

TR79-F

DRS TR79 TAPE DIAG  
CZTRACO

AH-9428C-MC  
FICHE 1 OF 1

APR 1982  
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A large grid of data tables, likely representing diagnostic test results for various components. Each table contains columns of numerical values and text labels, organized in a structured layout. The data is presented in a grid format, with multiple rows and columns of information. The text within the tables is small and difficult to read, but the overall structure is consistent across the page.



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.TITLE CZTRACO TR79F XXDP+ DRS COMPATIBLE MAG TAPE DIAGNOSTIC  
.SBTTL PROGRAM DOCUMENT  
.REM ^

I D E N T I F I C A T I O N  
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PRODUCT CODE: AC-9426C-MC  
PRODUCT NAME: CZTRACO TR79F TAPE DIAG  
PRODUCT DATE: FEBRUARY 1982  
MAINTAINER: DIAGNOSTIC ENGINEERING

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## 1.0 INTRODUCTION

THIS IS AN XXDP+ DRS COMPATIBLE DIAGNOSTIC TEST PROGRAM FOR THE TR79F MAGNETIC TAPE TRANSPORT AND CONTROL UNIT. IT IS DESIGNED FOR USE ON A PDP-11/70 WITH XXDP+ V1.1. THE TESTS IN THIS PROGRAM ARE MODIFIED VERSIONS OF THE TESTS IN THE DIAGNOSTIC PROGRAM CZTRAB. IN THIS PROGRAM TEST1 IS A NULL TEST WITH NO FUNCTION. TESTS 2,3,4 AND 5 ARE BASED ON TESTS 2,3,4 AND 5 IN CZTRAB. TEST6, THE TEST OF OPERATOR INTERVENTION FUNCTIONS, IS BASED ON TEST1 IN CZTRAB.

## 2.0 HARDWARE REQUIREMENTS

THE FOLLOWING HARDWARE IS REQUIRED TO RUN THE TR79F MAG TAPE DIAGNOSTIC.

PDP-11/70  
16K MEMORY  
CONSOLE TERMINAL  
TR79F MAGNETIC TAPE TRANSPORT AND CONTROL UNIT

## 3.0 OPERATING INSTRUCTIONS

THIS PROGRAM MAY BE LOADED UNDER XXDP+ FROM ANY XXDP+ MEDIA. IT IS DESIGNED TO RUN WITH XXDP+ DRS (DIAGNOSTIC RUN TIME SERVICES), USING XXDP+ V1.1.

TO EXECUTE THIS DIAGNOSTIC STANDALONE UNDER XXDP+ V1.1 PROCEED AS FOLLOWS.

- A. LOAD AND START THE DIAGNOSTIC USING THE RUN COMMAND.
- B. WAIT FOR THE RUN TIME SERVICES PROMPT DR>
- C. TYPE IN START<CR>
- D. ANSWER HARDWARE AND SOFTWARE QUESTIONS.
- E. RESPOND TO REQUESTS TO PERFORM TR79F MANUAL OPERATIONS.
- F. END OF PASS AND ERROR REPORTS WILL PRINT ON THE SYSTEM CONSOLE.
- G. TO END PROGRAM EXECUTION TYPE IN CTRL/C.



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## 4.0 DEVICE INFORMATION TABLES

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://////////////////////////
COMMAND REGISTER BIT DEFINITIONS
://////////////////////////

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```

GOBIT   = BIT0      :GOBIT = 1 INITIATE TAPE OPERATION
FNB00   = BIT1      :FNB03-FBN00 VALUE SPECIFIES TAPE FUNCTION
FNB01   = BIT2      :
FNB02   = BIT3      :
FNB03   = BIT4      :
BUSY    = BIT5      :TR79F OPERATION IN PROGRESS
INTENB  = BIT6      :INTENB = 1 TR79 INTERRUPT ENABLE ASSERTED
CURDY   = BIT7      :CURDY = 1 TR79F CONTROL UNIT READY
SBIT8   = BIT8      :SBIT8-9 VALUE SPECIFIES UNIT
SBIT9   = BIT9      :
MTRDY   = BIT10     :MTRDY = 1 TR79F TRANSPORT READY
PWRCLR  = BIT11     :PWRCLR = 1 INITIATE TR79F POWER CLEAR OPERATION
XBA16   = BIT12     :EXTENDED UNIBUS ADDRESS BIT 16
XBA17   = BIT13     :EXTENDED UNIBUS ADDRESS BIT 17
ILCMD   = BIT14     :ILLEGAL TR79F COMMAND ATTEMPTED ERROR INDICATOR
ERRBIT  = BIT15     :TR79F ERROR CONDITION DETECTED INDICATOR

```

