DR11B

DIAGNOSTIC

MD-11-DZDRB-D

EP-DZDRB-D-DL-A

FICHE 1 OF 1

NOV 1976

digital

MADE IN USA

.REM %

IDENTIFICATION

PRODUCT CODE: MAINDEC-11-DZDRB-D

PRODUCT NAME: DR11B - PDP11 GENERAL NPR INTERFACE
DA11B - PDP11 INTERPROCESSER LINK

DATE CREATED: APRIL 1971

MAINTAINER: DIAGNOSTIC GROUP

AUTHOR: LARRY CONDON, DICK JONES, STEVE POMFRET

REVISED BY: W.F.KELLICKER 29-JAN-1974
ALAN BOSTICK 20-JUN-1976

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                                1.      ABSTRACT

                                1.1 THIS IS A LOGIC TEST OF THE "NPR GENERAL INTERFACE" -DR11B.
                                    THERE IS A SPECIAL MAINTENANCE FEATURE THAT ALLOWS TESTING
                                    OF NPRS WITHOUT A CUSTOMERS DEVICE ATTACHED.
                                1.2 THERE IS A SECOND TEST INCLUDED FOR EXERCISING THE DA11B
                                    INTERPROCESSER LINK. THE DR11B TEST SHOULD BE RUN IN
                                    IN EACH COMPUTER BEFOUR TESTING THE DA11B.

                                2.      REQUIREMENTS

                                2.1     EQUIPMENT

                                        2.1.1 FOR THE DR11B

                                        PDP-11 STANDARD COMPUTER
                                        DR11B
                                        NOTE: WITH OR WITHOUT HARDWARE SWITCH REGISTER
                                        2.1.2 FOR THE DA11B

                                             2 PDP-11 STANDARD COMPUTERS
                                             1 DA11B CONSISTING OF 2 M7229 MODULES AND 2
                                                   BC08R CABLES.
                                        NOTE: WITH OR WITHOUT HARDWARE SWITCH REGISTER

                                2.2     STORAGE

                                        2.2.1  PROGRAM STORAGE - THE ROUTINE USES MEMORY
                                               FROM 0 TO 14000.


                                3.      LOADING PROCEDURE

                                3.1     METHOD

                                        PROCEDURE FOR NORMAL BINARY TAPES SHOULD BE FOLLOWED.


                                4.      DR11B STARTING PROCEDURE

                                4.1     CONTROL SWITCH SETTING

                                        STARTING AT SA 200 ALL SWITCHES SHOULD BE DOWN OR ZERO.

                                4.2     STARTING ADDRESS OR ADDRESSES

                                        (A)  200 = TEST OF LOGIC USING MAINTENANCE FEATURE M968 IN C04,D04

                                4.3     PROGRAM AND/OR OPERATOR ACTION
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LOAD PROGRAM INTO MEMORY.
LOAD STARTING ADDRESS
PRESS START.
THE PROGRAM WILL LOOP, BELL WILL RING ONCE
PER PASS OF THE PROGRAM.

NOTE: IF SOFTWARE SWITCH REGISTER IS SELECTED THEN THE
FOLLOWING WILL BE PRINTED:
        SWR= XXXXXX NEW=
(REFER TO SECTION 5.1 FOR OPERATOR OPTIONS)

5. DR11B OPERATING PROCEDURE

5.1 OPERATIONAL SWITCH SETTINGS

5.1.1 AT SA 200 .. THE INSTRUCTION AND LOGIC TEST.
WITH ALL SWITCHES DOWN THE PROGRAM WILL PRINT
OUT ON ERRORS AND CONTINUE IN TEST. (BELL
WILL RING AT COMPLETION OF A PASS)

5.1.2 SWITCH SETTINGS ARE

SW15 = 1 OR UP ... HALT ON ERROR
SW14 = 1 OR UP ... SCOPE LOOP
SW13 = 1 OR UP ... INHIBIT PRINTOUT
SW12 = 1 OR UP ... INHIBIT TRACE TRAP
SW11 = 1 OR UP ... INHIBIT ITERATIONS

5.1.3
IF THE DIAGNOSTIC IS RUN ON A CPU WITHOUT A SWITCH
REGISTER THEN A SOFTWARE SWITCH REGISTER IS USED WHICH ALLOWS
THE USER THE SAME SWITCH OPTIONS AS THE HARDWARE SWITCH REGISTER.
IF THE HARDWARE SWITCH REGISTER DOES NOT EXIST OR IF ONE DOES
AND IT CONTAINS ALL ONES (177777) THEN THE SOFTWARE SWITCH
REGISTER (LOC. 176) IS USED.

CONTROL:

THIS PROGRAM ALSO SUPPORTS THE DYNAMIC LOADING OF THE SOFTWARE SWITCH
REGISTER (LOC. 176) FROM THE TTY. THIS CAN BE ACCOMPLISHED BY
DOING THE FOLLOWING:

1) TYPE CONTROL G (↑G); THIS WILL ALLOW THE TTY TO ENTER DATA INTO
   LOC. 176 AT SELECTED POINTS WITHIN THE PROGRAM.

2) THE MACHINE WILL THEN TYPE: SWR=XXXXXXNEW= (XXXXXX IS THE OCTAL CONTENTS
   OF THE SOFTWARE SWITCH REGISTER.)

3) AFTER THE ''NEW='' HAS BEEN TYPED THEN THE OPERATOR CAN DO ONE
   OF THE FOLLOWING AT THE TTY:

   A) TYPE A NUMBER TO BE LOADED INTO LOC. 176 FOLLOWED BY A (CR).
      (ONLY NUMBERS BETWEEN 0-7 WILL BE ACCEPTED AND ONLY 6 NUMBERS
      WILL BE ALLOWED)

IF A <CR> IS THE FIRST KEY DEPRESSED THE SOFTWARE SWITCH
REGISTER CONTENTS WILL NOT BE CHANGED.

B) IF A CONTROL U <↑U> IS DEPRESSED THEN THE PROGRAM WILL SEND YOU
BACK TO STEP 2.

5.2. SUBROUTINE ABSTRACTS

BEGIN SA 200

5.2.1 SCOPE

THIS SUBROUTINE CALL IS PLACED BETWEEN EACH SUBTEST
IN THE INSTRUCTION SECTION. IT RECORDS THE STARTING
ADDRESS OF EACH SUB-TEST AS IT IS BEING ENTERED.
IF A SCOPE LOOP IS REQUESTED, IT WILL JUMP TO THE
START OF THE SUBTEST THAT THE SCOPE LOOP IS RE-
QUESTED FOR. IF SCOPE LOOP IS NOT REQUESTED, THERE
WILL BE EITHER A FIXED OR RANDOM NUMBER OF ITERATIONS
ON THAT SUBTEST BEFORE THE NEXT SUBTEST IS ENTERED.
SWITCH 11 ON A 1 INHIBITS ITERATION OF SUBTESTS.
NOTE: SUPPORTS ↑G ROUTINE FOR DYNAMIC LOADING
OF SOFTWARE SWITCH REGISTER

5.2.2 HALT

IS A ROUTINE THAT PRINTS-OUT AN ADDRESS THAT TAGS
THE FAILING SUBTEST,THE CP STATUS REGISTER AND
THE DR11B STATUS REGISTER AT THE TIME OF FAILURE.
NOTE: SUPPORTS ↑G ROUTINE FOR DYNAMIC LOADING
OF SOFTWARE SWITCH REGISTER

5.2.3 LODBUF

THE INBUF BUFFER IS LOADED WITH AN INCREMENTING
PATTERN (0,1,2,3,...) BEGINNING AT THE STARTING
ADDRESS OF INBUF. THE NUMBER OF WORDS LOADED IS
DETERMINED BY THE CONTENTS OF BUFLEN.

5.2.4 CHKBFF

THE CHKBUF BUFFER IS LOADED WITH A MODIFIED
INCREMENTING PATTERN (0,0,2,2,4,4,6,6,...)
BEGINNING AT THE STARTING ADDRESS OF CHKBUF.
THE NUMBER OF WORDS LOADED IS DETERMINED BY THE
CONTENTS OF BUFLEN. THIS BUFFER IS LOADED ONLY
FOR TESTS WHICH USE THE MAINTENANCE MODE OF THE
DR11-B WHICH HAS A SPECIAL ALTERNATING DATI-DATO
SEQUENCE OF OPERATION.

5.2.5 INTA

THE IE BIT IS CLEARED IN THE DRST THEN THE DRST
IS CHECKED FOR THE ABSENCE OF AN ERROR AND THE
PRESENCE OF READY. THE DRWC IS CHECKED TO SEE
THAT IT IS EQUAL TO ZERO. THE CORRECT CONTENTS

OF THE DRBA ARE CALCULATED AND CHECKED. THERE IS A JSR TO THE NORMAL SUB-ROUTINE BEFORE THIS ROUTINE IS EXITED. THE PROGRAM WILL HALT IF ERROR IS SET, READY IS CLEAR, OR READY AND ERROR ARE CLEAR.

5.2.6 DATCHK

THIS ROUTINE IS ENTERE. CHECK INBUF AFTER A MAINTENANCE MODE OPERATION. THE CONTENTS OF INBUF AND THE CONTENTS OF CHKBUF ARE CHECKED TO SEE THAT THEY ARE THE SAME. THE NUMBER OF COMPARISONS MADE IS DETERMINED BY THE CONTENTS OF BUFLEN.

5.2.7 NORMAL

THE ROUTINE IS ENTERED FROM INTA AND FROM SOME TESTS WHICH DON'T USE INTA. THE NUMBER OF THE DRINV+2 IS PUT INTO DRINV AND THE DRVS IS CLEARED. IF THE DR11-B INTERRUPTS UNDER THESE CONDITIONS THE PDP-11 WILL HALT AT DRVS. THE PROCESSOR STATUS WORD IS RESTORED TO LEVEL 7 AND THE ROUTINE IS EXITED.

5.2.8 DATOCK

AFTER A STRING OF DATO'S HAS BEEN COMPLETED THIS ROUTINE CHECKS THAT THE CORRECT DATA PATTERN (52525) WAS TRANSFERRED TO INBUF. THE NUMBER OF COMPARISONS MADE IS DETERMINED BY THE CONTENTS OF BUFLEN. AN ADDITIONAL CHECK IS MADE ON BUFLEN+2 TO INSURE THAT TOO MANY WORDS WEREN'T TRANSFERRED.

5.2.9 ERRCHK

THIS ROUTINE CLEARS IE AND HALTS IF ERROR IS SET.

5.2.10 TRAPCATCHER

THIS IS A SERIES OF INSTRUCTIONS STARTING AT LOCATION 0 DESIGNED TO DETECT AND ISOLATE UNEXPECTED TRAPS AND INTERRUPTS TO THE TRAP AND INTERRUPT VECTOR AREA OF MEMORY.

EACH VECTOR ENTRANCE ADDRESS IS LOADED WITH THE ADDRESS OF THE NEXT LOCATION. THE NEXT LOCATION IS LOADED WITH A HALT (000000). THUS AN ILLEGAL TRAP OR INTERRUPT WILL CAUSE A HALT AT THE TRAP LOCATION PLUS TWO.

IF A HALT OCCURS IN THE TRAP OR INTERRUPT AREA, EXAMINE REGISTER SIX, IT WILL CONTAIN THE CURRENT STACK ADDRESS. THE CONTENTS OF THE CURRENT STACK ADDRESS IS THE VALUE OF THE LOCATION COUNTER WHEN THE TRAP OR INTERRUPT OCCURRED.

5.3 PROGRAM AND/OR OPERATOR ACTION

5.3.1 LOADING AND STARTING AT 200 ITH ALL SWITCHES DOWN IS THE INSTRUCTION AND LOGIC TEST. IF AN ERROR IS DETECTED HERE, THERE WILL BE A PRINTOUT. WHEN AN ERROR IS DETECTED AND IT IS NECESSARY TO SCOPE ON IT, PLACE SW15 UP TO HALT ON ERROR, THEN SW14 UP TO LOOP ON ERROR, THEN SW13 UP TO DELETE PRINTOUTS.

6. DR11B ERRORS

6.1 ERROR PRINTOUT

THE PC OF THE FAILING TEST AND THE CP STATUS WILL BE PRINTED.

6.2 ERROR RECOVERY

DEPRESS CONTINUE TO RESTART SECTION

7. DR11B RESTRICTIONS

7.1 STARTING RESTRICTION

NONE

7.2 OPERATIONAL RESTRICTION

M968 MUST BE IN SLOTS C04/D04 - FOR DIAGNOSTIC TESTING
SHOULD BE IN A02/B02 FOR NORMAL USER OPERATION.

8. MISCELLANEOUS

8.1 EXECUTION TIME

ABOUT 2 MINUTES

9. PROGRAM DESCRIPTION

THE FOLLOWING IS A GENERAL LIST OF FUNCTIONS TESTED.

