICROADDRESS, THEN RETURN
```

```
      (7454)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
              7455:
         ZTARGET455:    NEXT,    BUTA(RETURN), J/BUTERROR7          !COMPARE MICROADDRESS, THEN RETURN
      (7455)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
              7456:
         ZTARGET456:    NEXT,    BUTA(RETURN), J/BUTERROR7          !COMPARE MICROADDRESS, THEN RETURN
      (7456)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
              7457:
         ZTARGET457:    NEXT,    BUTA(RETURN), J/BUTERROR7          !COMPARE MICROADDRESS, THEN RETURN
      (7457)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
              7460:
         ZTARGET460:    NEXT,    BUTA(RETURN), J/BUTERROR7          !COMPARE MICROADDRESS, THEN RETURN
      (7460)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
              7461:
         ZTARGET461:    NEXT,    BUTA(RETURN), J/BUTERROR7          !COMPARE MICROADDRESS, THEN RETURN
      (7461)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
              7462:
         ZTARGET462:    NEXT,    BUTA(RETURN), J/BUTERROR7          !COMPARE MICROADDRESS, THEN RETURN
      (7462)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
              7463:
         ZTARGET463:    NEXT,    BUTA(RETURN), J/BUTERROR7          !COMPARE MICROADDRESS, THEN RETURN
      (7463)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
              7464:
         ZTARGET464:    NEXT,    BUTA(RETURN), J/BUTERROR7          !COMPARE MICROADDRESS, THEN RETURN
      (7464)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
              7465:
         ZTARGET465:    NEXT,    BUTA(RETURN), J/BUTERROR7          !COMPARE MICROADDRESS, THEN RETURN
      (7465)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
              7466:
         ZTARGET466:    NEXT,    BUTA(RETURN), J/BUTERROR7          !COMPARE MICROADDRESS, THEN RETURN
      (7466)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
              7467:
         ZTARGET467:    NEXT,    BUTA(RETURN), J/BUTERROR7          !COMPARE MICROADDRESS, THEN RETURN
      (7467)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
              7470:
         ZTARGET470:    NEXT,    BUTA(RETURN), J/BUTERROR7          !COMPARE MICROADDRESS, THEN RETURN
      (7470)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
              7471:
         ZTARGET471:    NEXT,    BUTA(RETURN), J/BUTERROR7          !COMPARE MICROADDRESS, THEN RETURN
      (7471)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
              7472:
         ZTARGET472:    NEXT,    BUTA(RETURN), J/BUTERROR7          !COMPARE MICROADDRESS, THEN RETURN
      (7472)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
              7473:
         ZTARGET473:    NEXT,    BUTA(RETURN), J/BUTERROR7          !COMPARE MICROADDRESS, THEN RETURN
      (7473)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
              7474:
         ZTARGET474:    NEXT,    BUTA(RETURN), J/BUTERROR7          !COMPARE MICROADDRESS, THEN RETURN
      (7474)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
              7475:
         ZTARGET475:    NEXT,    BUTA(RETURN), J/BUTERROR7          !COMPARE MICROADDRESS, THEN RETURN
      (7475)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
              7476:
         ZTARGET476:    NEXT,    BUTA(RETURN), J/BUTERROR7          !COMPARE MICROADDRESS, THEN RETURN
```