```

://////////////////////////
:TR79 STATUS REGISTER BIT DEFINITIONS
://////////////////////////

```

```

INHBT   = BIT0      :INHBT = 1 TR79F OPERATION INHIBITED
RWDS    = BIT1      :RWDS = 1 REWIND IN PROGRESS
FPTS    = BIT2      :FPTS = 1 WRITE ENABLE RING NOT INSTALLED
EOFF    = BIT3      :EOFF = 1 TAPE MARK DETECTED ON READ OR WRITE
IDBF    = BIT4      :IDBF = 1 IDENTIFICATION BURST DETECTED ON READ OR WRITE
LDPTS   = BIT5      :LDPTS = 1 TAPE AT LOAD POINT
NXMF    = BIT6      :NXMF = 1 TR79F BUS ADDRESS REGISTER REFERENCES NON-EXISTENT MEM
EOTS    = BIT7      :EOTS = 1 END OF TAPE REFLECTOR DETECTED
TMOUT   = BIT8      :TMOUT = 1 TR79F OPERATION NOT COMPLETED IN TIME ALLOWED
RDCNT   = BIT9      :RDCNT = 1 BYTES READ NOT EQUAL COUNT IN WORD COUNT REGISTER
ONLNS   = BIT10     :ONLNS = 1 TR79F TRANSPORT IS ON-LINE
BGL     = BIT11     :BGL = 1 BUS GRANT LATE ON READ OR WRITE
STEF    = BIT12     :STEF = 1 ERROR DETECTED ON A SINGLE TAPE TRACK
MTEF    = BIT13     :MTEF = 1 ERROR DETECTED ON MORE THAN ONE TAPE TRACK
WPEF    = BIT14     :WPEF = 1 PARITY ERROR DETECTED DURING WRITE
RPEF    = BIT15     :RPEF = 1 PARITY ERROR DETECTED DURING READ

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////////////////////////////////////  
:TR79 FUNCTION CODES USED IN THIS PROGRAM  
:////////////////////////////////////

THE FOLLOWING CODES REPRESENT THE VALUES USED IN COMMAND REGISTER  
BITS FNB03-FNB00 (BIT4-BIT1) TO INVOKE PARTICULAR TR79F OPERATIONS.  
COMMAND REGISTER BIT0 MUST BE SET = 1 TO INITIATE AN OPERATION.  
UNIT VALUES ARE INCLUDED FOR TESTING CONTROL UNIT LOGIC.

		:UNIT	COMMAND
ILC00	=0	:0	ILLEGAL COMMAND
WRITE	=402	:1	WRITE FORWARD
READ	=4	:0	READ FORWARD
ILC03	=406	:1	ILLEGAL COMMAND
SPACER	=1410	:3	SPACE REVERSE 1 RECORD
ILC05	=1012	:2	ILLEGAL COMMAND
ILC06	=1414	:3	ILLEGAL COMMAND
ERASE	=16	:0	ERASE WORD COUNT FORWARD
REWIND	=1020	:1	REWIND TAPE
ILC11	=22	:0	ILLEGAL COMMAND
ILC12	=424	:1	ILLEGAL COMMAND
GOEOT	=1026	:2	FAST FORWARD TO EOT
ILC14	=1030	:2	ILLEGAL COMMAND
WIDB	=432	:1	WRITE I.D. BLOCK
WEOF	=1034	:2	WRITE END OF FILE
OFLINE	=1436	:3	TAKE UNIT OFF UNIT



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## 5.0 TEST DESCRIPTIONS

TEST1 THIS IS A NULL TEST INCLUDED TO PRESERVE THE TEST NUMBERING  
USED IN CZTRAB. MANUAL INTERVENTION TESTS ARE INCLUDED IN TEST6

TEST2 CHECKS THE INTERFACE LOGIC WITH MINIMUM TAPE MOTION

## TEST2 INCLUDES:

## TEST NAME IN CZTRAB

REWIND FROM LOAD POINT	TESTI
INSURE WRITE RING	TESTC
UNIBUS EXTENSION BIT TEST	TESTD
INTERRUPT BIT SET TEST	TESTE
INTERRUPT BIT CLEAR TEST	TESTF
ILLEGAL COMMAND TEST	TESTJ
WRITE FROM LOAD POINT	TESTK
WRITE EOF FROM LOAD POINT	TESTM
TEST TR79 POWER CLEAR	TESTG
SPACE REVERSE AT LOAD POINT	TESTAT
NXM TEST	TESTAB
BUS ADDRESS BIT TEST	TESTAU
WORD COUNT BIT TEST	TESTBA