CAN ALL REG BE ADDRESSED WITHOUT ERROR
RESET CLEAR DRWC
RESET CLEAR DRBA
CAN ALL DRWC BITS BE SET
CAN 15-1 IN DRBA BE SET
FNCT1 SET & CLEARED
FNCT2 SET & CLEARED
FNCT3 SET & CLEARED
XBA16 SET & CLEARED
XBA17 SET & CLEARED
IE SET & CLEARED
CYCLE SET & CLEARED

```
                                MAINT SET & CLEARED
                                ALL DRST R/W BITS CAN BE SET & CLEARED
                                ALL DRST R/W SET, RESET TO 0, RDY IS SET, NEX IS
                                CLEARED, GO IS 0
                                DRWC HOLD ALT. 0'S & 1'S AND ALT. 1'S & 0'S
                                DRBA HOLD ALT. 0'S & 1'S AND ALT. 1'S & 0'S
                                INC PATTERN TO WRAP-AROUND IN DRWC
                                INC PATTERN TO WRAP-AROUND IN DRBA
                                NO INT. AT LEVEL 7
                                NO INT. AT LEVEL 6
                                NO INT. AT LEVEL 5
                                DOES INT. AT LEVEL 4
                                NO MAINTBRD A02/B02
                                MAINTBRD C04/D04
                                FNCT BITS CONTROL DSTAT BITS
                                RESET 0'S DRDB
                                ALL DRDB BITS CAN BE SET
                                DRDB HOLD  ALT. 1'S & 0'S AND ALT. 0'S & 1'S
                                INC TO WRAP-AROUND IN DRDB
                                RESET SETS ONLY RDY IN DRST
                                BA00 READS AS 0
                                1 DATI NPR
                                1 DATO NPR
                                BA0F FORCES ERROR & IS CLEARED BY CLEARING DRBA OR RESET
                                GO CLEARS RDY
                                DATO TO DIODE MEM CAUSES NEX
                                DO WITHOUT CLEARING PREVIOUS ERROR CAUSES ANOTHER INT.
                                10 DATI'S (BURST)
                                10 DATO'S (BURST)
                                200 DATI'S (BURST)
                                200 DATO'S (BURST)
                                200 DATI'S (NON-BURST)
                                200 DATO'S (NON-BURST)
                                FUNCT BITS INC WITH MAINT MODE XFERS
                                10 MAINT MODE XFERS
                                200 MAINT MODE XFERS

10.     LISTING


11.     FLOW CHART(S)


12. DA11B STARTING PROCEDURE

        12.1 THERE ARE TWO STARTING LOCATIONS; ONE FOR THE
             COMUPTER THAT WILL BE THE SLAVE AND ANOTHER
             FOR THE COMPUTER THAT WILL BE THE MASTER.

        12.2 SLAVE COMPUTER, LOAD ADDRESS 1002 WITH THE HALT KEY
             DOWN AND PRESS START.

        12.3 MASTER COMPUTER, LOAD ADDRESS 1000 WITH THE HALT KEY
             DOWN AND PRESS START.
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12.4 SLAVE COMPUTER, PUT THE HALT KEY UP AND PRESS
CONTINUE.

12.5 MASTER COMPUTER,PUT THE HALT KEY PU AND PRESS
CONTINUE.

13. DA11B OPERATING PROCEDURE

13.1 THE PROGRAM WILL LOOP AFTER STARTING AND PRINT
OUT ANY ERRORS. THE PROGRAM WILL HALT AFTER
NON RECOVERABLE ERRORS.

13.2 THE MAINT MODULE MUST BE IN A02/B02 AND THE
THE DA11B MUST BE IN C04/D04 .

14. DA11B PROGRAM DISCRIPTION

14.1 THE SLAVE COMPUTER STARTS BY ENTERING A BACKGROUND
TO WAIT FOR AN INTERUPT WITH THE INTERUPT ENABLED.
THE FIRST INTERUPT THAT COMES SHOULD BE THE READY
INTERUPT SET UP WHEN THE MASTER HIT THE START KEY.
THE INTERUPT CAUSES THE SLAVE TO ENTER THE INTERUPT
SERVICE ROUTINE.

14.2 THE INTERUPT SERVICE ROUTINE DETERMINS WHAT
INTERUPT CAME UP AND IF IT SHOULD HAVE COME UP.
IF THE INTERUPT WAS THE ONE EXPECTED THAN THE
THAN THE PROGRAM GOES TO THE
TO THE PROPER JOB ROUTINE, SJOBXX FOR SLAVE SERVICE
AND JOBXX FOR THE MASTER ROUTINE.

14.3 THE NEXT THING THAT SHOULD HAPPEN IS THE MASTER
SHOULD ISSUE AN INTERUPT TO THE SLAVE .
THIS IS A SIGNAL FOR THE SLAVE TO ACCEPT
THE WORD COUNT,OFFSET,AND
TWO CHECK SUM WORDS. THE SLAVE ACCEPTS A WORD AT A TIME
FROM THE DATA BUFFER EACH TIME THE MASTER TOGGLES
FUNCTION BIT 3. EACH TIME IT READS A WORD THE SLAVE
SENDS THE WORD BACK TO THE MASTER FOR VERIFICATION.

14.4 AFTER THE SLAVE HAS RECIEVED ALL THE PARAMETERS
IT SETS ITS DIRECTION BIT TO THE OPPOSIT DIRECTION
AS THE MASTER AND STARTS THE NPR TRANSFER.

14.5 THE MASTER SETS UP THE TYPE OF TRANSFERS AND
CHECKS THE DATA WHEN IT COMES BACK FROM THE SLAVE.

15. DA11B ERRORS

15.1 THE PC OF THE FAILING TEST, THE CP STATUS AND
THE DR11B STATUS REGISTER WILL BE PRINTED AFTER AN ERROR.

15.2 THERE IS NO ERROR RECOVERY FOR THE DA11B TEST BECAUSE
THE OTHER COMPUTER WILL GET OUT OF SINC WHEN AN
ERROR OCCURS.

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                                %
                                        .ABS
                                        .MCALL .HEADER,STARS
                                ;;******************************************************************
                                ;;******************************************************************
                                .TITLE  MAINDEC-11-DZDRB-D
                                ;*COPYRIGHT (C) 1971,1976
                                ;*DIGITAL EQUIPMENT CORP.
                                ;*MAYNARD, MASS. 01754
                                ;*
                                ;*PROGRAM BY POMFRET,JONES,CONDON
                                ;*
                                ;*THIS PROGRAM WAS ASSEMBLED USING THE PDP-11 MAINDEC SYSMAC
                                ;*PACKAGE (MAINDEC-11-DZQAC-C2), SEPT 14, 1976.
                                ;*
000001                          $TN=1
160000                          $SWR=160000     ;;HALT ON ERROR, LOOP ON TEST, INHIBIT ERROR TYPOUT
                                ;;**************************************************************
                                ;       REVISED BY ALAN BOSTICK JUNE 1976
                                ;       MODIFIED FOR SOFTWARE SWITCH REGISTER
                                ;       INCLUDING DYNAMIC LOADING OF SWR
                                ;;**************************************************************
                                ;;**************************************************************

000240                                  NOP=000240
104400                                  SCOPE=TRAP
104000                                  HLT=EMT
000001                                  BIT0=000001
000002                                  BIT1=000002
000004                                  BIT2=000004
000010                                  BIT3=000010
000020                                  BIT4=000020
000040                                  BIT5=000040
000100                                  BIT6=000100
000200                                  BIT7=000200
000400                                  BIT8=000400
001000                                  BIT9=001000
002000                                  BIT10=002000
004000                                  BIT11=004000
010000                                  BIT12=010000
020000                                  BIT13=020000
040000                                  BIT14=040000
100000                                  BIT15=100000

000004                                  BUSERR=000004

                                ;LOAD TRAP CATCHER INTO 0 THRU 777.

000000                                  .=0
000030                                  .=30
000030  011072                          PRINT
000032  000340                          340
```

```
                    000034                          .=34
000034  011650                                      $COPEC
000036  000340                                      340
                    000176                          .=176
000176  000000                                      $SWREG:  0
                    000200                          .=200
000200  012706  013566                              MOV     #BUFF,%6        ;SET UP STACK LIMIT
000204  005077  000604                              CLR     @PSW
000210  005002                                      CLR     %2
000212  012702  012433                              MOV     #$HEAD,%2
000216  004767  012240                              JSR     %7,TTOUT
000222  012702  012403                              MOV     #$MAIN,%2
000226  004767  012230                              JSR     %7,TTOUT
000232  000167  000634                              JMP     SUSWR
                    001000                          .=1000


                                                ;;**************************************************************
                                                ;       START OF BACK-TO-BACK DR11-B
                                                ;;**************************************************************


001000  000402                                  MSTART: BR      MSX             ;MASTER START
001002  000167  006276                          SSTART: JMP     SS1             ;SLAVE START
001006  000167  006212                          MSX:    JMP     MS1
001012  177570                                  SR:     177570
001014  177776                                  PSW:    177776
001016  172410                                  DRWC:   172410
001020  172412                                  DRBA:   172412
001022  172414                                  DRST:   172414
001024  172416                                  DRDB:   172416
001026  000126                                  DRVS:   126
001030  000240                                  DRINL:  240
001032  000124                                  DRINV:  124
001034  052525                                  NPR1:   52525
001036  173000                                  DIOMEM: 173000
001040  013570                                  INBUF:  XINBUF
001042  014572                                  CHKBUF: XCHKBU
001044  000000                                  BUFLEN: HALT
001046  000000                                  LENCHK: HALT
001050  000000                                  BRWAIT: HALT
001052  000000                                  WCLEN:  HALT
001054  000000                                  RDYCHK: HALT
001056  177560                                  TKS:    177560
001060  177562                                  TKB:    177562
001062  177564                                  TPS:    177564
001066  177566                                  TPB:    177566
001066  000000                                  FNCCNT: HALT
001070  000000                                  INBUF1: HALT

001072  013746  000006                          SUSWR:  MOV     @#6,-(SP)       ;SAVE VECTORS
001076  013746  000004                                  MOV     @#4,-(SP)
001102  012737  001122  000004                          MOV     #64$,@#4        ;SET UP FOR TIMEOUT
001110  022777  177777  177674                          CMP     #-1,@SR         ;REFERENCE HARDWARE SWITCH REGISTER
001116  001402                                          BEQ     65$
001120  000404                                          BR      66$
```

```
                                64$:    CMP     (SP)+,(SP)+     ;ADJUST STACK
                                65$:    MOV     #SWREG,SR       ;POINT TO SOFTWARE SWITCH REG
                                66$:    MOV     (SP)+,@#4       ;RESTORE VECTORS
                                        MOV     (SP)+,@#6
                                        CMP     #SWREG,SR       ;IS SWREG USED
                                        BNE     BEGIN
                                        JSR     PC,CNTLU        ;ALLOW SWREG TO BE LOADED
                                BEGIN:  MOV     #340,@PSW       ;PROC. AT LEVEL #7
                                        MOV     #BEGIN,RETURN


                                ;;**************************************************************
                                ;       TEST 0 CAN ALL DR11-B REG BE ADDRESSED WITHOUT ERROR?
                                ;;**************************************************************


                                        SCOPE
                                        MOV     #ERRA,BUSERR    ;BUS ERROR VECTOR TO ERRA
                                        MOV     %7,%0           ;PC TO R0
                                        INC     @DRWC           ;ADDRESS DRWC
                                        MOV     %7,%0           ;PC TO R0
                                        INC     @DRBA           ;ADDRESS DRBA
                                        MOV     %7,%0           ;PC TO R0
                                        CLR     @DRST           ;ADDRESS DRST
                                        MOV     %7,%0           ;PC TO R0
                                        INC     @DRDB           ;ADDRESS DRDB
                                        BR      .+4             ;MADE IT - BRANCH OVER HALT
                                ERRA:   HLT                     ;BUS ERROR, R0 HAS PC OF ERROR
                                        MOV     #6,BUSERR       ;RESTORE #6 TO BUS ERROR VECTOR
                                        SCOPE


                                ;;**************************************************************
                                ;       TEST 1 DOES RESET CLEAR DRWC?
                                ;;**************************************************************


                                        MOV     #10,ICOUNT
                                        MOV     #-1,@DRWC       ;ALL ONES TO DRWC
                                        JSR     %7,CKSWR
                                        RESET                   ;INIT
                                        TST     @DRWC           ;LOOKING FOR Z-BIT TO SET
                                        BEQ     .+4             ;DID DRWC GET CLEARED?
                                        HLT                     ;DRWC NOT CLEAR
                                        SCOPE


                                ;;**************************************************************
                                ;       TEST2 DOES RESET CLEAR DRBA?
                                ;;**************************************************************


                                        SCOPE
                                        MOV     #-1,@DRBA       ;ALL ONES TO DRBA
                                        JSR     %7,CKSWR
```

```
                                        RESET                   ;INIT
001320  005777  177474                  TST     @DRBA           ;LOOKING FOR Z-BIT TO SET
001324  001401                          BEQ     .+4             ;DID DRBA GET CLEARED?
001326  104000                          HLT                     ;DRBA NOT CLEAR


                                ;;**************************************************************
                                ;       TEST3 CAN ALL DRWC BITS BE SET?
                                ;;**************************************************************


001330  104400                          SCOPE
001332  012767  004000  010370          MOV     #4000,ICOUNT
001340  012777  177777  177450          MOV     #-1,@DRWC       ;SET ALL BITS IN DRWC
001346  022777  177777  177442          CMP     #-1,@DRWC       ;LOOKING FOR Z-BIT TO SET
001354  001401                          BEQ     .+4             ;SEE IF ALL BITS GOT SET
001356  104000                          HLT                     ;ALL BITS AREN'T SET


                                ;;**************************************************************
                                ;       TEST4 CAN BITS 15-01 IN DRBA BE SET?
                                ;;**************************************************************


001360  104400                          SCOPE
001362  012777  177776  177430          MOV     #-2,@DRBA       ;SET BITS 15-01 IN DRBA
001370  022777  177776  177422          CMP     #-2,@DRBA       ;LOOKING FOR Z-BIT TO SET
001376  001401                          BEQ     .+4             ;SEE IF BITS 15-01 GOT SET
001400  104000                          HLT                     ;BITS 15-01 AREN'T SET


                                ;;**************************************************************
                                ;       TEST6 TEST THAT FNCT1 CAN BE SET AND CLEARED
                                ;;**************************************************************


001402  104400                          SCOPE
001404  052777  000002  177410          BIS     #BIT1,@DRST     ;SET FNCT1
001412  032777  000002  177402          BIT     #BIT1,@DRST     ;TEST FNCT1
001420  001001                          BNE     .+4             ;IS IT SET?
001422  104000                          HLT                     ;FNCT1 IS CLEAR
001424  042777  000002  177370          BIC     #BIT1,@DRST     ;CLEAR FNCT1
001432  032777  000002  177362          BIT     #BIT1,@DRST     ;TEST FNCT1
001440  001401                          BEQ     .+4             ;WAS IT CLEAR
001442  104000                          HLT                     ;FNCT1 WAS SET


                                ;;**************************************************************
                                ;       TEST7 TEST THAT FNCT2 CAN BE SET AND CLEARED
                                ;;**************************************************************


001444  104400                          SCOPE
001446  052777  000004  177346          BIS     #BIT2,@DRST     ;SET FNCT2
001454  032777  000004  177340          BIT     #BIT2,@DRST     ;TEST FNCT2
```

```
001462  001001                          BNE     .+4             ;IS IT SET?
001464  104000                          HLT                     ;FNCT2 IS CLEAR
001466  042777  000004  177326          BIC     #BIT2,@DRST     ;CLEAR FNCT2
001474  032777  000004  177320          BIT     #BIT2,@DRST     ;TEST FNCT2
001502  001401                          BEQ     .+4             ;WAS IT CLEAR?
001504  104000                          HLT                     ;FNCT2 WAS SET


                        ;;**************************************************************
                        ;       TEST10 TEST THAT FNCT3 CAN BE SET AND CLEARED
                        ;;**************************************************************

001506  104400                          SCOPE
001510  052777  000010  177304          BIS     #BIT3,@DRST     ;SET FNCT3
001516  032777  000010  177276          BIT     #BIT3,@DRST     ;TEST FNCT3
001524  001001                          BNE     .+4             ;IS IT SET?
001526  104000                          HLT                     ;FNCT3 IS CLEAR
001530  042777  000010  177264          BIC     #BIT3,@DRST     ;CLEAR FNCT3
001536  032777  000010  177256          BIT     #BIT3,@DRST     ;TEST FNCT3
001544  001401                          BEQ     .+4             ;WAS IT CLEAR?
001546  104000                          HLT                     ;FNCT3 WAS SET


                        ;;**************************************************************
                        ;       TEST11 TEST THAT XBA16 CAN BE SET AND CLEARED
                        ;;**************************************************************

001550  104400                          SCOPE
001552  052777  000020  177242          BIS     #BIT4,@DRST     ;SET XBA16
001560  032777  000020  177234          BIT     #BIT4,@DRST     ;TEST XBA16
001566  001001                          BNE     .+4             ;IS IT SET?
001570  104000                          HLT                     ;XBA16 IS CLEAR
001572  042777  000020  177222          BIC     #BIT4,@DRST     ;CLEAR XBA16
001600  032777  000020  177214          BIT     #BIT4,@DRST     ;TEST XBA16
001606  001401                          BEQ     .+4             ;IS IT CLEAR
001610  104000                          HLT                     ;XBA16 WAS SET


                        ;;**************************************************************
                        ;       TEST12 TEST THAT XBA17 CAN BE SET AND CLEARED
                        ;;**************************************************************

001612  104400                          SCOPE
001614  052777  000040  177200          BIS     #BIT5,@DRST     ;SET XBA17
001622  032777  000040  177172          BIT     #BIT5,@DRST     ;TEST XBA17
001630  001001                          BNE     .+4             ;IS IT SET?
001632  104000                          HLT                     ;XBA17 IS CLEAR
001634  042777  000020  177160          BIC     #BIT4,@DRST     ;CLEAR XBA17
001642  032777  000020  177152          BIT     #BIT4,@DRST     ;TEST XBA17
001650  001401                          BEQ     .+4             ;IS IT CLEAR?
001652  104000                          HLT                     ;XBA17 WAS SET


                        ;;**************************************************************
                        ;       TEST13 TEST THAT IE CAN BE SET AND CLEARED
                        ;;**************************************************************

001654  104400                          SCOPE
001656  052777  000100  177136          BIS     #BIT6,@DRST     ;SET IE
001664  032777  000100  177130          BIT     #BIT6,@DRST     ;TEST IE
```

```
                                                BNE     .+4             ;IS IT SET?
                                                HLT                     ;IE IS CLEAR
                                                BIC     #BIT6,@DRST     ;CLEAR IE
                                                BIT     #BIT6,@DRST     ;TEST IE
                                                BEQ     .+4             ;IS IT CLEAR?
                                                HLT                     ;IE WAS SET

                                        ;;**************************************************************
                                        ;       TEST14 TEST THAT CYCLE CAN BE SET AND CLEARED
                                        ;;**************************************************************
                                                SCOPE
                                                BIS     #BIT8,@DRST     ;SET CYCLE
                                                BIT     #BIT8,@DRST     ;TEST CYCLE
                                                BNE     .+4             ;IS IT SET?
                                                HLT                     ;CYCLE WAS CLEAR
                                                BIC     #BIT8,@DRST     ;CLEAR CYCLE
                                                BIT     #BIT8,@DRST     ;TEST CYCLE
                                                BEQ     .+4             ;IS IT CLEAR?
                                                HLT                     ;CYCLE WAS SET

                                        ;;**************************************************************
                                        ;       TEST15 TEST THAT MAINT CAN BE SET AND CLEARED
                                        ;;**************************************************************
                                                SCOPE
                                                BIS     #BIT12,@DRST    ;SET MAINT
                                                BIT     #BIT12,@DRST    ;TEST MAINT
                                                BNE     .+4             ;IS IT SET?
                                                HLT                     ;MAINT WAS CLEAR
                                                BIC     #BIT12,@DRST    ;CLEAR MAINT
                                                BIT     #BIT12,@DRST    ;TEST MAINT
                                                BEQ     .+4             ;IS MAINT CLEAR?
                                                HLT                     ;MAINT WAS SET

                                        ;;**************************************************************
                                        ;       TEST 16 TEST THAT ALL DRST R/W BITS CAN BE SET AND CLEARED
                                        ;;**************************************************************
                                                SCOPE
                                                BIS     #10576,@DRST    ;SET FOLLOWING: MAINT(12), CYCLE(08), IE(06), XBA17(05),
                                                                        ;                       XBA16(04), FNCT3(03), FUNCT2(02), FNCT1(01)
                                                BIT     #BIT1,@DRST     ;TEST FNCT1
                                                BNE     .+4             ;IS IT SET?
                                                HLT                     ;FNCT1 IS CLEAR
                                                BIT     #BIT2,@DRST     ;TEST FNCT2
                                                BNE     .+4             ;IS IT SET?
                                                HLT                     ;FNCT2 IS CLEAR
                                                BIT     #BIT3,@DRST     ;TEST FNCT3
                                                BNE     .+4             ;IS IT SET?
                                                HLT                     ;FNCT3 IS CLEAR
                                                BIT     #BIT4,@DRST     ;TEST XBA16
                                                BNE     .+4             ;IS IT SET?
                                                HLT                     ;XBA16 IS CLEAR
                                                BIT     #BIT5,@DRST     ;TEST XBA17
                                                BNE     .+4             ;IS IT SET?
                                                HLT                     ;XBA17 IS CLEAR
                                                BIT     #BIT6,@DRST     ;TEST IE
                                                BNE     .+4             ;IS IT SET?
```

```
 770  002124  104000                        HLT                     ;IE IS CLEAR
 771  002126  032777  000400  176666        BIT     #BIT8,@DRST     ;TEST CYCLE
 772  002134  001001                        BNE     .+4             ;IS CYCLE SET?
 773  002136  104000                        HLT                     ;CYCLE IS CLEAR
 774  002140  032777  010000  176654        BIT     #BIT12,@DRST    ;TEST MAINT
 775  002146  001001                        BNE     .+4             ;IS MAINT SET?
 776  002150  104000                        HLT                     ;MAINT IS CLEAR
 777  002152  042777  010576  176642        BIC     #10576,@DRST    ;CLEAR ALL R/W BITS IN DRST
 778  002160  032777  000002  176634        BIT     #BIT1,@DRST     ;TEST FNCT1
 779  002166  001401                        BEQ     .+4             ;IS FNCT1 CLEAR?
 780  002170  104000                        HLT                     ;FNCT1 IS SET
 781  002172  032777  000004  176622        BIT     #BIT2,@DRST     ;TEST FNCT2
 782  002200  001401                        BEQ     .+4             ;IS FNCT2 CLEAR?
 783  002202  104000                        HLT                     ;FNCT2 IS SET
 784  002204  032777  000010  176610        BIT     #BIT3,@DRST     ;TEST FNCT3
 785  002212  001401                        BEQ     .+4             ;IS FNCT3 CLEAR?
 786  002214  104000                        HLT                     ;FNCT3 IS SET
 787  002216  032777  000020  176576        BIT     #BIT4,@DRST     ;TEST XBA16
 788  002224  001401                        BEQ     .+4             ;IS XBA16 CLEAR
 789  002226  104000                        HLT                     ;XBA16 IS SET
 790  002230  032777  000040  176564        BIT     #BIT5,@DRST     ;TEST XBA17
 791  002236  001401                        BEQ     .+4             ;IS XBA17 CLEAR?
 792  002240  104000                        HLT                     ;XBA17 IS SET
 793
 794  002242  032777  000100  176552        BIT     #BIT6,@DRST     ;TEST IE
 795  002250  001401                        BEQ     .+4             ;IS IE CLEAR?
 796  002252  104000                        HLT                     ;IE IS SET
 797  002254  032777  000400  176540        BIT     #BIT8,@DRST     ;TEST CYCLE
 798  002262  001401                        BEQ     .+4             ;IS CYCLE CLEAR?
 799  002264  104000                        HLT                     ;CYCLE IS SET
 800  002266  032777  010000  176526        BIT     #BIT12,@DRST    ;TEST MAINT
 801  002274  001401                        BEQ     .+4             ;IS MAINT CLEAR?
 802  002276  104000                        HLT                     ;MAINT IS SET
 803
 804                          ;;*************************************************************
 805                          ;       TEST17 ALL R/W BITS IN DRST CAN BE SET AND RESET TO ZERO, THAT READY
 806                          ;       IS SET, NEX IS CLEAR, AND GO IS READ AS A 0.
 807                          ;;*************************************************************
 808  002300  104400                        SCOPE
 809  002302  012767  000010  007420        MOV     #10,ICOUNT
 810  002310  052777  010576  176504        BIS     #10576,@DRST    ;SET FOLLOWING: MAINT(12),CYCLE(08),IE(06),XBA17(05),
 811                                                                 ;       XBA16(04),FNCT3(03),FNCT2(02),FNCT1(01)
 812  002316  017701  176500                MOV     @DRST,%1        ;MOVE (DRST) TO R1
 813  002322  052701  167201                BIS     #167201,%1      ;SETS BITS IN R1 THAT WERE NOT SET IN DRST
 814  002326  005201                        INC     %1              ;R1 SHOULD GO FROM -1 TO ZERO
 815  002330  001401                        BEQ     .+4             ;WERE ALL DRST R/W BITS SET?
 816  002332  104000                        HLT                     ;NOT ALL BITS WERE SET
 817  002334  004767  007412                JSR     %7,CKSWR
 818  002340  000005                        RESET                   ;CLEAR ALL DRST R/W BITS
 819  002342  017701  176454                MOV     @DRST,%1        ;MOVE (DRST) TO R1
 820  002346  042701  127200                BIC     #127200,%1      ;CLEAR ALL BITS EXCEPT R/W BITS, NEX, AND GO
 821  002352  001401                        BEQ     .+4             ;SHOULD EQUAL ZERO
 822  002354  104000                        HLT                     ;RESET DIDN'T LEAVE DRST AS IT SHOULD HAVE
 823
 824                          ;;*************************************************************
 825                          ;       TEST20 CAN DRWC HOLD ALTERNATE ONE'S AND ZERO'S
```

```
                                ;;**********************************************************************
002356  104400                          SCOPE
002360  012767  004000  007342          MOV     #4000,ICOUNT
002366  012777  052525  176422          MOV     #052525,@DRWC   ;ALT 0'S AND 1'S TO DRWC
002374  022777  052525  176414          CMP     #052525,@DRWC   ;LOOKING FOR Z-BIT TO SET
002402  001401                          BEQ     .+4             ;DOES DRWC HAVE THE CORRECT PATTERN?
002404  104000                          HLT                     ;DRWC DOESN'T HAVE THE CORRECT PATTERN
002406  012777  125252  176402          MOV     #125252,@DRWC   ;ALT 1'S AND 0'S TO DRWC
002414  022777  125252  176374          CMP     #125252,@DRWC   ;LOOKING FOR Z-BIT TO SET
002422  001401                          BEQ     .+4             ;DOES DRWC HAVE THE CORRECT PATTERN?
002424  104000                          HLT                     ;DRWC DOESN'T HAVE THE CORRECT PATTERN

                                ;;**********************************************************************
                                ;       TEST21 CAN DRBA HOLD ALTERNATE ONE'S AND ZERO'S
                                ;;**********************************************************************
002426  104400                          SCOPE
002430  012777  052524  176362          MOV     #052524,@DRBA   ;ALT 0'S AND 1'S TO DRBA
002436  022777  052524  176354          CMP     #052524,@DRBA   ;LOOKING FOR Z-BIT TO SET
002444  001401                          BEQ     .+4             ;DOES DRBA HAVE THE CORRECT PATTERN?
002446  104000                          HLT                     ;DRBA DOESN'T HAVE THE CORRECT PATTERN
002450  012777  125252  176342          MOV     #125252,@DRBA   ;ALT 1'S AND 0'S TO DRBA
002456  022777  125252  176334          CMP     #125252,@DRBA   ;LOOKING FOR Z-BIT TO SET
002464  001401                          BEQ     .+4             ;DOES DRBA HAVE THE CORRECT PATTERN?
002466  104000                          HLT                     ;DRBA DOESN'T HAVE THE CORRECT PATTERN

                                ;;**********************************************************************
                                ;       TEST22 INCREMENTING PATTERN TO WRAP-AROUND IN DRWC
                                ;;**********************************************************************
002470  104400                          SCOPE
002472  005067  007232                  CLR     ICOUNT
002476  005001                          CLR     %1              ;SET-UP
002500  005077  176312                  CLR     @DRWC           ;SET-UP
002504  020177  176306          INCWC:  CMP     %1,@DRWC        ;SEE IF THEY ARE EQUAL
002510  001401                          BEQ     .+4             ;ARE THEY EQUAL?
002512  104000                          HLT                     ;THEY'RE NOT EQUAL
002514  005277  176276                  INC     @DRWC           ;GET NEXT NUMBER
002520  005201                          INC     %1              ;GET NEXT NUMBER
002522  001370                          BNE     INCWC           ;DONE WITH TEST?  IF NOT CONTINUE

                                ;;**********************************************************************
                                ;       TEST23 INCREMENTING PATTERN TO WRAP-AROUND IN DRBA
                                ;;**********************************************************************
002524  104400                          SCOPE
002526  005001                          CLR     %1              ;SET-UP
002530  005077  176264                  CLR     @DRBA           ;SET-UP
002534  020177  176260          INCBA:  CMP     %1,@DRBA        ;SEE IF THEY ARE EQUAL
002540  001401                          BEQ     .+4             ;ARE THEY EQUAL?
002542  104000                          HLT                     ;THEY'RE NOT EQUAL
002544  062777  000002  176246          ADD     #2,@DRBA        ;GET NEXT NUMBER
002552  062701  000002                  ADD     #2,%1           ;GET NEXT NUMBER
002556  001356                          BNE     INCBA           ;DONE WITH TEST?  IF NOT CONTINUE


                                ;;**********************************************************************
                                ;       TEST25 TEST THAT DR11-B DOES NOT INTERRUPT WITH PROC AT LEVEL 7
                                ;;**********************************************************************
```

```
                                SCOPE
002560  104400
002562  012767  004000  007140      MOV     #4000,ICOUNT
002570  012777  000340  176216      MOV     #340,@PSW       ;STATUS AT LEVEL 7
002576  032777  000200  176216      BIT     #BIT7,@DRST     ;CHECK READY BIT
002604  001010                      BNE     P7INV           ;IS IT SET
002606  004767  007140              JSR     %7,CKSWR
002612  000005                      RESET                   ;INIT TO SET READY
002614  032777  000200  176200      BIT     #BIT7,@DRST     ;SEE IF READY IS SET NOW
002622  001001                      BNE     .+4             ;IS READY SET?
002624  104000                      HLT                     ;READY CAN'T BE SET BY INIT
002626  012777  002654  176176  P7INV:  MOV     #P7ERR,@DRINV   ;SET UP INT VECTOR
002634  052777  000100  176160      BIS     #BIT6,@DRST     ;SET IE
002642  000240                      NOP
002644  042777  000100  176150      BIC     #BIT6,@DRST     ;DR11-B DIDN'T INTERRUPT - CLEAR IE
002652  000401                      BR      .+4
002654  104000              P7ERR:  HLT                     ;DR11-B INTERRUPTED, BUT IT SHOULDN'T HAVE

                        ;;**************************************************************
                        ;       TEST26 TEST THAT DR11-B DOES NOT INTERRUPT WITH PROC AT LEVEL 6
                        ;;**************************************************************
                                SCOPE
002656  104400
002660  012777  000300  176126      MOV     #300,@PSW       ;STATUS AT LEVEL 6
002666  032777  000200  176126      BIT     #BIT7,@DRST     ;CHECK READY BIT
002674  001010                      BNE     P6INV           ;IS IT SET?
002676  004767  007050              JSR     %7,CKSWR
002702  000005                      RESET                   ;INIT TO SET READY
002704  032777  000200  176110      BIT     #BIT7,@DRST     ;SEE IF READY IS SET NOW
002712  001001                      BNE     .+4             ;IS READY SET?
002714  104000                      HLT                     ;READY CAN'T BE SET BY INIT
002716  012777  002744  176106  P6INV:  MOV     #P6ERR,@DRINV   ;SET UP INT VECTOR
002724  052777  000100  176070      BIS     #BIT6,@DRST     ;SET IE
002732  000240                      NOP
002734  042777  000100  176060      BIC     #BIT6,@DRST     ;DR11-B DIDN'T INTERRUPT - CLEAR IE
002742  000401                      BR      .+4
002744  104000              P6ERR:  HLT                     ;DR11-B INTERRUPTED, BUT IT SHOULDN'T HAVE


                        ;;**************************************************************
                        ;       TEST27 TEST THAT DR11-B DOES NOT INTERRUPT WITH PROC AT LEVEL 5
                        ;;**************************************************************
                                SCOPE
002746  104400
002750  012777  000240  176036      MOV     #240,@PSW       ;STATUS AT LEVEL 5
002756  032777  000200  176036      BIT     #BIT7,@DRST     ;CHECK READY BIT
002764  001010                      BNE     P5INV           ;IS IT SET?
002766  004767  006760              JSR     %7,CKSWR
002772  000005                      RESET                   ;INIT TO SET READY
002774  032777  000200  176020      BIT     #BIT7,@DRST     ;SEE IF READY IS SET NOW
003002  001001                      BNE     .+4             ;IS IT SET?
003004  104000                      HLT                     ;RDY CAN'T BE SET BY INIT
003006  012777  003034  176016  P5INV:  MOV     #P5ERR,@DRINV   ;SET UP INT VECTOR
003014  052777  000100  176000      BIS     #BIT6,@DRST     ;SET IE
003022  000240                      NOP
003024  042777  000100  175770      BIC     #BIT6,@DRST     ;DR11-B DIDN'T INTERRUPT - CLEAR IE
003032  000401                      BR      .+4
003034  104000              P5ERR:  HLT                     ;DR11-B INTERRUPTED, BUT IT SHOULDN'T HAVE
```

```
                                ;;*****************************************************************
                                ;       TEST30 TEST THAT DR11-B DOES INTERRUPT WITH PROC AT LEVEL 4
                                ;;*****************************************************************
003036  104400                          SCOPE
003040  012777  000200  175746          MOV     #200,@PSW       ;STATUS AT LEVEL 4
003046  032777  000200  175746          BIT     #BIT7,@DRST     ;CHECK READY BIT
003054  001010                          BNE     P4INV           ;IS IT SET?
003056  004767  006670                  JSR     %7,CKSWR
003062  000005                          RESET                   ;INIT TO SET READY
003064  032777  000200  175730          BIT     #BIT7,@DRST     ;SEE IF READY IS SET NOW
003072  001001                          BNE     .+4             ;IS IT SET
003074  104000                          HLT                     ;READY CAN'T BE SET BY INIT
003076  012777  003116  175726  P4INV:  MOV     #P4INT,@DRINV   ;SET UP INT VECTOR
003104  052777  000100  175710          BIS     #BIT6,@DRST     ;SET IE
003112  000240                          NOP
003114  104000                          HLT                     ;DR11-B DIDN'T INTERRUPT
003116  005077  175700          P4INT:  CLR     @DRST           ;CLEAR IE
003122  022626                          CMP     (%6)+,(%6)+     ;REPOSITION THE STACK AFTER AN INTERRUPT
003124  012777  000126  175700          MOV     #126,@DRINV     ;RESTORE INTERRUPT VECTOR


                                ;;*****************************************************************
                                ;       TEST31 TEST THAT FNCT BITS CONTROL DSTAT BITS (M968 MUST BE USED IN USER SLOTS)
                                ;;*****************************************************************
003132  104400                          SCOPE
003134  005077  175662                  CLR     @DRST           ;CLEAR FUNCTION BITS
003140  032777  000016  175654          BIT     #16,@DRST       ;CHECK FUNCTION BITS
003146  001401                          BEQ     .+4             ;FUNCTION BITS CLEAR?
003150  104000                          HLT                     ;FUNCTION BITS NOT CLEAR
003152  052777  000002  175642          BIS     #BIT1,@DRST     ;SET FNCT1
003160  032777  001000  175634          BIT     #BIT9,@DRST     ;CHECK DSTAT C
003166  001001                          BNE     .+4             ;IS IT SET?
003170  104000                          HLT                     ;DSTAT C IS CLEAR
003172  032777  006000  175622          BIT     #6000,@DRST     ;CHECK THAT DSTAT A AND DSTAT B ARE CLEAR
003200  001401                          BEQ     .+4             ;ARE THEY CLEAR?
003202  104000                          HLT                     ;DSTAT A AND/OR DSTAT B IS SET
003204  005077  175612                  CLR     @DRST           ;CLEAR DRST
003210  052777  000004  175604          BIS     #BIT2,@DRST     ;SET FNCT2
003216  032777  002000  175576          BIT     #BIT10,@DRST    ;CHECK DSTAT B
003224  001001                          BNE     .+4             ;IS IT SET?
003226  104000                          HLT                     ;DSTAT B IS CLEAR
003230  032777  005000  175564          BIT     #5000,@DRST     ;CHECK THAT DSTAT A AND DSTAT C ARE CLEAR
003236  001401                          BEQ     .+4             ;ARE THEY CLEAR?
003240  104000                          HLT                     ;DSTAT A AND/OR DSTAT B IS SET
003242  005077  175554                  CLR     @DRST           ;CLEAR DRST
003246  052777  000010  175546          BIS     #BIT3,@DRST     ;SET FNCT3
003254  032777  004000  175540          BIT     #BIT11,@DRST    ;CHECK DSTAT A
003262  001001                          BNE     .+4             ;IS IT SET?
003264  104000                          HLT                     ;DSTAT A IS CLEAR
003266  032777  003000  175526          BIT     #3000,@DRST     ;CHECK THAT DSTAT B AND DSTAT C ARE CLEAR
003274  001401                          BEQ     .+4             ;ARE THEY CLEAR?
003276  104000                          HLT                     ;DSTAT B AND/OR DSTAT C IS SET
003300  005077  175516                  CLR     @DRST           ;CLR DRST
                                ;;*****************************************************************
                                ;       TEST 33 TEST FOR 1 DATI NPR TRANSFER (WITH M968 IN USER SLOTS)
                                ;;*****************************************************************
```

```
  994  003304  104400                          SCOPE
  995  003306  005777  175510          TNPR1:  TST     @DRST           ;CHECK ERROR BIT
  996  003312  100027                          BPL     NPRRDY          ;IS IT CLEAR?
  997  003314  032777  020000  175500          BIT     #BIT13,@DRST    ;CHECK ATTN
  998  003322  001401                          BEQ     .+4             ;IS ATTN CLEAR
  999  003324  104000                          HLT                     ;ATTN IS SET
 1000  003326  032777  040000  175466          BIT     #BIT14,@DRST    ;CHECK NEX
 1001  003334  001410                          BEQ     N1413           ;IS NEX CLEAR?
 1002  003336  042777  040000  175456          BIC     #BIT14,@DRST    ;TRY TO CLEAR NEX
 1003  003344  032777  040000  175450          BIT     #BIT14,@DRST    ;CHECK AGAIN
 1004  003352  001401                          BEQ     .+4             ;NEX STILL SET
 1005  003354  104000                          HLT                     ;NEX CAN'T BE CLEARED BY MOVING A 0 TO IT
 1006  003356  005077  175436          N1413:  CLR     @DRBA           ;TRY TO CLEAR BAOF
 1007  003362  005777  175434                  TST     @DRST           ;CHECK ERROR BIT AGAIN
 1008  003366  001401                          BEQ     .+4             ;IS IT CLEAR
 1009  003370  104000                          HLT                     ;ERROR CAUSED BY SOMETHING OTHER THAN NEX,ATTN, OR BAOF
 1010  003372  012777  177777  175416  NPRRDY: MOV     #-1,@DRWC       ;SET UP FOR 1 TRANSFER
 1011  003400  012777  001034  175412          MOV     #NPR1,@DRBA     ;TRANSFER FROM BUS ADDRESS IN NPR1
 1012  003406  005077  175412                  CLR     @DRDB           ;GET READY TO RECEIVE DATA
 1013  003412  012767  052525  175414          MOV     #52525,NPR1     ;SET UP TRANSFER DATA
 1014  003420  012777  003464  175404          MOV     #INTB,@DRINV    ;INTERRUPT VECTOR TO INTB
 1015  003426  012777  000005  175372          MOV     #5,@DRVS        ;INTERRUPT PRIORITY TO LEVEL 5
 1016  003434  005077  175354                  CLR     @PSW            ;LET THE DR11-B INTERRUPT
 1017  003440  012777  000101  175354          MOV     #101,@DRST      ;IE AND DO TO DRST
 1018  003446  005067  000002                  CLR     1$+2            ;WAIT FOR NPR AND INTERRUPT
 1019  003452  005227  000001          1$:     INC     #1
 1020  003456  001375                          BNE     1$
 1021  003460  104000                          HLT                     ;NO DR11-B INTERRUPT
 1022  003462  000424                          BR      T33CLR          ;CLEAR IE
 1023  003464  004767  003312          INTB:   JSR     %7,ERRCHK
 1024  003470  005777  175322                  TST     @DRWC           ;TEST DRWC
 1025  003474  001401                          BEQ     .+4             ;IS DRWC EQUAL TO ZERO?
 1026  003476  104000                          HLT                     ;DRWC NOT EQUAL TO ZERO
 1027  003500  022777  001036  175312          CMP     #NPR1+2,@DRBA   ;COMPARE CORRECT DRBA WITH DRBA
 1028  003506  001401                          BEQ     .+4             ;IS THE DRBA CORRECT?
 1029  003510  104000                          HLT                     ;DRBA IS WRONG
 1030  003512  022777  052525  175304          CMP     #52525,@DRDB    ;CHECK FOR CORRECT DATA
 1031  003520  001401                          BEQ     .+4             ;DATA GET TRANSFERRED?
 1032  003522  104000                          HLT                     ;BAD DATA IN DRDB
 1033  003524  004767  003162                  JSR     %7,NORMAL
 1034  003530  022626                          CMP     (%6)+,(%6)+     ;RESTORE STACK
 1035  003532  000403                          BR      TNPRO           ;GO TO NEXT TEST (NPR OUT)
 1036  003534  005077  175262          T33CLR: CLR     @DRST           ;CLEAR IE
 1037  003540  000662                          BR      TNPR1           ;TRY TEST AGAIN
 1038                                  ;;**************************************************************
 1039                                  ;       TEST 34 TEST FOR 1 DATO NPR TRANSFER (WITH M968 IN USER SLOTS)
 1040                                  ;;**************************************************************
 1041  003542  104400                  TNPRO:  SCOPE
 1042  003544  012777  177777  175244          MOV     #-1,@DRWC       ;SET UP FOR 1 TRANSFER
 1043  003552  012777  001034  175240          MOV     #NPR1,@DRBA     ;TRANSFER TO BUS ADDRESS IN NPR1
 1044  003560  005067  175250                  CLR     NPR1            ;GET READY TO RECEIVE DATA
 1045  003564  012777  052525  175232          MOV     #52525,@DRDB    ;SET UP TO TRANSFER DATA
 1046  003572  012777  003636  175232          MOV     #INTC,@DRINV    ;INTERRUPT VECTOR TO INTC
 1047  003600  016777  175224  175220          MOV     DRINL,@DRVS     ;INTERRUPT STATUS TO LEVEL DRINL
 1048  003606  005077  175202                  CLR     @PSW            ;PROC STATUS TO ZERO
 1049  003612  012777  000103  175202          MOV     #103,@DRST      ;IE, FNCT1(C1 CONTROL), AND DO TO DRST
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1050  003620  005067  000002              CLR     1$+2            ;WAIT FOR NPR AND INTER
1051  003624  005227  000001      1$:     INC     #1
1052  003630  001375                      BNE     1$
1053  003632  104000                      HLT                     ;NO DR11-B INTERRUPT
1054  003634  000424                      BR      T34CLR          ;CLEAR IE
1055  003636  004767  003140      INTC:   JSR     %7,ERRCHK
1056  003642  005777  175150              TST     @DRWC           ;TEST DRWC
1057  003646  001401                      BEQ     .+4             ;IS DRWC EQUAL TO ZERO?
1058  003650  104000                      HLT                     ;DRWC EQUAL TO ZERO
1059  003652  022777  001036  175140      CMP     #NPR1+2,@DRBA   ;COMPARE CORRECT DRBA WITH DRBA
1060  003660  001401                      BEQ     .+4             ;IS THE DRBA CORRECT?
1061  003662  104000                      HLT                     ;DRBA IS WRONG
1062
1063  003664  026727  175144  052525      CMP     NPR1,#52525     ;CHECK FOR CORRECT DATA
1064  003672  001401                      BEQ     .+4             ;CORRECT DATA TRANSFERRED?
1065  003674  104000                      HLT                     ;BAD DATA
1066  003676  004767  003010              JSR     %7,NORMAL
1067  003702  022626                      CMP     (%6)+,(%6)+     ;RESTORE STACK
1068  003704  000403                      BR      T35             ;GO TO NEXT TEST
1069  003706  005077  175110      T34CLR: CLR     @DRST           ;CLEAR IE
1070  003712  000713                      BR      TNPRO           ;TRY TEST AGAIN
1071
1072                                  ;;**************************************************************
1073                                  ;       TEST 35 STRING OF 10 DATI'S (WITH M968 IN USER SLOTS)
1074                                  ;;**************************************************************
1075  003714  104400              T35:    SCOPE
1076  003716  012767  000020  175120      MOV     #20,BUFLEN      ;LENGTH OF BUFFER=20
1077  003724  004767  002524              JSR     %7,LODBUF       ;LOAD THE BUFFER WITH INCREMENTING PATTERN
1078  003730  006267  175110              ASR     BUFLEN          ;BUFLEN=10
1079  003734  016767  175104  175110      MOV     BUFLEN,WCLEN    ;PREPARE NUMBER FOR DRWC
1080  003742  005467  175104              NEG     WCLEN           ;2'S COMPLEMENT OF BUFLEN
1081  003746  016777  175100  175042      MOV     WCLEN,@DRWC     ;SET UP DRWC
1082  003754  016777  175060  175036      MOV     INBUF,@DRBA     ;SET UP DRBA
1083  003762  012777  177777  175034      MOV     #-1,@DRDB       ;MAINT AIDE
1084  003770  012777  006556  175034      MOV     #INTA,@DRINV    ;INT VECTOR TO INTA
1085  003776  016777  175026  175022      MOV     DRINL,@DRVS     ;INT VECTOR TO PRIORITY DRINL
1086  004004  005077  175004              CLR     @PSW            ;LET THE DR11-B INTERRUPT
1087  004010  012777  000101  175004      MOV     #101,@DRST      ;IE AND DO TO DRST
1088  004016  000777                      BR      .               ;WAIT FOR INTERRUPT
1089  004020  022777  000007  174776      CMP     #7,@DRDB        ;CHECK THAT WORD #10 OF INBUF IS IN DRBA
1090  004026  001401                      BEQ     .+4             ;IS IT?
1091  004030  104000                      HLT                     ;BAD DATA IN DRDB
1092
1093                                  ;;**************************************************************
1094                                  ;       TEST 36 STRING OF 10 DATO'S (WITH M968 IN USER SLOTS)
1095                                  ;;**************************************************************
1096  004032  104400                      SCOPE
1097  004034  012767  000020  175002      MOV     #20,BUFLEN      ;LENGTH OF BUFFER=20
1098  004042  004767  002406              JSR     %7,LODBUF       ;LOAD THE BUFFER WITH INCREMENTING PATTERN
1099  004046  006267  174772              ASR     BUFLEN          ;BUFLEN=10
1100  004052  016767  174766  174772      MOV     BUFLEN,WCLEN    ;PREPARE NUMBER FOR DRWC
1101  004060  005467  174766              NEG     WCLEN           ;2'S COMPLEMENT OF BUFLEN
1102  004064  016777  174762  174724      MOV     WCLEN,@DRWC     ;SET UP DRWC
1103  004072  016777  174742  174720      MOV     INBUF,@DRBA     ;SET UP DRBA
1104  004100  012777  052525  174716      MOV     #52525,@DRDB    ;SET UP DRDB
1105  004106  012777  006556  174716      MOV     #INTA,@DRINV    ;INTERRUPT VECTOR TO INTA
```