```
        (7476)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
          7477:
        ZTARGET477:    NEXT,    BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7477)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
          7500:
        ZTARGET500:    NEXT,    BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7500)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
          7501:
        ZTARGET501:    NEXT,    BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7501)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
          7502:
        ZTARGET502:    NEXT,    BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7502)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
          7503:
        ZTARGET503:    NEXT,    BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7503)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
          7504:
        ZTARGET504:    NEXT,    BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7504)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
          7505:
        ZTARGET505:    NEXT,    BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7505)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
          7506:
        ZTARGET506:    NEXT,    BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7506)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
          7507:
        ZTARGET507:    NEXT,    BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7507)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
          7510:
        ZTARGET510:    NEXT,    BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7510)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
          7511:
        ZTARGET511:    NEXT,    BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7511)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
          7512:
        ZTARGET512:    NEXT,    BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7512)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
          7513:
        ZTARGET513:    NEXT,    BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7513)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
          7514:
        ZTARGET514:    NEXT,    BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7514)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
          7515:
        ZTARGET515:    NEXT,    BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7515)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
          7516:
        ZTARGET516:    NEXT,    BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7516)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
          7517:
        ZTARGET517:    NEXT,    BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7517)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
          7520:
        ZTARGET520:    NEXT,    BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
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      (7520)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
        7521:
        ZTARGET521:    NEXT,    BUTA(RETURN), J/BUTERROR7        !COMPARE MICROADDRESS, THEN RETURN
      (7521)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
        7522:
        ZTARGET522:    NEXT,    BUTA(RETURN), J/BUTERROR7        !COMPARE MICROADDRESS, THEN RETURN
      (7522)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
        7523:
        ZTARGET523:    NEXT,    BUTA(RETURN), J/BUTERROR7        !COMPARE MICROADDRESS, THEN RETURN
      (7523)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
        7524:
        ZTARGET524:    NEXT,    BUTA(RETURN), J/BUTERROR7        !COMPARE MICROADDRESS, THEN RETURN
      (7524)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
        7525:
        ZTARGET525:    NEXT,    BUTA(RETURN), J/BUTERROR7        !COMPARE MICROADDRESS, THEN RETURN
      (7525)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
        7526:
        ZTARGET526:    NEXT,    BUTA(RETURN), J/BUTERROR7        !COMPARE MICROADDRESS, THEN RETURN
      (7526)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
        7527:
        ZTARGET527:    NEXT,    BUTA(RETURN), J/BUTERROR7        !COMPARE MICROADDRESS, THEN RETURN
      (7527)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
        7530:
        ZTARGET530:    NEXT,    BUTA(RETURN), J/BUTERROR7        !COMPARE MICROADDRESS, THEN RETURN
      (7530)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
        7531:
        ZTARGET531:    NEXT,    BUTA(RETURN), J/BUTERROR7        !COMPARE MICROADDRESS, THEN RETURN
      (7531)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
        7532:
        ZTARGET532:    NEXT,    BUTA(RETURN), J/BUTERROR7        !COMPARE MICROADDRESS, THEN RETURN
      (7532)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
        7533:
        ZTARGET533:    NEXT,    BUTA(RETURN), J/BUTERROR7        !COMPARE MICROADDRESS, THEN RETURN
      (7533)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
        7534:
        ZTARGET534:    NEXT,    BUTA(RETURN), J/BUTERROR7        !COMPARE MICROADDRESS, THEN RETURN
      (7534)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
        7535:
        ZTARGET535:    NEXT,    BUTA(RETURN), J/BUTERROR7        !COMPARE MICROADDRESS, THEN RETURN
      (7535)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
        7536:
        ZTARGET536:    NEXT,    BUTA(RETURN), J/BUTERROR7        !COMPARE MICROADDRESS, THEN RETURN
      (7536)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
        7537:
        ZTARGET537:    NEXT,    BUTA(RETURN), J/BUTERROR7        !COMPARE MICROADDRESS, THEN RETURN
      (7537)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
        7540:
        ZTARGET540:    NEXT,    BUTA(RETURN), J/BUTERROR7        !COMPARE MICROADDRESS, THEN RETURN
      (7540)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
        7541:
        ZTARGET541:    NEXT,    BUTA(RETURN), J/BUTERROR7        !COMPARE MICROADDRESS, THEN RETURN
      (7541)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
        7542:
        ZTARGET542:    NEXT,    BUTA(RETURN), J/BUTERROR7        !COMPARE MICROADDRESS, THEN RETURN
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      (7542)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
        7543:
        ZTARGET543:    NEXT,   BUTA(RETURN), J/BUTERROR7        !COMPARE MICROADDRESS, THEN RETURN
      (7543)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
        7544:
        ZTARGET544:    NEXT,   BUTA(RETURN), J/BUTERROR7        !COMPARE MICROADDRESS, THEN RETURN
      (7544)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
        7545:
        ZTARGET545:    NEXT,   BUTA(RETURN), J/BUTERROR7        !COMPARE MICROADDRESS, THEN RETURN
      (7545)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
        7546:
        ZTARGET546:    NEXT,   BUTA(RETURN), J/BUTERROR7        !COMPARE MICROADDRESS, THEN RETURN
      (7546)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
        7547:
        ZTARGET547:    NEXT,   BUTA(RETURN), J/BUTERROR7        !COMPARE MICROADDRESS, THEN RETURN
      (7547)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
        7550:
        ZTARGET550:    NEXT,   BUTA(RETURN), J/BUTERROR7        !COMPARE MICROADDRESS, THEN RETURN
      (7550)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
        7551:
        ZTARGET551:    NEXT,   BUTA(RETURN), J/BUTERROR7        !COMPARE MICROADDRESS, THEN RETURN
      (7551)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
        7552:
        ZTARGET552:    NEXT,   BUTA(RETURN), J/BUTERROR7        !COMPARE MICROADDRESS, THEN RETURN
      (7552)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
        7553:
        ZTARGET553:    NEXT,   BUTA(RETURN), J/BUTERROR7        !COMPARE MICROADDRESS, THEN RETURN
      (7553)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
        7554:
        ZTARGET554:    NEXT,   BUTA(RETURN), J/BUTERROR7        !COMPARE MICROADDRESS, THEN RETURN
      (7554)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
        7555:
        ZTARGET555:    NEXT,   BUTA(RETURN), J/BUTERROR7        !COMPARE MICROADDRESS, THEN RETURN
      (7555)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
        7556:
        ZTARGET556:    NEXT,   BUTA(RETURN), J/BUTERROR7        !COMPARE MICROADDRESS, THEN RETURN
      (7556)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
        7557:
        ZTARGET557:    NEXT,   BUTA(RETURN), J/BUTERROR7        !COMPARE MICROADDRESS, THEN RETURN
      (7557)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
        7560:
        ZTARGET560:    NEXT,   BUTA(RETURN), J/BUTERROR7        !COMPARE MICROADDRESS, THEN RETURN
      (7560)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
        7561:
        ZTARGET561:    NEXT,   BUTA(RETURN), J/BUTERROR7        !COMPARE MICROADDRESS, THEN RETURN
      (7561)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
        7562:
        ZTARGET562:    NEXT,   BUTA(RETURN), J/BUTERROR7        !COMPARE MICROADDRESS, THEN RETURN
      (7562)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
        7563:
        ZTARGET563:    NEXT,   BUTA(RETURN), J/BUTERROR7        !COMPARE MICROADDRESS, THEN RETURN
      (7563)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
        7564:
        ZTARGET564:    NEXT,   BUTA(RETURN), J/BUTERROR7        !COMPARE MICROADDRESS, THEN RETURN
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 (7564)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
          7565:
         ZTARGET565:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
 (7565)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
          7566:
         ZTARGET566:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
 (7566)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
          7567:
         ZTARGET567:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
 (7567)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
          7570:
         ZTARGET570:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
 (7570)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
          7571:
         ZTARGET571:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
 (7571)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
          7572:
         ZTARGET572:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
 (7572)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
          7573:
         ZTARGET573:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
 (7573)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
          7574:
         ZTARGET574:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
 (7574)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
          7575:
         ZTARGET575:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
 (7575)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
          7576:
         ZTARGET576:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
 (7576)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
          7577:
         ZTARGET577:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
 (7577)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
          7600:
         ZTARGET600:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
 (7600)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
          7601:
         ZTARGET601:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
 (7601)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
          7602:
         ZTARGET602:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
 (7602)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
          7603:
         ZTARGET603:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
 (7603)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
          7604:
         ZTARGET604:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
 (7604)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
          7605:
         ZTARGET605:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
 (7605)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
          7606:
         ZTARGET606:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
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     (7606)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
          7607:
          ZTARGET607:     NEXT,    BUTA(RETURN), J/BUTERROR7        !COMPARE MICROADDRESS, THEN RETURN
     (7607)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
          7610:
          ZTARGET610:     NEXT,    BUTA(RETURN), J/BUTERROR7        !COMPARE MICROADDRESS, THEN RETURN
     (7610)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
          7611:
          ZTARGET611:     NEXT,    BUTA(RETURN), J/BUTERROR7        !COMPARE MICROADDRESS, THEN RETURN
     (7611)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
          7612:
          ZTARGET612:     NEXT,    BUTA(RETURN), J/BUTERROR7        !COMPARE MICROADDRESS, THEN RETURN
     (7612)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
          7613:
          ZTARGET613:     NEXT,    BUTA(RETURN), J/BUTERROR7        !COMPARE MICROADDRESS, THEN RETURN
     (7613)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
          7614:
          ZTARGET614:     NEXT,    BUTA(RETURN), J/BUTERROR7        !COMPARE MICROADDRESS, THEN RETURN
     (7614)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
          7615:
          ZTARGET615:     NEXT,    BUTA(RETURN), J/BUTERROR7        !COMPARE MICROADDRESS, THEN RETURN
     (7615)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
          7616:
          ZTARGET616:     NEXT,    BUTA(RETURN), J/BUTERROR7        !COMPARE MICROADDRESS, THEN RETURN
     (7616)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
          7617:
          ZTARGET617:     NEXT,    BUTA(RETURN), J/BUTERROR7        !COMPARE MICROADDRESS, THEN RETURN
     (7617)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
          7620:
          ZTARGET620:     NEXT,    BUTA(RETURN), J/BUTERROR7        !COMPARE MICROADDRESS, THEN RETURN
     (7620)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
          7621:
          ZTARGET621:     NEXT,    BUTA(RETURN), J/BUTERROR7        !COMPARE MICROADDRESS, THEN RETURN
     (7621)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
          7622:
          ZTARGET622:     NEXT,    BUTA(RETURN), J/BUTERROR7        !COMPARE MICROADDRESS, THEN RETURN
     (7622)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
          7623:
          ZTARGET623:     NEXT,    BUTA(RETURN), J/BUTERROR7        !COMPARE MICROADDRESS, THEN RETURN
     (7623)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
          7624:
          ZTARGET624:     NEXT,    BUTA(RETURN), J/BUTERROR7        !COMPARE MICROADDRESS, THEN RETURN
     (7624)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
          7625:
          ZTARGET625:     NEXT,    BUTA(RETURN), J/BUTERROR7        !COMPARE MICROADDRESS, THEN RETURN
     (7625)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
          7626:
          ZTARGET626:     NEXT,    BUTA(RETURN), J/BUTERROR7        !COMPARE MICROADDRESS, THEN RETURN
     (7626)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
          7627:
          ZTARGET627:     NEXT,    BUTA(RETURN), J/BUTERROR7        !COMPARE MICROADDRESS, THEN RETURN
     (7627)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
          7630:
          ZTARGET630:     NEXT,    BUTA(RETURN), J/BUTERROR7        !COMPARE MICROADDRESS, THEN RETURN
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    (7630)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
        7631:
        ZTARGET631:     NEXT,    BUTA(RETURN), J/BUTERROR7        !COMPARE MICROADDRESS, THEN RETURN
    (7631)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
        7632:
        ZTARGET632:     NEXT,    BUTA(RETURN), J/BUTERROR7        !COMPARE MICROADDRESS, THEN RETURN
    (7632)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
        7633:
        ZTARGET633:     NEXT,    BUTA(RETURN), J/BUTERROR7        !COMPARE MICROADDRESS, THEN RETURN
    (7633)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
        7634:
        ZTARGET634:     NEXT,    BUTA(RETURN), J/BUTERROR7        !COMPARE MICROADDRESS, THEN RETURN
    (7634)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
        7635:
        ZTARGET635:     NEXT,    BUTA(RETURN), J/BUTERROR7        !COMPARE MICROADDRESS, THEN RETURN
    (7635)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
        7636:
        ZTARGET636:     NEXT,    BUTA(RETURN), J/BUTERROR7        !COMPARE MICROADDRESS, THEN RETURN
    (7636)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
        7637:
        ZTARGET637:     NEXT,    BUTA(RETURN), J/BUTERROR7        !COMPARE MICROADDRESS, THEN RETURN
    (7637)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
        7640:
        ZTARGET640:     NEXT,    BUTA(RETURN), J/BUTERROR7        !COMPARE MICROADDRESS, THEN RETURN
    (7640)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
        7641:
        ZTARGET641:     NEXT,    BUTA(RETURN), J/BUTERROR7        !COMPARE MICROADDRESS, THEN RETURN
    (7641)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
        7642:
        ZTARGET642:     NEXT,    BUTA(RETURN), J/BUTERROR7        !COMPARE MICROADDRESS, THEN RETURN
    (7642)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
        7643:
        ZTARGET643:     NEXT,    BUTA(RETURN), J/BUTERROR7        !COMPARE MICROADDRESS, THEN RETURN
    (7643)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
        7644:
        ZTARGET644:     NEXT,    BUTA(RETURN), J/BUTERROR7        !COMPARE MICROADDRESS, THEN RETURN
    (7644)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
        7645:
        ZTARGET645:     NEXT,    BUTA(RETURN), J/BUTERROR7        !COMPARE MICROADDRESS, THEN RETURN
    (7645)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
        7646:
        ZTARGET646:     NEXT,    BUTA(RETURN), J/BUTERROR7        !COMPARE MICROADDRESS, THEN RETURN
    (7646)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
        7647:
        ZTARGET647:     NEXT,    BUTA(RETURN), J/BUTERROR7        !COMPARE MICROADDRESS, THEN RETURN
    (7647)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
        7650:
        ZTARGET650:     NEXT,    BUTA(RETURN), J/BUTERROR7        !COMPARE MICROADDRESS, THEN RETURN
    (7650)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
        7651:
        ZTARGET651:     NEXT,    BUTA(RETURN), J/BUTERROR7        !COMPARE MICROADDRESS, THEN RETURN
    (7651)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
        7652:
        ZTARGET652:     NEXT,    BUTA(RETURN), J/BUTERROR7        !COMPARE MICROADDRESS, THEN RETURN
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      (7652) DCS[0.00.0.0.0.0] BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19593   7653:
19594   ZTARGET653:    NEXT,   BUTA(RETURN), J/BUTERROR7      !COMPARE MICROADDRESS, THEN RETURN
      (7653) DCS[0.00.0.0.0.0] BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19595   7654:
19596   ZTARGET654:    NEXT,   BUTA(RETURN), J/BUTERROR7      !COMPARE MICROADDRESS, THEN RETURN
      (7654) DCS[0.00.0.0.0.0] BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19597   7655:
19598   ZTARGET655:    NEXT,   BUTA(RETURN), J/BUTERROR7      !COMPARE MICROADDRESS, THEN RETURN
      (7655) DCS[0.00.0.0.0.0] BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19599   7656:
19600   ZTARGET656:    NEXT,   BUTA(RETURN), J/BUTERROR7      !COMPARE MICROADDRESS, THEN RETURN
      (7656) DCS[0.00.0.0.0.0] BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19601   7657:
19602   ZTARGET657:    NEXT,   BUTA(RETURN), J/BUTERROR7      !COMPARE MICROADDRESS, THEN RETURN
      (7657) DCS[0.00.0.0.0.0] BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19603   7660:
19604   ZTARGET660:    NEXT,   BUTA(RETURN), J/BUTERROR7      !COMPARE MICROADDRESS, THEN RETURN
      (7660) DCS[0.00.0.0.0.0] BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19605   7661:
19606   ZTARGET661:    NEXT,   BUTA(RETURN), J/BUTERROR7      !COMPARE MICROADDRESS, THEN RETURN
      (7661) DCS[0.00.0.0.0.0] BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19607   7662:
19608   ZTARGET662:    NEXT,   BUTA(RETURN), J/BUTERROR7      !COMPARE MICROADDRESS, THEN RETURN
      (7662) DCS[0.00.0.0.0.0] BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19609   7663:
19610   ZTARGET663:    NEXT,   BUTA(RETURN), J/BUTERROR7      !COMPARE MICROADDRESS, THEN RETURN
      (7663) DCS[0.00.0.0.0.0] BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19611   7664:
19612   ZTARGET664:    NEXT,   BUTA(RETURN), J/BUTERROR7      !COMPARE MICROADDRESS, THEN RETURN
      (7664) DCS[0.00.0.0.0.0] BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19613   7665:
19614   ZTARGET665:    NEXT,   BUTA(RETURN), J/BUTERROR7      !COMPARE MICROADDRESS, THEN RETURN
      (7665) DCS[0.00.0.0.0.0] BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19615   7666:
19616   ZTARGET666:    NEXT,   BUTA(RETURN), J/BUTERROR7      !COMPARE MICROADDRESS, THEN RETURN
      (7666) DCS[0.00.0.0.0.0] BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19617   7667:
19618   ZTARGET667:    NEXT,   BUTA(RETURN), J/BUTERROR7      !COMPARE MICROADDRESS, THEN RETURN
      (7667) DCS[0.00.0.0.0.0] BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19619   7670:
19620   ZTARGET670:    NEXT,   BUTA(RETURN), J/BUTERROR7      !COMPARE MICROADDRESS, THEN RETURN
      (7670) DCS[0.00.0.0.0.0] BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19621   7671:
19622   ZTARGET671:    NEXT,   BUTA(RETURN), J/BUTERROR7      !COMPARE MICROADDRESS, THEN RETURN
      (7671) DCS[0.00.0.0.0.0] BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19623   7672:
19624   ZTARGET672:    NEXT,   BUTA(RETURN), J/BUTERROR7      !COMPARE MICROADDRESS, THEN RETURN
      (7672) DCS[0.00.0.0.0.0] BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19625   7673:
19626   ZTARGET673:    NEXT,   BUTA(RETURN), J/BUTERROR7      !COMPARE MICROADDRESS, THEN RETURN
      (7673) DCS[0.00.0.0.0.0] BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19627   7674:
19628   ZTARGET674:    NEXT,   BUTA(RETURN), J/BUTERROR7      !COMPARE MICROADDRESS, THEN RETURN
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	(7674)	DCS[0.00.0.0.0.0]	BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
		7675:
		ZTARGET675:	NEXT,	BUTA(RETURN), J/BUTERROR7	!COMPARE MICROADDRESS, THEN RETURN
	(7675)	DCS[0.00.0.0.0.0]	BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
		7676:
		ZTARGET676:	NEXT,	BUTA(RETURN), J/BUTERROR7	!COMPARE MICROADDRESS, THEN RETURN
	(7676)	DCS[0.00.0.0.0.0]	BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
		7677:
		ZTARGET677:	NEXT,	BUTA(RETURN), J/BUTERROR7	!COMPARE MICROADDRESS, THEN RETURN
	(7677)	DCS[0.00.0.0.0.0]	BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
		7700:
		ZTARGET700:	NEXT,	BUTA(RETURN), J/BUTERROR7	!COMPARE MICROADDRESS, THEN RETURN
	(7700)	DCS[0.00.0.0.0.0]	BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
		7701:
		ZTARGET701:	NEXT,	BUTA(RETURN), J/BUTERROR7	!COMPARE MICROADDRESS, THEN RETURN
	(7701)	DCS[0.00.0.0.0.0]	BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
		7702:
		ZTARGET702:	NEXT,	BUTA(RETURN), J/BUTERROR7	!COMPARE MICROADDRESS, THEN RETURN
	(7702)	DCS[0.00.0.0.0.0]	BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
		7703:
		ZTARGET703:	NEXT,	BUTA(RETURN), J/BUTERROR7	!COMPARE MICROADDRESS, THEN RETURN
	(7703)	DCS[0.00.0.0.0.0]	BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
		7704:
		ZTARGET704:	NEXT,	BUTA(RETURN), J/BUTERROR7	!COMPARE MICROADDRESS, THEN RETURN
	(7704)	DCS[0.00.0.0.0.0]	BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
		7705:
		ZTARGET705:	NEXT,	BUTA(RETURN), J/BUTERROR7	!COMPARE MICROADDRESS, THEN RETURN
	(7705)	DCS[0.00.0.0.0.0]	BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
		7706:
		ZTARGET706:	NEXT,	BUTA(RETURN), J/BUTERROR7	!COMPARE MICROADDRESS, THEN RETURN
	(7706)	DCS[0.00.0.0.0.0]	BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
		7707:
		ZTARGET707:	NEXT,	BUTA(RETURN), J/BUTERROR7	!COMPARE MICROADDRESS, THEN RETURN
	(7707)	DCS[0.00.0.0.0.0]	BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
		7710:
		ZTARGET710:	NEXT,	BUTA(RETURN), J/BUTERROR7	!COMPARE MICROADDRESS, THEN RETURN
	(7710)	DCS[0.00.0.0.0.0]	BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
		7711:
		ZTARGET711:	NEXT,	BUTA(RETURN), J/BUTERROR7	!COMPARE MICROADDRESS, THEN RETURN
	(7711)	DCS[0.00.0.0.0.0]	BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
		7712:
		ZTARGET712:	NEXT,	BUTA(RETURN), J/BUTERROR7	!COMPARE MICROADDRESS, THEN RETURN
	(7712)	DCS[0.00.0.0.0.0]	BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
		7713:
		ZTARGET713:	NEXT,	BUTA(RETURN), J/BUTERROR7	!COMPARE MICROADDRESS, THEN RETURN
	(7713)	DCS[0.00.0.0.0.0]	BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
		7714:
		ZTARGET714:	NEXT,	BUTA(RETURN), J/BUTERROR7	!COMPARE MICROADDRESS, THEN RETURN
	(7714)	DCS[0.00.0.0.0.0]	BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
		7715:
		ZTARGET715:	NEXT,	BUTA(RETURN), J/BUTERROR7	!COMPARE MICROADDRESS, THEN RETURN
	(7715)	DCS[0.00.0.0.0.0]	BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
		7716:
		ZTARGET716:	NEXT,	BUTA(RETURN), J/BUTERROR7	!COMPARE MICROADDRESS, THEN RETURN
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     (7716) DCS[0.00.0.0.0.0] BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
        7717:
        ZTARGET717:    NEXT,    BUTA(RETURN), J/BUTERROR7          !COMPARE MICROADDRESS, THEN RETURN
     (7717) DCS[0.00.0.0.0.0] BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
        7720:
        ZTARGET720:    NEXT,    BUTA(RETURN), J/BUTERROR7          !COMPARE MICROADDRESS, THEN RETURN
     (7720) DCS[0.00.0.0.0.0] BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
        7721:
        ZTARGET721:    NEXT,    BUTA(RETURN), J/BUTERROR7          !COMPARE MICROADDRESS, THEN RETURN
     (7721) DCS[0.00.0.0.0.0] BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
        7722:
        ZTARGET722:    NEXT,    BUTA(RETURN), J/BUTERROR7          !COMPARE MICROADDRESS, THEN RETURN
     (7722) DCS[0.00.0.0.0.0] BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
        7723:
        ZTARGET723:    NEXT,    BUTA(RETURN), J/BUTERROR7          !COMPARE MICROADDRESS, THEN RETURN
     (7723) DCS[0.00.0.0.0.0] BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
        7724:
        ZTARGET724:    NEXT,    BUTA(RETURN), J/BUTERROR7          !COMPARE MICROADDRESS, THEN RETURN
     (7724) DCS[0.00.0.0.0.0] BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
        7725:
        ZTARGET725:    NEXT,    BUTA(RETURN), J/BUTERROR7          !COMPARE MICROADDRESS, THEN RETURN
     (7725) DCS[0.00.0.0.0.0] BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
        7726:
        ZTARGET726:    NEXT,    BUTA(RETURN), J/BUTERROR7          !COMPARE MICROADDRESS, THEN RETURN
     (7726) DCS[0.00.0.0.0.0] BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
        7727:
        ZTARGET727:    NEXT,    BUTA(RETURN), J/BUTERROR7          !COMPARE MICROADDRESS, THEN RETURN
     (7727) DCS[0.00.0.0.0.0] BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
        7730:
        ZTARGET730:    NEXT,    BUTA(RETURN), J/BUTERROR7          !COMPARE MICROADDRESS, THEN RETURN
     (7730) DCS[0.00.0.0.0.0] BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
        7731:
        ZTARGET731:    NEXT,    BUTA(RETURN), J/BUTERROR7          !COMPARE MICROADDRESS, THEN RETURN
     (7731) DCS[0.00.0.0.0.0] BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
        7732:
        ZTARGET732:    NEXT,    BUTA(RETURN), J/BUTERROR7          !COMPARE MICROADDRESS, THEN RETURN
     (7732) DCS[0.00.0.0.0.0] BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
        7733:
        ZTARGET733:    NEXT,    BUTA(RETURN), J/BUTERROR7          !COMPARE MICROADDRESS, THEN RETURN
     (7733) DCS[0.00.0.0.0.0] BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
        7734:
        ZTARGET734:    NEXT,    BUTA(RETURN), J/BUTERROR7          !COMPARE MICROADDRESS, THEN RETURN
     (7734) DCS[0.00.0.0.0.0] BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
        7735:
        ZTARGET735:    NEXT,    BUTA(RETURN), J/BUTERROR7          !COMPARE MICROADDRESS, THEN RETURN
     (7735) DCS[0.00.0.0.0.0] BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
        7736:
        ZTARGET736:    NEXT,    BUTA(RETURN), J/BUTERROR7          !COMPARE MICROADDRESS, THEN RETURN
     (7736) DCS[0.00.0.0.0.0] BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
        7737:
        ZTARGET737:    NEXT,    BUTA(RETURN), J/BUTERROR7          !COMPARE MICROADDRESS, THEN RETURN
     (7737) DCS[0.00.0.0.0.0] BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
        7740:
        ZTARGET740:    NEXT,    BUTA(RETURN), J/BUTERROR7          !COMPARE MICROADDRESS, THEN RETURN
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      (7740) DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
         7741:
         ZTARGET741:    NEXT,   BUTA(RETURN), J/BUTERROR7        !COMPARE MICROADDRESS, THEN RETURN
      (7741) DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
         7742:
         ZTARGET742:    NEXT,   BUTA(RETURN), J/BUTERROR7        !COMPARE MICROADDRESS, THEN RETURN
      (7742) DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
         7743:
         ZTARGET743:    NEXT,   BUTA(RETURN), J/BUTERROR7        !COMPARE MICROADDRESS, THEN RETURN
      (7743) DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
         7744:
         ZTARGET744:    NEXT,   BUTA(RETURN), J/BUTERROR7        !COMPARE MICROADDRESS, THEN RETURN
      (7744) DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
         7745:
         ZTARGET745:    NEXT,   BUTA(RETURN), J/BUTERROR7        !COMPARE MICROADDRESS, THEN RETURN
      (7745) DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
         7746:
         ZTARGET746:    NEXT,   BUTA(RETURN), J/BUTERROR7        !COMPARE MICROADDRESS, THEN RETURN
      (7746) DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
         7747:
         ZTARGET747:    NEXT,   BUTA(RETURN), J/BUTERROR7        !COMPARE MICROADDRESS, THEN RETURN
      (7747) DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
         7750:
         ZTARGET750:    NEXT,   BUTA(RETURN), J/BUTERROR7        !COMPARE MICROADDRESS, THEN RETURN
      (7750) DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
         7751:
         ZTARGET751:    NEXT,   BUTA(RETURN), J/BUTERROR7        !COMPARE MICROADDRESS, THEN RETURN
      (7751) DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
         7752:
         ZTARGET752:    NEXT,   BUTA(RETURN), J/BUTERROR7        !COMPARE MICROADDRESS, THEN RETURN
      (7752) DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
         7753:
         ZTARGET753:    NEXT,   BUTA(RETURN), J/BUTERROR7        !COMPARE MICROADDRESS, THEN RETURN
      (7753) DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
         7754:
         ZTARGET754:    NEXT,   BUTA(RETURN), J/BUTERROR7        !COMPARE MICROADDRESS, THEN RETURN
      (7754) DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
         7755:
         ZTARGET755:    NEXT,   BUTA(RETURN), J/BUTERROR7        !COMPARE MICROADDRESS, THEN RETURN
      (7755) DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
         7756:
         ZTARGET756:    NEXT,   BUTA(RETURN), J/BUTERROR7        !COMPARE MICROADDRESS, THEN RETURN
      (7756) DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
         7757:
         ZTARGET757:    NEXT,   BUTA(RETURN), J/BUTERROR7        !COMPARE MICROADDRESS, THEN RETURN
      (7757) DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
         7760:
         ZTARGET760:    NEXT,   BUTA(RETURN), J/BUTERROR7        !COMPARE MICROADDRESS, THEN RETURN
      (7760) DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
         7761:
         ZTARGET761:    NEXT,   BUTA(RETURN), J/BUTERROR7        !COMPARE MICROADDRESS, THEN RETURN
      (7761) DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
         7762:
         ZTARGET762:    NEXT,   BUTA(RETURN), J/BUTERROR7        !COMPARE MICROADDRESS, THEN RETURN
```

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(7762)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
       7763:
       ZTARGET763:      NEXT,    BUTA(RETURN), J/BUTERROR7        !COMPARE MICROADDRESS, THEN RETURN
(7763)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
       7764:
       ZTARGET764:      NEXT,    BUTA(RETURN), J/BUTERROR7        !COMPARE MICROADDRESS, THEN RETURN
(7764)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
       7765:
       ZTARGET765:      NEXT,    BUTA(RETURN), J/BUTERROR7        !COMPARE MICROADDRESS, THEN RETURN
(7765)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
       7766:
       ZTARGET766:      NEXT,    BUTA(RETURN), J/BUTERROR7        !COMPARE MICROADDRESS, THEN RETURN
(7766)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
       7767:
       ZTARGET767:      NEXT,    BUTA(RETURN), J/BUTERROR7        !COMPARE MICROADDRESS, THEN RETURN
(7767)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
       7770:
       ZTARGET770:      NEXT,    BUTA(RETURN), J/BUTERROR7        !COMPARE MICROADDRESS, THEN RETURN
(7770)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
       7771:
       ZTARGET771:      NEXT,    BUTA(RETURN), J/BUTERROR7        !COMPARE MICROADDRESS, THEN RETURN
(7771)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
       7772:
       ZTARGET772:      NEXT,    BUTA(RETURN), J/BUTERROR7        !COMPARE MICROADDRESS, THEN RETURN
(7772)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
       7773:
       ZTARGET773:      NEXT,    BUTA(RETURN), J/BUTERROR7        !COMPARE MICROADDRESS, THEN RETURN
(7773)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
       7774:
       ZTARGET774:      NEXT,    BUTA(RETURN), J/BUTERROR7        !COMPARE MICROADDRESS, THEN RETURN
(7774)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
       7775:
       ZTARGET775:      NEXT,    BUTA(RETURN), J/BUTERROR7        !COMPARE MICROADDRESS, THEN RETURN
(7775)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
       7776:
       ZTARGET776:      NEXT,    BUTA(RETURN), J/BUTERROR7        !COMPARE MICROADDRESS, THEN RETURN
(7776)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
       7777:
       ZTARGET777:      NEXT,    BUTA(RETURN), J/BUTERROR7        !COMPARE MICROADDRESS, THEN RETURN
(7777)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]


       !********************************************************************************
       .TOC   * END OF KD11-K MICRODIAGNOSTIC CODE
       !********************************************************************************

       .END
```

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7100	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
7140	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
7200	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

7240	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0
7300	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
7340	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	0
7400	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
7440	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
7500	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
7540	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
7600	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
7640	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
7700	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
7740	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