TEST3 CHECKS TR79 TRANSPORTS RESPONSE TO COMMANDS  
CHECKS IDB AND EOF OPERATIONS  
CHECKS COUNT AND PARITY ERROR DETECTION

## TEST3 INCLUDES:

## TEST NAME IN CZTRAB

INSURE WRITE ENABLE RING	TESTC
REWIND THE TAPE	TESTI
WRITE ID BLOCK	TESTO
ILLEGAL ID BLOCK TEST	TESTH
SPACE REVERSE OVER ID BLOCK	TESTAV
READ ID BLOCK	TESTAW
WRITE EOF MARKS	RUNL
SPACE REVERSE OVER EOF MARKS	RUNU
READ EOF MARKS	RUNV
TIME OUT TEST	TESTW
READ WITH COUNT LONG	TESTAC
READ WITH COUNT SHORT	TESTAD
SPACE REVERSE WITH COUNT SHORT	TESTAE
SPACE REVERSE WITH COUNT LONG	TESTAF
WRITE EVEN PARITY	TESTAX
SPACE REVERSE OVER EVEN PARITY	TESTAY
READ EVEN PARITY	TESTAZ

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## TEST4 WRITES, READS AND TESTS DATA WRITTEN ON TAPE

TEST4 WRITES A FILE OF DATA TO TAPE A NUMBER OF TIMES. THE FILE CONTAINS 15 BLOCKS OF DATA. EACH TIME A BLOCK IS WRITTEN THE DATA IS READ BACK AND CHECKED. THE NUMBER OF TIMES WRITING AND CHECKING A FILE IS REPEATED IS SPECIFIED IN THE SOFTWARE P-TABLE. THE DEFAULT VALUE FOR THIS REPEAT COUNT IS 10.(DECIMAL).

TEST4 INCLUDES:	TEST NAME IN CZTRAB
INSURE WRITE RING	TESTC
REWIND AND WRITE ID BLOCK	TESTO
WRITE,SPACE REV, READ AND TEST DATA	TESTXX

## TEST5 READ DATA WRITTEN BY TEST4

TEST5 INCLUDES:	TEST NAME IN CZTRAB
REWIND THE TAPE	TESTI
READ THE ID BLOCK	TESTAW
READ THE TAPE	TESTXY

## TEST6 CHECKS MANUAL INTERVENTION OPERATIONS

TEST6 CORRESPONDS TO TEST GROUP 1 FROM CZTRAB

TEST6 INCLUDES:	TEST NAME IN CZTRAB
REMOVE WRITE RING	TESTB
TRY TO WRITE WITHOUT RING	RUNAS
INSERT WRITE RING	TESTC
DELAY 10 SECONDS	TESTAJ
TAKE UNIT OFF LINE	TESTP
TELL OPERATOR TO RESET	TESTAK
REWIND THE TAPE	TESTI
WRITE PAST EOT	TESTAL
SPACE REVERSE PAST EOT	TESTAM
READ PAST EOT	TESTAN
WRITE EOF PAST EOT	TESTAO
SPACE REVERSE OVER EOF PAST EOT	TESTAP
READ EOF PAST EOT	TESTAQ
REWIND AND GO OFF LINE	TESTQ



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## 6.0 ERROR INFORMATION

ERRORS ARE REPORTED BY THE PROGRAM AS THEY OCCUR IF ERROR REPORTING IS NOT INHIBITED. THIS PROGRAM CONSIDERS AN UNANTICIPATED VALUE IN ONE OR MORE OF THE TR79F CONTROL AND STATUS REGISTERS TO BE AN ERROR. ERROR REPORTS CONFORM TO THE XXDP+ DIAGNOSTIC RUN TIME SERVICES ERROR REPORT FORMAT. THE REPORTS SPECIFY THE ERROR TYPE AND NUMBER, THE TEST AND SUBTEST IN WHICH THE ERROR OCCURED, THE PC OF THE CALL TO THE ERROR REPORT SUBROUTINE, AND A DESCRIPTION OF THE TR79F OPERATION WHOSE INVOCATION GENERATED AN ERROR CONDITION. IN ADDITION, ACTUAL AND EXPECTED TR79F CONTROL AND STATUS REGISTER, AND I/O DATA VALUES ARE SHOWN IN BASIC ERROR REPORTS IF BASIC REPORTS ARE NOT INHIBITED.