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1106  004114  016777  174710  174704          MOV     DRINL,@DRVS     ;INTERRUPT VECTOR TO PRIORITY DRINL
1107  004122  005077  174666                  CLR     @PSW            ;LET THE DR11-B INTERRUPT
1108  004126  012777  000103  174666          MOV     #103,@DRST      ;IE, FNCT1(C1 CONTROL), AND DO TO DRST
1109  004134  000777                          BR      .               ;WAIT FOR INTERRUPT
1110  004136  004767  002572                  JSR     %7,DATOCK       ;CHECK INBUF
1111
1112                                  ;;**********************************************************************
1113                                  ;       TEST 37 STRING OF 200 DATI'S
1114                                  ;;**********************************************************************
1115  004142  104400                  SCOPE
1116  004144  012767  000200  174672          MOV     #200,BUFLEN     ;LENGTH OF BUFFER=200
1117  004152  004767  002276                  JSR     %7,LODBUF       ;LOAD THE BUFFER WITH INCREMENTING PATTERN
1118  004156  016767  174662  174666          MOV     BUFLEN,WCLEN    ;PREPARE NUMBER FOR DRWC
1119  004164  005467  174662                  NEG     WCLEN           ;2'S COMPLEMENT OF BUFLEN
1120  004170  016777  174656  174620          MOV     WCLEN,@DRWC     ;SET UP DRWC
1121  004176  016777  174636  174614          MOV     INBUF,@DRBA     ;SET UP DRBA
1122  004204  012777  177777  174612          MOV     #-1,@DRDB       ;MAINT AIDE
1123  004212  012777  006556  174612          MOV     #INTA,@DRINV    ;INT VECTOR TO INTA
1124  004220  016777  174604  174600          MOV     DRINL,@DRVS     ;INT VECTOR TO PRIORITY DRINL
1125  004226  005077  174562                  CLR     @PSW            ;LET THE DR11-B INTERRUPT
1126  004232  012777  000101  174562          MOV     #101,@DRST      ;IE AND DO TO DRST
1127  004240  000777                          BR      .               ;WAIT FOR INTERRUPT
1128  004242  022777  000177  174554          CMP     #177,@DRDB      ;CHECK THAT WORD #200 OF INBUF IS IN DRBA
1129  004250  001401                          BEQ     .+4             ;IS IT?
1130  004252  104000                          HLT                     ;BAD DATA IN DRDB
1131                                  ;;**********************************************************************
1132                                  ;       TEST 40 STRING OR 200 DATO'S
1133                                  ;;**********************************************************************
1134  004254  104400                  SCOPE
1135  004256  012767  000201  174560          MOV     #201,BUFLEN     ;LENGTH OF BUFFER=201
1136  004264  004767  002164                  JSR     %7,LODBUF       ;LOAD THE BUFFER WITH INCREMENTING PATTERN
1137  004270  005367  174550                  DEC     BUFLEN          ;BUFLEN=200
1138  004274  016767  174544  174550          MOV     BUFLEN,WCLEN    ;PREPARE NUMBER FOR DRWC
1139  004302  005467  174544                  NEG     WCLEN           ;2'S COMPLEMENT OF BUFLEN
1140  004306  016777  174540  174502          MOV     WCLEN,@DRWC     ;SET UP DRWC
1141  004314  016777  174520  174476          MOV     INBUF,@DRBA     ;SET UP DRBA
1142  004322  012777  052525  174474          MOV     #52525,@DRDB    ;SET UP DRDB
1143  004330  012777  006556  174474          MOV     #INTA,@DRINV    ;INTERRUPT VECTOR TO INTA
1144  004336  016777  174466  174462          MOV     DRINL,@DRVS     ;INTERRUPT VECTOR TO PRIORITY DRINL
1145  004344  005077  174444                  CLR     @PSW            ;LET THE DR11-B INTERRUPT
1146  004350  012777  000103  174444          MOV     #103,@DRST      ;IE, FNCT1, AND DO TO DRST
1147  004356  000777                          BR      .               ;WAIT FOR INTERRUPT
1148  004360  004767  002350                  JSR     %7,DATOCK       ;CHECK INBUF
1149
1150                                  ;;**********************************************************************
1151                                  ;       TEST 42 TEST THAT DOING A DATO TO THE DIODE MEMORY CAUSES NEX
1152                                  ;;**********************************************************************
1153  004364  104400                  SCOPE
1154  004366  012777  177776  174422          MOV     #-2,@DRWC       ;SET UP DRWC
1155  004374  016777  174436  174416          MOV     DIOMEM,@DRBA    ;SET UP DRBA
1156  004402  012777  004436  174422          MOV     #NEXCHK,@DRINV  ;INTERRUPT VECTOR TO NEXCHK
1157  004410  016777  174414  174410          MOV     DRINL,@DRVS     ;INTERRUPT STATUS TO LEVEL DRINL
1158  004416  005077  174372                  CLR     @PSW            ;LET THE DR11-B INTERRUPT
1159  004422  012777  000163  174372          MOV     #163,@DRST      ;IE, FNCT1, XBA17, XBA16, AND GO TO DRST
1160  004430  005237  177560                  INC     @#177560        ;WAIT FOR INTERRUPT
1161  004434  104000                          HLT                     ;NO DR11-B INTERRUPT
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1162  004436  005777  174360          NEXCHK: TST     @DRST           ;TEST DRST
1163  004442  001001                          BNE     .+4             ;ERROR SET?
1164  004444  104000                          HLT                     ;ERROR NOT SET
1165  004446  105777  174350                  TSTB    @DRST           ;TEST FOR READY
1166  004452  001001                          BNE     .+4             ;READY SET?
1167  004454  104000                          HLT                     ;READY ISN'T SET
1168  004456  032777  040000  174336          BIT     #BIT14,@DRST    ;CHECK NEX
1169  004464  001001                          BNE     .+4             ;NEX SET?
1170  004466  104000                          HLT                     ;NEX IS CLEAR
1171  004470  022626                          CMP     (%6)+,(%6)+     ;RESTORE THE STACK
1172  004472  004767  002214                  JSR     %7,NORMAL
1173
1174                                  ;;**************************************************************
1175                                  ;       TEST 43 TEST THAT BAOF FORCES ERROR AND READY AND THAT BAOF IS
1176                                  ;       CLEARED BY CLEARING THE DRBA OR A RESET
1177                                  ;;**************************************************************
1178  004476  104400                          SCOPE
1179  004500  012767  000010  005222          MOV     #10,ICOUNT
1180  004506  012777  177760  174302          MOV     #-20,@DRWC      ;SET UP DRWC
1181  004514  012777  177776  174276          MOV     #-2,@DRBA       ;SET UP DRBA FOR PROC STATUS ADDRESS
1182  004522  012777  004556  174302          MOV     #BAOFCK,@DRINV  ;INTERRUPT VECTOR TO BAOFCK
1183  004530  016777  174274  174270          MOV     DRINL,@DRVS     ;INTERRUPT STATUS TO LEVEL DRINL
1184  004536  005077  174252                  CLR     @PSW            ;LET THE DR11-B INTERRUPT
1185  004542  012777  000163  174252          MOV     #163,@DRST      ;IE, FNCT1, XBA17, XBA16, AND GO TO DRST
1186  004550  005237  177560                  INC     @#177560        ;WAIT FOR INTERRUPT
1187  004554  104000                          HLT                     ;NO DR11-B INTERRUPT
1188  004556  022626                  BAOFCK: CMP     (%6)+,(%6)+     ;RESTORE THE STACK
1189  004560  005777  174236                  TST     @DRST           ;TEST DRST
1190  004564  100401                          BMI     .+4             ;ERROR SET?
1191  004566  104000                          HLT                     ;ERROR NOT SET
1192  004570  105777  174226                  TSTB    @DRST           ;TEST FOR READY
1193  004574  100401                          BMI     .+4             ;READY SET?
1194  004576  104000                          HLT                     ;READY ISN'T SET
1195  004600  042777  040000  174214          BIC     #BIT14,@DRST    ;CLEAR NEX
1196  004606  032777  060000  174206          BIT     #60000,@DRST    ;CHECK NEX AND ATTN
1197  004614  001401                          BEQ     .+4             ;ARE THEY CLEAR?
1198  004616  104000                          HLT                     ;NEX AND/OR ATTN IS SET
1199  004620  005777  174176                  TST     @DRST           ;TEST FOR ERROR
1200  004624  100401                          BMI     .+4             ;IS ERROR SET?
1201  004626  104000                          HLT                     ;ERROR IS CLEAR
1202  004630  005077  174164                  CLR     @DRBA           ;CLEAR BAOF
1203  004634  005777  174162                  TST     @DRST           ;CHECK ERROR
1204  004640  100001                          BPL     .+4             ;SHOULD BE CLEAR
1205  004642  104000                          HLT                     ;CLEARING DRBA DIDN'T CLEAR BAOF
1206
1207  004644  012777  177776  174146          MOV     #-2,@DRBA       ;SET UP DRBA FOR PROC STATUS ADDRESS
1208  004652  012777  004706  174152          MOV     #BAOCK1,@DRINV  ;INTERRUPT VECTOR TO BAOCK1
1209  004660  016777  174144  174140          MOV     DRINL,@DRVS     ;INTERRUPT STATUS TO LEVEL DRINL
1210  004666  005077  174122                  CLR     @PSW            ;LET THE DR11-B INTERRUPT
1211  004672  012777  000163  174122          MOV     #163,@DRST      ;I.E., XBA17,XBA16,FNCT1, AND GO TO DRST
1212  004700  005237  177560                  INC     @#177560        ;WAIT FOR INTERRUPT
1213  004704  104000                          HLT                     ;NO DR11-B INTERRUPT
1214  004706  022626                  BAOCK1: CMP     (%6)+,(%6)+     ;RESTORE THE STACK
1215  004710  005777  174106                  TST     @DRST           ;TEST DRST
1216  004714  100401                          BMI     .+4             ;ERROR SET?
1217  004716  104000                          HLT                     ;ERROR NOT SET
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1218  004720  105777  174076          TSTB    @DRST           ;TEST FOR READY
1219  004724  100401                  BMI     .+4             ;READY SET?
1220  004726  104000                  HLT                     ;READY ISN'T SET
1221  004730  042777  040000  174064  BIC     #BIT14,@DRST    ;CLEAR NEX
1222  004736  032777  060000  174056  BIT     #60000,@DRST    ;CHECK NEX AND ATTN
1223  004744  001401                  BEQ     .+4             ;ARE THEY CLEAR?
1224  004746  104000                  HLT                     ;NEX AND/OR ATTN IS SET
1225  004750  005777  174046          TST     @DRST           ;TEST FOR ERROR
1226  004754  100401                  BMI     .+4             ;IS ERROR SET?
1227  004756  104000                  HLT                     ;ERROR IS CLEAR
1228  004760  004767  004766          JSR     %7,CKSWR
1229  004764  000005                  RESET                   ;INIT
1230  004766  005777  174030          TST     @DRST           ;CHECK ERROR
1231  004772  100001                  BPL     .+4             ;SHOULD BE CLEAR
1232  004774  104000                  HLT                     ;RESET DIDN'T CLEAR BAOF
1233  004776  004767  001710          JSR     %7,NORMAL
1234
1235                                  ;;******************************************************************
1236                                  ;       TEST 44 TEST THAT RESET CLEARS DRDB
1237                                  ;;******************************************************************
1238  005002  104400                  SCOPE
1239  005004  012767  000010  004716  MOV     #10,ICOUNT
1240  005012  012777  177777  174004  MOV     #-1,@DRDB       ;ALL ONES TO DRBA
1241  005020  004767  004726          JSR     %7,CKSWR
1242  005024  000005                  RESET                   ;INIT
1243  005026  005777  173772          TST     @DRDB           ;LOOKING FOR Z-BIT TO SET
1244  005032  001401                  BEQ     .+4             ;DID DRDB GET CLEARED?
1245  005034  104000                  HLT                     ;DRDB NOT CLEAR
1246
1247                                  ;;******************************************************************
1248                                  ;       TEST 45 TEST THAT ALL DRDB BITS CAN BE SET
1249                                  ;;******************************************************************
1250  005036  104400                  SCOPE
1251  005040  012767  004000  004662  MOV     #4000,ICOUNT
1252  005046  012777  177777  173750  MOV     #-1,@DRDB       ;SET ALL BITS IN DRDB
1253  005054  022777  177777  173742  CMP     #-1,@DRDB       ;LOOKING FOR Z-BIT TO SET
1254  005062  001401                  BEQ     .+4             ;SEE IF ALL BITS GOT SET
1255  005064  104000                  HLT                     ;ALL DRDB BITS AREN'T SET
1256
1257                                  ;;******************************************************************
1258                                  ;       TEST 46 TEST THAT DRDB CAN HOLD ALTERNATE ONE'S AND ZERO'S
1259                                  ;;******************************************************************
1260  005066  104400                  SCOPE
1261  005070  012777  052525  173726  MOV     #052525,@DRDB   ;ALT 0'S AND 1'S TO DRDB
1262  005076  022777  052525  173720  CMP     #052525,@DRDB   ;LOOKING FOR Z-BIT TO SET
1263  005104  001401                  BEQ     .+4             ;DOES DRDB HAVE THE CORRECT PATTERN?
1264  005106  104000                  HLT                     ;DRDB IS WRONG
1265  005110  012777  125252  173706  MOV     #125252,@DRDB   ;ALT 1'S AND 0'S TO DRDB
1266  005116  022777  125252  173700  CMP     #125252,@DRDB   ;LOOKING FOR Z-BIT TO SET
1267  005124  001401                  BEQ     .+4             ;DOES DRDB HAVE THE CORRECT PATTERN
1268  005126  104000                  HLT                     ;DRDB IS WRONG
1269
1270                                  ;;******************************************************************
1271                                  ;       TEST 47 INCREMENTING PATTERN TO WRAP-AROUND IN DRDB
1272                                  ;;******************************************************************
1273  005130  104400                  SCOPE
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1274   005132  005067  004572                  CLR     ICOUNT
1275   005136  005001                          CLR     %1                      ;SET-UP
1276   005140  005077  173660                  CLR     @DRDB                   ;SET-UP
1277   005144  020177  173654          INCDB:  CMP     %1,@DRDB                ;SEE IF THEY ARE EQUAL
1278   005150  001401                          BEQ     .+4                     ;ARE THEY EQUAL?
1279   005152  104000                          HLT                             ;THEY'RE NOT EQUAL
1280   005154  005277  173644                  INC     @DRDB                   ;GET NEXT NUMBER
1281   005160  005201                          INC     %1                      ;GET NEXT NUMBER
1282   005162  001370                          BNE     INCDB                   ;DONE WITH TEST? IF NOT CONTINUE
1283
1284                                  ;;*****************************************************************
1285                                  ;       TEST 50 TEST THAT RESET SETS READY AND CLEARS ALL OTHER
1286                                  ;       DRST BITS (WITH M968 INSERTED)
1287                                  ;;*****************************************************************
1288   005164  104400                          SCOPE
1289   005166  004767  004560                  JSR     %7,CKSWR
1290   005172  000005                          RESET                           ;INIT
1291   005174  032777  000200  173620          BIT     #BIT7,@DRST             ;CHECK DRST
1292   005202  001001                          BNE     .+4                     ;IS READY SET?
1293   005204  104000                          HLT                             ;READY IS CLEAR
1294   005206  032777  177577  173606          BIT     #177577,@DRST           ;CHECK DRST
1295   005214  001401                          BEQ     .+4                     ;ARE THEY ALL CLEAR?
1296   005216  104000                          HLT                             ;A BIT OTHER THAN READY IS SET IN THE DRST
1297
1298                                  ;;*****************************************************************
1299                                  ;       TEST 51 TEST THAT BA00 READS AS A ZERO WITH MAINT BOARD INSERTED
1300                                  ;;*****************************************************************
1301   005220  104400                          SCOPE
1302   005222  012767  004000  004500          MOV     #4000,ICOUNT
1303   005230  032777  000001  173562          BIT     #BIT0,@DRBA             ;TEST BIT 0 OF DRBA
1304   005236  001401                          BEQ     .+4                     ;IS IT CLEAR?
1305   005240  104000                          HLT                             ;BA00 IS SET
1306
1307
1308
1309                                  ;;*****************************************************************
1310                                  ;       TEST 52 TEST THAT GO CLEARS READY
1311                                  ;;*****************************************************************
1312   005242  104400                          SCOPE
1313   005244  012767  004000  004456          MOV     #4000,ICOUNT
1314   005252  012777  177600  173536          MOV     #-200,@DRWC             ;SET-UP DRWC
1315   005260  016777  173554  173532          MOV     INBUF,@DRBA             ;SET-UP DRBA
1316   005266  105777  173530                  TSTB    @DRST                   ;CHECK READY
1317   005272  100401                          BMI     .+4                     ;IS READY SET?
1318   005274  104000                          HLT                             ;READY IS CLEAR
1319   005276  012777  000011  173516          MOV     #11,@DRST               ;FNCT3 (NON-BURST) AND GO TO DRST
1320   005304  105777  173512                  TSTB    @DRST                   ;CHECK READY
1321   005310  100001                          BPL     .+4                     ;IS READY CLEAR?
1322   005312  104000                          HLT                             ;READY IS STILL SET
1323   005314  005067  173534                  CLR     RDYCHK                  ;CLEAR READY CHECK
1324   005320  105777  173476          TSTRDY: TSTB    @DRST                   ;CHECK READY
1325   005324  100406                          BMI     DONE                    ;IF SET GO TO DONE
1326   005326  062767  000004  173520          ADD     #4,RDYCHK               ;CHECKING TIME FOR READY TO BE SET
1327   005334  100401                          BMI     .+4                     ;IF RDYCHK GETS NEGATIVE IT TOOK TOO LONG
1328   005336  000770                          BR      TSTRDY                  ;CHECK AGAIN
1329   005340  104000                          HLT                             ;READY GOT CLEARED BUT NEVER SET AGAIN
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1330  005342  000240                    DONE:   NOP                     ;GO TO NEXT TEST
1331                                    ;;**************************************************************
1332                                    ;TEST 55 TEST THAT GIVING A DO WITHOUT CLEARING A PREVIOUS ERROR
1333                                    ;CAUSES ANOTHER INTERRUPT
1334                                    ;;**************************************************************
1335  005344  104400                            SCOPE
1336  005346  012777  177760  173442            MOV     #-20,@DRWC      ;SET-UP DRWC
1337  005354  016777  173456  173436            MOV     DIOMEM,@DRBA    ;SET-UP DRBA
1338  005362  012777  005416  173442            MOV     #ERRD0,@DRINV   ;INTERRUPT VECTOR TO ERRD0
1339  005370  012777  000200  173430            MOV     #200,@DRVS      ;INTERRUPT STATUS TO LEVEL 4
1340  005376  005077  173412                    CLR     @PSW            ;LET THE DR11-B INTERRUPT
1341  005402  012777  000163  173412            MOV     #163,@DRST      ;IE, XBA17,XBA16,FNCT1 AND GO TO DRST
1342  005410  005277  173442                    INC     @TKS            ;WAIT FOR INTERUPT
1343  005414  104000                            HLT                     ;NO DR11-B INTERRUPT
1344  005416  005777  173400          ERRD0:    TST     @DRST           ;TEST DRST
1345  005422  100401                            BMI     .+4             ;ERROR SET?
1346  005424  104000                            HLT                     ;ERROR IS CLEAR - SHOULD HAVE NEX
1347  005426  012777  005474  173376            MOV     #ERRD01,@DRINV  ;INTERRUPT VECTOR TO ERRD01
1348  005434  005077  173360                    CLR     @DRBA           ;PREVENT CAUSING ANOTHER ERROR
1349  005440  042777  000062  173354            BIC     #62,@DRST       ;CLEAR XBA17, XBA16, AND FNCT1
1350  005446  012777  177777  173342            MOV     #-1,@DRWC       ;SET-UP DRWC
1351  005454  005277  173342                    INC     @DRST           ;DO TO DRST
1352  005460  005067  000002                    CLR     1$+2
1353  005464  005227  000001          1$:       INC     #1
1354  005470  001375                            BNE     1$
1355  005472  104000                            HLT                     ;NO DR11-B INTERRUPT
1356  005474  005777  173322          ERRD01:   TST     @DRST           ;CHECK ERROR
1357  005500  100401                            BMI     .+4             ;ERROR SET?
1358  005502  104000                            HLT                     ;ERROR IS CLEAR - SHOULD BE SET BECAUSE
1359                                                                    ;PREVIOUS ERROR WAS NOT CLEARED
1360  005504  062706  000010                    ADD     #10,%6          ;REPOSITION THE STACK
1361  005510  004767  001176                    JSR     %7,NORMAL
1362
1363                                    ;;**************************************************************
1364                                    ;       TEST 56 STRING OF 200 DATI'S NON-BURST MODE
1365                                    ;;**************************************************************
1366  005514  104400                            SCOPE
1367  005516  012767  000200  173320            MOV     #200,BUFLEN     ;LENGTH OF BUFFER=200
1368  005524  004767  000724                    JSR     %7,LODBUF       ;LOAD THE BUFFER WITH INCREMENTING PATTERN
1369  005530  016767  173310  173314            MOV     BUFLEN,WCLEN    ;PREPARE NUMBER FOR DRWC
1370  005536  005467  173310                    NEG     WCLEN           ;2'S COMPLEMENT OF BUFLEN
1371  005542  016777  173304  173246            MOV     WCLEN,@DRWC     ;SET-UP DRWC
1372  005550  016777  173264  173242            MOV     INBUF,@DRBA     ;SET-UP DRBA
1373  005556  012777  177777  173240            MOV     #-1,@DRDB       ;MAINT AIDE
1374  005564  012777  006556  173240            MOV     #INTA,@DRINV    ;INT VECTOR TO INTA
1375  005572  016777  173232  173226            MOV     DRINL,@DRVS     ;INT VECTOR TO PRIORITY DRINL
1376  005600  005077  173210                    CLR     @PSW            ;LET THE DR11-B INTERRUPT
1377  005604  012777  000111  173210            MOV     #111,@DRST      ;IE, FNCT3, AND DO TO DRST
1378  005612  005267  173232                    INC     BRWAIT          ;USE A WAIT OR BR. INSTRUCTION
1379  005616  032767  000001  173224            BIT     #BIT0,BRWAIT    ;SEE WHICH ONE
1380  005624  001403                            BEQ     DATINB          ;BIT 0 CLEAR=BR.
1381  005626  000001                            WAIT                    ;WAIT FOR INTERRUPT
1382  005630  000240                            NOP
1383  005632  000401                            BR      .+4
1384  005634  000777                  DATINB:   BR      .
1385  005636  022777  000177  173160            CMP     #177,@DRDB      ;CHECK THAT WORD #200 OF INBUF IS IN DRBA
```