G01

LINE	LOCN	SYMBOL	LINE	LOCN	SYMBOL	LINE	LOCN	SYMBOL	LINE	LOCN	SYMBOL
8399	7025	AGAINSRD350	14400	7155	AL1-537A	18075	4731	ALLOW763A	5887	4003	ALU114A
5946	4610	ALU115A1	6028	4015	ALU115B1	6111	4622	ALU115C1	6171	4026	ALU115D1
6242	4634	ALU116A1	6333	4040	ALU116B	6366	4646	ALU116C1	6459	4050	ALU116D
6502	4666	ALU117A1	6577	4057	ALU117B1	6640	4063	ALU117C1	6692	4664	ALU120A1
6752	4072	ALU120B1	6839	4706	ALU121A1	6913	4107	ALU121B1	6994	4670	ALU121C1
7068	4121	ALU121D1	7155	4672	ALU122A1	8041	7007	ALUCARRY1	8050	7017	ALUCARRY1A
8058	7020	ALUCARRY2	8067	7021	ALUCARRY2A	14347	7145	AR11-537A	14298	6451	AR3-537A
14323	7141	AR7-537A	7290	4540	ARITH130A1	7341	4140	ARITH130B1	7399	4520	ARITH131A1
7450	4150	ARITH131B1	7509	4522	ARITH132A1	7554	4157	ARITH132B1	10856	6114	ASIDE410C
11048	6525	ASSERTFOVS00	15612	5413	BC1FCN622A	15269	5570	BCERC620A	15641	5416	BCERC622B
17504	7204	BDX05	17492	7177	BDX12	14407	4242	BL1-537A	14353	7146	BR11-537A
14305	7134	BR3-537A	14329	7142	BR7-537A	17885	4551	BUMPD762A	16180	4313	BUSFCN710A
16342	4311	BUSFCN711A	16480	4316	BUSFCN712A	16608	7167	BUSFCN713A	16758	7176	BUSFCN720A
16863	7201	BUSFCN721A	16974	4324	BUSFCN722A	17101	4331	BUSFCN730A	17161	4337	BUSFCN730B
17257	4346	BUSFCN730D	17328	4764	BUSFCN731A	17370	4356	BUSFCN731B	17440	4364	BUSFCN731D
17563	4371	BUSFCN740A	17598	4373	BUSFCN740B	17627	4374	BUSFCN740C	17660	4401	BUSFCN740D
19178	7351	BUTBADD	18972	7307	BUTBGFPSERV	19022	7316	BUTBGSERVL	11873	6217	BUTCLR505A
14517	7136	BUTCOUNT-IS-377	18985	7311	BUTCOUT7DOUT7	19118	7341	BUTD-IS-ZERO	18998	7313	BUTDMSMBYTE
19160	7347	BUTDR6-7L	19139	7344	BUTD[C]A	19173	7350	BUTD[C]B	18977	7310	BUTD[C]C
2880	4376	BUTERROR4	2886	5376	BUTERROR5	2892	6376	BUTERROR6	2898	7376	BUTERROR7
19222	7371	BUTFPFD	19191	7354	BUTFPPROC	18990	7312	BUTFPS05	19006	7314	BUTGD3-2
18964	7306	BUTINSTR1	18932	7301	BUTINSTRS	19209	7356	BUTINSTRBRANCH	19204	7355	BUTINTRHIGH
19126	7342	BUTIR11B	18940	7302	BUTIR11FLTPT3-0	18924	7300	BUTIR15-12	18948	7304	BUTIR9-6
19038	7321	BUTMDOD	19071	7327	BUTMEXFLAG1	19093	7333	BUTMEXFLAG2	19060	7325	BUTMFLAG7
19082	7331	BUTMFLTPTS	19105	7336	BUTMINITJAM	19027	7317	BUTMMASKPS[T]	19032	7320	BUTMNXT000
19043	7322	BUTMNXT001	19054	7324	BUTMNXT002	19065	7326	BUTMNXT003	19076	7330	BUTMNXT004
19087	7332	BUTMNXT005	19098	7334	BUTMNXT006	19110	7340	BUTMNXT007	18956	7305	BUTMOVDR7IR5-3
19049	7323	BUTMPS[N]	19186	7352	BUTOTHERJAM	19217	7360	BUTPREFETCHJAM	19131	7343	BUTPS15
19147	7345	BUTSERVICE	19014	7315	BUTSR1-0	18916	7276	BUTSR3-0	19155	7346	BUTVECTLOAD
10540	7062	BYTE375A	10745	7070	BYTEFIRST410	10764	7367	BYTESECOND410	17509	7205	C17X05
17497	7203	C17X12	10547	7063	CHECK375A	10570	5300	CHECK375B	12293	6254	CIN507F
18600	7247	CJESERVICETOD	18454	7227	CLEAR-I-O-A	18459	7230	CLEAR-I-O-B	12106	6236	CLEAR506E
15878	7165	CLEAR624	16278	6470	CLEAR710D	17747	4404	CLEAR761A	18464	7231	CLEARIO02
18470	7232	CLEARIO04	18476	7233	CLEARIO05	18638	7255	CLRJAMTOD	18585	7244	CLRSERVICETOD
18674	7262	CMPPROCDAT	15618	5414	CNST0622A	7299	4135	COMP130A1	7350	4141	COMP130B1
7408	4145	COMP131A1	7459	4151	COMP131B1	8424	4702	COMP350A	8451	4244	COMP350B
8479	4246	COMP350C	8506	4250	COMP350D	8576	4704	COMP351A	8598	4257	COMP351B
8620	4261	COMP351C	8641	4263	COMP351D	8677	4714	COMP352A	8699	4267	COMP352B
8721	4271	COMP352C	8742	4273	COMP352D	8860	6004	COMP361B	8943	6012	COMP362A
8976	6015	COMP362B	9051	6022	COMP363A	9174	6034	COMP365A	9242	6042	COMP366A
9302	6047	COMP366C	9386	6057	COMP370A	9447	6064	COMP370C	9517	6072	COMP371A
10797	6106	COMP410A	10827	6111	COMP410B	10861	6115	COMP410C	10893	6120	COMP410D
10925	6123	COMP410E	11078	6134	COMP500A	11114	6137	COMP500C	11143	6141	COMP500D
11178	6144	COMP500E	13548	6350	COMP533A	13589	6354	COMP533B	13630	6357	COMP534A
13664	6362	COMP534B	13704	6365	COMP534C	13738	6370	COMP534D	13785	6374	COMP534E
13824	6402	COMP534F	13906	6411	COMP535A	13946	6415	COMP535B	13999	6422	COMP536A
14039	6426	COMP536B	14082	6431	COMP536C	14129	6436	COMP536D	14175	6442	COMP536E
14215	6446	COMP536F	14422	4302	COMP537A	15580	5412	COMP621H	17116	4333	COMP730A
17342	4354	COMP731A	17409	4361	COMP731C	14579	4301	COUNTER01	14584	4310	COUNTER02
14592	4526	COUNTER03	14603	4545	COUNTER04	14612	4557	COUNTER05	14621	4534	COUNTER06
14631	4535	COUNTER07	14641	4536	COUNTER08	14652	4525	COUNTER09	14663	4527	COUNTER10
14670	4533	COUNTER10A	14676	4531	COUNTER10B	14683	4547	COUNTER11	14690	4555	COUNTER12

H01

LINE	LOCN	SYMBOL	LINE	LOCN	SYMBOL	LINE	LOCN	SYMBOL	LINE	LOCN	SYMBOL
13851	6404	COUNTERS34G	14359	7147	CR11-537A	14311	7137	CR3-537A	14335	7143	CR7-537A
9574	7035	CSP16XORFLTTOIRS	9568	7031	CSP16XORSRTOIRS	15352	5372	CSP1L621A	9627	6222	CUA372A
9678	5555	CUA372B	18650	7257	CUATOD	18543	7241	D0500A	18529	7237	D1106A
18518	7235	D1512A	18590	7245	DATISERVICETOD	18595	7246	DATOSERVICETOD	18758	7270	DBUFINTOIR
18788	7274	DBUFINTOIRS	17958	4415	DELAY762C	18752	7267	DINTOIR	8359	7353	DINTOIR350
18782	7273	DINTOIRS	8408	4563	DINTOIRA350	18410	7222	DISP002	18416	7223	DISP003
18422	7224	DISP004	18428	7225	DISP005	18434	7226	DISP006	18404	7221	DISPLAY
10718	6531	DNONZERO410	11282	6153	DOFCC503A	11611	6177	DOFCC504A	10608	5440	DOIT376A
12009	7072	DOIT506A	14785	5313	DOIT610A1	14835	5321	DOIT610A2	14898	5327	DOIT610B1
14953	5336	DOIT610B2	15016	5344	DOIT610C1	15067	5352	DOIT610C2	15124	5357	DOIT610D1
15163	5363	DOIT610D2	7613	4163	DOPA133A1	7725	4173	DOPA134A1	7838	4203	DOPA135A1
7944	4212	DOPA136A1	9926	5225	DOWRITE374A1	9946	5230	DOWRITE374A2	9999	5234	DOWRITE374B1
10019	5237	DOWRITE374B2	10072	5243	DOWRITE374C1	10092	5247	DOWRITE374C2	10145	5253	DOWRITE374D1
10165	5256	DOWRITE374D2	10218	5262	DOWRITE374E1	10238	5265	DOWRITE374E2	10291	5271	DOWRITE374F1
10311	5274	DOWRITE374F2	14365	7150	DR11-537A	14317	7140	DR3-537A	14341	7144	DR7-537A
18558	7243	DTOIRB	17836	4411	DW11L762A	18552	7242	DZERO	10728	6533	DZERO410
18538	7240	D[05-00]	18524	7236	D[11-06]	18511	7234	D[15-12]	12452	6270	ENFLAG510D
18230	4431	EOP001	18237	6452	EOP002	18243	6510	EOP003	18250	6511	EOP004
18256	7211	EOP005	18265	6776	EOP006	18275	6512	EOP007	18282	7212	EOP010
14371	7151	ER3-537A	2827	6543	ERROR010	15426	5615	ERROR621A	15803	6567	ERROR624A
8853	6003	EXPEC361B	8969	6014	EXPEC362B	9167	6033	EXPEC365A	9236	6041	EXPEC366A
9295	6046	EXPEC366C	9914	5222	EXPEC374A1	9987	5537	EXPEC374B1	10060	5557	EXPEC374C1
10133	5567	EXPEC374D1	10206	5515	EXPEC374E1	10279	5527	EXPEC374F1	10785	7363	EXPEC410A
10822	6110	EXPEC410B	10851	6113	EXPEC410C	10886	6117	EXPEC410D	10918	6122	EXPEC410E
11108	6136	EXPEC500C	11171	6143	EXPEC500E	11262	6150	EXPEC503A	11414	6163	EXPEC503E
11599	6175	EXPEC504A	11723	6206	EXPEC504E	11860	6215	EXPEC505A	11959	6612	EXPEC506A
12151	6602	EXPEC507A	13893	6407	EXPEC535A	13934	6413	EXPEC535B	13986	6420	EXPEC536A
14026	6424	EXPEC536B	14116	6434	EXPEC536D	15502	5405	EXPEC621E	15528	5407	EXPEC621F
15688	5421	EXPEC623	15846	5430	EXPEC624C	15939	7166	EXPEC701A	15988	6455	EXPEC701C
16052	5437	EXPEC702A	16096	6460	EXPEC702B	16243	6465	EXPEC710C	16272	6467	EXPEC710D
16381	6473	EXPEC711B	16411	6475	EXPEC711C	16562	6501	EXPEC712D	16648	5452	EXPEC713B
16697	6504	EXPEC713D	17156	4336	EXPEC730B	18013	4417	EXPEC762E	18069	4422	EXPEC763A
17953	4414	FILL762C	10526	7046	FIRST375A	11056	6527	FIXPAT500	12446	6267	FLAG510D
12571	7075	FLAGFPS02	12577	7076	FLAGFPS03	12582	7077	FLAGFPS04	12566	7073	FLAGFPSSEQLOD
18619	7252	FLAGFPSTOD	14382	7152	FR3-537A	11992	6231	FUDGEPS506A	12177	6244	FUDGEPS507A
16474	4314	GENADR712A	5954	4010	GETALTN115A1	15535	5410	GETCUA621F	15695	5422	GETCUA623
15852	5431	GETCUA624C	17109	4332	GETDBUF730A	17335	4353	GETDBUF731A	8118	4222	GETDC320A
8176	4227	GETDC320C	8237	4234	GETDC320E	14794	5314	GETIT610A1	14844	5322	GETIT610A2
14907	5330	GETIT610B1	14962	5337	GETIT610B2	15025	5345	GETIT610C1	15076	5353	GETIT610C2
15133	5360	GETIT610D1	15172	5364	GETIT610D2	17169	4340	GETIT730B	17265	4347	GETIT730D
17376	4357	GETIT731B	17853	7210	GETIT762A	15324	5371	GETJAM620C	15508	5406	GETJAM621E
15665	5420	GETJAM622C	18662	7260	GETMSKPROCDAT	5881	4600	GETONES114A	18657	7373	GETPROCDAT
9934	5226	GETTEM374A1	9954	5231	GETTEM374A2	10007	5235	GETTEM374B1	10027	5240	GETTEM374B2
10080	5244	GETTEM374C1	10100	5250	GETTEM374C2	10153	5254	GETTEM374D1	10173	5257	GETTEM374D2
10226	5263	GETTEM374E1	10246	5266	GETTEM374E2	10299	5272	GETTEM374F1	10319	5275	GETTEM374F2
5894	4004	GETZEROES114A	3056	5003	GOBUT012A	3077	5004	GOBUT012B	3097	5005	GOBUT012C
3116	5006	GOBUT012D	3135	5007	GOBUT012E	3155	5010	GOBUT012F	3177	5011	GOBUT012G
3220	5013	GOBUT013A	3242	5014	GOBUT013B	3261	5015	GOBUT013C	3280	5016	GOBUT013D
3299	5017	GOBUT013E	3320	5020	GOBUT013F	3339	5021	GOBUT013G	3382	5023	GOBUT014A
3403	5024	GOBUT014B	3422	5025	GOBUT014C	3444	5026	GOBUT014D	3488	5030	GOBUT015A
3508	5031	GOBUT015B	3527	5032	GOBUT015C	3570	5034	GOBUT016A	3613	5036	GOBUT017A
3635	5037	GOBUT017B	3677	5041	GOBUT020A	3697	5042	GOBUT020B	3719	5043	GOBUT020C

LINE	LOCN	SYMBOL	LINE	LOCN	SYMBOL	LINE	LOCN	SYMBOL	LINE	LOCN	SYMBOL
3762	5045	GOBUT021A	3783	5046	GOBUT021B	3805	5047	GOBUT021C	3848	5051	GOBUT022A
3892	5053	GOBUT023A	3936	5055	GOBUT024A	3957	5056	GOBUT024B	4001	5060	GOBUT025A
4045	5062	GOBUT026A	4089	5064	GOBUT027A	4132	5066	GOBUT030A	4155	5067	GOBUT030B
4174	5070	GOBUT030C	4197	5071	GOBUT030D	4240	5073	GOBUT031A	4261	5074	GOBUT031B
4304	5076	GOBUT032A	4325	5077	GOBUT032B	4370	5101	GOBUT033A	4414	5103	GOBUT034A
4457	5105	GOBUT035A	4502	5107	GOBUT036A	4546	5111	GOBUT037A	4589	5113	GOBUT040A
4611	5114	GOBUT040B	4654	5116	GOBUT041A	4676	5117	GOBUT041B	4718	5121	GOBUT042A
4739	5122	GOBUT042B	4783	5124	GOBUT043A	4804	5125	GOBUT043B	4848	5127	GOBUT044A
4893	5131	GOBUT045A	4935	5133	GOBUT046A	4958	5134	GOBUT046B	5004	5136	GOBUT047A
5027	5137	GOBUT047B	5047	5140	GOBUT047C	5093	5142	GOBUT050A	5122	5144	GOBUT050B
5626	5210	GOBUT105A1	5674	5213	GOBUT105B1	5899	4005	GOBUT114A	5913	4006	GOBUT114A2
5959	4011	GOBUT115A1	5991	4013	GOBUT115A2	6008	4014	GOBUT115A3	5975	4012	GOBUT115A4
6036	4016	GOBUT115B1	6068	4020	GOBUT115B2	6085	4021	GOBUT115B3	6052	4017	GOBUT115B4
6119	4023	GOBUT115C1	6134	4024	GOBUT115C2	6151	4025	GOBUT115C3	6179	4027	GOBUT115D1
6194	4030	GOBUT115D2	6211	4031	GOBUT115D3	6250	4033	GOBUT116A1	6264	4034	GOBUT116A2
6279	4035	GOBUT116A3	6296	4036	GOBUT116A4	6312	4037	GOBUT116A5	6340	4041	GOBUT116B
6374	4043	GOBUT116C1	6389	4044	GOBUT116C2	6404	4045	GOBUT116C3	6420	4046	GOBUT116C4
6436	4047	GOBUT116C5	6466	4051	GOBUT116D	6510	4053	GOBUT117A1	6525	4054	GOBUT117A2
6542	4055	GOBUT117A3	6557	4056	GOBUT117A4	6585	4060	GOBUT117B1	6600	4061	GOBUT117B2
6617	4062	GOBUT117B3	6647	4064	GOBUT117C1	6662	4065	GOBUT117C2	6700	4067	GOBUT120A1
6715	4070	GOBUT120A2	6732	4071	GOBUT120A3	6760	4073	GOBUT120B1	6775	4074	GOBUT120B2
6792	4075	GOBUT120B3	6807	4076	GOBUT120B4	6847	4103	GOBUT121A1	6862	4104	GOBUT121A2
6878	4105	GOBUT121A3	6893	4106	GOBUT121A4	6921	4110	GOBUT121B1	6936	4111	GOBUT121B2
6953	4112	GOBUT121B3	6968	4113	GOBUT121B4	7002	4115	GOBUT121C1	7017	4116	GOBUT121C2
7033	4117	GOBUT121C3	7048	4120	GOBUT121C4	7076	4122	GOBUT121D1	7091	4123	GOBUT121D2
7108	4124	GOBUT121D3	7123	4125	GOBUT121D4	7163	4127	GOBUT122A1	7179	4130	GOBUT122A2
7195	4131	GOBUT122A3	7215	4133	GOBUT122A4	7306	4136	GOBUT130A1	7321	4137	GOBUT130A2
7357	4142	GOBUT130B1	7372	4143	GOBUT130B2	7415	4146	GOBUT131A1	7430	4147	GOBUT131A2
7466	4152	GOBUT131B1	7481	4153	GOBUT131B2	7518	4155	GOBUT132A1	7534	4156	GOBUT132A2
7563	4160	GOBUT132B1	7579	4161	GOBUT132B2	7638	4165	GOBUT133A2	7685	4170	GOBUT133B2
7750	4175	GOBUT134A2	7798	4200	GOBUT134B2	7863	4205	GOBUT135A2	7911	4210	GOBUT135B2
7969	4214	GOBUT136A2	8017	4217	GOBUT136B2	8125	4223	GOBUT320A	8146	4224	GOBUT320B
8184	4230	GOBUT320C	8204	4231	GOBUT320D	8244	4235	GOBUT320E	8263	4236	GOBUT320F
8429	4243	GOBUT350A	8456	4245	GOBUT350B	8484	4247	GOBUT350C	8512	4251	GOBUT350D
8581	4256	GOBUT351A	8603	4260	GOBUT351B	8625	4262	GOBUT351C	8647	4264	GOBUT351D
8682	4266	GOBUT352A	8704	4270	GOBUT352B	8726	4272	GOBUT352C	8748	4274	GOBUT352D
8880	6005	GOBUT361D	8902	6006	GOBUT361E	8949	6013	GOBUT362A	8996	6016	GOBUT362D
9017	6017	GOBUT362E	9056	6023	GOBUT363A	9076	6024	GOBUT363B	9104	6026	GOBUT364A
9131	6030	GOBUT364B	9194	6035	GOBUT365B	9263	6043	GOBUT366B	9345	6053	GOBUT367B
9391	6060	GOBUT370A	9412	6061	GOBUT370B	9452	6065	GOBUT370C	9474	6066	GOBUT370D
9522	6073	GOBUT371A	9545	6074	GOBUT371B	9821	6101	GOBUT373B	10552	7064	GOBUT375A
10575	5301	GOBUT375B	10626	5303	GOBUT376A	10866	6116	GOBUT410C	10898	6121	GOBUT410D
10930	6124	GOBUT410E	11084	6135	GOBUT500A	11121	6140	GOBUT500C	11149	6142	GOBUT500D
11184	6145	GOBUT500E	11306	6155	GOBUT503A	11325	6156	GOBUT503B	11346	6157	GOBUT503C
11393	6162	GOBUT503D	11366	6160	GOBUT503DA	11440	6165	GOBUT503F	11461	6166	GOBUT503G
11482	6167	GOBUT503H	11502	6170	GOBUT503I	11520	6171	GOBUT503J	11539	6172	GOBUT503K
11636	6201	GOBUT504A	11654	6202	GOBUT504B	11675	6203	GOBUT504C	11702	6205	GOBUT504D
11749	6210	GOBUT504F	11770	6211	GOBUT504G	11791	6212	GOBUT504H	11811	6213	GOBUT504I
11899	6221	GOBUT505B	11919	6223	GOBUT505C	12022	7071	GOBUT506A	12041	6233	GOBUT506B
12062	6234	GOBUT506C	12083	6235	GOBUT506D	12112	6237	GOBUT506E	12189	6246	GOBUT507A
12208	6247	GOBUT507B	12229	6250	GOBUT507C	12250	6251	GOBUT507D	12273	6253	GOBUT507E
12328	6261	GOBUT507F	12381	6264	GOBUT510A	12403	6265	GOBUT510B	12425	6266	GOBUT510C