THE FOLLOWING EXAMPLE IS A TYPICAL ERROR REPORT. IN THIS CASE THE REPORT IS PRODUCED BY THE DETECTION OF A PARITY ERROR DURING A WRITE OPERATION.

CZTRACO SFT ERR 00020 ON UNIT 00 TST 003 SUB 001 PC: 027070  
WRITE

REGISTER	LOCATION	EXPECTED	ACTUAL
COMMAND	164000	002602	102602
STATUS	164002	002001	102001
WORD COUNT	164004	000000	000000

^

.SBTTL LISTING &amp; ASSEMBLY CONTROL

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## LISTING &amp; ASSEMBLY CONTROL

```

308
309      000000      HELP=0      ; CONTROL LISTING OF HELP INFORMATION
310                                     ; HELP=0   NO LIST
311                                     ; HELP=1   LIST
312
313      .SBTTL  INITIALIZE SUPERVISOR
314
315      002000      .=2000
316
317      002000      .MCALL  SVC
318      002000      SVC      ; INITIALIZE SUPERVISOR MACROS
319
320
321      002000      BGNMOD TR79
322
323
324      000001      $LSTIN= 1
325      000001      $LSTTAG= 1
326      000000      SVCINS= 0      ; LIST INSTRUCTIONS, SHIFTED RIGHT
327      000000      SVCTST= 0      ; LIST TEST TAGS, SHIFTED RIGHT
328      000000      SVCSUB= 0      ; LIST SUBTEST TAGS, SHIFTED RIGHT
329      000000      SVCGBL= 0      ; LIST GLOBAL TAGS, SHIFTED RIGHT
330      000000      SVCTAG= 0      ; LIST OTHER TAGS, SHIFTED RIGHT
331
332      ; CHANGE THE VALUES OF THE SVC... SYMBOLS TO BE ZERO IF YOU WISH
333      ; TO ALIGN THE MACRO CALLS AND THEIR EXPANSIONS. CHANGE THE
334      ; SYMBOLS TO BE MINUS-ONE TO NOT LIST THE EXPANSIONS. YOU MAY
335      ; CHANGE THE SYMBOLS AT ANY POINT IN YOUR PROGRAM.
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342      .SBTTL  SELECT OPTIONAL SECTIONS

```



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SELECT OPTIONAL SECTIONS

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002000

;\* SELECTION OF OPTIONAL PROGRAM SECTIONS  
POINTER ERRIBL,BGNSW,BGNSFT

.SBTTL PROGRAM HEADER

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## PROGRAM HEADER

```

353
354      :++
355      ;THE PROGRAM HEADER MACRO CHARACTERIZES THIS DIAGNOSTIC. THE
356      ;HEADER MACRO'S ARGUMENTS ARE FILE NAME, RELEASE LEVEL, PATCH
357      ;DISPOSITION OF THE MOST RECENT PATCH, MAXIMUM TEST TIME IN SEC.,
358      ;AND THE TYPE OF DIAGNOSTIC (0-SEQUENTIAL, 1-EXERCISER). THESE
359      ;ARGUMENTS ARE IN RESPECTIVE ORDER.
360      :--
361
362
363
364      002000      HEADER CZTRA,C,0,7200,,0
365      002000      L$NAME::      ;DIAGNOSTIC NAME
366      002000      103          .ASCII /C/
367      002001      132          .ASCII /Z/
368      002002      124          .ASCII /T/
369      002003      122          .ASCII /R/
370      002004      101          .ASCII /A/
371      002005      000          .BYTE 0
372      002006      000          .BYTE 0
373      002007      000          .BYTE 0
374      002010      LSREV::      ;REVISION LEVEL
375      002010      103          .ASCII /C/
376      002011      LSDEPO::      ;0
377      002011      060          .ASCII /0/
378      002012      LSUNIT::      ;NUMBER OF UNITS
379      002012      000000      .WORD 0
380      002014      L$TIML::      ;LONGEST TEST TIME
381      002014      016040      .WORD 7200.
382      002016      L$HPCP::      ;PTR. TO H.W. QUES.
383      002016      034460      .WORD L$HARD
384      002020      L$SPCP::      ;PTR. TO S.W. QUES.
385      002020      034624      .WORD L$SOFT
386      002022      L$HPTP::      ;PTR. TO DEF. H.W. PTABLE
387      002022      002142      .WORD L$HW
388      002024      L$SPTP::      ;PTR. TO S.W. PTABLE
389      002024      002152      .WORD L$SW
390      002026      L$LADP::      ;DIAG. END ADDRESS
391      002026      035402      .WORD L$LAST
392      002030      L$STA::      ;RESERVED FOR APT STATS
393      002030      000000      .WORD 0
394      002032      L$CO::      .WORD 0
395      002032      000000      .WORD 0
396      002034      L$DTYP::      ;DIAGNOSTIC TYPE
397      002034      000000      .WORD 0
398      002036      L$APT::      ;APT EXPANSION
399      002036      000000      .WORD 0
400      002040      L$DTP::      ;PTR. TO DISPATCH TABLE
401      002040      002124      .WORD L$DISPATCH
402      002042      L$PRIO::      ;DIAGNOSTIC RUN PRIORITY
403      002042      000000      .WORD 0
404      002044      L$ENVI::      ;FLAGS DESCRIBE HOW IT WAS SETUP
405      002044      000000      .WORD 0
406      002046      L$EXP1::      ;EXPANSION WORD
407      002046      000000      .WORD 0
408      002050      L$MREV::      ;SVC REV AND EDIT #