```
1386   005644   001401                          BEQ     .+4             ;IS IT?
1387   005646   104000                          HLT                     ;BAD DATA IN DRDB
1388
1389                                    ;;**********************************************************************
1390                                    ;       TEST 57 STRING OF 200 DATO'S NON-BURST MODE
1391                                    ;;**********************************************************************
1392   005650   104400                          SCOPE
1393   005652   012767   000201   173164        MOV     #201,BUFLEN     ;LENGTH OF BUFFER=201
1394   005660   004767   000570                JSR     %7,LODBUF       ;LOAD THE BUFFER WITH INCREMENTING PATTERN
1395   005664   005367   173154                DEC     BUFLEN          ;BUFLEN=200
1396   005670   016767   173150   173154       MOV     BUFLEN,WCLEN    ;PREPARE NUMBER FOR DRWC
1397   005676   005467   173150                NEG     WCLEN           ;2'S COMPLEMENT OF BUFLEN
1398   005702   016777   173144   173106       MOV     WCLEN,@DRWC     ;SET UP DRWC
1399   005710   016777   173124   173102       MOV     INBUF,@DRBA     ;SET UP DRBA
1400   005716   012777   052525   173100       MOV     #52525,@DRDB    ;SET UP DRDB
1401   005724   012777   006556   173100       MOV     #INTA,@DRINV    ;INTERRUPT VECTOR TO INTA
1402   005732   016777   173072   173066       MOV     DRINL,@DRVS     ;INTERRUPT VECTOR TO PRIORITY DRINL
1403   005740   005077   173050                CLR     @PSW            ;LET THE DR11-B INTERRUPT
1404   005744   012777   000113   173050       MOV     #113,@DRST      ;IE, FNCT3, FNCT1, AND DO TO DRST
1405   005752   005267   173072                INC     BRWAIT          ;USE A WAIT OR BR. INSTRUCTION
1406   005756   032767   000001   173064       BIT     #BIT0,BRWAIT    ;BIT 0 CLEAR=BR.
1407   005764   001403                          BEQ     DATONB
1408   005766   000001                          WAIT                    ;WAIT FOR INTERRUPT
1409   005770   000240                          NOP
1410   005772   000401                          BR      .+4
1411   005774   000777                DATONB:   BR      .
1412   005776   004767   000732                JSR     %7,DATOCK       ;CHECK INBUF
1413
1414                                    ;;**********************************************************************
1415                                    ;       TEST 60 TEST THAT FUNCTION BITS INCREMENT WITH MAINT MODE TRANSFERS
1416                                    ;;**********************************************************************
1417   006002   104400                          SCOPE
1418   006004   012767   000010   173032        MOV     #10,BUFLEN      ;SET-UP BUFLEN FOR LODBUF AND CHKBUFF
1419   006012   016777   173022   173000       MOV     INBUF,@DRBA     ;SET-UP DR8A
1420   006020   004767   000430                JSR     %7,LODBUF       ;LOAD INBUF
1421   006024   004767   000462                JSR     %7,CHKBFF       ;LOAD CHKBUF
1422   006030   005077   172766                CLR     @DRST           ;INIT FOR STARTING
1423   006034   012767   000001   173024        MOV     #1,FNCCNT       ;GET READY FOR CHECKING
1424   006042   012767   000001   172774        MOV     #1,BUFLEN       ;CHANGE IS NECESSARY FOR INTA ROUTINE
1425   006050   016767   172764   173012        MOV     INBUF,INBUF1    ;SAVE INBUF
1426   006056   012777   006556   172746 MFLOOP: MOV     #INTA,@DRINV    ;INTERRUPT VECTOR TO INTA
1427   006064   016777   172740   172734       MOV     DRINL,@DRVS     ;INTERRUPT VECTOR PRIORITY TO DRINL
1428   006072   005077   172716                CLR     @PSW            ;LET THE DR11-B INTERRUPT
1429   006076   012777   177777   172712       MOV     #-1,@DRWC       ;SET-UP FOR 1 TRANSFER
1430   006104   052777   010101   172710       BIS     #10101,@DRST    ;MAINT, IE, AND DO TO DRST
1431   006112   000001                          WAIT                    ;WAIT FOR INTERRUPT
1432   006114   000240                          NOP                     ;FAKE-OUT RETURN ADDRESS CHANGING
1433   006116   117701   172700                MOVB    @DRST,%1        ;LOWER BYTE OF DRST TO R1
1434   006122   042701   000600                BIC     #600,%1         ;GET RID OF READY AND CYCLE BECAUSE OF MAINT MODE
1435   006126   006201                          ASR     %1              ;MOVE IT RIGHT ONE PLACE
1436   006130   126701   172732                CMPB    FNCCNT,%1       ;CHECK AGAINST FNCCNT
1437   006134   001401                          BEQ     .+4             ;SHOULD BE EQUAL
1438   006136   104000                          HLT                     ;FUNCTION BITS DIDN'T INCREMENT IN MAINT MODE
1439   006140   005267   172722                INC     FNCCNT          ;GET READY FOR NEXT PASS
1440   006144   022767   000010   172714        CMP     #10,FNCCNT      ;ONLY 10 BECAUSE FNCT3-1 GO TO ZERO
1441   006152   001404                          BEQ     MFCHK           ;IF ITS EQUAL GO CHECK DATA
```

```
 1442  006154  062767  000002  172656          ADD     #2,INBUF        ;FAKE-OUT INTA ROUTINE
 1443  006162  000735                          BR      MFLOOP          ;DO IT AGAIN
 1444  006164  012767  000007  172652  MFCHK:  MOV     #7,BUFLEN       ;SET UP FOR DATCHK (10 FNCT CHECKS, 7 TRANSFERS
 1445  006172  016767  172672  172640          MOV     INBUF1,INBUF    ;RESTORE INBUF
 1446  006200  004767  000446                  JSR     %7,DATCHK       ;CHECK DATA
 1447
 1448                                  ;;*****************************************************************
 1449                                  ;       TEST 61 TEST FOR 10 MAINT MODE TRANSFERS
 1450                                  ;;*****************************************************************
 1451  006204  104400                          SCOPE
 1452  006206  012767  000010  172630          MOV     #10,BUFLEN      ;BUFLEN=10
 1453  006214  016767  172624  172630          MOV     BUFLEN,WCLEN    ;PREPARE NUMBER FOR DRWC
 1454  006222  005467  172624                  NEG     WCLEN           ;2'S COMPLEMENT OF BUFLEN
 1455  006226  004767  000222                  JSR     %7,LODBUF       ;LOAD IN BUFFER WITH INCREMENTING PATTERN
 1456  006232  004767  000254                  JSR     %7,CHKBFF       ;LOAD CHECK BUFFER WITH MODIFIED INCREMENTING PATTERN
 1457  006236  016777  172610  172552          MOV     WCLEN,@DRWC     ;SET UP DRWC
 1458  006244  016777  172570  172546          MOV     INBUF,@DRBA     ;SET UP DRBA
 1459  006252  012777  177777  172544          MOV     #-1,@DRDB       ;MAINT AIDE
 1460  006260  012777  006556  172544          MOV     #INTA,@DRINV    ;INTERRUPT VECTOR TO INTA
 1461  006266  016777  172536  172532          MOV     DRINL,@DRVS     ;INTERRUPT STATUS AT PRIORITY DRINL
 1462  006274  005077  172514                  CLR     @PSW            ;LET DR11-B INTERRUPT
 1463  006300  012777  010101  172514          MOV     #10101,@DRST    ;MAINT, IE, AND DO TO DRST
 1464  006306  000777                          BR      .               ;WAIT FOR INTERRUPT
 1465  006310  004767  000336                  JSR     %7,DATCHK
 1466
 1467                                  ;;*****************************************************************
 1468                                  ;       TEST 62 TEST FOR 200 NPR TRANSFERS IN MAINT MODE
 1469                                  ;;*****************************************************************
 1470  006314  104400                          SCOPE
 1471  006316  012767  000200  172520          MOV     #200,BUFLEN     ;LENGTH OF BUFFER = 200
 1472  006324  016767  172514  172520          MOV     BUFLEN,WCLEN    ;PREPARE NUMBER FOR DRWC
 1473  006332  005467  172514                  NEG     WCLEN           ;2'S COMPLEMENT OF BUFLEN
 1474  006336  004767  000112                  JSR     %7,LODBUF       ;LOAD INBUF WITH INCREMENTING PATTERN
 1475  006342  004767  000144                  JSR     %7,CHKBFF       ;LOAD CHKBUF WITH MODIFIED INCREMENTED PATTERN
 1476  006346  016777  172500  172442          MOV     WCLEN,@DRWC     ;SET UP DRWC
 1477  006354  016777  172460  172436          MOV     INBUF,@DRBA     ;SET UP DRBA
 1478  006362  012777  000001  172434          MOV     #1,@DRDB        ;MAINT AIDE
 1479  006370  012777  006556  172434          MOV     #INTA,@DRINV    ;INT VECTOR TO INTA
 1480  006376  016777  172426  172422          MOV     DRINL,@DRVS     ;INT VECTOR AT PRIORITY DRINL
 1481  006404  005077  172404                  CLR     @PSW            ;LET THE DR11-B INTERRUPT
 1482  006410  012777  010101  172404          MOV     #010101,@DRST   ;FOLLOWING TO DRST:  MAINT(12),IE(06),DO(00)
 1483  006416  005267  172426                  INC     BRWAIT          ;USE A WAIT OR BR. INSTRUCTION
 1484  006422  032767  000001  172420          BIT     #BIT0,BRWAIT    ;SEE WHICH ONE
 1485  006430  001403                          BEQ     BRANCH          ;BIT 0 CLEAR = BR.
 1486  006432  000001                          WAIT
 1487  006434  000240                          NOP
 1488  006436  000401                          BR      .+4
 1489  006440  000777                  BRANCH: BR      .
 1490  006442  004767  000204                  JSR     %7,DATCHK       ;CHECK THAT CORRECT DATA WAS TRANSFERRED
 1491  006446  104400                          SCOPE
 1492  006450  000167  000356                  JMP     BELL            ;DO IT ALL AGAIN.
 1493  006454  016702  172360          LODBUF: MOV     INBUF,%2        ;MOVE STARTING ADDRESS OF INBUF TO R2
 1494  006460  005067  172362                  CLR     LENCHK          ;CLEAR LENGTH CHECK
 1495  006464  005022                          CLR     (%2)+           ;CLEAR STARTING ADDRESS OF INBUFF AND INC BY 2
 1496  006466  005267  172354          LOADA:  INC     LENCHK          ;INC LENGTH CHECK BY 1
 1497  006472  026767  172350  172344          CMP     LENCHK,BUFLEN   ;CHECK FOR DONE
```