LINE	LOCN	SYMBOL	LINE	LOCN	SYMBOL	LINE	LOCN	SYMBOL	LINE	LOCN	SYMBOL
12462	6272	GOBUT510D	12483	6273	GOBUT510DA	12509	6275	GOBUT510E	12538	6277	GOBUT510F
13555	6351	GOBUT533A	13595	6355	GOBUT533B	13636	6360	GOBUT534A	13671	6363	GOBUT534B
13711	6366	GOBUT534C	13745	6371	GOBUT534D	13791	6375	GOBUT534E	13831	6403	GOBUT534F
13856	6405	GOBUT534G	13912	6412	GOBUT535A	13952	6416	GOBUT535B	14005	6423	GOBUT536A
14046	6427	GOBUT536B	14089	6432	GOBUT536C	14135	6437	GOBUT536D	14182	6443	GOBUT536E
14222	6447	GOBUT536F	14428	4303	GOBUT537A	15275	5366	GOBUT620A	15293	5367	GOBUT620B
15447	5402	GOBUT621B	15465	5403	GOBUT621C	15483	5404	GOBUT621D	15557	5411	GOBUT621G
15586	7160	GOBUT621H	15623	5415	GOBUT622A	15646	5417	GOBUT622B	15871	5432	GOBUT624D
15969	5434	GOBUT701B	16018	5435	GOBUT701D	16537	6500	GOBUT712C	16671	6503	GOBUT713C
17127	4335	GOBUT730A	17175	4341	GOBUT730B	17196	4342	GOBUT730C	17219	4443	GOBUT730C1
17270	4350	GOBUT730D	17293	4351	GOBUT730E	17347	4355	GOBUT731A	17382	4360	GOBUT731B
17414	4362	GOBUT731C	17452	4366	GOBUT731D	17474	4367	GOBUT731E	17572	4776	GOBUT740A
17605	4766	GOBUT740B	17633	4375	GOBUT740C	17667	4767	GOBUT740D	17752	4405	GOBUT761A
17773	4406	GOBUT761B	17793	4407	GOBUT761C	17932	4762	GOBUT762B	17987	4416	GOBUT762D
18038	4421	GOBUT762F	18115	4425	GOBUT763B	18136	4426	GOBUT763C	18155	4427	GOBUT763D
10773	7361	GOFOR410	18019	4420	GOGET762E	10832	6112	GOPUT410B	11300	6154	GOPUT503A
11421	6164	GOPUT503E	11630	6200	GOPUT504A	11730	6207	GOPUT504E	11879	6220	GOPUT505A
5173	5147	GOTEST101A	5263	5156	GOTEST102A	5289	5160	GOTEST102B	5316	5162	GOTEST102C
5342	5164	GOTEST102D	5409	5173	GOTEST103A	5435	5175	GOTEST103B	5462	5177	GOTEST103C
5488	5201	GOTEST103D	5528	5203	GOTEST104A	5555	5205	GOTEST104B	5606	5207	GOTEST105A
5654	5212	GOTEST105B	5702	5215	GOTEST105C	5729	5217	GOTEST105D	5750	5220	GOTEST105E
7619	4164	GOTEST133A1	7669	4167	GOTEST133B1	7731	4174	GOTEST134A1	7781	4177	GOTEST134B1
7844	4204	GOTEST135A1	7894	4207	GOTEST135B1	7950	4213	GOTEST136A1	8000	4216	GOTEST136B1
9967	5232	GOTEST374A2	10040	5241	GOTEST374B2	10113	5251	GOTEST374C2	10186	5260	GOTEST374D2
10259	5267	GOTEST374E2	10332	5276	GOTEST374F2	12761	6550	GOTEST511A1	12772	7107	GOTEST511A2
12783	7111	GOTEST511A3	12794	7113	GOTEST511A4	12817	6554	GOTEST511B1	12828	7115	GOTEST511B2
12839	7117	GOTEST511B3	12850	7121	GOTEST511B4	13045	6311	GOTEST512A1	13060	6312	GOTEST512A2
13100	6315	GOTEST512B1	13115	6316	GOTEST512B2	13149	6321	GOTEST512C1	13164	6322	GOTEST512C2
13204	6325	GOTEST512D1	13219	6326	GOTEST512D2	13253	6331	GOTEST512E1	13268	6332	GOTEST512E2
13346	6335	GOTEST520A	13374	6337	GOTEST520B	13403	6341	GOTEST520C	13431	6343	GOTEST520D
13460	6345	GOTEST520E	14487	4564	GOTEST551A	14511	4560	GOTEST551B	14528	7157	GOTEST551B1
14552	5626	GOTEST551C	15949	7171	GOTEST701A	15998	6457	GOTEST701C	16074	5444	GOTEST702A
16113	6463	GOTEST702B	16219	6464	GOTEST710B	16248	6466	GOTEST710C	16284	6471	GOTEST710D
16301	6472	GOTEST710E	16387	6474	GOTEST711B	16416	6476	GOTEST711C	16435	6477	GOTEST711D
16519	5450	GOTEST712B	16567	6502	GOTEST712D	16653	5453	GOTEST713B	16702	6505	GOTEST713D
16796	6506	GOTEST720B	16820	4317	GOTEST720C	16901	4321	GOTEST721B	16925	4322	GOTEST721C
17012	4325	GOTEST722B	17036	4326	GOTEST722C	14388	7153	GR3-537A	14394	7154	HR3-537A
13535	6666	INIT533A	13576	6352	INIT533B	13887	6656	INIT535A	13980	6654	INIT536A
14110	6433	INIT536D	13542	6347	INITD533A	13582	6353	INITD533B	13623	6664	INITD534A
13658	6361	INITD534B	13698	6662	INITD534C	13732	6367	INITD534D	13778	6373	INITD534E
13817	6401	INITD534F	13899	6410	INITD535A	13940	6414	INITD535B	13993	6421	INITD536A
14033	6425	INITD536B	14075	6652	INITD536C	14122	6435	INITD536D	14168	6441	INITD536E
14209	6445	INITD536F	2931	6532	INITIALIZE01	2937	7001	INITIALIZE03	2942	7003	INITIALIZE04
2948	7004	INITIALIZE05	2953	7005	INITIALIZE06	2958	7006	INITIALIZE07	2965	4101	INITIALIZE10
2977	4102	INITIALIZE11	2988	4001	INITIALIZE12	14280	7131	INITSR537A	18367	7215	INSERT02
18378	7217	INSERT03	18384	7220	INSERT04	18362	7214	INSERTEOPREVNO	18373	7216	INSERTREVNO
10802	6107	INTOIR410A	18643	7256	JAMTOD	18822	4777	JAMUPP001	18830	4757	JAMUPP002B
18835	4434	JAMUPP002C	18841	7213	JAMUPP002D	18847	4756	JAMUPP003	18854	4746	JAMUPP004
18861	4747	JAMUPP005	18867	4435	JAMUPP006	18872	4436	JAMUPP007	18877	4437	JAMUPP010
18882	4440	JAMUPP011	18176	4763	KILL764A	12933	7114	KTSRCDST01	12938	7123	KTSRCDST02
12944	7124	KTSRCDST03	12951	7125	KTSRCDST04	12958	7126	KTSRCDST04B	12967	7335	KTSRCDST05
12973	7337	KTSRCDST06	12981	7127	KTSRCDST07	12987	7130	KTSRCDST08	5252	5154	LOAD00-102A

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LINE	LOCN	SYMBOL	LINE	LOCN	SYMBOL	LINE	LOCN	SYMBOL	LINE	LOCN	SYMBOL
5232	5530	LOAD01-102A	14758	5306	LOAD01-610A1	14819	5316	LOAD01-610A2	14882	5324	LOAD01-610B1
14937	5333	LOAD01-610B2	15000	5341	LOAD01-610C1	15051	5347	LOAD01-610C2	15108	5510	LOAD01-610D1
2809	4100	LOAD010	2854	5001	LOAD011	3049	5002	LOAD012A	3213	5744	LOAD013A
3376	5742	LOAD014A	14272	4300	LOAD01537A	3481	5740	LOAD015A	3563	5736	LOAD016A
3606	5732	LOAD017A	5237	5151	LOAD02-102A	3670	5724	LOAD020A	3754	5720	LOAD021A
3841	5716	LOAD022A	3885	5714	LOAD023A	3928	5706	LOAD024A	3994	5704	LOAD025A
4038	5702	LOAD026A	4082	5700	LOAD027A	4125	5676	LOAD030A	4232	5672	LOAD031A
4297	5666	LOAD032A	4363	5664	LOAD033A	4406	5662	LOAD034A	14266	4277	LOAD03537A
4450	5660	LOAD035A	4494	5656	LOAD036A	4539	5654	LOAD037A	5242	5152	LOAD04-102A
4582	5650	LOAD040A	4646	5644	LOAD041A	4711	5640	LOAD042A	4775	5634	LOAD043A
4841	5632	LOAD044A	4886	5630	LOAD045A	4928	5560	LOAD046A	4997	5550	LOAD047A
8548	4567	LOAD05-351	14764	5307	LOAD05-610A1	15045	5346	LOAD05-610C2	5086	5552	LOAD050A
5116	5143	LOAD050B	8554	4254	LOAD06-351	14769	5310	LOAD06-610A1	14813	5315	LOAD06-610A2
5393	5170	LOAD07-103A	14932	5332	LOAD07-610B2	5247	5153	LOAD10-102A	5388	5167	LOAD13-103A
14259	4276	LOAD14537A	5383	5166	LOAD15-103A	5377	5546	LOAD16-103A	14252	4574	LOAD16537A
5398	5171	LOAD17-103A	9633	6703	LOAD372A	9684	5503	LOAD372B	11854	6620	LOAD505A
16170	4307	LOADADR710A	15944	7170	LOADBA701A	15993	6456	LOADBA701C	16069	5443	LOADBA702A
16107	6462	LOADBA702B	5168	5520	LOADD101A	5258	5155	LOADD102A	5284	5157	LOADD102B
5311	5161	LOADD102C	5337	5163	LOADD102D	5404	5172	LOADD103A	5430	5174	LOADD103B
5457	5176	LOADD103C	5483	5200	LOADD103D	5523	5540	LOADD104A	5550	5204	LOADD104B
17096	4330	LOADDATA730A	17240	4343	LOADDATA730D	12015	6104	LOADDCS506A	12184	6245	LOADDCS507A
11276	6152	LOADFCCS03A	11605	6176	LOADFCCS04A	11246	6614	LOADFLAG503A	11585	6622	LOADFLAG504A
11255	6147	LOADFPSS03A	11593	6174	LOADFPSS04A	18704	7264	LOADFPSCC	18710	7265	LOADFPSCC02
8384	7357	LOADHI350	8393	7024	LOADHIA350	14476	4305	LOADIN551A	11017	6132	LOADIRS00
11386	6161	LOADIRS03D	11695	6204	LOADIRS04D	14752	5532	LOADIR610A1	14876	5534	LOADIR610B1
14926	5331	LOADIR610B2	14994	5544	LOADIR610C1	16743	7172	LOADIR720A	17091	4754	LOADIR730A
17435	4363	LOADIR731D	17551	4765	LOADIR740A	17586	4372	LOADIR740B	17647	4400	LOADIR740D
12375	6263	LOADPRIO510A	8841	6001	LOADRES361A	8937	6011	LOADRES362A	9161	6032	LOADRES365A
9224	6037	LOADRES366A	9332	6051	LOADRES367A	9375	6055	LOADRES370A	9505	6070	LOADRES371A
9907	6103	LOADRES374	16164	5472	LOADRET710A	16335	5470	LOADRET711A	16467	5466	LOADRET712A
16602	5464	LOADRET713A	16737	5462	LOADRET720A	16847	4320	LOADRET721A	16958	5456	LOADRET722A
5600	5542	LOADSR105A	5649	5211	LOADSR105B	5697	5214	LOADSR105C	5723	5216	LOADSR105D
8848	6002	LOADSR361A	9340	6052	LOADSR367A	14162	6650	LOADSRS36E	14203	6444	LOADSRS36F
8350	4241	LOADSRD350	11999	7067	LOADUCON506A	15369	5374	LODBRK621A	15747	5425	LODBRK624A
13772	6660	LODCNTRS34E	13812	6400	LODCNTRS34F	15388	5400	LODFLG621A	15731	5562	LODIR624A
9613	6540	LOOP372A	17252	4345	MANGLED730D	17446	4365	MANGLED731D	11270	6151	MASK503A
15317	5370	MASK62DC	15933	5476	MASK701A	16047	5474	MASK702A	17842	7202	MASK762A
12686	6232	MFSS01	12692	6302	MFSS02	12699	6303	MFSS03	12706	6304	MFSS04
12715	6552	MFSS05	12725	6553	MFSS06	12735	6545	MFSSEXPEC0	12742	6547	MFSSEXPEC1
18668	7261	MSKPROCDAT	14291	6643	NEWCTR537A	2767	7303	NEXT007	2833	5245	NEXT010
16193	4445	NEXT710A	16355	4446	NEXT711A	16492	4447	NEXT712A	16621	7365	NEXT713A
16769	7364	NEXT720A	16875	7362	NEXT721A	16985	4524	NEXT722A	17891	4467	NEXTD762A
8376	7023	NEXTPAT350	10737	7065	NEXTPAT410	11039	6377	NEXTPAT500	8536	4253	NEXTPATA350
18633	7254	ODDJAMTOD	7659	4166	OPA133B1	7712	4512	OPA134A1	7771	4176	OPA134B1
7825	4514	OPA135A1	7884	4206	OPA135B1	7990	4215	OPA136B1	7607	4510	OPB133A1
7719	4172	OPB134A1	7832	4202	OPB135A1	7938	4542	OPB136A1	9665	6100	PAGE372B
18612	7251	PBATOD	17847	7207	PRIO6762A	14774	5311	PSCC-DC610A1	14824	5317	PSCC-DC610A2
14887	5325	PSCC-DC610B1	14942	5334	PSCC-DC610B2	15005	5342	PSCC-DC610C1	15056	5350	PSCC-DC610C2
15113	5355	PSCC-DC610D1	15152	5361	PSCC-DC610D2	15212	7162	PSCCTOSR3-D	15217	7163	PSCCTOSR3-DAA
15222	7164	PSCCTOSR3-DBB	11972	6226	PSHI506A	12157	6241	PSHI507A	11985	6230	PSL0506A
12170	6243	PSL0507A	11979	6227	PSMID506A	12164	6242	PSMID507A	12596	7100	PSSEQLOD
12601	7101	PSSEQLOD02	12607	7102	PSSEQLOD03	12612	7103	PSSEQLOD04	12618	7104	PSSEQLOD05