```



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## PROGRAM HEADER

409	002050	003		.BYTE	C\$REVISION	
410	002051	003		.BYTE	C\$EDIT	
411	002052		L\$EF::			;DIAG. EVENT FLAGS
412	002052	000000		.WORD	0	
413	002054	000000		.WORD	0	
414	002056		L\$SPC::			
415	002056	000000		.WORD	0	
416	002060		L\$DEVP::			; POINTER TO DEVICE TYPE LIST
417	002060	012322		.WORD	L\$DVTYP	
418	002062		L\$REPP::			;PTR. TO REPORT CODE
419	002062	000000		.WORD	0	
420	002064		L\$EXP4::			
421	002064	000000		.WORD	0	
422	002066		L\$EXP5::			
423	002066	000000		.WORD	0	
424	002070		L\$AUT::			;PTR. TO ADD UNIT CODE
425	002070	000000		.WORD	0	
426	002072		L\$DUT::			;PTR. TO DROP UNIT CODE
427	002072	000000		.WORD	0	
428	002074		L\$LUN::			;LUN FOR EXERCISERS TO FILL
429	002074	000000		.WORD	0	
430	002076		L\$DESP::			;POINTER TO DIAG. DESCRIPTION
431	002076	012330		.WORD	L\$DESC	
432	002100		L\$LOAD::			;GENERATE SPECIAL AUTOLOAD EMT
433	002100	104035		EMT	ESLOAD	
434	002102		L\$ETP::			;POINTER TO ERRtbl
435	002102	002154		.WORD	L\$ERRtbl	
436	002104		L\$IICP::			;PTR. TO INIT CODE
437	002104	024034		.WORD	L\$INIT	
438	002106		L\$CCP::			;PTR. TO CLEAN-UP CODE
439	002106	024202		.WORD	L\$CLEAN	
440	002110		L\$ACP::			;PTR. TO AUTO CODE
441	002110	024200		.WORD	L\$AUTO	
442	002112		L\$PRT::			;PTR. TO PROTECT TABLE
443	002112	024026		.WORD	L\$PROT	
444	002114		L\$TEST::			;TEST NUMBER
445	002114	000000		.WORD	0	
446	002116		L\$DLY::			;DELAY COUNT
447	002116	000000		.WORD	0	
448	002120		L\$HIME::			;PTR. TO HIGH MEM
449	002120	000000		.WORD	0	
450						
451			.EVEN			
452						
453						
454			.SBTTL DISPATCH TABLE			

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DISPATCH TABLE

455  
 456  
 457  
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 461  
 462 002122  
 463 002122 000006  
 464 002124  
 465 002124 024204  
 466 002126 024206  
 467 002130 026522  
 468 002132 031316  
 469 002134 032040  
 470 002136 032344  
 471  
 472  
 473  
 474  
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```

:////////////////////
:// THE DISPATCH TABLE CONTAINS THE STARTING ADDRESS OF EACH TEST.
:// IT IS USED BY THE SUPERVISOR TO DISPATCH TO EACH TEST.
:////////////////////

```