```
1498   006500   001403                          BEQ     LDEXIT          ;IS INBUF FILLED?
1499   006502   016722   172340                 MOV     LENCHK,(%2)+    ;LOAD NEXT BUFFER WORD
1500   006506   000767                          BR      LOADA           ;CONTINUE CHECKING
1501   006510   000207                  LDEXIT: RTS     %7              ;EXIT
1502   006512   016702   172324          CHKBFF: MOV     CHKBUF,%2       ;STARTING ADDRESS OF CHECK-BUFFER TO R2
1503   006516   005067   172324                 CLR     LENCHK          ;CLEAR LENGTH CHECK
1504   006522   005003                          CLR     %3              ;CLEAR R3
1505   006524   010323                  CHKA:   MOV     %3,(%2)+        ;MOVE R3 TO CHKBUF ADDRESS AND INC BY 2
1506   006526   010322                          MOV     %3,(%2)+        ;MOVE R3 TO NEXT CHKBUF ADDRESS AND INC BY 2
1507   006530   062767   000002   172310        ADD     #2,LENCHK       ;ADD 2 TO LENGTH CHECK
1508   006536   026767   172304   172300        CMP     LENCHK,BUFLEN   ;CHECK FOR DONE
1509   006544   100003                          BPL     .+10            ;IS CHECK-BUFFER FILLED?
1510   006546   062703   000002                 ADD     #2,%3           ;NEXT NUMBER FOR BUFFER
1511   006552   000764                          BR      CHKA            ;CONTINUE FILLING
1512   006554   000207                          RTS     %7              ;EXIT
1513   006556   042777   000100   172236 INTA:   BIC     #BIT6,@DRST     ;CLEAR IE
1514   006564   005777   172232                 TST     @DRST           ;CHECKING FOR ERROR
1515   006570   100001                          BPL     .+4             ;ERROR SET?
1516   006572   104000                          HLT                     ;ERROR BIT IS SET
1517   006574   105777   172222                 TSTB    @DRST           ;CHECKING READY BIT
1518   006600   100401                          BMI     .+4             ;IS READY SET
1519   006602   104000                          HLT                     ;FALSE INTERRUPT - ERROR AND READY ARE CLEAR
1520   006604   005777   172206                 TST     @DRWC           ;TEST1 FOR DRWC=0
1521   006610   001401                          BEQ     .+4             ;WAS IT EQUAL?
1522   006612   104000                          HLT                     ;DRWC NOT =0
1523   006614   016702   172224                 MOV     BUFLEN,%2       ;BUFFER LENGTH TO R2
1524   006620   066702   172220                 ADD     BUFLEN,%2       ;NUMBER OF TRANSFERS TIMES 2
1525   006624   066702   172210                 ADD     INBUF,%2        ;CORRECT DRBA
1526   006630   027702   172164                 CMP     @DRBA,%2        ;CHECKING DRBA
1527   006634   001401                          BEQ     .+4             ;IS DRBA CORRECT?
1528   006636   104000                          HLT                     ;DRBA NOT CORRECT
1529   006640   062716   000002                 ADD     #2,(%6)         ;RETURN ADDRESS TO RETURN ADDRESS +2
1530   006644   004767   000042                 JSR     %7,NORMAL
1531   006650   000002                          RTI                     ;EXIT
1532
1533   006652   016702   172164          DATCHK: MOV     CHKBUF,%2       ;STARTING ADDRESS OF CHECK BUFFER TO R2
1534   006656   016703   172156                 MOV     INBUF,%3        ;STARTING ADDRESS OF IN BUFFER TO R3
1535   006662   005067   172160                 CLR     LENCHK          ;CLEAR LENGTH CHECK
1536   006666   005267   172154          COMPAR: INC     LENCHK          ;MAKE A COMPARISON
1537   006672   022223                          CMP     (%2)+,(%3)+     ;IS THE DATA CORRECT?
1538   006674   001401                          BEQ     .+4             ;BRANCH IF OK
1539   006676   104000                          HLT                     ;BAD DATA
1540   006700   026767   172142   172136        CMP     LENCHK,BUFLEN   ;SEE IF THE BUFFER HAS BEEN CHECKED
1541   006706   001367                          BNE     COMPAR          ;BUFFER CHECKED?
1542   006710   000207                          RTS     %7
1543   006712   012777   001026   172112 NORMAL: MOV     #DRVS,@DRINV    ;RESTORE DR11-B INTERRUPT VECTOR
1544   006720   005077   172102                 CLR     @DRVS           ;RESTORE DR11-B INTERRUPT STATUS
1545   006724   012777   000340   172062        MOV     #340,@PSW       ;RESTORE PROC TO PRIORITY LEVEL 7
1546   006732   000207                          RTS     %7              ;EXIT
1547   006734   012702   052525          DATOCK: MOV     #52525,%2       ;DATO NUMBER TO R2
1548   006740   016703   172074                 MOV     INBUF,%3        ;STARTING ADDRESS OF IN BUFFER TO R3
1549   006744   005067   172076                 CLR     LENCHK          ;CLEAR LENGTH CHECK
1550   006750   005267   172072          COMPRR: INC     LENCHK          ;MAKE A COMPARISON
1551   006754   020223                          CMP     %2,(%3)+        ;IS THE DATA CORRECT?
1552   006756   001401                          BEQ     .+4             ;BRANCH IF OK
1553   006760   104000                          HLT                     ;BAD DATA
```

```
1554  006762  026767  172060  172054          CMP     LENCHK,BUFLEN   ;SEE IF THE BUFFER HAS BEEN CHECKED
1555  006770  001367                          BNE     COMPRR          ;BUFFER CHECKED?
1556  006772  020223                          CMP     %2,(%3)+        ;CHECK END OF BUFFER + 1
1557  006774  001001                          BNE     .+4             ;SEE IF TOO MANY WORDS WERE TRANSFERRED
1558  006776  104000                          HLT                     ;TOO MANY
1559  007000  000207                          RTS     %7              ;EXIT
1560  007002  042777  000100  172012  ERRCHK: BIC     #BIT6,@DRST     ;CLEAR IE
1561  007010  005777  172006                  TST     @DRST           ;CHECKING FOR ERROR
1562  007014  100001                          BPL     .+4             ;ERROR SET?
1563  007016  104000                          HLT                     ;ERROR BIT IS SET
1564  007020  105777  171776                  TSTB    @DRST           ;CHECKING READY BIT
1565  007024  100401                          BMI     .+4             ;IS RDY SET
1566  007026  104000                          HLT                     ;FALSE ENTRY - ERROR AND READY ARE CLEAR
1567  007030  000207                          RTS     %7              ;EXIT
1568
1569                                  ;;*****************************************************************
1570                                  ;       BELL ON PASS COMPLETE
1571                                  ;;*****************************************************************
1572  007032  012737  000207  177566  BELL:   MOV     #207,@#177566
1573  007040  105737  177564                  TSTB    @#177564
1574  007044  100375                          BPL     .-4
1575  007046  012702  012365                  MOV     #$DR11,%2
1576  007052  004767  003404                  JSR     %7,TTOUT
1577                                  ;;*****************************************************************
1578                                  ;       ROUTINE TO CHECK FOR TRACE TRAP TO BE RUN WITH PROGRAM
1579                                  ;;*****************************************************************
1580
1581
1582  007056  004767  002670  TRTRAP: JSR     %7,CKSWR        ;CHECK FO CONT G
1583  007062  032777  010000  171722          BIT     #10000,@SR      ;SHOULD WE RUN WITH TRACE TRAP
1584  007070  001417                          BEQ     YESTR           ;YES
1585  007072  005767  000104                  TST     YESTR1          ;NO  HAVE WE RAN WITH TRACE TRAP ON
1586  007076  001411                          BEQ     TRPA            ;IF SO RESTORE PREVIOUS CONTENTS
1587  007100  016767  000076  170706          MOV     YESTR1,14
1588  007106  016767  000072  170702          MOV     YESTR2,16
1589  007114  042777  000020  171672          BIC     #20,@PSW        ;CLEAR TRACE TRAP
1590  007122  000167  172030          TRPA:   JMP     BEGIN           ;START OF TEST WITH TRACE OFF
1591  007126  000000          TRPB:   0
1592
1593                                  ;;*****************************************************************
1594                                  ;       SAVE OLD CONTENTS, SET UP FOR TRACE TRAP
1595                                  ;;*****************************************************************
1596  007130  016767  170660  000044  YESTR:  MOV     14,YESTR1       ;SAVE ODT PC
1597  007136  016767  170654  000040          MOV     16,YESTR2       ;SAVE ODT STATUS
1598  007144  012767  007206  170642          MOV     #YESRT,14       ;NEW TRAP VECTOR
1599  007152  005067  170640                  CLR     16              ;NEW CONDITION CODES
1600  007156  005077  171632                  CLR     @PSW
1601  007162  005167  177740                  COM     TRPB
1602  007166  100403                          BMI     .+10
1603  007170  052777  000020  171616          BIS     #20,@PSW        ;SET TRACE TRAP
1604  007176  000167  171754                  JMP     BEGIN           ;START OF TEST WITH TRACE ON
1605
1606  007202  000000          YESTR1: 0               ;STORAGE FOR ODT PC
1607  007204  000000          YESTR2: 0               ;STORAG FOR ODT STATUS
1608  007206  000002          YESRT:  RTI             ;RETURN TO PROGRAM FROM TRAP
1609  007210  000000                  HALT            ;RTI FAILED
```

```
                                ;;*****************************************************************
                                ;       BUS TO BUS TEST (DR11-B TO DR11-B)
                                ;;*****************************************************************

                        000000  R0=%0
                        000001  R1=%1
                        000002  R2=%2
                        000003  R3=%3
                        000004  R4=%4
                        000005  R5=%5
                        000006  R6=%6
                        000007  R7=%7
                        000007  PC=%7
                        000006  SP=%6

                        000001  GO=1
                        000002  FNCT1=2          ;OUTPUT MODE
                        000004  FNCT2=4          ;OUTPUT DIRECTION
                        000010  FNCT3=10         ;OUTPUT INTER REQ
                        000020  XBA16=20
                        000040  XBA17=40
                        000100  IE=100
                        000200  READY=200
                        000400  CYCLE=400
                        001000  DSTATA=1000      ;INPUT MODE
                        002000  DSTATB=2000      ;INPUT DIRECTION
                        004000  DSTATC=4000      ;INPUT INTR REQ
                        010000  MAINT=10000
                        020000  ATTN=20000
                        040000  NEX=40000
                        100000  ERROR=100000

007212  000004          NWRDXF: 4               ;# OF WORDS TRANSFERRED UNDER FLAG CONTROL PRIOR TO NPR
007214  000000          NEXJOB: 0               ;HOLDS ADDRESS OF READY INTERRUPT ROUTINE
007216  000000                  0               ;HOLDS ADDRESS OF ERROR INTERRUPT ROUTINE
007220  000000          JBFLAG: 0               ;JOB FLAG
007222  000000          JBCNT:  0               ;JOB COUNT
                                ;;*****************************************************************
                                ;MASTER START
                                ;;*****************************************************************
007224  000240          MS1:    NOP
007226  005067  177770          CLR     JBCNT           ;CLEAR JOB COUNT
007232  012706  013566          MOV     #BUFF,R6        ;SETUP STACK
007236  004767  000256          JSR     R7,SETVEC       ;SET UP INTERRUPT VECTORS
007242  005067  177752          CLR     JBFLAG          ;CLEAR JOB FLAG
007246  012767  007700  177740  MOV     #JOBA0,NEXJOB   ;DO JOBA0 FIRST
007254  012767  000000  177734  MOV     #0,NEXJOB+2     ;NO ERROR RECOVERY
007262  012777  000340  171524  MOV     #340,@PSW       ;LOCK OUT INTERRUPTS
007270  012777  000100  171524  MOV     #IE,@DRST       ;SET INTERRUPT ENABLE
007276  005077  171512          CLR     @PSW            ;DROP PRIOTIRY TO ZERO
007302  000425                  BR      BACKGD          ;WAIT FOR JOBS IN BACKGROUND
```

```
                                ;;*****************************************************************
                                ;       SLAVE START
                                ;;*****************************************************************

007304  000240                  SS1:    NOP
007306  012706  013566                  MOV     #BUFF,R6
007312  004767  000202                  JSR     R7,SETVEC       ;SET UP INTERRUPT VECTORS
007316  005067  177676                  CLR     JBFLAG
007322  012767  010122  177664          MOV     #SJOB1,NEXJOB   ;FOR READY INTERRUPT
007330  012767  010140  177660          MOV     #SJOB2,NEXJOB+2 ;FOR ERROR INTERRUPT
007336  012777  000340  171450          MOV     #340,@PSW       ;RAISE CP PRIORITY TO 7
007344  012777  000100  171450          MOV     #IE,@DRST       ;SET INTERRUPT ENABLE
007352  005077  171436                  CLR     @PSW            ;DROP CP PRIORITY TO 0 AND ENTER BACKGROUND

                                ;;*****************************************************************
                                ;       BACKGROUND PROGRAM; WAITS FOR JBFLAG TO SET
                                ;;*****************************************************************

007356  005200                  BACKGD: INC     R0
007360  005201                          INC     R1
007362  005202                          INC     R2
007364  005203                          INC     R3
007366  005204                          INC     R4
007370  005205                          INC     R5
007372  020005                          CMP     R0,R5
007374  001402                          BEQ     .+6
007376  104000                          HLT
007400  000000                          HALT                    ;BACKGROUND TEST FAILED
007402  020104                          CMP     R1,R4
007404  001402                          BEQ     .+6
007406  104000                          HLT
007410  000000                          HALT                    ;BACKGROUND TEST FAILED
007412  020203                          CMP     R2,R3
007414  001402                          BEQ     .+6
007416  104000                          HLT
007420  000000                          HALT                    ;BACKGROUND TEST FAILED
007422  005767  177572                  TST     JBFLAG          ;ANY JOBS?
007426  001753                          BEQ     BACKGD          ;BRANCH IF NONE
007430  004567  000032                  JSR     R5,SAVALL       ;YES & EXECUTE JOB WHOSE ADDRESS IS IN JBFLAG
007434  005067  177554                  CLR     NEXJOB
007440  005067  177552                  CLR     NEXJOB+2
007444  016767  177550  170362          MOV     JBFLAG,34
007452  005067  177542                  CLR     JBFLAG
007456  104400                          TRAP                    ;TRAP THROUGH JBFLAG AT 34
007460  004567  000016                  JSR     R5,RESALL
007464  000734                          BR      BACKGD

                                ;;*****************************************************************
                                ;       SUBROUTINE TO PUSH ALL REGISTERS ONTO THE STACK
                                ;;*****************************************************************

007466  010446                  SAVALL: MOV     R4,-(R6)        ;R5 WAS PUSHED BY JSR
007470  010346                          MOV     R3,-(R6)
007472  010246                          MOV     R2,-(R6)
```

```
                        MOV     R1,-(R6)
                        MOV     R0,-(R6)
                        JMP     (R5)            ;R5 HOLDS RETURN ADDRESS

                ;;**************************************************************
                ;       SUBROUTINE TO POP ALL REGISTERS OFF THE STACK
                ;;**************************************************************

                RESALL: TST     (R6)+
                        MOV     (R6)+,R0
                        MOV     (R6)+,R1
                        MOV     (R6)+,R2
                        MOV     (R6)+,R3
                        MOV     (R6)+,R4
                        RTS     R5

                ;;**************************************************************
                ;       ROUTINE TO SET UP INTERRUPT VECTORS
                ;;**************************************************************

                SETVEC: MOV     DRINV,R0        ;R0 IS VECTOR ADDRRSS
                        MOV     #DRINS,(R0)+    ;PUT SERVICE ADDRESS INTO VECTOR
                        MOV     DRINL,(R0)      ;PUT PRIORITY INTO VECTOR+2
                        MOV     #PRINT,30       ;SET UP EMT ADDRESS
                        MOV     DRINL,32        ;SET UP EMT PRIORITY LEVEL
                        CLR     34
                        MOV     DRINL,36        ;SET UP TRAP ADDRESS
                        CLR     R0              ;INITIALIZE REGISTERS
                        CLR     R1
                        CLR     R2
                        CLR     R3
                        CLR     R4
                        CLR     R5
                        RTS     R7
                ;;**************************************************************
                ;       PRIMARY INTERRUPT SERVICE ROUTINE.
                ;       SETS UP JBLFAG WITH ADDRESS OF JOB TO BE RUNSTARS
                ;;**************************************************************

                DRINS:  TST     JBFLAG          ;HAS THE PREVIOUS INTERRUPT BEEN SERVICED?
                        BEQ     DRIN0
                        HLT
                        HALT                    ;NO
                DRIN0:  BIT     #DSTATC,@DRST   ;CHECK FOR ERROR
                        BEQ     DRIN3           ;BRANCH IF NO ERROR
                        TST     NEXJOB+2        ;IS THERE AN ERROR SERVICE ROUTINE?
                        BNE     DRIN1           ;BRANCH IF THERE IS.
                        HLT
                        HALT                    ;ERROR INTERRUPT, NO ERROR SERVICE.
                DRIN1:  MOV     NEXJOB+2,JBFLAG ;SET UP JOBFLAG WITH ADDRESS OF SERVICE ROUTINE
                        RTI
                DRIN3:  TSTB    @DRST           ;CHECK READY
                        BMI     DRIN2           ;BRANCH IF SET
                        HLT
                        HALT                    ;INTERRUPT WITHOUT ERROR OR READY
                DRIN2:  TST     NEXJOB          ;IS THERE A READY SERVICE ROUTINE
```