L01

LINE	LOCN	SYMBOL	LINE	LOCN	SYMBOL	LINE	LOCN	SYMBOL	LINE	LOCN	SYMBOL
12623	7105	PSSEQL0006	18626	7253	PSTOD	18082	4423	READVECT763A	8530	4703	RESETIR350
8435	7022	RESETIR350A	8461	7026	RESETIR350B	8489	7027	RESETIR350C	18679	7263	RESETPROCDAT
18765	7271	RESETUCONP	18795	7275	RESETUCONP5	8769	4715	RESTORE01	8776	7030	RESTORE02
8782	7032	RESTORE03	8788	7033	RESTORE04	9745	6562	RETURN373A	3185	5012	SCOPE012
3347	5022	SCOPE013	3452	5027	SCOPE014	3533	5033	SCOPE015	3578	5035	SCOPE016
3642	5040	SCOPE017	3726	5044	SCOPE020	3812	5050	SCOPE021	3856	5052	SCOPE022
3899	5054	SCOPE023	3965	5057	SCOPE024	4008	5061	SCOPE025	4053	5063	SCOPE026
4095	5065	SCOPE027	4204	5072	SCOPE030	4268	5075	SCOPE031	4333	5100	SCOPE032
4378	5102	SCOPE033	4421	5104	SCOPE034	4465	5106	SCOPE035	4510	5110	SCOPE036
4554	5112	SCOPE037	4618	5115	SCOPE040	4683	5120	SCOPE041	4747	5123	SCOPE042
4811	5126	SCOPE043	4855	5130	SCOPE044	4900	5132	SCOPE045	4967	5135	SCOPE046
5056	5141	SCOPE047	5129	5145	SCOPE050	5180	5150	SCOPE101	5350	5165	SCOPE102
5496	5202	SCOPE103	5563	5206	SCOPE104	5758	5221	SCOPE105	5920	4007	SCOPE114A
6092	4022	SCOPE115B	6217	4032	SCOPE115D	6348	4042	SCOPE116C	6474	4052	SCOPE116D
6670	4066	SCOPE117C	6813	4077	SCOPE120B	6976	4114	SCOPE121C	7129	4126	SCOPE121D
7223	4134	SCOPE122A	7380	4144	SCOPE130B	7489	4154	SCOPE131B	7587	4162	SCOPE132B
7693	4171	SCOPE133B	7806	4201	SCOPE134B	7919	4211	SCOPE135B	8025	4220	SCOPE136B
8270	4237	SCOPE320	8520	4252	SCOPE350	8655	4265	SCOPE351	8756	4275	SCOPE352
9553	6075	SCOPE371	9700	5501	SCOPE372B	9828	6102	SCOPE373	9975	5233	SCOPE374A
10048	5242	SCOPE374B	10121	5252	SCOPE374C	10194	5261	SCOPE374D	10267	5270	SCOPE374E
10340	5277	SCOPE374F	10633	5304	SCOPE376	10937	6125	SCOPE410	11192	6146	SCOPE500F
11550	6173	SCOPE503	11820	6214	SCOPE504	11925	6224	SCOPE505	12121	6240	SCOPE506
12338	6262	SCOPE507	12548	6300	SCOPE510	12800	6301	SCOPE511A	12856	6305	SCOPE511B
13066	6313	SCOPE512A	13170	6323	SCOPE512C	13275	6333	SCOPE512E	13469	6346	SCOPE520
13601	6356	SCOPE533B	13677	6364	SCOPE534B	13752	6372	SCOPE534D	13866	6406	SCOPE534G
13959	6417	SCOPE535B	14052	6430	SCOPE536B	14141	6440	SCOPE536D	14228	6450	SCOPE536F
14434	4304	SCOPE537A	14559	5305	SCOPE551	14852	5323	SCOPE610A	14970	5340	SCOPE610B
15084	5354	SCOPE610C	15180	5365	SCOPE610D	15702	5423	SCOPE623	15884	5224	SCOPE624
16027	5436	SCOPE701	16120	5433	SCOPE702	16310	5445	SCOPE710	16443	5446	SCOPE711
16576	5447	SCOPE712	16711	5451	SCOPE713	16934	5454	SCOPE721	17045	4327	SCOPE722
17299	4352	SCOPE730	17481	4370	SCOPE731	17675	4402	SCOPE740	17801	4410	SCOPE761
18163	4430	SCOPE763	10533	7061	SECOND375A	18605	7250	SERVICETOD	16748	7174	SETADR720A
16853	7173	SETADR721A	16964	4470	SETADR722A	15361	5373	SETBRK621A	15738	5424	SETBRK624A
14780	5312	SETBUSA610A1	14830	5320	SETBUSA610A2	14893	5326	SETBUSA610B1	14948	5335	SETBUSA610B2
15011	5343	SETBUSA610C1	15062	5351	SETBUSA610C2	15119	5356	SETBUSA610D1	15158	5362	SETBUSA610D2
10673	6560	SETBYTEB410	10680	7060	SETBYTEC410	10685	7066	SETBYTED410	10691	6000	SETBYTEE410
10697	6105	SETBYTEG410	12320	6260	SETCIN507F	7210	4132	SETD122A4	8111	4221	SETD320A
8169	4226	SETD320C	8230	4233	SETD320E	15760	6306	SETD624A	9622	6076	SETDC372A
9671	5000	SETDC372B	8932	6010	SETDDC362A	9040	6020	SETDDC363A	9099	6025	SETDDC364A
9126	6027	SETDDC364B	9285	6044	SETDDC366C	9436	6062	SETDDC370C	14246	6651	SETEMIT537A
10975	6676	SETFETCHB500	10982	6126	SETFETCHD500	10987	6127	SETFETCHE500	10992	6130	SETFETCHF500
10998	6131	SETFETCHG500	11867	6216	SETFLAG505A	12457	6271	SETFLAG510D	15382	5377	SETFLG621A
15765	6453	SETFLG624A	9751	7034	SETIR373A	10602	5302	SETIR376A	13033	6564	SETIR512A1
13088	6536	SETIR512B1	13137	6317	SETIR512C1	13192	6626	SETIR512D1	13241	6327	SETIR512E1
3039	5760	SETIRA	16175	4312	SETJAM710A	16753	7175	SETJAM720A	16858	7200	SETJAM721A
16969	4323	SETJAM722A	16062	5442	SETKT702A	16101	6461	SETKT702B	16057	5441	SETLED702A
8105	4700	SETONE320A	8164	4225	SETONE320C	8224	4232	SETONE320E	12370	6606	SETONES510A
17907	4463	SETPRG-762A	17912	4413	SETPRI762A	17966	7206	SETPRI762C	12301	6256	SETPS507F
13039	6310	SETPSFLAG512A1	13094	6314	SETPSFLAG512B1	13143	6320	SETPSFLAG512C1	13198	6324	SETPSFLAG512D1
13247	6330	SETPSFLAG512E1	8834	6570	SETRES361A	8924	6007	SETRES362A	9153	6031	SETRES365A
9216	6036	SETRES366A	9324	6050	SETRES367A	9367	6054	SETRES370A	9497	6067	SETRES371A
14285	7135	SETRESA537A	14377	7370	SETRESB537A	15376	5375	SETRET621A	15754	5426	SETRET624A

LINE	LOCN	SYMBOL	LINE	LOCN	SYMBOL	LINE	LOCN	SYMBOL	LINE	LOCN	SYMBOL
10519	5506	SETSP375A	9757	7037	SETSR373A	12310	6257	SETSR507F	14481	4306	SETSR551A
14506	4565	SETSR551B	14546	4561	SETSR551C	15395	5401	SETSR621A	15771	6454	SETSR624A
11965	6225	SETUCONS06A	13001	6555	SETUPS12A	13007	6307	SETUPS12B	13338	6334	SETUPS20A
13367	6336	SETUPS20B	13396	6340	SETUPS20C	13424	6342	SETUPS20D	13452	6344	SETUPS20E
5862	7015	SETUPCSP00A	5852	7013	SETUPCSP05A	5857	7014	SETUPCSP07A	5847	7012	SETUPCSP12A
5842	7011	SETUPCSP14A	5837	7010	SETUPCSP15A	5832	7002	SETUPCSP16A	5826	5543	SETUPCSP17A
15197	7156	SETUPPSCC#DC	15202	7161	SETUPPSCC#DC02	17245	4344	SETZER730D	10415	5746	SFDFTOSR
10428	7047	SFDFTOSRA	10423	7040	SFDFTOSRAA	10434	7050	SFDFTOSRB	10440	7051	SFDFTOSRC
10446	7052	SFDFTOSRD	10452	7053	SFDFTOSRE	10458	7054	SFDFTOSRF	10464	7055	SFDFTOSRG
10470	7056	SFDFTOSRH	10476	7057	SFDFTOSRI	9045	6021	SHIFT363A	9230	6040	SHIFT366A
9290	6045	SHIFT366C	9381	6056	SHIFT370A	9442	6063	SHIFT370C	9511	6071	SHIFT371A
18747	7266	SRINTOIR	18777	7272	SRINTOIRS	8343	4240	START350	2816	7000	SUBR010
9639	6077	SUBRA372A	9689	5223	SUBRA372B	13482	7122	SUCBRTEST01	13487	7132	SUCBRTEST02
13492	7133	SUCBRTEST03	2633	4000	TEST001	2654	6252	TEST002	2673	6631	TEST003
2692	5525	TEST004	2711	5146	TEST005	2730	4474	TEST006	2749	4377	TEST007
2802	4775	TEST010	2847	5777	TEST011	3031	5775	TEST012A	3069	5773	TEST012B
3088	5771	TEST012C	3108	5767	TEST012D	3127	5765	TEST012E	3147	5764	TEST012F
3169	5763	TEST012G	3205	5761	TEST013A	3233	5757	TEST013B	3253	5755	TEST013C
3272	5753	TEST013D	3291	5751	TEST013E	3312	5750	TEST013F	3331	5747	TEST013G
3368	5745	TEST014A	3394	5752	TEST014B	3414	5762	TEST014C	3436	5710	TEST014D
3473	5743	TEST015A	3500	5772	TEST015B	3519	5722	TEST015C	3555	5741	TEST016A
3598	5737	TEST017A	3626	5735	TEST017B	3662	5733	TEST020A	3689	5731	TEST020B
3711	5727	TEST020C	3746	5725	TEST021A	3775	5723	TEST021B	3797	5774	TEST021C
3833	5721	TEST022A	3877	5717	TEST023A	3920	5715	TEST024A	3949	5711	TEST024B
3986	5707	TEST025A	4029	5705	TEST026A	4074	5703	TEST027A	4117	5701	TEST030A
4147	5712	TEST030B	4166	5713	TEST030C	4189	5734	TEST030D	4224	5677	TEST031A
4253	5675	TEST031B	4288	5673	TEST032A	4317	5671	TEST032B	4354	5667	TEST033A
4398	5665	TEST034A	4442	5663	TEST035A	4486	5661	TEST036A	4531	5657	TEST037A
4574	5655	TEST040A	4602	5653	TEST040B	4638	5651	TEST041A	4667	5647	TEST041B
4703	5645	TEST042A	4731	5643	TEST042B	4767	5641	TEST043A	4796	5637	TEST043B
4833	5635	TEST044A	4878	5633	TEST045A	4920	5631	TEST046A	4950	5770	TEST046B
4988	5561	TEST047A	5019	5670	TEST047B	5039	5730	TEST047C	5077	5551	TEST050A
5108	5726	TEST050B	5161	5553	TEST101A	5225	5521	TEST102A	5277	5574	TEST102B
5303	5564	TEST102C	5330	5554	TEST102D	5370	5531	TEST103A	5423	5572	TEST103B
5449	5576	TEST103C	5476	5674	TEST103D	5516	5547	TEST104A	5543	5646	TEST104B
5592	5541	TEST105A	5619	5610	TEST105A1	5642	5652	TEST105B	5666	5600	TEST105B1
5690	5642	TEST105C	5716	5636	TEST105D	5743	5620	TEST105E	5874	4607	TEST114A
5906	4603	TEST114A2	5939	4601	TEST115A1	5983	4616	TEST115A2	6000	4615	TEST115A3
5967	4604	TEST115A4	6021	4614	TEST115B1	6060	4613	TEST115B2	6077	4612	TEST115B3
6044	4602	TEST115B4	6104	4611	TEST115C1	6126	4617	TEST115C2	6143	4627	TEST115C3
6164	4626	TEST115D1	6186	4625	TEST115D2	6203	4624	TEST115D3	6235	4623	TEST116A1
6257	4621	TEST116A2	6271	4620	TEST116A3	6288	4637	TEST116A4	6305	4636	TEST116A5
6326	4606	TEST116B	6359	4635	TEST116C1	6381	4633	TEST116C2	6396	4632	TEST116C3
6413	4631	TEST116C4	6429	4630	TEST116C5	6452	4645	TEST116D	6495	4647	TEST117A1
6517	4644	TEST117A2	6534	4643	TEST117A3	6549	4642	TEST117A4	6570	4641	TEST117B1
6592	4640	TEST117B2	6609	4657	TEST117B3	6633	4656	TEST117C1	6655	4677	TEST117C2
6685	4667	TEST120A1	6707	4655	TEST120A2	6724	4654	TEST120A3	6745	4653	TEST120B1
6767	4652	TEST120B2	6784	4651	TEST120B3	6799	4650	TEST120B4	6832	4665	TEST121A1
6854	4676	TEST121A2	6871	4675	TEST121A3	6885	4674	TEST121A4	6906	4663	TEST121B1
6928	4662	TEST121B2	6945	4661	TEST121B3	6960	4660	TEST121B4	6987	4707	TEST121C1
7009	4605	TEST121C2	7025	4717	TEST121C3	7040	4716	TEST121C4	7061	4727	TEST121D1
7083	4726	TEST121D2	7100	4737	TEST121D3	7115	4736	TEST121D4	7148	4671	TEST122A1

LINE	LOCN	SYMBOL
7172	4570	TEST122A2
7314	4550	TEST130A2
7423	4544	TEST131A2
7527	4516	TEST132A2
7630	4500	TEST133A2
7742	4503	TEST134A2
7855	4506	TEST135A2
7961	4476	TEST136A2
8138	4552	TEST320B
8256	4556	TEST320F
8471	4742	TEST350C
8612	4723	TEST351C
8713	4724	TEST352C
8894	6767	TEST361E
9010	6755	TEST362E
9119	6745	TEST364B
9256	6735	TEST366B
9405	6723	TEST370B
9538	6713	TEST371B
9814	6572	TEST373B
10105	5524	TEST374C2
10512	5517	TEST375A
10666	5507	TEST410
10879	6727	TEST410D
11100	6726	TEST500C
11318	6630	TEST503B
11407	6700	TEST503E
11495	6742	TEST503I
11647	6730	TEST504B
11742	6672	TEST504F
11847	6623	TEST505A
12034	6754	TEST506B
12144	6613	TEST507A
12265	6674	TEST507E
12418	6616	TEST510C
12524	6610	TEST510F
12789	7112	TEST511A4
12845	7120	TEST511B4
13108	6546	TEST512B2
13212	6576	TEST512D2
13360	6764	TEST520B
13528	6625	TEST533A
13691	6665	TEST534C
13844	6752	TEST534G
14019	6640	TEST536B
14196	6642	TEST536F
14539	4566	TEST551C
14919	5612	TEST610B2
15145	5624	TEST610D2
15344	5617	TEST621A
15495	5605	TEST621E
15605	5601	TEST622A

LINE	LOCN	SYMBOL
7188	4734	TEST122A3
7334	4530	TEST130B1
7443	4546	TEST131B1
7547	4517	TEST132B1
7652	4501	TEST133B1
7764	4504	TEST134B1
7877	4507	TEST135B1
7983	4475	TEST136B1
8157	4562	TEST320C
8337	4701	TEST350
8499	4743	TEST350D
8634	4712	TEST351D
8735	4725	TEST352D
8917	6765	TEST362A
9033	6753	TEST363A
9146	6743	TEST365A
9278	6733	TEST366C
9429	6721	TEST370C
9606	6571	TEST372A
9898	6563	TEST374
10178	5500	TEST374D2
10563	5625	TEST375B
10790	6711	TEST410A
10911	6705	TEST410E
11136	6746	TEST500D
11338	6632	TEST503C
11433	6710	TEST503F
11513	6756	TEST503J
11667	6740	TEST504C
11762	6702	TEST504G
11891	6712	TEST505B
12054	6744	TEST506C
12201	6724	TEST507B
12286	6647	TEST507F
12438	6600	TEST510D
12755	6607	TEST511A
12812	6551	TEST511B1
13026	6542	TEST512A1
13130	6556	TEST512C1
13234	6577	TEST512E1
13388	6772	TEST520C
13569	6633	TEST533B
13725	6635	TEST534D
13879	6661	TEST535A
14067	6655	TEST536C
14413	4572	TEST537A
14744	5627	TEST610A1
14987	5535	TEST610C1
15262	5511	TEST620A
15440	5613	TEST621B
15521	5603	TEST621F
15634	5577	TEST622B

LINE	LOCN	SYMBOL
7202	4735	TEST122A4
7365	4532	TEST130B2
7474	4750	TEST131B2
7572	4472	TEST132B2
7679	4502	TEST133B2
7791	4505	TEST134B2
7904	4477	TEST135B2
8010	4473	TEST136B2
8197	4537	TEST320D
8417	4752	TEST350A
8569	4732	TEST351A
8670	4705	TEST352A
8827	6573	TEST361A
8962	6763	TEST362B
9069	6751	TEST363B
9187	6741	TEST365B
9317	6731	TEST367A
9467	6717	TEST370D
9658	6701	TEST372B
9959	5604	TEST374A2
10251	5502	TEST374E2
10595	5513	TEST376A
10814	6704	TEST410B
10968	6561	TEST500
11164	6736	TEST500E
11379	6670	TEST503D
11453	6720	TEST503G
11531	6646	TEST503K
11688	6750	TEST504D
11783	6706	TEST504H
11912	6722	TEST505C
12076	6734	TEST506D
12221	6611	TEST507C
12363	6603	TEST510A
12475	6617	TEST510DA
12767	7074	TEST511A2
12823	7106	TEST511B2
13053	6544	TEST512A2
13157	6566	TEST512C2
13261	6535	TEST512E2
13417	6762	TEST520D
13615	6667	TEST534A
13765	6663	TEST534E
13926	6637	TEST535B
14103	6641	TEST536D
14469	4575	TEST551A
14806	5622	TEST610A2
15038	5602	TEST610C2
15286	5623	TEST620B
15458	5611	TEST621C
15550	5766	TEST621G
15657	5575	TEST622C

LINE	LOCN	SYMBOL
7283	4673	TEST130A1
7392	4541	TEST131A1
7502	4521	TEST132A1
7600	4523	TEST133A1
7705	4511	TEST134A1
7818	4513	TEST135A1
7931	4515	TEST136A1
8098	4543	TEST320A
8217	4554	TEST320E
8444	4753	TEST350B
8591	4722	TEST351B
8692	4713	TEST352B
8873	6771	TEST361D
8989	6757	TEST362D
9091	6747	TEST364A
9209	6737	TEST366A
9360	6725	TEST370A
9490	6715	TEST371A
9738	6541	TEST373A
10032	5606	TEST374B2
10324	5504	TEST374F2
10619	5614	TEST376A1
10844	6707	TEST410C
11070	6673	TEST500A
11238	6677	TEST503A
11359	6601	TEST503DA
11474	6732	TEST503H
11578	6615	TEST504A
11716	6760	TEST504E
11804	6716	TEST504I
11952	6621	TEST506A
12099	6605	TEST506E
12243	6557	TEST507D
12396	6675	TEST510B
12497	6604	TEST510E
12778	7110	TEST511A3
12834	7116	TEST511B3
13081	6565	TEST512B1
13185	6537	TEST512D1
13322	6627	TEST520A
13445	6775	TEST520E
13650	6634	TEST534B
13805	6636	TEST534F
13973	6657	TEST536A
14154	6653	TEST536E
14498	4576	TEST551B
14869	5533	TEST610B1
15101	5545	TEST610D1
15309	5621	TEST620C
15476	5607	TEST621D
15572	5754	TEST621H
15680	5573	TEST623

B02

LINE	LOCN	SYMBOL	LINE	LOCN	SYMBOL	LINE	LOCN	SYMBOL	LINE	LOCN	SYMBOL
15724	5571	TEST624A	15817	5565	TEST624B	15839	5776	TEST624C	15864	5756	TEST624D
15925	5563	TEST701A	15962	5523	TEST701B	15981	6770	TEST701C	16011	5512	TEST701D
16040	5477	TEST702A	16089	6761	TEST702B	16157	5475	TEST710A	16212	6644	TEST710B
16236	6645	TEST710C	16265	6574	TEST710D	16294	6575	TEST710E	16328	5473	TEST711A
16374	6534	TEST711B	16404	6530	TEST711C	16427	6526	TEST711D	16460	5471	TEST712A
16512	5505	TEST712B	16530	6524	TEST712C	16555	6523	TEST712D	16594	5467	TEST713A
16640	5616	TEST713B	16664	6522	TEST713C	16689	6521	TEST713D	16730	5465	TEST720A
16788	6520	TEST720B	16813	4760	TEST720C	16840	4571	TEST721A	16894	4573	TEST721B
16918	4577	TEST721C	16951	5463	TEST722A	17004	4464	TEST722B	17029	4465	TEST722C
17084	4471	TEST730A	17149	4466	TEST730B	17188	4460	TEST730C	17211	4450	TEST730C1
17233	4461	TEST730D	17286	4462	TEST730E	17321	4755	TEST731A	17363	4457	TEST731B
17401	4456	TEST731C	17428	4455	TEST731D	17467	4454	TEST731E	17556	4744	TEST740A
17591	4453	TEST740B	17619	4452	TEST740C	17653	4451	TEST740D	17726	4745	TEST761A
17765	4771	TEST761B	17786	4774	TEST761C	17829	4773	TEST762A	17899	4553	TEST762A1
17924	4751	TEST762B	17946	4740	TEST762C	17980	4741	TEST762D	18006	4730	TEST762E
18031	4711	TEST762F	18062	4761	TEST763A	18108	4720	TEST763B	18128	4721	TEST763C
18148	4710	TEST763D	11292	6714	TESTA503A	11621	6766	TESTA504A	10707	6773	TESTD410
11008	6671	TESTD500	11031	6777	TESTINHASP500	11023	6133	TESTINHBSP500	18089	4424	TESTVECT763A
15400	5522	UBRK621A	15776	6255	UBRK624A	13329	6624	UCON520A	18103	4733	VECTLOAD763A
18301	6774	VFY001	18308	4412	VFY002	18313	4255	VFY003	18321	4433	VFY004
18333	7375	VFY005	18340	7374	VFY006	10755	7366	WORD410	8364	4002	WRITEDF350
8371	7016	WRITESF350	17861	4315	ZAPD762A	17122	4334	ZAPDBUF730A	9919	5536	ZERO374A1
9941	5227	ZERO374A2	9992	5556	ZERO374B1	10014	5236	ZERO374B2	10065	5566	ZERO374C1
10087	5246	ZERO374C2	10138	5514	ZERO374D1	10160	5255	ZERO374D2	10211	5526	ZERO374E1
10233	5264	ZERO374E2	10284	5516	ZERO374F1	10306	5273	ZERO374F2	12504	6274	ZEROD510E
17734	4772	ZERODSR761A	12531	6276	ZEROFLAG510E	15824	5427	ZEROIR624B	17739	4403	ZEROIT761A
10386	7044	ZEROSF	10365	7036	ZEROSF02DF04	10370	7041	ZEROSF04DF02	10392	7045	ZEROSFA
10375	7042	ZEROSFDF	10381	7043	ZEROSFDFA	19252	7400	ZTARGET400	19254	7401	ZTARGET401
19256	7402	ZTARGET402	19258	7403	ZTARGET403	19260	7404	ZTARGET404	19262	7405	ZTARGET405
19264	7406	ZTARGET406	19266	7407	ZTARGET407	19268	7410	ZTARGET410	19270	7411	ZTARGET411
19272	7412	ZTARGET412	19274	7413	ZTARGET413	19276	7414	ZTARGET414	19278	7415	ZTARGET415
19280	7416	ZTARGET416	19282	7417	ZTARGET417	19284	7420	ZTARGET420	19286	7421	ZTARGET421
19288	7422	ZTARGET422	19290	7423	ZTARGET423	19292	7424	ZTARGET424	19294	7425	ZTARGET425
19296	7426	ZTARGET426	19298	7427	ZTARGET427	19300	7430	ZTARGET430	19302	7431	ZTARGET431
19304	7432	ZTARGET432	19306	7433	ZTARGET433	19308	7434	ZTARGET434	19310	7435	ZTARGET435
19312	7436	ZTARGET436	19314	7437	ZTARGET437	19316	7440	ZTARGET440	19318	7441	ZTARGET441
19320	7442	ZTARGET442	19322	7443	ZTARGET443	19324	7444	ZTARGET444	19326	7445	ZTARGET445
19328	7446	ZTARGET446	19330	7447	ZTARGET447	19332	7450	ZTARGET450	19334	7451	ZTARGET451
19336	7452	ZTARGET452	19338	7453	ZTARGET453	19340	7454	ZTARGET454	19342	7455	ZTARGET455
19344	7456	ZTARGET456	19346	7457	ZTARGET457	19348	7460	ZTARGET460	19350	7461	ZTARGET461
19352	7462	ZTARGET462	19354	7463	ZTARGET463	19356	7464	ZTARGET464	19358	7465	ZTARGET465
19360	7466	ZTARGET466	19362	7467	ZTARGET467	19364	7470	ZTARGET470	19366	7471	ZTARGET471
19368	7472	ZTARGET472	19370	7473	ZTARGET473	19372	7474	ZTARGET474	19374	7475	ZTARGET475
19376	7476	ZTARGET476	19378	7477	ZTARGET477	19380	7500	ZTARGET500	19382	7501	ZTARGET501
19384	7502	ZTARGET502	19386	7503	ZTARGET503	19388	7504	ZTARGET504	19390	7505	ZTARGET505
19392	7506	ZTARGET506	19394	7507	ZTARGET507	19396	7510	ZTARGET510	19398	7511	ZTARGET511
19400	7512	ZTARGET512	19402	7513	ZTARGET513	19404	7514	ZTARGET514	19406	7515	ZTARGET515
19408	7516	ZTARGET516	19410	7517	ZTARGET517	19412	7520	ZTARGET520	19414	7521	ZTARGET521
19416	7522	ZTARGET522	19418	7523	ZTARGET523	19420	7524	ZTARGET524	19422	7525	ZTARGET525
19424	7526	ZTARGET526	19426	7527	ZTARGET527	19428	7530	ZTARGET530	19430	7531	ZTARGET531
19432	7532	ZTARGET532	19434	7533	ZTARGET533	19436	7534	ZTARGET534	19438	7535	ZTARGET535
19440	7536	ZTARGET536	19442	7537	ZTARGET537	19444	7540	ZTARGET540	19446	7541	ZTARGET541

LINE	LOCN	SYMBOL	LINE	LOCN	SYMBOL	LINE	LOCN	SYMBOL	LINE	LOCN	SYMBOL
19448	7542	ZTARGET542	19450	7543	ZTARGET543	19452	7544	ZTARGET544	19454	7545	ZTARGET545
19456	7546	ZTARGET546	19458	7547	ZTARGET547	19460	7550	ZTARGET550	19462	7551	ZTARGET551
19464	7552	ZTARGET552	19466	7553	ZTARGET553	19468	7554	ZTARGET554	19470	7555	ZTARGET555
19472	7556	ZTARGET556	19474	7557	ZTARGET557	19476	7560	ZTARGET560	19478	7561	ZTARGET561
19480	7562	ZTARGET562	19482	7563	ZTARGET563	19484	7564	ZTARGET564	19486	7565	ZTARGET565
19488	7566	ZTARGET566	19490	7567	ZTARGET567	19492	7570	ZTARGET570	19494	7571	ZTARGET571
19496	7572	ZTARGET572	19498	7573	ZTARGET573	19500	7574	ZTARGET574	19502	7575	ZTARGET575
19504	7576	ZTARGET576	19506	7577	ZTARGET577	19508	7600	ZTARGET600	19510	7601	ZTARGET601
19512	7602	ZTARGET602	19514	7603	ZTARGET603	19516	7604	ZTARGET604	19518	7605	ZTARGET605
19520	7606	ZTARGET606	19522	7607	ZTARGET607	19524	7610	ZTARGET610	19526	7611	ZTARGET611
19528	7612	ZTARGET612	19530	7613	ZTARGET613	19532	7614	ZTARGET614	19534	7615	ZTARGET615
19536	7616	ZTARGET616	19538	7617	ZTARGET617	19540	7620	ZTARGET620	19542	7621	ZTARGET621
19544	7622	ZTARGET622	19546	7623	ZTARGET623	19548	7624	ZTARGET624	19550	7625	ZTARGET625
19552	7626	ZTARGET626	19554	7627	ZTARGET627	19556	7630	ZTARGET630	19558	7631	ZTARGET631
19560	7632	ZTARGET632	19562	7633	ZTARGET633	19564	7634	ZTARGET634	19566	7635	ZTARGET635
19568	7636	ZTARGET636	19570	7637	ZTARGET637	19572	7640	ZTARGET640	19574	7641	ZTARGET641
19576	7642	ZTARGET642	19578	7643	ZTARGET643	19580	7644	ZTARGET644	19582	7645	ZTARGET645
19584	7646	ZTARGET646	19586	7647	ZTARGET647	19588	7650	ZTARGET650	19590	7651	ZTARGET651
19592	7652	ZTARGET652	19594	7653	ZTARGET653	19596	7654	ZTARGET654	19598	7655	ZTARGET655
19600	7656	ZTARGET656	19602	7657	ZTARGET657	19604	7660	ZTARGET660	19606	7661	ZTARGET661
19608	7662	ZTARGET662	19610	7663	ZTARGET663	19612	7664	ZTARGET664	19614	7665	ZTARGET665
19616	7666	ZTARGET666	19618	7667	ZTARGET667	19620	7670	ZTARGET670	19622	7671	ZTARGET671
19624	7672	ZTARGET672	19626	7673	ZTARGET673	19628	7674	ZTARGET674	19630	7675	ZTARGET675
19632	7676	ZTARGET676	19634	7677	ZTARGET677	19636	7700	ZTARGET700	19638	7701	ZTARGET701
19640	7702	ZTARGET702	19642	7703	ZTARGET703	19644	7704	ZTARGET704	19646	7705	ZTARGET705
19648	7706	ZTARGET706	19650	7707	ZTARGET707	19652	7710	ZTARGET710	19654	7711	ZTARGET711
19656	7712	ZTARGET712	19658	7713	ZTARGET713	19660	7714	ZTARGET714	19662	7715	ZTARGET715
19664	7716	ZTARGET716	19666	7717	ZTARGET717	19668	7720	ZTARGET720	19670	7721	ZTARGET721
19672	7722	ZTARGET722	19674	7723	ZTARGET723	19676	7724	ZTARGET724	19678	7725	ZTARGET725
19680	7726	ZTARGET726	19682	7727	ZTARGET727	19684	7730	ZTARGET730	19686	7731	ZTARGET731
19688	7732	ZTARGET732	19690	7733	ZTARGET733	19692	7734	ZTARGET734	19694	7735	ZTARGET735
19696	7736	ZTARGET736	19698	7737	ZTARGET737	19700	7740	ZTARGET740	19702	7741	ZTARGET741
19704	7742	ZTARGET742	19706	7743	ZTARGET743	19708	7744	ZTARGET744	19710	7745	ZTARGET745
19712	7746	ZTARGET746	19714	7747	ZTARGET747	19716	7750	ZTARGET750	19718	7751	ZTARGET751
19720	7752	ZTARGET752	19722	7753	ZTARGET753	19724	7754	ZTARGET754	19726	7755	ZTARGET755
19728	7756	ZTARGET756	19730	7757	ZTARGET757	19732	7760	ZTARGET760	19734	7761	ZTARGET761
19736	7762	ZTARGET762	19738	7763	ZTARGET763	19740	7764	ZTARGET764	19742	7765	ZTARGET765
19744	7766	ZTARGET766	19746	7767	ZTARGET767	19748	7770	ZTARGET770	19750	7771	ZTARGET771
19752	7772	ZTARGET772	19754	7773	ZTARGET773	19756	7774	ZTARGET774	19758	7775	ZTARGET775
19760	7776	ZTARGET776	19762	7777	ZTARGET777						