```
 1778  007662  001002                        BNE     .+6             ;BRANCH IF THERE IS.
 1779  007664  104000                        HLT
 1780  007666  000000                        HALT                    ;READY INTERRUPT, NO READY SERVICE
 1781  007670  016767  177320  177322        MOV     NEXJOB,JBFLAG   ;SET UP JOBFLAG WITH SERVICE ROUTINE ADDRESS
 1782  007676  000002                        RTI
 1783
 1784                                  ;;*************************************************************
 1785                                  ;       MASTER'S INTERRUPT SERVICE ROUTINES
 1786                                  ;       ROUTINE A, SEGMENT 0
 1787                                  ;       FILL BUFFER AND TRANSMIT
 1788                                  ;;*************************************************************
 1789  007700  012700  011034        JOBA0:  MOV     #LISTA,R0       ;R0 IS XMIT LIST ADDRESS
 1790  007704  012701  011046                MOV     #LISTA1,R1      ;LISTA1 WILL BE REC LIST
 1791  007710  012021                        MOV     (R0)+,(R1)+     ;START WITH BUS ADDRESSES EQUAL
 1792  007712  012002                        MOV     (R0)+,R2        ;R2 HOLDS WORD COUNT OF XMIT
 1793  007714  010211                        MOV     R2,(R1)         ;MAKE REC WORD COUNT THE SAME
 1794  007716  005402                        NEG     R2              ;MAKE WORD COUNT POSITIVE
 1795  007720  006302                        ASL     R2              ;TRANSFORM INTO BYTE COUNT
 1796  007722  060241                        ADD     R2,-(R1)        ;ADD TO REC BUS ADDRESS
 1797  007724  005010                        CLR     (R0)            ;CLEAR OFFSET IN XMIT LIST
 1798  007726  024040                        CMP     -(R0),-(R0)     ;LEAVE R0=LISTA=XMIT LIST
 1799
 1800  007730  022767  000100  177264        CMP     #100,JBCNT      ;ENOUGH PASSES FOR BELL?
 1801  007736  003010                        BGT     JOBA0A          ;BRANCH IF NOT ENOUGH
 1802  007740  105737  177564        JOBA0B: TSTB    @#177564        ;TTY READY?
 1803  007744  100375                        BPL     JOBA0B
 1804  007746  012737  000207  177566        MOV     #207,@#177566   ;RING BELL
 1805  007754  005067  177242                CLR     JBCNT           ;RESET JOB COUNT
 1806  007760  004767  000704        JOBA0A: JSR     R7,SETBUF       ;FILL UP XMIT BUFFER WITH SPECIAL BINARY COUNT
 1807  007764  012700  011034                MOV     #LISTA,R0
 1808  007770  004767  000370                JSR     R7,MXMIT        ;TRANSMIT DATA TO SLAVE
 1809  007774  012767  010012  177212        MOV     #JOBA1,NEXJOB   ;JOBA1 IS NEXT
 1810  010002  012767  000000  177206        MOV     #0,NEXJOB+2     ;NO ERROR RECOVERY
 1811  010010  000002                        RTI                     ;RETURN TO BACKGROUND VIA TRAP
 1812
 1813                                  ;;*************************************************************
 1814                                  ;       ROUTINE A, SEGMENT 1
 1815                                  ;       FLUSH A BUFFER AND RECEIVE DATA
 1816                                  ;;*************************************************************
 1817
 1818  010012  012700  011046        JOBA1:  MOV     #LISTA1,R0      ;PUT REC LIST ADDRESS INTO R0
 1819  010016  004767  000574                JSR     R7,FLUSH        ;FLUSH BUFFER
 1820  010022  012700  011046                MOV     #LISTA1,R0
 1821  010026  004767  000406                JSR     R7,MREC         ;RECEIVE DATA FROM SLAVE
 1822  010032  012767  010050  177154        MOV     #JOBA2,NEXJOB   ;JOBA2 IS NEXT
 1823  010040  012767  000000  177150        MOV     #0,NEXJOB+2     ;NO ERROR RECOVERY
 1824  010046  000002                        RTI
 1825
 1826                                  ;;*************************************************************
 1827                                  ;       ROUTINE A, SEGMENT 2
 1828                                  ;       CHECKS TRANSMITTED DATA WITH RECEIVED
 1829                                  ;;*************************************************************
 1830
 1831  010050  012700  011034        JOBA2:  MOV     #LISTA,R0       ;XMIT BUFFER LIST
 1832  010054  012701  011046                MOV     #LISTA1,R1      ;REC BUFFER LIST
 1833  010060  004767  000642                JSR     R7,BUFCHK       ;COMPARE THE TWO BUFFERS
```

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1834  010064  042777  000100  170730          BIC     #IE.@DRST       ;GLITCH INTERRUPT
1835  010072  012777  000100  170722          MOV     #IE.@DRST
1836  010100  012767  007700  177106          MOV     #JOBAD,NEXJOB   ;REPEAT JOBAD
1837  010106  012767  000000  177102          MOV     #0,NEXJOB+2
1838  010114  005267  177102                  INC     JBCNT           ;ADVANCE COUNT
1839  010120  000002                          RTI
1840
1841                                  ;;**********************************************************************
1842                                  ;       SLAVE'S INTERRUPT SERVICE ROUTINES
1843                                  ;
1844                                  ;       JOB1:  IGNORE FIRST READY INTERRUPT
1845                                  ;;**********************************************************************
1846
1847  010122  012767  000000  177064  SJOB1:  MOV     #0,NEXJOB       ;NO MORE READY INTERRUPTS
1848  010130  012767  010140  177060          MOV     #SJOB2,NEXJOB+2 ;UNTIL ATTN INTERRUPT
1849  010136  000002                          RTI
1850
1851                                  ;;**********************************************************************
1852                                  ;       JOB2:  WAIT FOR COMMAND
1853                                  ;;**********************************************************************
1854
1855  010140  032777  004000  170654  SJOB2:  BIT     #DSTATC,@DRST   ;TEST FOR INTER
1856  010146  001002                          BNE     SJOB2A
1857  010150  104000                          HLT
1858  010152  000000                          HALT                    ;ERROR OTHER THAN DSTATC
1859  010154  005001                  SJOB2A: CLR     R1              ;SET UP FOR PARAMETERS
1860  010156  016702  170640                  MOV     DRST,R2         ;R2 IS STATUS ADDRESS
1861  010162  012703  000010                  MOV     #FNCT3,R3       ;R3 IS FUNCTION BIT 3
1862  010166  012704  004000                  MOV     #DSTATC,R4      ;R4 IS INTERUPT BIT
1863  010172  016705  170626                  MOV     DRDB,R5         ;R5 IS DATA BUFFER ADDRESS
1864  010176  012700  011062                  MOV     #LISTB+2,R0     ;STORE PARAMETERS HERE STARTING WITH WORD COUNT
1865  010202  004767  000122                  JSR     R7,HNDSHK       ;GET PARAMETERS
1866  010206  012700  011060                  MOV     #LISTB,R0       ;R0 IS TOP OF LIST
1867  010212  016010  000004                  MOV     4(R0),(R0)      ;MOVE OFFSET TO TOP
1868  010216  066710  170616                  ADD     INBUF,(R0)      ;TOP OF LIST IS BUFFER START + OFFSET
1869  010222  012077  170572                  MOV     (R0)+,@DRBA     ;SET UP BUS ADDRESS
1870  010226  012077  170564                  MOV     (R0)+,@DRWC     ;SET UP WORD COUNT
1871  010232  005077  170564                  CLR     @DRST           ;CLEAR ALL FUNCTION BITS
1872  010236  032777  002000  170556          BIT     #DSTATB,@DRST   ;WHICH DIRECTION
1873  010244  001405                          BEQ     SJOB2C          ;BRANCH IF RECIEVE (LEAVE FNCT1 CLEAR FOR DATI'S)
1874  010246  032777  000400  170546  SJOB2B: BIT     #CYCLE,@DRST    ;WAIT FOR MASTER TO SET CYCLE
1875  010254  001774                          BEQ     SJOB2B          ;BRANCH IF NOT SET
1876  010256  000412                          BR      SJOB2D          ;GO DO THE COMAND
1877  010260  012700  011060          SJOB2C: MOV     #LISTB,R0
1878  010264  004767  000356                  JSR     R7,BLUSH        ;BLUSH THE BUFFER
1879  010270  052777  000004  170524          BIS     #FNCT2,@DRST    ;SET FNCT2 FOR DATO'S
1880  010276  042777  000400  170516          BIC     #CYCLE,@DRST    ;CLEAR CYCLE
1881  010304  052777  000101  170510  SJOB2D: BIS     #IE!GO,@DRST    ;EXECUTE COMMAND AND INTERRUPT WHEN DONE
1882  010312  012767  010122  176674          MOV     #SJOB1,NEXJOB   ;IGNORE READY INTERRUPT
1883  010320  012767  010140  176670          MOV     #SJOB2,NEXJOB+2 ;WAIT FOR ATTN INTERRUPT
1884  010326  000002                          RTI
1885
1886                                  ;;**********************************************************************
1887                                  ;       SLAVE ROUTINE TO ACCEPT PARAMETERS FROM MASTER
1888                                  ;;**********************************************************************
1889
```

```
                                        HNDSHK: MOV     (R5),(R5)       ;ECHO PARAMETER
                                                MOV     (R5),(R0)+      ;STORE PARAMETER
                                                BIS     R3,(R2)         ;REPLY WITH FNCT3
                                        HNDSH1: BIT     R4,(R2)         ;WAIT FOR ATTN TO DROP
                                                BNE     HNDSH1
                                                BIC     R3,(R2)         ;DROP FNCT3
                                                INC     R1              ;CHECK NUMBER
                                                CMP     R1,NWRDXF
                                                BLT     HNDSH2          ;BRANCH IF NOT DONE YET
                                                RTS     R7
                                        HNDSH2: BIT     R4,(R2)         ;WAIT FOR NEXT WORD
                                                BEQ     HNDSH2          ;BRANCH IF ATTN CLEAR
                                                BR      HNDSHK          ;GET ANOTHER PARAMETER

                                        ;;**************************************************************
                                        ;       MASTER TRANSMIT ROUTINE
                                        ;       ENTER WITH TRANSFER LIST IN R0
                                        ;;**************************************************************

                                        MXMIT:  TST     @DRST           ;MAKE SURE ERROR IS CLEAR
                                                BPL     MXMIT1          ;AND READY IS SET
                                                HLT
                                                HALT                    ;ERROR IS SET
                                        MXMIT1: TSTB    @DRST
                                                BMI     MXMIT2
                                                HLT
                                                HALT                    ;READY NOT SET
                                        MXMIT2: MOV     #0,@DRST        ;SET UP FUNCTION FOR DATI'S
                                                JSR     R7,PRMXFR       ;TRANSFER PARAMETERS OF LIST WHOSE ADDRESS IS IN R0
                                                BIC     #CYCLE,@DRST    ;MAKE SURE CYCLE IS CLEAR
                                                BIS     #IE!GO,@DRST    ;EXECUTE COMMAND AND INTERRUPT WHEN DONE
                                                RTS     R7

                                        ;;**************************************************************
                                        ;       MASTER RECEIVE ROUTINE
                                        ;       ENTER WITH TRANSFER LIST IN R0
                                        ;;**************************************************************

                                        MREC:   TST     @DRST           ;MAKE SURE ERROR IS CLEAR
                                                BPL     MREC1           ;AND READY SET.
                                                HLT
                                                HALT                    ;ERROR SET
                                        MREC1:  TSTB    @DRST
                                                BMI     MREC2
                                                HLT
                                                HALT                    ;READY CLEAR
                                        MREC2:  MOV     #FNCT2,@DRST    ;SET UP FUNCTION FOR DATO'S
                                                JSR     R7,PRMXFR       ;TRANSFER PARAMETERS OF LIST WHOSE ADDRESS IS IN R0
                                        MREC3:  BIT     #DSTATB,@DRST   ;WAIT FOR SLAVE TO CLEAR DIRECTION
                                                BNE     MREC3           ;BRANCH IF SET
                                                BIC     #CYCLE,@DRST    ;CLEAR CYCLE
                                                BIS     #IE!GO,@DRST    ;EXECUTE COMMAND AND INTERRUPT WHEN DONE.
                                                RTS     R7

                                        ;;**************************************************************
                                        ;       ROUTINE TO TRANSFER AND CHECK PARAMETERS UNDER FLAG CONTROL
                                        ;       ENTER WITH R0 POINTING TO TRANSFER LIST
```

```
1946                                    ;;**********************************************************************
1947
1948  010524  012077  170270   PRMXFR: MOV     (R0)+,@DRBA     ;FIRST WORD IN LIST IS ADDRESS
1949  010530  011077  170262           MOV     (R0),@DRWC      ;SECOND WORD IN LIST IS WORD COUNT
1950  010534  005001                   CLR     R1              ;R1 COUNTS PARAMETERS TRANSFERRED
1951  010536  016702  170260           MOV     DRST,R2         ;R2 IS THE STATUS ADDRESS
1952  010542  012703  000010           MOV     #FNCT3,R3       ;R3 USED FOR FUNCTION BIT 3
1953  010546  012704  004000           MOV     #DSTATC,R4      ;R4 USED FOR INTERUPT BIT
1954  010552  016705  170246           MOV     DRDB,R5         ;R5 IS THE DATA BUFFER ADDRESS
1955  010556  011015           PRMXF1: MOV     (R0),(R5)       ;SET UP DRDB WITH PARAMETER
1956  010560  050312                   BIS     R3,(R2)         ;CALL SLAVE'S ATTN
1957  010562  030412           PRMXF2: BIT     R4,(R2)         ;WAIT FOR REPLY
1958  010564  001776                   BEQ     PRMXF2          ;BRANCH IF ATTN CLEAR
1959  010566  022015                   CMP     (R0)+,(R5)      ;COMPARE PARAMETER SENT WITH SLAVE'S ECHO
1960  010570  001402                   BEQ     PRMXF3          ;BRANCH IF EQUAL
1961  010572  104000                   HLT
1962  010574  000000                   HALT                    ;PARAMETER DID NOT ECHO
1963  010576  040312           PRMXF3: BIC     R3,(R2)         ;DROP SLAVE'S ATTN
1964  010600  030412           PRMXF4: BIT     R4,(R2)         ;WAIT FOR REPLY
1965  010602  001376                   BNE     PRMXF4          ;BRANCH IF ATTN SET
1966  010604  005201                   INC     R1              ;ADVANCE PARAMETER COUNT
1967  010606  020167  176400           CMP     R1,NWRDXF       ;ALL PARAMETER XFERRED?
1968  010612  002761                   BLT     PRMXF1          ;BRANCH IF NOT DONE
1969  010614  000207                   RTS     R7              ;RETURN WHEN ALL PARAMETERS TRANSFERRED AND CHECKED.
1970
1971                                    ;;**********************************************************************
1972                                    ;       ROUTINE TO CLEAR BUFFER
1973                                    ;       ENTER WITH R0 POINTING TO TRANSFER LIST
1974                                    ;;**********************************************************************
1975
1976  010616  005005           FLUSH:  CLR     R5              ;SET R5 TO ZIP
1977  010620  004767  000030           JSR     R7,BSETUP       ;SET UP REGISTERS
1978  010624  004767  000004   FLUSH1: JSR     R7,BUFPUT       ;STORE ITEM IN BUFFER
1979  010630  002775                   BLT     FLUSH1
1980  010632  000432                   BR      BUFOUT          ;STOP WHEN BUFFER FULL
1981
1982  010634  010521           BUFPUT: MOV     R5,(R1)+        ;PUT R5 INTO BUFFER
1983  010636  060503                   ADD     R5,R3           ;INCLUDE IN CHECKSUM
1984  010640  005504                   ADC     R4
1985  010642  005202                   INC     R2              ;ADVANCE WORD COUNT
1986  010644  000207                   RTS     R7              ;RETURN WITH STATUS SET
1987
1988                                    ;;**********************************************************************
1989                                    ;       ROUTINE TO FILL BUFFER WITH ALL ONE'S
1990                                    ;       ENTER WITH R0 POINTING TO TRANSFER LIST
1991                                    ;;**********************************************************************
1992  010646  012705  177777   BLUSH:  MOV     #-1,R5          ;SET R5 TO ALL ONE'S
1993  010652  000762                   BR      FLUSH+2
1994
1995                                    ;REGISTER SETUP ROUTINE
1996  010654  012001           BSETUP: MOV     (R0)+,R1        ;R1 IS BUS ADDRESS
1997  010656  012002                   MOV     (R0)+,R2        ;R2 IS WORD COUNT
1998  010660  005720                   TST     (R0)+           ;SKIP OVER OFFSET
1999  010662  005003                   CLR     R3              ;CLEAR LOW CHECKSUM
2000  010664  005004                   CLR     R4              ;CLEAR HIGH CHECKSUM
2001  010666  000207                   RTS     R7              ;RETURN
```

```
                                        ;;*****************************************************************
                                        ;       ROUTINE TO FILL BUFFER WITH SPECIAL BINARY COUNT
                                        ;       ENTER WITH R0 POINTING TO TRANSFER LIST
                                        ;;*****************************************************************
010670  004767  177760          SETBUF: JSR     R7,BSETUP       ;SET UP REGISTERS
010674  005005                          CLR     R5
010676  004767  177732          SETBF1: JSR     R7,BUFPUT       ;NUMBER TO BUFFER
010702  002006                          BGE     BUFOUT
010704  005105                          COM     R5
010706  004767  177722                  JSR     R7,BUFPUT       ;COMPLEMENT OF NUMBER TO BUFFER
010712  002002                          BGE     BUFOUT
010714  005405                          NEG     R5              ;INCREMENT NUMBER
010716  000767                          BR      SETBF1
010720  010320                  BUFOUT: MOV     R3,(R0)+        ;MOVE LOW CHECK TO LIST
010722  010420                          MOV     R4,(R0)+        ;MOVE HIGH CHECK TO LIST
010724  000207                          RTS     R7              ;RETURN

                                        ;;*****************************************************************
                                        ;       ROUTINE TO COMPARE TWO BUFFERS
                                        ;       BUFFER LIST #1 IS IN R1
                                        ;       BUFFER LIST #2 IS IN R0.  #2 CHECKED FOR PROPER CHECKSUM
                                        ;;*****************************************************************

010726  010046          BUFCHK: MOV     R0,-(R6)        ;SAVE LIST#2 ON STACK
010730  010146                  MOV     R1,-(R6)        ;SAVE LIST#1 ON STACK
010732  004767  000036          JSR     R7,CHKSUM       ;VERIFY INTEGRITY OF CHECK BUFFER (#2)
010736  012600                  MOV     (R6)+,R0        ;RECOVER 1ST LIST POINTER
010740  012001                  MOV     (R0)+,R1        ;BUS ADDRESS #1
010742  012002                  MOV     (R0)+,R2        ;WORD COUNT #1
010744  012600                  MOV     (R6)+,R0        ;RECOVER 2ND LIST POINTER
010746  012003                  MOV     (R0)+,R3        ;BUS ADDRESS #2
010750  020220                  CMP     R2,(R0)+        ;COMPARE WORD COUNTS
010752  003402                  BLE     BUFCK1          ;BRANCH IF EQUAL OR LESS THAN
010754  104000                  HLT                     ;BUFFER 2 IS LONGER THAN 1
010756  000000                  HALT

010760  022123          BUFCK1: CMP     (R1)+,(R3)+     ;COMPARE BUFFERS
010762  001401                  BEQ     BUFCK2
010764  104000                  HLT                     ;DATA ERROR
010766  005202          BUFCK2: INC     R2              ;ADVANCE COUNT
010770  002773                  BLT     BUFCK1          ;BRANCH IF NOT DONE
010772  000207                  RTS     R7              ;RETURN; STACK IS CLEAR

                                        ;;*****************************************************************
                                        ;       ROUTINE TO CHECK SUM OF BUFFER
                                        ;       ENTER WITH R0 POINTING TO TRANSFER LIST
                                        ;;*****************************************************************
010774  004767  177654          CHKSUM: JSR     R7,BSETUP       ;SET UP REGISTERS
011000  004767  000016          CHKSM1: JSR     R7,GETBUF       ;GET ITEM FROM BUFFER
011004  002775                  BLT     CHKSM1          ;BRANCH IF NOT DONE
011006  020320                  CMP     R3,(R0)+        ;COMPARE LOW ORDER CHECKS
011010  001003                  BNE     CHKSM2
011012  020420                  CMP     R4,(R0)+        ;COMPARE HIGH ORDER CHECKS
011014  001001                  BNE     CHKSM2
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```
                                        RTS     R7              ;RETURN IF CHECKSUM OK.
011020  104000                  CHKSM2: HLT                     ;ORIGINAL BUFFER CHECKSUM DOES NOT AGREE WITH PRESENT

011022  012105                  GETBUF: MOV     (R1)+,R5        ;GET ITEM OUT OF BUFFER
011024  060503                          ADD     R5,R3           ;ADD TO CHECKSUM
011026  005504                          ADC     R4
011030  005202                          INC     R2              ;ADVANCE WORD COUNT
011032  000207                          RTS     R7

011034  013570                  LISTA:  XINBUF                  ;START OF XMIT BUFFER
011036  177605                          -123.                   ;WORD COUNT
011040  000000                          0                       ;OFFSET
011042  000000                          0                       ;CHECKSUM LOW
011044  000000                          0                       ;CHECKSUM HIGH

011046  000000                  LISTA1: 0                       ;START OF REC BUFFER
011050  000000                          0                       ;WORD COUNT
011052  000000                          0                       ;OFFSET
011054  000000                          0                       ;CHECKSUM LOW
011056  000000                          0                       ;CHECKSUM HIGH

011060  013570                  LISTB:  XINBUF                  ;SLAVE'S ECHO BUFFER
011062  000000                          0
011064  000000                          0
011066  000000                          0
011070  000000                          0


                                ;;**************************************************************
                                ;       ENTERED WITH SYSTEM TRAP CALL(HLT)
                                ;       PRINT OUT THE ERROR PC AND STATUS REGISTER
                                ;;**************************************************************

011072  004767  000654          PRINT:  JSR     %7,CKSWR
011076  037727  167710  020000          BIT     @SR,#20000      ;TEST FOR INHIBIT PRINT OU
011104  001401                          BEQ     .+4             ;BRANCH TO PRINT
011106  000002                          RTI                     ;INHIBIT, RETURN TO MAIN STREAM
011110  012667  000172                  MOV     (6)+,SAVPC      ;PC OF FAILING ROUTINE
011114  012667  000170                  MOV     (6)+,SAVCC      ;CC OF ERROR CONDITION
011120  024646                          CMP     -(6),-(6)       ;REPOSITION THE STACK
011122  012777  000215  167734          MOV     #215,@TPB       ;CR
011130  105777  167726                  TSTB    @TPS
011134  100375                          BPL     .-4
011136  012777  000212  167720          MOV     #212,@TPB       ;LINE FEED
011144  105777  167712                  TSTB    @TPS
011150  100375                          BPL     .-4
011152  010267  000122                  MOV     %2,SAVR2        ;SAVE R2
011156  010367  000120                  MOV     %3,SAVR3        ;SAVE R3
011162  010467  000116                  MOV     %4,SAVR4        ;SAVE R4
011166  016702  000114                  MOV     SAVPC,%2
011172  004767  000114                  JSR     %7,PRTAB        ;PRINT OCTAL NUMBER
011176  012777  000240  167660          MOV     #240,@TPB
011204  105777  167652                  TSTB    @TPS            ;SPACE BETWEEN WORDS
011210  100375                          BPL     .-4
011212  016702  000072                  MOV     SAVCC,%2
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2114  011216  004767  000070                    JSR     %7,PRTAB        ;PRINT OCTAL NUMBER
2115  011222  012777  000240  167634            MOV     #240,@TPB       ;PRINT SPACE
2116  011230  105777  167626                    TSTB    @TPS            ;PRINTER DONE
2117  011234  100375                            BPL     .-4             ;BRANCH WHEN NOT DONE
2118  011236  017702  167560                    MOV     @DRST,%2        ;GET DR11B STATUS
2119  011242  004767  000044                    JSR     %7,PRTAB        ;PRINT OCTAL NUMBER
2120  011246  016702  000026                    MOV     SAVR2,%2
2121  011252  016703  000024                    MOV     SAVR3,%3
2122  011256  016704  000022                    MOV     SAVR4,%4
2123  011262  004767  000464                    JSR     %7,CKSWR
2124  011266  005777  167520                    TST     @SR             ;CHECK SR FOR HALT SWITCH
2125  011272  100001                            BPL     .+4
2126  011274  000000                            HALT                    ;HALT ON ERROR UP
2127  011276  000002                            RTI                     ;RETURN TO MAINLINE
2128  011300  000000                SAVR2:  0
2129  011302  000000                SAVR3:  0
2130  011304  000000                SAVR4:  0
2131  011306  000000                SAVPC:  0
2132  011310  000000                SAVCC:  0
2133
2134  011312  005067  000260        PRTAB:  CLR     BINCT
2135  011316  005067  000252                CLR     WGTCT
2136  011322  012704  011602                MOV     #LIST,%4        ;GET LIST ADDRESS
2137  011326  142777  000177  167526        BICB    #177,@TPS       ;CLR INT FLAG
2138  011334  012767  000005  000236        MOV     #5,ASCNT
2139  011342  012767  000007  000220        MOV     #7,SEVEN
2140  011350  012767  000001  000214        MOV     #1,DECML
2141  011356  105777  167500        WAIT1:  TSTB    @TPS
2142  011362  100375                        BPL     WAIT1
2143  011364  005702                        TST     %2
2144  011366  100404                        BMI     MINUS           ;NEG SIGN PRINT 1
2145  011370  012777  000260  167466        MOV     #260,@TPB       ;POS SIGN PRINT 0
2146  011376  000403                        BR      START
2147  011400  012777  000261  167456  MINUS:  MOV     #261,@TPB
2148  011406  016703  000156        START:  MOV     SEVEN,%3        ;PUT MASK IN R3
2149  011412  010267  000150                MOV     %2,TOODLE       ;GET READY TO DOODLE NUMBER IN TOODLE
2150  011416  005167  000144                COM     TOODLE          ;COMPENSATES FOR COMPLEMENT DURING BIC
2151  011422  046703  000140                BIC     TOODLE,%3       ;AND IN OCTAL CHARACTER
2152  011426  001410                        BEQ     WRTOC           ;ZERO, WRITE 0 IN LIST
2153  011430  066767  000136  000136  MKNUM:  ADD     DECML,WGTCT     ;COUNT UP TO
2154  011436  005267  000134                INC     BINCT           ;AND RECORD
2155  011442  026703  000126                CMP     WGTCT,%3        ;SAME BINARY WEIGHT
2156  011446  001370                        BNE     MKNUM           ;KEEP COUNTN
2157  011450  062767  000260  000120  WRTOC:  ADD     #260,BINCT      ;ADD ASCII PREFIX
2158  011456  016724  000114                MOV     BINCT,(4)+      ;WRITE ASCII CHAR IN LIST
2159  011462  066767  000102  000102        ADD     SEVEN,DECML     ;EXPAND BINARY WEIGHT
2160  011470  005067  000100                CLR     WGTCT
2161  011474  005067  000076                CLR     BINCT
2162  011500  005367  000074                DEC     ASCNT
2163  011504  001410                        BEQ     XLIST           ;5 CHAR IN LIST
2164  011506  012703  000003                MOV     #3,%3           ;SET X3 FOR ADD LOOP
2165  011512  066767  000052  000050  MOADD:  ADD     SEVEN,SEVEN     ;MAKING SEVENTY BY SEVEN
2166  011520  005303                        DEC     %3
2167  011522  001373                        BNE     MOADD
2168  011524  000730                        BR      START           ;NX SEVEN SET GET NX OCTAL
2169  011526  012767  000005  000044  XLIST:  MOV     #5,ASCNT        ;SEND 5 CHAR TO TTY
```

```
011534  105777  167322          WAIT2:  TSTB    @TPS
011540  100375                          BPL     WAIT2
011542  014477  167316                  MOV     -(4),@TPB
011546  005367  000026                  DEC     ASCNT
011552  001401                          BEQ     HOFHM                   ;FINISH PRINTING GET NXT NUM
011554  000767                          BR      WAIT2
011556  105777  167300          HOFHM:  TSTB @TPS
011562  100375                          BPL     .-4
011564  000207                          RTS     %7                      ;HEAD FOR HOME
011566  000000                  TOODLE: 0
011570  000000                  SEVEN:  0
011572  000000                  DECML:  0
011574  000000                  WGTCT:  0
011576  000000                  BINCT:  0
011600  000000                  ASCNT:  0
011602  000000                  LIST:   0
011604  000000                          0
011606  000000                          0
011610  000000                          0
011612  000000                          0
                                ;;*******************************************************************
                                ;       SCOPE LOOP ROUTINE ENTERED BY USER TRAP
                                ;;*******************************************************************

011614  004767  000132          SCOPEA: JSR     %7,CKSWR
011620  032777  040000  167164          BIT     #40000,@SR
011626  001003                          BNE     SCOPEB                  ;SCOPE, BIT IS A ONE
011630  011667  000100                  MOV     @%6,RETURN              ;NO - SAVE PC FOR NEXT TIME
011634  000002                          RTI                             ;RETURN IN SEQUENCE
011636  022606                  SCOPEB: CMP     (6)+,%6                 ;REPOSITION THE STACK
011640  012677  167150                  MOV     (6)+,@PSW
011644  000177  000064                  JMP     @RETURN                 ;SCOPE RETURN

                                ;;*******************************************************************
                                ;       SCOPE OR/AND ITERATION LOOP FOR EACH TEST 4000 TIMES
                                ;;*******************************************************************

011650  004767  000076          SCOPEC: JSR     %7,CKSWR
011654  032777  040000  167130          BIT     #40000,@SR              ;TEST SR FOR SCOPE
011662  001365                          BNE     SCOPEB                  ;YES SCOPE
011664  004767  000062                  JSR     %7,CKSWR
011670  032777  004000  167114          BIT     #4000,@SR               ;NO - TEST FOR ITERATION
011676  001007                          BNE     SCOPEG                  ;INHIBIT ITERATION
011700  026767  000026  000022          CMP     SCOPEF,ICOUNT
011706  001403                          BEQ     SCOPEG                  ;EXIT - DONE
011710  005267  000016                  INC     SCOPEF                  ;INCREMENT COUNT
011714  000750                          BR      SCOPEB                  ;LOOP SOME MORE
011716  005067  000010          SCOPEG: CLR     SCOPEF                  ;CLEAR COUNT
011722  011667  000006                  MOV     @%6,RETURN              ;SAVE SCOPE RETURN POINTER
011726  000002                          RTI                             ;RETURN INLINE-NEXT TEST
011730  004000                  ICOUNT: 4000
011732  000000                  SCOPEF: 0                               ;COUNT LOCATION FOR ITERATION LOOP
011734  001156                  RETURN: BEGIN                           ;ADDRESS OF LAST TEST
                                        .EVEN
```