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LOCN	----0-----	----1-----	----2-----	----3-----	----4-----	----5-----	----6-----	----7-----
4000	TEST001	INITIALIZE12	WRITEDF350	ALU114A	GETZEROES114A	GOBUT114A	GOBUT114A2	SCOPE114A
4010	GETALTN115A1	GOBUT115A1	GOBUT115A4	GOBUT115A2	GOBUT115A3	ALU115B1	GOBUT115B1	GOBUT115B4
4020	GOBUT115B2	GOBUT115B3	SCOPE115B	GOBUT115C1	GOBUT115C2	GOBUT115C3	ALU115D1	GOBUT115D1
4030	GOBUT115D2	GOBUT115D3	SCOPE115D	GOBUT116A1	GOBUT116A2	GOBUT116A3	GOBUT116A4	GOBUT116A5
4040	ALU116B	GOBUT116B	SCOPE116C	GOBUT116C1	GOBUT116C2	GOBUT116C3	GOBUT116C4	GOBUT116C5
4050	ALU116D	GOBUT116D	SCOPE116D	GOBUT117A1	GOBUT117A2	GOBUT117A3	GOBUT117A4	ALU117B1
4060	GOBUT117B1	GOBUT117B2	GOBUT117B3	ALU117C1	GOBUT117C1	GOBUT117C2	SCOPE117C	GOBUT120A1
4070	GOBUT120A2	GOBUT120A3	ALU120B1	GOBUT120B1	GOBUT120B2	GOBUT120B3	GOBUT120B4	SCOPE120B
4100	LOAD010	INITIALIZE10	INITIALIZE11	GOBUT121A1	GOBUT121A2	GOBUT121A3	GOBUT121A4	ALU121B1
4110	GOBUT121B1	GOBUT121B2	GOBUT121B3	GOBUT121B4	SCOPE121C	GOBUT121C1	GOBUT121C2	GOBUT121C3
4120	GOBUT121C4	ALU121D1	GOBUT121D1	GOBUT121D2	GOBUT121D3	GOBUT121D4	SCOPE121D	GOBUT122A1
4130	GOBUT122A2	GOBUT122A3	SETD122A4	GOBUT122A4	SCOPE122A	COMP130A1	GOBUT130A1	GOBUT130A2
4140	ARITH130B1	COMP130B1	GOBUT130B1	GOBUT130B2	SCOPE130B	COMP131A1	GOBUT131A1	GOBUT131A2
4150	ARITH131B1	COMP131B1	GOBUT131B1	GOBUT131B2	SCOPE131B	GOBUT132A1	GOBUT132A2	ARITH132B1
4160	GOBUT132B1	GOBUT132B2	SCOPE132B	DOPA133A1	GOTEST133A1	GOBUT133A2	OPA133B1	GOTEST133B1
4170	GOBUT133B2	SCOPE133B	OPB134A1	DOPA134A1	GOTEST134A1	GOBUT134A2	OPA134B1	GOTEST134B1
4200	GOBUT134B2	SCOPE134B	OPB135A1	DOPA135A1	GOTEST135A1	GOBUT135A2	OPA135B1	GOTEST135B1
4210	GOBUT135B2	SCOPE135B	DOPA136A1	GOTEST136A1	GOBUT136A2	OPA136B1	GOTEST136B1	GOBUT136B2
4220	SCOPE136B	SETD320A	GETDC320A	GOBUT320A	GOBUT320B	SETONE320C	SETD320C	GETDC320C
4230	GOBUT320C	GOBUT320D	SETONE320E	SETD320E	GETDC320E	GOBUT320E	GOBUT320F	SCOPE320
4240	START350	LOADSRD350	BL1-537A	GOBUT350A	COMP350B	GOBUT350B	COMP350C	GOBUT350C
4250	COMP350D	GOBUT350D	SCOPE350	NEXTPATA350	LOAD06-351	VFY003	GOBUT351A	COMP351B
4260	GOBUT351B	COMP351C	GOBUT351C	COMP351D	GOBUT351D	SCOPE351	GOBUT352A	COMP352B
4270	GOBUT352B	COMP352C	GOBUT352C	COMP352D	GOBUT352D	SCOPE352	LOAD14537A	LOAD03537A
4300	LOAD01537A	COUNTER01	COMPS37A	GOBUT537A	SCOPE537A	LOADIN551A	SETSRS51A	LOADADR710A
4310	COUNTER02	BUSFCN711A	SETJAM710A	BUSFCN710A	GENADR712A	ZAPD762A	BUSFCN712A	GOTEST720C
4320	LOADRET721A	GOTEST721B	GOTEST721C	SETJAM722A	BUSFCN722A	GOTEST722B	GOTEST722C	SCOPE722
4330	LOADDATA730A	BUSFCN730A	GETDBUF730A	COMP730A	ZAPDBUF730A	GOBUT730A	EXPEC730B	BUSFCN730B
4340	GETIT730B	GOBUT730B	GOBUT730C	LOADDATA730D	SETZER730D	MANGLED730D	BUSFCN730D	GETIT730D
4350	GOBUT730D	GOBUT730E	SCOPE730	GETDBUF731A	COMP731A	GOBUT731A	BUSFCN731B	GETIT731B
4360	GOBUT731B	COMP731C	GOBUT731C	LOADIR731D	BUSFCN731D	MANGLED731D	GOBUT731D	GOBUT731E
4370	SCOPE731	BUSFCN740A	LOADIR740B	BUSFCN740B	BUSFCN740C	GOBUT740C	BUTERROR4	TEST007
4400	LOADIR740D	BUSFCN740D	SCOPE740	ZEROIT761A	CLEAR761A	GOBUT761A	GOBUT761B	GOBUT761C
4410	SCOPE761	DW11L762A	VFY002	SETPRI762A	FILL762C	DELAY762C	GOBUT762D	EXPEC762E
4420	GOGET762E	GOBUT762F	EXPEC763A	READVECT763A	TESTVECT763A	GOBUT763B	GOBUT763C	GOBUT763D
4430	SCOPE763	EOP001	. . . . .	VFY004	JAMUPP002C	JAMUPP006	JAMUPP007	JAMUPP010
4440	JAMUPP011	. . . . .	. . . . .	GOBUT730C1	. . . . .	NEXT710A	NEXT711A	NEXT712A
4450	TEST730C1	TEST740D	TEST740C	TEST740B	TEST731E	TEST731D	TEST731C	TEST731B
4460	TEST730C	TEST730D	TEST730E	SETPR6-762A	TEST722B	TEST722C	TEST730B	NEXTD762A
4470	SETADR722A	TEST730A	TEST132B2	TEST136B2	TEST006	TEST136B1	TEST136A2	TEST135B2
4500	TEST133A2	TEST133B1	TEST133B2	TEST134A2	TEST134B1	TEST134B2	TEST135A2	TEST135B1
4510	OPB133A1	TEST134A1	OPA134A1	TEST135A1	OPA135A1	TEST136A1	TEST132A2	TEST132B1
4520	ARITH131A1	TEST132A1	ARITH132A1	TEST133A1	NEXT722A	COUNTER09	COUNTER03	COUNTER10
4530	TEST130B1	COUNTER10B	TEST130B2	COUNTER10A	COUNTER06	COUNTER07	COUNTER08	TEST320D
4540	ARITH130A1	TEST131A1	OPB136A1	TEST320A	TEST131A2	COUNTER04	TEST131B1	COUNTER11
4550	TEST130A2	BUMPD762A	TEST320B	TEST762A1	TEST320E	COUNTER12	TEST320F	COUNTER05
4560	GOTEST551B	SETSR551C	TEST320C	DINTOIRA350	GOTEST551A	SETSR551B	TEST551C	LOAD05-351
4570	TEST122A2	TEST721A	TEST537A	TEST721B	LOAD16537A	TEST551A	TEST551B	TEST721C
4600	GETONES114A	TEST115A1	TEST115B4	TEST114A2	TEST115A4	TEST121C2	TEST116B	TEST114A
4610	ALU115A1	TEST115C1	TEST115B3	TEST115B2	TEST115B1	TEST115A3	TEST115A2	TEST115C2
4620	TEST116A3	TEST116A2	ALU115C1	TEST116A1	TEST115D3	TEST115D2	TEST115D1	TEST115C3
4630	TEST116C5	TEST116C4	TEST116C3	TEST116C2	ALU116A1	TEST116C1	TEST116A5	TEST116A4

LOCN	----0-----	----1-----	----2-----	----3-----	----4-----	----5-----	----6-----	----7-----
4640	TEST117B2	TEST117B1	TEST117A4	TEST117A3	TEST117A2	TEST116D	ALU116C1	TEST117A1
4650	TEST120B4	TEST120B3	TEST120B2	TEST120B1	TEST120A3	TEST120A2	TEST117C1	TEST117B3
4660	TEST121B4	TEST121B3	TEST121B2	TEST121B1	ALU120A1	TEST121A1	ALU117A1	TEST120A1
4670	ALU121C1	TEST122A1	ALU122A1	TEST130A1	TEST121A4	TEST121A3	TEST121A2	TEST117C2
4700	SETONE320A	TEST350	COMP350A	RESETIR350	COMP351A	TEST352A	ALU121A1	TEST121C1
4710	TEST763D	TEST762F	TEST351D	TEST352B	COMP352A	RESTORE01	TEST121C4	TEST121C3
4720	TEST763B	TEST763C	TEST351B	TEST351C	TEST352C	TEST352D	TEST121D2	TEST121D1
4730	TEST762E	ALLOW763A	TEST351A	VECTLOAD763A	TEST122A3	TEST122A4	TEST121D4	TEST121D3
4740	TEST762C	TEST762D	TEST350C	TEST350D	TEST740A	TEST761A	JAMUPP004	JAMUPP005
4750	TEST131B2	TEST762B	TEST350A	TEST350B	LOADIR730A	TEST731A	JAMUPP003	JAMUPP002B
4760	TEST720C	TEST763A	GOBUT762B	KILL764A	BUSFCN731A	LOADIR740A	GOBUT740B	GOBUT740D
4770	. . . .	TEST761B	ZERODSR761A	TEST762A	TEST761C	TEST010	GOBUT740A	JAMUPP001

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5000	SETDC372B	LOAD011	LOAD012A	GOBUT012A	GOBUT012B	GOBUT012C	GOBUT012D	GOBUT012E
5010	GOBUT012F	GOBUT012G	SCOPE012	GOBUT013A	GOBUT013B	GOBUT013C	GOBUT013D	GOBUT013E
5020	GOBUT013F	GOBUT013G	SCOPE013	GOBUT014A	GOBUT014B	GOBUT014C	GOBUT014D	SCOPE014
5030	GOBUT015A	GOBUT015B	GOBUT015C	SCOPE015	GOBUT016A	SCOPE016	GOBUT017A	GOBUT017B
5040	SCOPE017	GOBUT020A	GOBUT020B	GOBUT020C	SCOPE020	GOBUT021A	GOBUT021B	GOBUT021C
5050	SCOPE021	GOBUT022A	SCOPE022	GOBUT023A	SCOPE023	GOBUT024A	GOBUT024B	SCOPE024
5060	GOBUT025A	SCOPE025	GOBUT026A	SCOPE026	GOBUT027A	SCOPE027	GOBUT030A	GOBUT030B
5070	GOBUT030C	GOBUT030D	SCOPE030	GOBUT031A	GOBUT031B	SCOPE031	GOBUT032A	GOBUT032B
5100	SCOPE032	GOBUT033A	SCOPE033	GOBUT034A	SCOPE034	GOBUT035A	SCOPE035	GOBUT036A
5110	SCOPE036	GOBUT037A	SCOPE037	GOBUT040A	GOBUT040B	SCOPE040	GOBUT041A	GOBUT041B
5120	SCOPE041	GOBUT042A	GOBUT042B	SCOPE042	GOBUT043A	GOBUT043B	SCOPE043	GOBUT044A
5130	SCOPE044	GOBUT045A	SCOPE045	GOBUT046A	GOBUT046B	SCOPE046	GOBUT047A	GOBUT047B
5140	GOBUT047C	SCOPE047	GOBUT050A	LOAD050B	GOBUT050B	SCOPE050	TEST005	GOTEST101A
5150	SCOPE101	LOAD02-102A	LOAD04-102A	LOAD10-102A	LOAD00-102A	LOADD102A	GOTEST102A	LOADD102B
5160	GOTEST102B	LOADD102C	GOTEST102C	LOADD102D	GOTEST102D	SCOPE102	LOAD15-103A	LOAD13-103A
5170	LOAD07-103A	LOAD17-103A	LOADD103A	GOTEST103A	LOADD103B	GOTEST103B	LOADD103C	GOTEST103C
5200	LOADD103D	GOTEST103D	SCOPE103	GOTEST104A	LOADD104B	GOTEST104B	SCOPE104	GOTEST105A
5210	GOBUT105A1	LOADSR105B	GOTEST105B	GOBUT105B1	LOADSR105C	GOTEST105C	LOADSR105D	GOTEST105D
5220	GOTEST105E	SCOPE105	EXPEC374A1	SUBRA372B	SCOPE624	DOWRITE374A1	GETTEM374A1	ZERO374A2
5230	DOWRITE374A2	GETTEM374A2	GOTEST374A2	SCOPE374A	DOWRITE374B1	GETTEM374B1	ZERO374B2	DOWRITE374B2
5240	GETTEM374B2	GOTEST374B2	SCOPE374B	DOWRITE374C1	GETTEM374C1	NEXT010	ZERO374C2	DOWRITE374C2
5250	GETTEM374C2	GOTEST374C2	SCOPE374C	DOWRITE374D1	GETTEM374D1	ZERO374D2	DOWRITE374D2	GETTEM374D2
5260	GOTEST374D2	SCOPE374D	DOWRITE374E1	GETTEM374E1	ZERO374E2	DOWRITE374E2	GETTEM374E2	GOTEST374E2
5270	SCOPE374E	DOWRITE374F1	GETTEM374F1	ZERO374F2	DOWRITE374F2	GETTEM374F2	GOTEST374F2	SCOPE374F
5300	CHECK375B	GOBUT375B	SETIR376A	GOBUT376A	SCOPE376	SCOPE551	LOAD01-610A1	LOAD05-610A1
5310	LOAD06-610A1	PSCC-DC610A1	SETBUSA610A1	DOIT610A1	GETIT610A1	LOAD06-610A2	LOAD01-610A2	PSCC-DC610A2
5320	SETBUSA610A2	DOIT610A2	GETIT610A2	SCOPE610A	LOAD01-610B1	PSCC-DC610B1	SETBUSA610B1	DOIT610B1
5330	GETIT610B1	LOADIR610B2	LOAD07-610B2	LOAD01-610B2	PSCC-DC610B2	SETBUSA610B2	DOIT610B2	GETIT610B2
5340	SCOPE610B	LOAD01-610C1	PSCC-DC610C1	SETBUSA610C1	DOIT610C1	GETIT610C1	LOAD05-610C2	LOAD01-610C2
5350	PSCC-DC610C2	SETBUSA610C2	DOIT610C2	GETIT610C2	SCOPE610C	PSCC-DC610D1	SETBUSA610D1	DOIT610D1
5360	GETIT610D1	PSCC-DC610D2	SETBUSA610D2	DOIT610D2	GETIT610D2	SCOPE610D	GOBUT620A	GOBUT620B
5370	MASK620C	GETJAM620C	CSP1L621A	SETBRK621A	LODBRK621A	SETRET621A	BUTERRORS	SETFLG621A
5400	LODFLG621A	SETSR621A	GOBUT621B	GOBUT621C	GOBUT621D	EXPEC621E	GETJAM621E	EXPEC621F
5410	GETCUA621F	GOBUT621G	COMP621H	BC1FCN622A	CNST0622A	GOBUT622A	BCERC622B	GOBUT622B
5420	GETJAM622C	EXPEC623	GETCUA623	SCOPE623	SETBRK624A	LODBRK624A	SETRET624A	ZEROIR624B
5430	EXPEC624C	GETCUA624C	GOBUT624D	SCOPE702	GOBUT701B	GOBUT701D	SCOPE701	EXPEC702A
5440	DOIT376A	SETLED702A	SETKT702A	LOADBA702A	GOTEST702A	SCOPE710	SCOPE711	SCOPE712
5450	GOTEST712B	SCOPE713	EXPEC713B	GOTEST713B	SCOPE721	. . . . .	LOADRET722A	. . . . .
5460	. . . . .	. . . . .	LOADRET720A	TEST722A	LOADRET713A	TEST720A	LOADRET712A	TEST713A
5470	LOADRET711A	TEST712A	LOADRET710A	TEST711A	MASK702A	TEST710A	MASK701A	TEST702A
5500	TEST374D2	SCOPE372B	TEST374E2	LOAD372B	TEST374F2	TEST712B	SETSP375A	TEST410
5510	LOAD01-610D1	TEST620A	TEST701D	TEST376A	ZERO374D1	EXPEC374E1	ZERO374F1	TEST375A
5520	LOADD101A	TEST102A	UBRK621A	TEST701B	TEST374C2	TEST004	ZERO374E1	EXPEC374F1
5530	LOAD01-102A	TEST103A	LOADIR610A1	TEST610B1	LOADIR610B1	TEST610C1	ZERO374A1	EXPEC374B1
5540	LOADD104A	TEST105A	LOADSR105A	SETUPCSP17A	LOADIR610C1	TEST610D1	LOAD16-103A	TEST104A
5550	LOAD047A	TEST050A	LOAD050A	TEST101A	TEST102D	CUA372B	ZERO374B1	EXPEC374C1
5560	LOAD046A	TEST047A	LODIR624A	TEST701A	TEST102C	TEST624B	ZERO374C1	EXPEC374D1
5570	BCERC620A	TEST624A	TEST103B	TEST623	TEST102B	TEST622C	TEST103C	TEST622B
5600	TEST105B1	TEST622A	TEST610C2	TEST621F	TEST374A2	TEST621E	TEST374B2	TEST621D
5610	TEST105A1	TEST621C	TEST610B2	TEST621B	TEST376A1	ERROR621A	TEST713B	TEST621A
5620	TEST105E	TEST620C	TEST610A2	TEST620B	TEST610D2	TEST375B	GOTEST551C	TEST610A1
5630	LOAD045A	TEST046A	LOAD044A	TEST045A	LOAD043A	TEST044A	TEST105D	TEST043B

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LOCN	----0-----	----1-----	----2-----	----3-----	----4-----	----5-----	----6-----	----7-----
5640	LOAD042A	TEST043A	TEST105C	TEST042B	LOAD041A	TEST042A	TEST104B	TEST041B
5650	LOAD040A	TEST041A	TEST105B	TEST040B	LOAD037A	TEST040A	LOAD036A	TEST037A
5660	LOAD035A	TEST036A	LOAD034A	TEST035A	LOAD033A	TEST034A	LOAD032A	TEST033A
5670	TEST047B	TEST032B	LOAD031A	TEST032A	TEST103D	TEST031B	LOAD030A	TEST031A
5700	LOAD027A	TEST030A	LOAD026A	TEST027A	LOAD025A	TEST026A	LOAD024A	TEST025A
5710	TEST014D	TEST024B	TEST030B	TEST030C	LOAD023A	TEST024A	LOAD022A	TEST023A
5720	LOAD021A	TEST022A	TEST015C	TEST021B	LOAD020A	TEST021A	TEST050B	TEST020C
5730	TEST047C	TEST020B	LOAD017A	TEST020A	TEST030D	TEST017B	LOAD016A	TEST017A
5740	LOAD015A	TEST016A	LOAD014A	TEST015A	LOAD013A	TEST014A	SFDFTOSR	TEST013G
5750	TEST013F	TEST013E	TEST014B	TEST013D	TEST621H	TEST013C	TEST624D	TEST013B
5760	SETIRA	TEST013A	TEST014C	TEST012G	TEST012F	TEST012E	TEST621G	TEST012D
5770	TEST046B	TEST012C	TEST015B	TEST012B	TEST021C	TEST012A	TEST624C	TEST011