C04


```
011736  000167  166236                    JMP     200



                                  ;;*******************************************************
                                  ;         CHECK SWITCH REGISTER ROUTINE. CHECKS FOR ↑G TO ALLOW CHANGING
                                  ;         OF LOC. 176.
                                  ;;*******************************************************
011742  000000                            TEMPST: .WORD   0
011744  000000                            COUNT:  .WORD   0
011746  000000                            RDSW:   .WORD   0
011750  000000                            TIB:    .WORD   0

011752  022767  000176  167032    CKSWR:  CMP     #SWREG,SR               ;SOFTWARE SWITCH REGISTER PRESENT
011760  001133                            BNE     OUT
011762  105777  167070                    TSTB    @TKS                    ;YES,WAIT FOR
011766  100130                            BPL     OUT                     ;READY, GET CHARACTER
011770  017767  167064  177752            MOV     @TKB,TIB                ;AND STRIP OFF
011776  042767  177600  177744            BIC     #177600,TIB             ;THE GARBAGE
012004  022767  000007  177736            CMP     #7,TIB                  ;IS IT A <↑G>
012012  001116                            BNE     OUT
012014  012702  012324                    MOV     #$CNTG,%2
012020  004767  000436                    JSR     PC,TTOUT
012024  012702  012336            CNTLU:  MOV     #$MSWR,%2
012030  004767  000426                    JSR     PC,TTOUT
012034  017702  166752                    MOV     @SR,%2
012040  004767  177246                    JSR     %7,PRTAB
012044  012702  012346                    MOV     #$MNEW,%2
012050  004767  000406                    JSR     PC,TTOUT
012054  005037  011742                    CLR     @#TEMPST
012060  005067  177656            $READ:  CLR     TEMPST
012064  012767  000007  177652            MOV     #7,COUNT
012072  004767  000154            1$:     JSR     PC,TTIN                 ;GO  READ A CHARACTER
012076  042767  177600  177644            BIC     #177600,TIB             ;STRIP OFF GARBAGE
012104  122767  000025  177636            CMPB    #25,TIB                 ;IS IT A ↑U?
012112  001001                            BNE     2$                      ;BRANCH IF NOT
012114  000743                    3$:     BR CNTLU                        ;START OVER
012116  122767  000015  177624    2$:     CMPB    #15,TIB                 ;IS IT A <CR>?
012124  001011                            BNE     4$                      ;BRANCH IF NOT
012126  012702  012332                    MOV     #$CRLF,%2
012132  004767  000324                    JSR     %7,TTOUT
012136  022767  000007  177600            CMP     #7,COUNT                ;WAS IT FIRST CHARACTER
012144  001036                            BNE     7$                      ;CHANGE SWR IF NOT FIRST ONE
012146  000440                    8$:     BR      OUT                     ;GET OUT
012150  122767  000060  177572    4$:     CMPB    #60,TIB
012156  003004                            BGT     5$
012160  122767  000067  177562            CMPB    #67,TIB
012166  002005                            BGE     6$
012170  012702  012357            5$:     MOV     #$QUEST,%2
012174  004767  000262                    JSR     PC,TTOUT
012200  000745                            BR      3$                      ;START OVER IF NOT LEGAL CHARACTER
012202  006367  177534            6$:     ASL     TEMPST
012206  006367  177530                    ASL     TEMPST
012212  006367  177524                    ASL     TEMPST
012216  142767  000060  177524            BICB    #60,TIB                 ;GET NITTY-GRITTY
012224  156767  177520  177510            BISB    TIB,TEMPST
012232  005367  177506                    DEC     COUNT                   ;ONLY WANT 6   DIGITS
```

```
 2282  012236  001754                        BEQ     5$
 2283  012240  000714                        BR      1$
 2284  012242  016777  177474  166542  7$:   MOV     TEMPST,@SR      ;CHANGE SWITCH REGISTER CONTENTS
 2285  012250  000207                OUT:    RTS     %7              ;RETURN TO PROGRAM
 2286                                ;;**************************************************************
 2287                                ;       TTY READ SUBROUTINE**********
 2288                                ;;**************************************************************
 2289
 2290
 2291
 2292  012252  005077  166600        TTIN:   CLR     @TKS
 2293  012256  005077  166576                CLR     @TKB
 2294  012262  005067  177462                CLR     TIB
 2295  012266  005277  166564                INC     @TKS
 2296  012272  105777  166560        TTIN1:  TSTB    @TKS
 2297  012276  100375                        BPL     TTIN1
 2298  012300  017767  166554  177442        MOV     @TKB,TIB
 2299  012306  105777  166550        TTIN2:  TSTB    @TPS
 2300  012312  100375                        BPL     TTIN2
 2301  012314  116777  177430  166542        MOVB    TIB,@TPB
 2302
 2303  012322  000207                        RTS     %7
 2304  012324  057137  020107  000046  $CNTG:  .ASCIZ  '←↑G 3'
 2305  012332  020137  000046  $CRLF:  .ASCIZ  '← 3'
 2306  012336  051537  051127  020075  $MSWR:  .ASCIZ  '←SWR= 3'
 2307  012344  000046
 2308  012346  020040  042516  036527  $MNEW:  .ASCIZ  '  NEW= 3'
 2309  012354  023040      000
 2310  012357     137  020077  023137  $QUEST: .ASCIZ  '←? ←3'
 2311  012364     000
 2312  012365     137  051104  030461  $DR11:  .ASCIZ  '←DR11B OK   3'
 2313  012372  020102  045517  020040
 2314  012400  020040      000
 2315  012403     137  046440  044501  $MAIN:  .ASCIZ  '← MAINDEC-11-DZDRB-D ←3'
 2316  012410  042116  041505  030455
 2317  012416  026461  055104  051104
 2318  012424  026502  020104  023137
 2319  012432     000
 2320  012433     137  042040  030522  $HEAD:  .ASCIZ  '← DR11B LOGIC TEST 3'
 2321  012440  041061  046040  043517
 2322  012446  041511  052040  051505
 2323  012454  020124  000046
 2324                                        .EVEN
 2325
 2326  012460  000000                OFL:    0                               ;FIRST CHAR FLAG
 2327
 2328
 2329                                ;;**************************************************************
 2330                                ;       TTY ASCII OUTPUT ROUTINE
 2331                                ;;**************************************************************
 2332
 2333
 2334  012462  105712                TTOUT:  TSTB    (2)             ;CHECK FOR NULL CHARACTER
 2335  012464  001403                        BEQ     1$              ;IF NOT, TYPE THE CHARACTER
 2336  012466  122712  000046               CMPB    #'&,(2)         ;CHECK FOR TERMINATOR
 2337  012472  001005                        BNE     .EMPTY
```

```
  2338  012474  042777  000100  166360  1$:     BIC     #100,@TPS
  2339  012502  005002                  CLR     %2              ;CLEAR POINTER TO CHARACTER
  2340  012504  000207                  RTS     %7              ;RETURN
  2341  012506  122712  000137          .EMPTY: CMPB    #'_,(2)         ;CRLF CHAR?
  2342  012512  001411                  BEQ     .RET
  2343  012514  122712  000041                  CMPB    #'!,(2)         ;CHECK FOR RETURN TERMINATOR
  2344  012520  001414                  BEQ     .REST
  2345  012522  105777  166334          1$:     TSTB    @TPS
  2346  012526  100375                  BPL     1$
  2347  012530  112277  166330                  MOVB    (2)+,@TPB       ;TYPE CHARACTER
  2348  012534  000752                  BR      TTOUT
  2349  012536  005202                  .RET:   INC     %2
  2350  012540  010267  000020                  MOV     %2,.SAV         ;SET UP NEW POINTER
  2351  012544  012702  012560                  MOV     #.RETR,%2
  2352  012550  000767                  BR      .RET-6
  2353  012552  016702  000006          .REST:  MOV     .SAV,%2
  2354  012556  000741                  BR      TTOUT
  2355
  2356  012560     015     012     041  .RETR:  .BYTE   15,12,'!
        012564                          .EVEN
  2358  012564  000000                  .SAV:   0
        013566                          .=.+1000
  2360  013566  000000                  BUFF:   0               ;FOR STACK POINTER 100 LOCATIONS
  2361  013570  013570                  XINBUF: .
        014572                          .=.+1000
  2363  014572  014572                  XCHKBU: .
  2364          000001                  .END
```

```
ASCNT   011600          2138*   2162*   2169*   2173*   2184#
ATTN  = 020000          1641#
BACKGD  007356          1665    1686#   1705    1713
BACOK1  004706          1208    1214#
BACFOK  004556          1182    1188#
BEGIN   001156           551     553#    554    1590    1604    2224
BELL    007032          1492    1572#
BINCT   011576          2134*   2154*   2157*   2158    2161*   2183#
BIT0  = 000001           465#    1303    1379    1406    1484
BIT1  = 000002           466#     639     640     643     644     753     778     967
BIT10 = 002000           475#     976
BIT11 = 004000           476#     984
BIT12 = 010000           477#     738     739     742     743     774     800
BIT13 = 020000           478#     997
BIT14 = 040000           479#    1000    1002    1003    1168    1195    1221
BIT15 = 100000           480#
BIT2  = 000004           467#     656     657     660     661     756     781     975
BIT3  = 000010           468#     673     674     677     678     759     784     983
BIT4  = 000020           469#     686     687     690     691     703     704     762     787
BIT5  = 000040           470#     699     700     765     790
BIT6  = 000100           471#     712     713     716     717     768     794     893     895     912     914     932     934
                         951     1513    1560
BIT7  = 000200           472#     885     889     904     908     924     928     943     947    1291
BIT8  = 000400           473#     725     726     729     730     771     797
BIT9  = 001000           474#     968
BLUSH   010646          1878    1992#
BRANCH  006440          1485    1489#
BRWAIT  001050           530#    1378*   1379    1405*   1406    1483*   1484
BSETUP  010654          1977    1996#   2008    2051
BUFCHK  010726          1833    2027#
BUFCK1  010760          2036    2040#   2044
BUFCK2  010766          2041    2043#
BUFF    013566           496    1657    1673    2360#
BUFLEN  001044           528#    1076*   1078*   1079    1097*   1099*   1100    1116*   1118    1135*   1137*   1138    1367*
                        1369    1393*   1395*   1396    1418*   1424*   1444*   1452*   1453    1471*   1472    1497    1508
                        1523    1524    1540    1554
BUFOUT  010720          1980    2011    2014    2017#
BUFPUT  010634          1978    1982#   2010    2013
BUSERR= 000004           482#    563*    574*
CHKA    006524          1505#   1511
CHKBFF  006512          1421    1456    1475    1502#
CHKBUF  001042           527#   1502    1533
CHKSM1  011000          2052#   2053
CHKSM2  011020          2055    2057    2059#
CHKSUM  010774          2029    2051#
CKSWR   011752           585     601     817     887     906     926     945    1228    1241    1289    1582    2092    2123
                        2195    2209    2212    2238#
CNTLU   012024           552    2248#   2261
COMPAR  006666          1536#   1541
COMPRR  006750          1550#   1555
COUNT   011744          2234#   2256*   2266    2281*
CYCLE = 000400          1636#   1874    1880    1919    1939
DATCHK  006652          1446    1465    1490    1533#
DATINB  005634          1380    1384#
DATOCK  006734          1110    1148    1412    1547#
DATONB  005774          1407    1411#
```

```
DECML   011572  2140* 2153  2159* 2181#
DIOMEM  001036   525# 1155  1337
DONE    005342  1325  1330#
DRBA    001020   518#  567*  600*  603   626*  627   842*  843   846*  847   870*  871   874*
                1006* 1011* 1027  1043* 1059  1082* 1103* 1121* 1141* 1155* 1181* 1202* 1207*
                1303  1315* 1337* 1348* 1372* 1399* 1419* 1458* 1477* 1526  1869* 1948*
DRDB    001024   520#  571* 1012* 1030  1045* 1083* 1089  1104* 1122* 1128  1142* 1240* 1243
                1252* 1253  1261* 1262  1265* 1266  1276* 1277  1280* 1373* 1385  1400* 1459*
                1478* 1863  1954
DRINL   001030   522# 1047  1085  1106  1124  1144  1157  1183  1209  1375  1402  1427  1461
                1480  1744  1746  1748
DRINS   007600  1743  1761#
DRINV   001032   523#  892*  911*  931*  950*  956*  1014* 1046* 1084* 1105* 1123* 1143* 1156*
                1182* 1208* 1338* 1347* 1374* 1401* 1426* 1460* 1479* 1543* 1742
DRIN0   007612  1762  1765#
DRIN1   007634  1768  1771#
DRIN2   007656  1774  1777#
DRIN3   007644  1766  1773#
DRST    001022   519#  569*  639*  640   643*  644   656*  657   660*  661   673*  674   677*
                 678   686*  687   690*  691   699*  700   703*  704   712*  713   716*  717
                 725*  726   729*  730   738*  739   742*  743   751*  753   756   759   762
                 765   768   771   774   777*  778   781   784   787   790   794   797   800
                 810*  812   819   885   889   893*  895*  904   908   912*  914*  924   928
                 932*  934*  943   947   951*  954*  963*  964   967*  968   971   974*  975*
                 976   979   982*  983*  984   987   990*  995   997  1000  1002* 1003  1007
                1017* 1036* 1049* 1069* 1087* 1108* 1126* 1146* 1159* 1162  1165  1168  1185*
                1189  1192  1195* 1196  1199  1203  1211* 1215  1218  1221* 1222  1225  1230
                1291  1294  1316  1319* 1320  1324  1341* 1344  1349* 1351* 1356  1377* 1404*
                1422* 1430* 1433  1463* 1482* 1513* 1514  1517  1560* 1561  1564  1663* 1679*
                1765  1773  1834* 1835* 1855  1860  1871* 1872  1874  1879* 1880* 1881* 1909
                1913  1917* 1919* 1920  1927  1931  1935* 1937  1939* 1940* 1951  2118
DRVS    001026   521# 1015* 1047* 1085* 1106* 1124* 1144* 1157* 1183* 1209* 1339* 1375* 1402*
                1427* 1461* 1480* 1543  1544*
DRWC    001016   517#  565*  584*  587   615*  616   829*  830   833*  834   857*  858   861*
                1010* 1024  1042* 1056  1081* 1102* 1120* 1140* 1154* 1180* 1314* 1336* 1350*
                1371* 1398* 1429* 1457* 1476* 1520  1870* 1949*
DSTATA= 001000  1637#
DSTATB= 002000  1638# 1872  1937
DSTATC= 004000  1639# 1765  1855  1862  1953
ERRA    001234   563   573#
ERRCHK  007002  1023  1055  1560#
ERRDO   005416  1338  1344#
ERRDO1  005474  1347  1356#
ERROR = 100000  1643#
FLUSH   010616  1819  1976#  1993
FLUSH1  010624  1978# 1979
FNCCNT  001066   537# 1423*  1436  1439*  1440
FNCT1 = 000002  1629#
FNCT2 = 000004  1630# 1879  1935
FNCT3 = 000010  1631# 1861  1952
GETBUF  011022  2052  2061#
GO    = 000001  1628# 1881  1920  1940
HDFHM   011556  2174  2176#
HLT   = 104000   464#  573   589   605   618   629   642   646   659   663   676   680   689
                 693   702   706   715   719   728   732   741   745   755   758   761   764
                 767   770   773   776   780   783   786   789   792   796   799   802   816
```

```
                    822     832     836     845     849     860     873     891     897     910     916     930     936
                    949     953     966     970     973     978     981     986     989     999    1005    1009    1021
                   1026    1029    1032    1053    1058    1061    1065    1091    1130    1161    1164    1167    1170
                   1187    1191    1194    1198    1201    1205    1213    1217    1220    1224    1227    1232    1245
                   1255    1264    1268    1279    1293    1296    1305    1318    1322    1329    1343    1346    1355
                   1358    1387    1438    1516    1519    1522    1528    1539    1553    1558    1563    1566    1694
                   1698    1702    1763    1769    1775    1779    1857    1911    1915    1929    1933    1961    2037
                   2042    2059
HNDSHK  010330     1865    1890#   1902
HNDSH1  010336     1893#   1894
HNDSH2  010356     1898    1900#   1901
ICCUNT  011730      583*    614*    809*    828*    855*    883*   1179*   1239*   1251*   1274*   1302*   1313*   2215
                   2222#
IE    = 000100     1634#   1663    1679    1834    1835    1881    1920    1940
INBUF   001040      526#   1082    1103    1121    1141    1315    1372    1399    1419    1425    1442*   1445*   1458
                   1477    1493    1525    1534    1548    1868
INBUF1  001070      538#   1425*   1445
INCBA   002534      871#    876
INCDB   005144     1277#   1282
INCWC   002504      858#    863
INTA    006556     1084    1105    1123    1143    1374    1401    1426    1460    1479    1513#
INTB    003464     1014    1023#
INTC    003636     1046    1055#
JBCNT   007222     1651#   1656*   1800    1805*   1838*
JBFLAG  007220     1650#   1659*   1675*   1704    1709    1710*   1761    1771*   1781*
JOBAD   007700     1660    1799#   1836
JOBADA  007760     1801    1806#
JOBADB  007740     1802*   1803
JOBA1   010012     1809    1818#
JOBA2   010050     1822    1831#
LDEXIT  006510     1498    1501#
LENCHK  001046      529#   1494*   1496*   1497    1499    1503*   1507*   1508    1535*   1536*   1540    1549*   1550*
                   1554
LIST    011602     2136    2185#
LISTA   011034     1789    1807    1831    2067#
LISTA1  011046     1790    1818    1820    1832    2073#
LISTB   011060     1864    1866    1877    2079#
LOADA   006466     1496#   1500
LODBUF  006454     1077    1098    1117    1136    1368    1394    1420    1455    1474    1493#
MAINT = 010000     1640#
MFCHK   006164     1441    1444#
MFLOOP  006056     1426#   1443
MINUS   011400     2144    2147#
MKNUM   011430     2153#   2156
MOADD   011512     2165#   2167
MREC    010440     1821    1927#
MREC1   010452     1928    1931#
MREC2   010464     1932    1935#
MREC3   010476     1937#   1938
MSTART  001000      512#
MSX     001006      512     514#
MS1     007224      514    1655#
MXMIT   010364     1808    1909#
MXMIT1  010376     1910    1913#
MXMIT2  010410     1914    1917#
NEX   = 040000     1642#
```

```
NEXCHK  004436  1156  1162#
NEXJOB  007214  1648* 1660* 1661* 1676* 1677* 1707* 1708* 1767  1771  1777  1781  1809* 1810*
                1822* 1823* 1836* 1837* 1947* 1848* 1882* 1883*
NOP   = 000240   462#
NORMAL  006712  1033  1066  1172  1233  1361  1530  1543#
NRRDY   003372   996  1010#
NPR1    001034   524# 1011  1013* 1027  1043  1044* 1059  1063
NWRDXF  007212  1647# 1897  1967
N1413   003356  1001  1006#
OFL     012460  2326#
OUT     012250  2239  2241  2245  2268  2285#
PC    =%000007   552* 1625# 2247* 2249* 2253* 2257* 2274*
PRINT   011072   488  1745  2092#
PRMXFR  010524  1918  1936  1948#
PRMXF1  010556  1955# 1968
PRMXF2  010562  1957# 1959
PRMXF3  010576  1960  1963#
PRMXF4  010600  1964# 1965
PRTAB   011312  2109  2114  2119  2134# 2251
PSW     001014   497*  516#  553*  884*  903*  923*  942* 1016* 1048* 1086* 1107* 1125* 1145*
                1158* 1184* 1210* 1340* 1376* 1403* 1428* 1462* 1481* 1545* 1589* 1600* 1603*
                1662* 1664* 1678* 1680* 2201*
P4INT   003116   950  954#
P4INV   003076   944  950#
P5ERR   003034   931  936#
P5INV   003006   925  931#
P6ERR   002744   911  916#
P6INV   002716   905  911#
P7ERR   002654   892  897#
P7INV   002626   886  892#
RDSW    011746  2235#
RDYCHK  001054   532# 1323* 1326*
READY = 000200  1635#
RESALL  007502  1712  1730#
RETURN  011734   554* 2198* 2202  2220* 2224#
R0    =%000000  1617# 1686* 1692  1723  1731* 1742* 1743* 1744* 1749* 1789* 1791  1792  1797*
                1798  1807* 1818* 1820* 1831* 1864* 1866* 1867* 1868* 1869  1870  1877* 1991*
                1948  1949  1955  1959  1996  1997  1998  2017* 2018* 2027  2030* 2031  2032
                2033* 2034  2035  2054  2056
R1    =%000001  1618# 1687* 1696  1722  1732* 1750* 1790* 1791* 1793* 1796* 1832* 1859* 1996*
                1897  1950* 1966* 1967  1982* 1996* 2028  2031* 2040  2061
R2    =%000002  1619# 1688* 1700  1721  1733* 1751* 1792* 1793  1794* 1795* 1796  1860* 1892*
                1893  1895* 1900  1951* 1956* 1957  1963* 1964  1985* 1997* 2032* 2035  2043*
                2064*
R3    =%000003  1620# 1689* 1700  1720  1734* 1752* 1861* 1892  1895  1952* 1956  1963  1983*
                1999* 2017  2034* 2040  2054  2062*
R4    =%000004  1621# 1690* 1696  1719  1735* 1753* 1862* 1893  1900  1953* 1957  1964  1984*
                2000* 2018  2056  2063*
R5    =%000005  1622# 1691* 1692  1706* 1712* 1724  1736* 1754* 1863* 1890* 1891  1954* 1955*
                1959  1976* 1982  1983  1992* 2009* 2012* 2015* 2061* 2062
R6    =%000006  1623# 1657* 1673* 1719* 1720* 1721* 1722* 1723* 1730  1731  1732  1733  1734
                1735  2027* 2028* 2030  2033
R7    =%000007  1624# 1658* 1674* 1755* 1806* 1808* 1819* 1821* 1833* 1865* 1878* 1899* 1918*
                1921* 1936* 1941* 1969* 1977* 1978* 1986* 2001* 2008* 2010* 2013* 2019* 2029*
                2045* 2051* 2052* 2058* 2065*
SAVALL  007466  1706  1719#
```

DZDRB.P11 CROSS REFERENCE TABLE -- USER SYMBOLS

```
SAVCC   011310          2097*   2113    2132#
SAVPC   011306          2096*   2108    2131#
SAVR2   011300          2105*   2120    2128#
SAVR3   011302          2106*   2121    2129#
SAVR4   011304          2107*   2122    2130#
SCOPE = 104400           463#    562     575     590     599     613     625     638     655     672     685     698     711
                         724     737     750     808     827     841     854     868     882     902     922     941     962
                         994    1041    1075    1096    1115    1134    1153    1178    1238    1250    1260    1273    1288
                        1301    1312    1335    1366    1392    1417    1451    1470    1491
SCOPEA  011614          2195#
SCOPEB  011636          2197    2200#   2211    2218
SCOPEC  011650           491    2209#
SCOPEF  011732          2215    2217*   2219*   2223#
SCOPEG  011716          2214    2216    2219#
SETBF1  010676          2010#   2016
SETBUF  010670          1806    2008#
SETVEC  007520          1658    1674    1742#
SEVEN   011570          2139*   2148    2159    2165*   2180#
SJOB1   010122          1676    1847#   1882
SJOB2   010140          1677    1848    1855#   1883
SJOB2A  010154          1856    1859#
SJOB2B  010246          1874#   1875
SJOB2C  010260          1873    1877#
SJOB2D  010304          1876    1891#
SP     =%000006          540*    541*    546     548     549    1626#
SR      001012           515#    543     547*    550    1583    2093    2124    2196    2210    2213    2238    2250    2284*
SSTART  001002           513#
SS1     007304           513    1672#
START   011406          2146    2148#   2168
SUSWR   001072           503     540#
SWREG   000176           494#    547     550    2238
TEMPST  011742          2233#   2254*   2255*   2276*   2277*   2278*   2280*   2284
TIB     011750          2236#   2242*   2243*   2244    2258*   2259    2262    2269    2271    2279*   2280    2294*   2298*
                        2301
TKB     001060           534#   2242    2293*   2298
TKS     001056           533#   1342*   2240    2292*   2295*   2296
TNPRO   003542          1035    1041#   1070
TNPR1   003306           995#   1037
TOODLE  011566          2149*   2150*   2151    2179#
TPB     001064           536#   2099*   2102*   2110*   2115*   2145*   2147*   2172*   2301*   2347*
TPS     001062           535#   2100    2103    2111    2116    2137*   2141    2170    2176    2299    2338*   2345
TRPA    007122          1586    1590#
TRPB    007126          1591#   1601*
TRTRAP  007056          1582#
TSTRDY  005320          1324#   1328
TTIN    012252          2257    2292#
TTIN1   012272          2296#   2297
TTIN2   012306          2299#   2300
TTOUT   012462           500     502    1576    2247    2249    2253    2265    2274    2334#   2348    2354
T33CLR  003534          1022    1036#
T34CLR  003706          1054    1069#
T35     003714          1068    1075#
WAIT1   011356          2141#   2142
WAIT2   011534          2170#   2171    2175
WCLEN   001052           531#   1079*   1080*   1081    1100*   1101*   1102    1118*   1119*   1120    1138*   1139*   1140
                        1369*   1370*   1371    1396*   1397*   1398    1453*   1454*   1457    1472*   1473*   1476
```

```
WGTCT   011574          2135*   2153*   2155    2160*   2182#
WRTOC   011450          2152    2157#
XBA16 = 000020          1632#
XBA17 = 000040          1633#
XCHKBU  014572           527    2363#
XINBUF  013570           526    2067    2079    2361#
XLIST   011526          2163    2169#
YESRT   007206          1598    1608#
YESTR   007130          1584    1596#
YESTR1  007202          1585    1587    1596*   1606#
YESTR2  007204          1588    1597*   1607#
$CNTG   012324          2246    2304#
$CRLF   012332          2264    2305#
$DR11   012365          1575    2312#
$HD   = 000003           453     454
$HEAD   012433           499    2320#
$MAIN   012403           501    2315#
$MNEW   012346          2252    2308#
$MSWR   012336          2248    2306#
$QUEST  012357          2273    2310#
$READ   012060          2255#
$SWR  = 160000           453     454#
$TN   = 000001           453#
.     = 014574           486#    487#    490#    493#    495#    504#    572     588     604     617     628     641     645
                         658     662     675     679     688     692     701     705     714     718     727     731     740
                         744     754     757     760     763     766     769     772     775     779     782     785     788
                         791     795     798     801     815     821     831     835     844     848     859     872     890
                         896     909     915     929     935     948     965     969     972     977     980     985     988
                         998    1004    1008    1025    1028    1031    1057    1060    1064    1088    1090    1109    1127
                        1129    1147    1163    1166    1169    1190    1193    1197    1200    1204    1216    1219    1223
                        1226    1231    1244    1254    1263    1267    1278    1292    1295    1304    1317    1321    1327
                        1345    1357    1383    1384    1386    1410    1411    1437    1464    1488    1489    1509    1515
                        1518    1521    1527    1538    1552    1557    1562    1565    1574    1602    1693    1697    1701
                        1778    2094    2101    2104    2112    2117    2125    2177    2357#   2359#   2361    2362#   2363
.EMPTY  012506          2337    2341#
.REST   012552          2344    2353#
.RET    012536          2342    2349#   2352
.RETR   012560          2351    2356#
.SAV    012564          2350*   2353    2358#
```

```
COMMEN          1#
ENDCOM          1#
ESCAPE          1#
GETPRI          1#
GETSWR          1#
MULT            1#
NEWTST          1#
POP             1#
PUSH            1#
REPORT          1#
SETPRI          1#
SETUP           1#
SKIP            1#
SLASH           1#
STARS           1#  440#   441   455   459   507   509   557   559   578   580   594   596   608   610
                620   622   633   635   650   652   667   669   682   684   695   697   708   710   721
                723   734   736   747   749   804   807   824   826   838   840   851   853   865   867
                879   881   899   901   919   921   938   940   959   961   991   993  1038  1040  1072
               1074  1093  1095  1112  1114  1131  1133  1150  1152  1174  1177  1235  1237  1247  1249
               1257  1259  1270  1272  1284  1287  1298  1300  1309  1311  1331  1334  1363  1365  1389
               1391  1414  1416  1448  1450  1467  1469  1569  1571  1577  1579  1593  1595  1612  1614
               1652  1654  1668  1670  1682  1684  1715  1717  1726  1728  1738  1740  1756  1759  1784
               1788  1813  1816  1826  1829  1841  1845  1851  1853  1886  1888  1904  1907  1923  1926
               1943  1946  1971  1974  1988  1991  2003  2006  2021  2025  2047  2050  2086  2089  2190
               2192  2204  2206  2229  2232  2286  2288  2329  2331
SWRSU           1#
TYPBIN          1#
TYPDEC          1#
TYPNAM          1#
TYPNUM          1#
TYPOCS          1#
TYPOCT          1#
TYPTXT          1#
$$ESCA          1#
$$NEWT          1#
$$SKIP          1#
.EQUAT          1#
.HEADE          1#  440#   443
.KT11           1#
.SETUP          1#
.SWRHI          1#
.$ACTI          1#
.$APTB          1#
.$APTH          1#
.$APTY          1#
.$ASTA          1#
.$CATC          1#
.$CMTA          1#
.$DB2D          1#
.$DB2O          1#
.$DIV           1#
.$EOP           1#
.$ERRO          1#
.$ERRT          1#
.$MULT          1#
.$POWE          1#
```

```
.$RAND      1#
.$RDDE      1#
.$RDOC      1#
.$READ      1#
.$RZAZ      1#
.$SAVE      1#
.$SB2D      1#
.$SB2O      1#
.$SCOP      1#
.$SUTM      1#
.$SUPK      1#
.$TRAP      1#
.$TYPB      1#
.$TYPD      1#
.$TYPE      1#
.$TYPO      1#
.$40CA      1#
.1170       1#
```

```
ADC     1984  2063
ADD      874   875  1326  1360  1442  1507  1510  1524  1525  1529  1796  1868  1982  2062  2153
        2157  2159  2165
ASL     1795  2276  2277  2278
ASR     1078  1099  1435
BEQ      544   588   604   617   628   645   662   679   692   705   718   731   744   779   792
         785   788   791   795   798   801   815   821   831   835   844   848   859   872   965
         972   980   988   998  1001  1004  1008  1025  1028  1031  1057  1060  1064  1090  1129
        1197  1223  1244  1254  1263  1267  1278  1295  1304  1380  1386  1407  1437  1441  1485
        1498  1521  1527  1538  1552  1584  1586  1693  1697  1701  1705  1762  1766  1873  1875
        1901  1958  1960  2041  2094  2152  2163  2174  2216  2282  2335  2342  2344
BGE     2011  2014  2272
BGT     1801  2270
BIC      643   660   677   690   703   716   729   742   777   820   895   914   934  1002  1195
        1221  1349  1434  1513  1560  1589  1834  1880  1895  1919  1939  1963  2151  2243  2258
        2338
BICB    2137  2279
BIS      639   656   673   686   699   712   725   738   751   810   813   893   912   932   951
         967   975   983  1430  1603  1879  1881  1952  1920  1940  1956
BISB    2280
BIT      640   644   657   661   674   678   687   691   700   704   713   717   726   730   739
         743   753   756   759   762   765   768   771   774   778   781   784   787   790   794
         797   800   885   889   904   908   924   928   943   947   964   968   971   976   979
         984   987   997  1000  1003  1168  1196  1222  1291  1294  1303  1379  1406  1484  1583
        1765  1855  1872  1874  1893  1900  1937  1957  1964  2093  2196  2210  2213
BLE     2036
BLT     1898  1968  1979  2044  2053
BMI     1190  1193  1200  1216  1219  1226  1317  1325  1327  1345  1357  1518  1565  1602  1774
        1914  1932  2144
BNE      551   641   658   675   688   701   714   727   740   754   757   760   763   766   769
         772   775   863   876   886   890   905   909   925   929   944   948   969   977   985
        1020  1052  1163  1166  1169  1282  1292  1354  1541  1555  1557  1768  1778  1856  1894
        1938  1965  2055  2057  2156  2167  2197  2211  2214  2239  2245  2260  2263  2267  2337
BPL      996  1204  1231  1321  1509  1515  1562  1574  1803  1910  1928  2101  2104  2112  2117
        2125  2142  2171  2177  2241  2297  2300  2346
BR       512   545   572   896   915   935  1022  1035  1037  1054  1068  1070  1088  1109  1127
        1147  1328  1383  1384  1410  1411  1443  1464  1488  1489  1500  1511  1665  1713  1876
        1902  1980  1993  2016  2146  2168  2175  2218  2261  2268  2275  2283  2348  2352  2354
CLR      497   498   569   855   856   857   869   870   954   963   974   982   990  1006  1012
        1016  1018  1036  1044  1048  1050  1069  1086  1107  1125  1145  1158  1184  1202  1210
        1274  1275  1276  1323  1340  1348  1352  1376  1403  1422  1428  1462  1481  1494  1495
        1503  1504  1535  1544  1549  1599  1600  1656  1659  1664  1675  1680  1707  1708  1710
        1747  1749  1750  1751  1752  1753  1754  1797  1805  1859  1871  1950  1976  1999  2000
        2009  2134  2135  2160  2161  2219  2254  2255  2292  2293  2294  2339
CMP      543   546   550   616   627   830   834   843   847   858   971   955  1027  1030  1034
        1059  1063  1067  1089  1128  1171  1188  1214  1253  1262  1266  1277  1395  1440  1497
        1508  1526  1537  1540  1551  1554  1556  1692  1696  1700  1798  1800  1897  1959  1967
        2035  2040  2054  2056  2098  2155  2200  2215  2238  2244  2266
CMPB    1436  2256  2262  2269  2271  2336  2341  2343
COM     1601  2012  2150
DEC     1137  1395  2162  2166  2173  2281
EMT      464
HALT     487   528   529   530   531   532   537   538  1609  1695  1699  1703  1764  1770  1776
        1780  1858  1912  1916  1930  1934  1962  2038  2126
INC      565   567   571   814   861   862  1019  1051  1160  1186  1212  1280  1281  1342  1351
        1353  1378  1405  1439  1483  1496  1536  1550  1686  1687  1688  1689  1690  1691  1838
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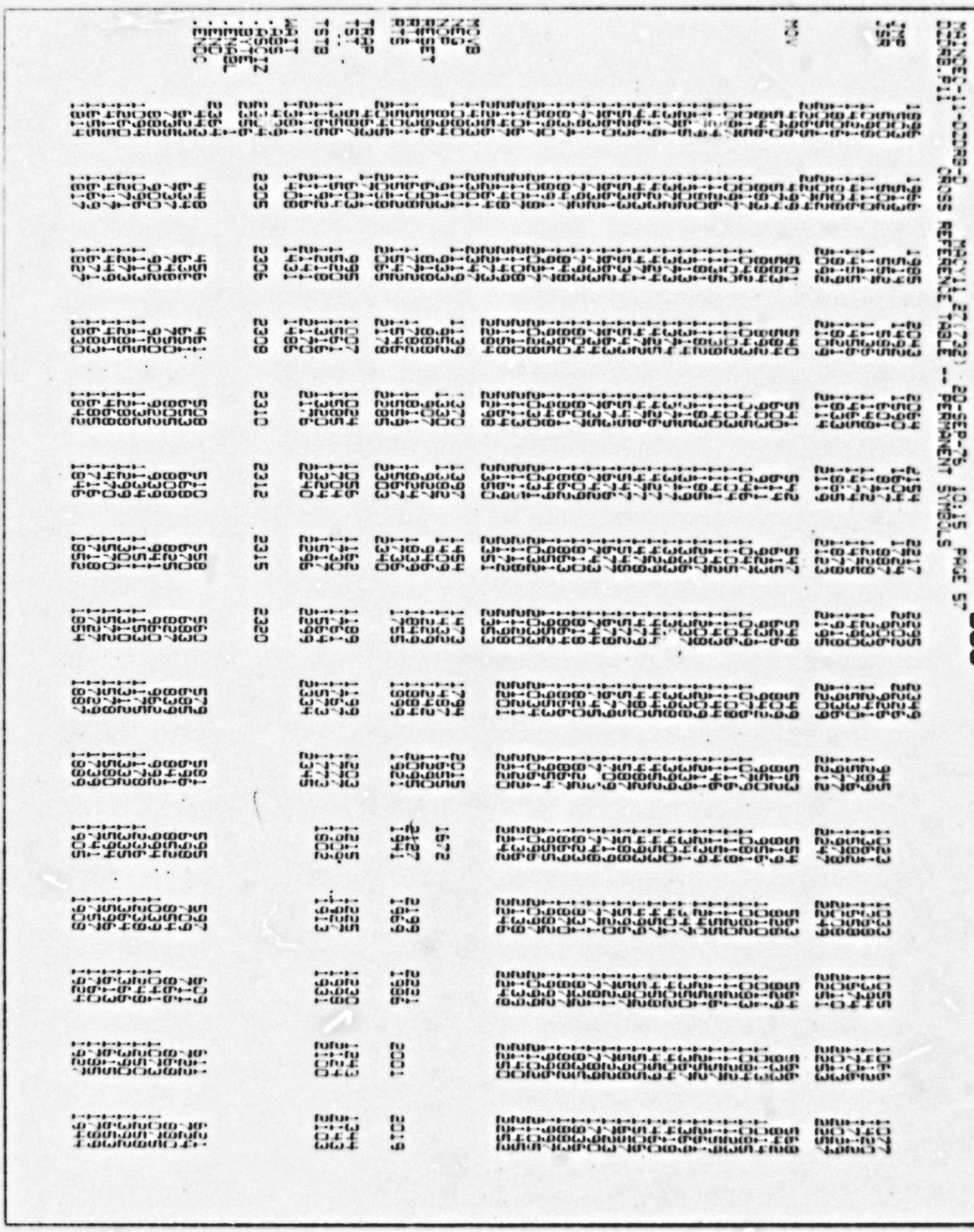

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          1947   1972   1975   1989   1992   2004   2007   2022   2026   2049   2051   2087   2090   2191   2193
          2205   2207   2230   2233   2287   2289   2330   2332
.EVEN     2225   2324   2357
.IF        441    444    455    459    507    509    557    559    578    580    594    596    608    610    620
           622    633    635    650    652    667    669    682    684    695    697    708    710    721    723
           734    736    747    749    804    807    824    826    838    840    851    853    865    867    879
           881    899    901    919    921    938    940    959    961    991    993   1038   1040   1072   1074
          1093   1095   1112   1114   1131   1133   1150   1152   1174   1177   1235   1237   1247   1249   1257
          1259   1270   1272   1284   1287   1298   1300   1309   1311   1331   1334   1363   1365   1389   1391
          1414   1416   1448   1450   1467   1469   1569   1571   1577   1579   1593   1595   1612   1614   1652
          1654   1668   1670   1682   1684   1715   1717   1726   1728   1738   1740   1756   1759   1784   1788
          1813   1816   1826   1829   1841   1845   1851   1853   1886   1889   1904   1907   1923   1926   1943
          1946   1971   1974   1988   1991   2003   2006   2021   2025   2047   2050   2086   2089   2190   2192
          2204   2206   2229   2232   2286   2288   2329   2331
.IFF       441    456    459    508    510    558    560    579    581    595    597    609    611    621    623
           634    636    651    653    668    670    633    695    696    698    709    711    722    724    735
           737    748    750    805    808    825    827    839    841    852    854    866    868    880    882
           900    902    920    922    939    941    960    962    992    994   1039   1041   1073   1075   1094
          1096   1113   1115   1132   1134   1151   1153   1175   1178   1236   1238   1248   1250   1258   1260
          1271   1273   1285   1288   1299   1301   1310   1312   1332   1335   1364   1366   1390   1392   1415
          1417   1449   1451   1468   1470   1570   1572   1578   1580   1594   1596   1613   1615   1653   1655
          1669   1671   1683   1685   1716   1718   1727   1729   1739   1741   1757   1760   1785   1789   1814
          1817   1827   1830   1842   1846   1852   1854   1887   1889   1905   1908   1924   1927   1944   1947
          1972   1975   1989   1992   2004   2007   2022   2026   2048   2051   2087   2090   2191   2193   2205
          2207   2230   2233   2287   2289   2330   2332
.IIF       443    448    453    454
.LIST        1    441    442    443    459    460    461    487
.MACRO       1
.MCALL     440
.NLIST       1    441    442    443    459    460    461    487
.REM         1
.REPT      441    459    487
.TITLE     443
.WORD     2233   2234   2235   2236


 ERRORS DETECTED:  0
 DEFAULT GLOBALS GENERATED:  0

 *,DZDRB.SEQ/SOL/CRF/PAGNUM←LIB:SYSMAC.SML,DSK:DZDRB
 RUN-TIME: 30 37 4 SECONDS
 RUN-TIME RATIO: 171/71=2.3
 CORE USED:  33K  (65 PAGES)
```

Spooler runtime 9 Seconds, 41 KCS, 246 disk reads, 3 disk writes, 54 pages

[redacted]