LOCN	----0-----	----1-----	----2-----	----3-----	----4-----	----5-----	----6-----	----7-----
6000	SETBYTEE410	LOADRES361A	LOADSR361A	EXPEC361B	COMP361B	GOBUT361D	GOBUT361E	SETRES362A
6010	SETDDC362A	LOADRES362A	COMP362A	GOBUT362A	EXPEC362B	COMP362B	GOBUT362D	GOBUT362E
6020	SETDDC363A	SHIFT363A	COMP363A	GOBUT363A	GOBUT363B	SETDDC364A	GOBUT364A	SETDDC364B
6030	GOBUT364B	SETRES365A	LOADRES365A	EXPEC365A	COMP365A	GOBUT365B	SETRES366A	LOADRES366A
6040	SHIFT366A	EXPEC366A	COMP366A	GOBUT366B	SETDDC366C	SHIFT366C	EXPEC366C	COMP366C
6050	SETRES367A	LOADRES367A	LOADSR367A	GOBUT367B	SETRES370A	LOADRES370A	SHIFT370A	COMP370A
6060	GOBUT370A	GOBUT370B	SETDDC370C	SHIFT370C	COMP370C	GOBUT370C	GOBUT370D	SETRES371A
6070	LOADRES371A	SHIFT371A	COMP371A	GOBUT371A	GOBUT371B	SCOPE371	SETDC372A	SUBRA372A
6100	PAGE372B	GOBUT373B	SCOPE373	LOADRES374	LOADDCS506A	SETBYTEG410	COMP410A	INTOIR410A
6110	EXPEC410B	COMP410B	GOPUT410B	EXPEC410C	ASIDE410C	COMP410C	GOBUT410C	EXPEC410D
6120	COMP410D	GOBUT410D	EXPEC410E	COMP410E	GOBUT410E	SCOPE410	SETFETCHD500	SETFETCHE500
6130	SETFETCHF500	SETFETCHG500	LOADIR500	TESTINHBSP500	COMP500A	GOBUT500A	EXPEC500C	COMP500C
6140	GOBUT500C	COMP500D	GOBUT500D	EXPEC500E	COMP500E	GOBUT500E	SCOPE500F	LOADFPS503A
6150	EXPEC503A	MASK503A	LOADFCC503A	DOFCC503A	GOPUT503A	GOBUT503A	GOBUT503B	GOBUT503C
6160	GOBUT503DA	LOADIR503D	GOBUT503D	EXPEC503E	GOPUT503E	GOBUT503F	GOBUT503G	GOBUT503H
6170	GOBUT503I	GOBUT503J	GOBUT503K	SCOPE503	LOADFPS504A	EXPEC504A	LOADFCC504A	DOFCC504A
6200	GOPUT504A	GOBUT504A	GOBUT504B	GOBUT504C	LOADIR504D	GOBUT504D	EXPEC504E	GOPUT504E
6210	GOBUT504F	GOBUT504G	GOBUT504H	GOBUT504I	SCOPE504	EXPEC505A	SETFLAG505A	BUTCLR505A
6220	GOPUT505A	GOBUT505B	CUA372A	GOBUT505C	SCOPE505	SETUCON506A	PSHI506A	PSMID506A
6230	PSLO506A	FUDGEPS506A	MFSS01	GOBUT506B	GOBUT506C	GOBUT506D	CLEAR506E	GOBUT506E
6240	SCOPE506	PSHI507A	PSMID507A	PSLO507A	FUDGEPS507A	LOADDCS507A	GOBUT507A	GOBUT507B
6250	GOBUT507C	GOBUT507D	TEST002	GOBUT507E	CIN507F	UBRK624A	SETPS507F	SETSR507F
6260	SETCIN507F	GOBUT507F	SCOPE507	LOADPRIO510A	GOBUT510A	GOBUT510B	GOBUT510C	FLAG510D
6270	ENFLAG510D	SETFLAG510D	GOBUT510D	GOBUT510DA	ZERO510E	GOBUT510E	ZEROFLAG510E	GOBUT510F
6300	SCOPE510	SCOPE511A	MFSS02	MFSS03	MFSS04	SCOPE511B	SETD624A	SETUP512B
6310	SETPSFLAG512A1	GOTEST512A1	GOTEST512A2	SCOPE512A	SETPSFLAG512B1	GOTEST512B1	GOTEST512B2	SETIR512C1
6320	SETPSFLAG512C1	GOTEST512C1	GOTEST512C2	SCOPE512C	SETPSFLAG512D1	GOTEST512D1	GOTEST512D2	SETIR512E1
6330	SETPSFLAG512E1	GOTEST512E1	GOTEST512E2	SCOPE512E	SETUP520A	GOTEST520A	SETUP520B	GOTEST520B
6340	SETUP520C	GOTEST520C	SETUP520D	GOTEST520D	SETUP520E	GOTEST520E	SCOPE520	INITD533A
6350	COMP533A	GOBUT533A	INIT533B	INITD533B	COMP533B	GOBUT533B	SCOPE533B	COMP534A
6360	GOBUT534A	INITD534B	COMP534B	GOBUT534B	SCOPE534B	COMP534C	GOBUT534C	INITD534D
6370	COMP534D	GOBUT534D	SCOPE534D	INITD534E	COMP534E	GOBUT534E	BUTERROR6	NEXTPAT500
6400	LODCNTR534F	INITD534F	COMP534F	GOBUT534F	COUNTER534G	GOBUT534G	SCOPE534G	EXPEC535A
6410	INITD535A	COMP535A	GOBUT535A	EXPEC535B	INITD535B	COMP535B	GOBUT535B	SCOPE535B
6420	EXPEC536A	INITD536A	COMP536A	GOBUT536A	EXPEC536B	INITD536B	COMP536B	GOBUT536B
6430	SCOPE536B	COMP536C	GOBUT536C	INIT536D	EXPEC536D	INITD536D	COMP536D	GOBUT536D
6440	SCOPE536D	INITD536E	COMP536E	GOBUT536E	LOADSR536F	INITD536F	COMP536F	GOBUT536F
6450	SCOPE536F	AR3-537A	EOP002	SETFLG624A	SETSR624A	EXPEC701C	LOADBA701C	GOTEST701C
6460	EXPEC702B	SETKT702B	LOADBA702B	GOTEST702B	GOTEST710B	EXPEC710C	GOTEST710C	EXPEC710D
6470	CLEAR710D	GOTEST710D	GOTEST710E	EXPEC711B	GOTEST711B	EXPEC711C	GOTEST711C	GOTEST711D
6500	GOBUT712C	EXPEC712D	GOTEST712D	GOBUT713C	EXPEC713D	GOTEST713D	GOTEST720B	. . . . .
6510	EOP003	EOP004	EOP007					
6520	TEST720B	TEST713D	TEST713C	TEST712D	TEST712C	ASSERTFOV500	TEST711D	FIXPAT500
6530	TEST711C	DNONZERO410	INITIALIZE01	DZERO410	TEST711B	TEST512E2	SETIR512B1	TEST512D1
6540	LOOP372A	TEST373A	TEST512A1	ERROR010	TEST512A2	MFSSEXPEC0	TEST512B2	MFSSEXPEC1
6550	GOTEST511A1	TEST511B1	MFSS05	MFSS06	GOTEST511B1	SETUP512A	TEST512C1	TEST507D
6560	SETBYTEB410	TEST500	RETURN373A	TEST374	SETIR512A1	TEST512B1	TEST512C2	ERROR624A
6570	SETRES361A	TEST372A	TEST373B	TEST361A	TEST710D	TEST710E	TEST512D2	TEST512E1
6600	TEST510D	TEST503DA	EXPEC507A	TEST510A	TEST510E	TEST506E	SETONES510A	TEST511A
6610	TEST510F	TEST507C	EXPEC506A	TEST507A	LOADFLAG503A	TEST504A	TEST510C	TEST510DA
6620	LOAD505A	TEST506A	LOADFLAG504A	TEST505A	UCON520A	TEST533A	SETIR512D1	TEST520A
6630	TEST503B	TEST003	TEST503C	TEST533B	TEST534B	TEST534D	TEST534F	TEST535B

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6640	TEST536B	TEST536D	TEST536F	NEWCTR537A	TEST710B	TEST710C	TEST503K	TEST507F
6650	LOADSR536E	SETEMIT537A	INITD536C	TEST536E	INIT536A	TEST536C	INIT535A	TEST536A
6660	LODCNTR534E	TEST535A	INITD534C	TEST534E	INITD534A	TEST534C	INIT533A	TEST534A
6670	TEST503D	TESTD500	TEST504F	TEST500A	TEST507E	TEST510B	SETFETCHB500	TEST503A
6700	TEST503E	TEST372B	TEST504G	LOAD372A	TEST410B	TEST410E	TEST504H	TEST410C
6710	TEST503F	TEST410A	TEST505B	TEST371B	TESTA503A	TEST371A	TEST504I	TEST370D
6720	TEST503G	TEST370C	TEST505C	TEST370B	TEST507B	TEST370A	TEST500C	TEST410D
6730	TEST504B	TEST367A	TEST503H	TEST366C	TEST506D	TEST366B	TEST500E	TEST366A
6740	TEST504C	TEST365B	TEST503I	TEST365A	TEST506C	TEST364B	TEST500D	TEST364A
6750	TEST504D	TEST363B	TEST534G	TEST363A	TEST506B	TEST362E	TEST503J	TEST362D
6760	TEST504E	TEST702B	TEST520D	TEST362B	TEST520B	TEST362A	TESTA504A	TEST361E
6770	TEST701C	TEST361D	TEST520C	TESTD410	VFY001	TEST520E	EOP006	TESTINHASP500

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7000	SUBR010	INITIALIZE03	SETUPCSP16A	INITIALIZE04	INITIALIZE05	INITIALIZE06	INITIALIZE07	ALUCARRY1
7010	SETUPCSP15A	SETUPCSP14A	SETUPCSP12A	SETUPCSP05A	SETUPCSP07A	SETUPCSP00A	WRITESF350	ALUCARRY1A
7020	ALUCARRY2	ALUCARRY2A	RESETIR350A	NEXTPAT350	LOADHIA350	AGAINSRD350	RESETIR350B	RESETIR350C
7030	RESTORE02	CSP16XORSRTOIRS	RESTORE03	RESTORE04	SETIR373A	CSP16XORFLTTOIR	ZEROSF02DF04	SETSR373A
7040	SFDFTOSRAA	ZEROSF04DF02	ZEROSFDF	ZEROSFDFA	ZEROSF	ZEROSFA	FIRST375A	SFDFTOSRA
7050	SFDFTOSRB	SFDFTOSRC	SFDFTOSRD	SFDFTOSRE	SFDFTOSRF	SFDFTOSRG	SFDFTOSRH	SFDFTOSRI
7060	SETBYTEC410	SECOND375A	BYTE375A	CHECK375A	GOBUT375A	NEXTPAT410	SETBYTED410	LOADUCON506A
7070	BYTEFIRST410	GOBUT506A	DOIT506A	FLAGFPSSEQLOD	TEST511A2	FLAGFPS02	FLAGFPS03	FLAGFPS04
7100	PSSEQLOD	PSSEQLOD02	PSSEQLOD03	PSSEQLOD04	PSSEQLOD05	PSSEQLOD06	TEST511B2	GOTEST511A2
7110	TEST511A3	GOTEST511A3	TEST511A4	GOTEST511A4	KTSRCDST01	GOTEST511B2	TEST511B3	GOTEST511B3
7120	TEST511B4	GOTEST511B4	SUCBRTEST01	KTSRCDST02	KTSRCDST03	KTSRCDST04	KTSRCDST04B	KTSRCDST07
7130	KTSRCDST08	INITSR537A	SUCBRTEST02	SUCBRTEST03	BR3-537A	SETRESA537A	BUTCOUNT-IS-377	CR3-537A
7140	DR3-537A	AR7-537A	BR7-537A	CR7-537A	DR7-537A	AR11-537A	BR11-537A	CR11-537A
7150	DR11-537A	ER3-537A	FR3-537A	GR3-537A	HR3-537A	AL1-537A	SETUPPSCC#DC	GOTEST551B1
7160	GOBUT621H	SETUPPSCC#DC02	PSCCTOSR3-0	PSCCTOSR3-0AA	PSCCTOSR3-0BB	CLEAR624	EXPEC701A	BUSFCN713A
7170	LOADBA701A	GOTEST701A	LOADIR720A	SETADR721A	SETADR720A	SETJAM720A	BUSFCN720A	BDX12
7200	SETJAM721A	BUSFCN721A	MASK762A	C17X12	BDX05	C17X05	SETPRI762C	PRI06762A
7210	GETIT762A	EOP005	EOP010	JAMUPP002D	INSERTEOPREVNO	INSERT02	INSERTREVNO	INSERT03
7220	INSERT04	DISPLAY	DISP002	DISP003	DISP004	DISP005	DISP006	CLEAR-I-0-A
7230	CLEAR-I-0-B	CLEARI002	CLEARI004	CLEARI005	D[15-12]	D1512A	D[11-06]	D1106A
7240	D[05-00]	D0500A	DZERO	DTOIRB	CLRSERVICETOD	DATISERVICETOD	DATOSERVICETOD	CJESERVICETOD
7250	SERVICETOD	PBATOD	FLAGFPSTOD	PSTOD	ODDJAMTOD	CLRJAMTOD	JAMTOD	CUATOD
7260	GETMSKPROCDAT	MSKPROCDAT	CMPPROCDAT	RESETPROCDAT	LOADFPSCC	LOADFPSCC02	SRINTOIR	DINTOIR
7270	DBUFINTOIR	RESETUCONP	SRINTOIRS	DINTOIRS	DBUFINTOIRS	RESETUCONPS	BUTSR3-0	
7300	BUTIR15-12	BUTINSTR5	BUTIR11FLTPT3-0	NEXT007	BUTIR9-6	BUTMOVDR7IRS-3	BUTINSTR1	BUTBGFPSERV
7310	BUTD[C]C	BUTCOUT7DOUT7	BUTFPS05	BUTDMSMBYTE	BUTGD3-2	BUTSR1-0	BUTBGSERVL	BUTMMASKPS[T]
7320	BUTMNXT000	BUTMD00	BUTMNXT001	BUTMPS[N]	BUTMNXT002	BUTMFLAG7	BUTMNXT003	BUTMEXFLAG1
7330	BUTMNXT004	BUTMFLTPTS	BUTMNXT005	BUTMEXFLAG2	BUTMNXT006	KTSRCDST05	BUTMINITJAM	KTSRCDST06
7340	BUTMNXT007	BUTD-IS-ZERO	BUTIR11B	BUTPS15	BUTD[C]A	BUTSERVICE	BUTVECTLOAD	BUTDR6-7L
7350	BUTD[C]B	BUTBA00	BUTOTHERJAM	DINTOIR350	BUTFPPROC	BUTINTRHIGH	BUTINSTRBRANCH	LOADHI350
7360	BUTPREFETCHJAM	GOFOR410	NEXT721A	EXPEC410A	NEXT720A	NEXT713A	WORD410	BYTESECOND410
7370	SETRESB537A	BUTFPFD		GETPROCDAT	VFY006	VFY005	BUTERROR7	
7400	ZTARGET400	ZTARGET401	ZTARGET402	ZTARGET403	ZTARGET404	ZTARGET405	ZTARGET406	ZTARGET407
7410	ZTARGET410	ZTARGET411	ZTARGET412	ZTARGET413	ZTARGET414	ZTARGET415	ZTARGET416	ZTARGET417
7420	ZTARGET420	ZTARGET421	ZTARGET422	ZTARGET423	ZTARGET424	ZTARGET425	ZTARGET426	ZTARGET427
7430	ZTARGET430	ZTARGET431	ZTARGET432	ZTARGET433	ZTARGET434	ZTARGET435	ZTARGET436	ZTARGET437
7440	ZTARGET440	ZTARGET441	ZTARGET442	ZTARGET443	ZTARGET444	ZTARGET445	ZTARGET446	ZTARGET447
7450	ZTARGET450	ZTARGET451	ZTARGET452	ZTARGET453	ZTARGET454	ZTARGET455	ZTARGET456	ZTARGET457
7460	ZTARGET460	ZTARGET461	ZTARGET462	ZTARGET463	ZTARGET464	ZTARGET465	ZTARGET466	ZTARGET467
7470	ZTARGET470	ZTARGET471	ZTARGET472	ZTARGET473	ZTARGET474	ZTARGET475	ZTARGET476	ZTARGET477
7500	ZTARGET500	ZTARGET501	ZTARGET502	ZTARGET503	ZTARGET504	ZTARGET505	ZTARGET506	ZTARGET507
7510	ZTARGET510	ZTARGET511	ZTARGET512	ZTARGET513	ZTARGET514	ZTARGET515	ZTARGET516	ZTARGET517
7520	ZTARGET520	ZTARGET521	ZTARGET522	ZTARGET523	ZTARGET524	ZTARGET525	ZTARGET526	ZTARGET527
7530	ZTARGET530	ZTARGET531	ZTARGET532	ZTARGET533	ZTARGET534	ZTARGET535	ZTARGET536	ZTARGET537
7540	ZTARGET540	ZTARGET541	ZTARGET542	ZTARGET543	ZTARGET544	ZTARGET545	ZTARGET546	ZTARGET547
7550	ZTARGET550	ZTARGET551	ZTARGET552	ZTARGET553	ZTARGET554	ZTARGET555	ZTARGET556	ZTARGET557
7560	ZTARGET560	ZTARGET561	ZTARGET562	ZTARGET563	ZTARGET564	ZTARGET565	ZTARGET566	ZTARGET567
7570	ZTARGET570	ZTARGET571	ZTARGET572	ZTARGET573	ZTARGET574	ZTARGET575	ZTARGET576	ZTARGET577
7600	ZTARGET600	ZTARGET601	ZTARGET602	ZTARGET603	ZTARGET604	ZTARGET605	ZTARGET606	ZTARGET607
7610	ZTARGET610	ZTARGET611	ZTARGET612	ZTARGET613	ZTARGET614	ZTARGET615	ZTARGET616	ZTARGET617
7620	ZTARGET620	ZTARGET621	ZTARGET622	ZTARGET623	ZTARGET624	ZTARGET625	ZTARGET626	ZTARGET627
7630	ZTARGET630	ZTARGET631	ZTARGET632	ZTARGET633	ZTARGET634	ZTARGET635	ZTARGET636	ZTARGET637

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7640	ZTARGET640	ZTARGET641	ZTARGET642	ZTARGET643	ZTARGET644	ZTARGET645	ZTARGET646	ZTARGET647
7650	ZTARGET650	ZTARGET651	ZTARGET652	ZTARGET653	ZTARGET654	ZTARGET655	ZTARGET656	ZTARGET657
7660	ZTARGET660	ZTARGET661	ZTARGET662	ZTARGET663	ZTARGET664	ZTARGET665	ZTARGET666	ZTARGET667
7670	ZTARGET670	ZTARGET671	ZTARGET672	ZTARGET673	ZTARGET674	ZTARGET675	ZTARGET676	ZTARGET677
7700	ZTARGET700	ZTARGET701	ZTARGET702	ZTARGET703	ZTARGET704	ZTARGET705	ZTARGET706	ZTARGET707
7710	ZTARGET710	ZTARGET711	ZTARGET712	ZTARGET713	ZTARGET714	ZTARGET715	ZTARGET716	ZTARGET717
7720	ZTARGET720	ZTARGET721	ZTARGET722	ZTARGET723	ZTARGET724	ZTARGET725	ZTARGET726	ZTARGET727
7730	ZTARGET730	ZTARGET731	ZTARGET732	ZTARGET733	ZTARGET734	ZTARGET735	ZTARGET736	ZTARGET737
7740	ZTARGET740	ZTARGET741	ZTARGET742	ZTARGET743	ZTARGET744	ZTARGET745	ZTARGET746	ZTARGET747
7750	ZTARGET750	ZTARGET751	ZTARGET752	ZTARGET753	ZTARGET754	ZTARGET755	ZTARGET756	ZTARGET757
7760	ZTARGET760	ZTARGET761	ZTARGET762	ZTARGET763	ZTARGET764	ZTARGET765	ZTARGET766	ZTARGET767
7770	ZTARGET770	ZTARGET771	ZTARGET772	ZTARGET773	ZTARGET774	ZTARGET775	ZTARGET776	ZTARGET777

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