```

DISPATCH      6.
.WORD          6
LSDISPATCH::
.WORD          T1
.WORD          T2
.WORD          T3
.WORD          T4
.WORD          T5
.WORD          T6

```

.SBTTL DEFAULT HARDWARE P-TABLE

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DEFAULT HARDWARE P-TABLE

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002140  
002140 000003  
002142  
002142  
002142 164000  
002144 000170  
002146 000240  
002150  
002150

////////////////////////////////////  
:/ THE DEFAULT HARDWARE P-TABLE CONTAINS DEFAULT VALUES OF  
:/ THE TEST-DEVICE PARAMETERS. THE STRUCTURE OF THIS TABLE  
:/ IS IDENTICAL TO THE STRUCTURE OF THE RUN-TIME P-TABLE.  
////////////////////////////////////

                  BGNHW  DFPTBL  
                  .WORD  L10000-L\$HW/2  
L\$HW::  
DFPTBL::  
                  .WORD  164000          ;TR79 CSR UNIBUS ADDRESS  
                  .WORD  170              ;TR79 INTERRUPT VECTOR  
                  .WORD  PRI05          ;TR79 INTERRUPT PRIORITY LEVEL = 5  
  
                  ENDHW  
L10000:  
  
.SBTTL  SOFTWARE P-TABLE



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SOFTWARE P-TABLE

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517002150  
002150 000001  
002152  
002152 000012  
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:////////////////////////////////////
:          THE SOFTWARE P-TABLE CONTAINS PROGRAM PARAMETERS WHOSE VALUE
:          CAN BE CHANGED BY THE OPERATOR.
:////////////////////////////////////

```

```

          BGNSW  SFPTBL
          .WORD  L10001-L$SW/2
L$SW::
SFPTBL::
RPTCNT: .WORD  10.          ;DEFAULT VALUE FOR NUMBER OF FILES WRITTEN
                          ; IN TEST4
          ENDSW
L10001:

```

.SBTTL GLOBAL EQUATES SECTION

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GLOBAL EQUATES SECTION

```

518
519
520 ///////////////////////////////////////////////////////////////////
521 // THE GLOBAL EQUATES SECTION CONTAINS PROGRAM EQUATES THAT
522 // ARE USED IN MORE THAN ONE TEST.
523 ///////////////////////////////////////////////////////////////////
524 002154                EQUALS
525
526 : BIT DIFINITIONS
527
528 100000                BIT15== 100000
529 040000                BIT14== 40000
530 020000                BIT13== 20000
531 010000                BIT12== 10000
532 004000                BIT11== 4000
533 002000                BIT10== 2000
534 001000                BIT09== 1000
535 000400                BIT08== 400
536 000200                BIT07== 200
537 000100                BIT06== 100
538 000040                BIT05== 40
539 000020                BIT04== 20
540 000010                BIT03== 10
541 000004                BIT02== 4
542 000002                BIT01== 2
543 000001                BIT00== 1
544
545 001000                BIT9== BIT09
546 000400                BIT8== BIT08
547 000200                BIT7== BIT07
548 000100                BIT6== BIT06
549 000040                BIT5== BIT05
550 000020                BIT4== BIT04
551 000010                BIT3== BIT03
552 000004                BIT2== BIT02
553 000002                BIT1== BIT01
554 000001                BIT0== BIT00
555
556 : EVENT FLAG DEFINITIONS
557 : EF32:EF17 RESERVED FOR SUPERVISOR TO PROGRAM COMMUNICATION
558
559 000040                EF.START== 32. : START COMMAND WAS ISSUED
560 000037                EF.RESTART== 31. : RESTART COMMAND WAS ISSUED
561 000036                EF.CONTINUE== 30. : CONTINUE COMMAND WAS ISSUED
562 000035                EF.NEW== 29. : A NEW PASS HAS BEEN STARTED
563 000034                EF.PWR== 28. : A POWER-FAIL/POWER-UP OCCURRED
564
565
566 : PRIORITY LEVEL DEFINITIONS
567
568 000340                PRI07== 340
569 000300                PRI06== 300
570 000240                PRI05== 240
571 000200                PRI04== 200
572 000140                PRI03== 140
573 000100                PRI02== 100

```

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## GLOBAL EQUATES SECTION

574 000040  
575 000000  
576  
577  
578  
579 000004  
580 000010  
581 000020  
582 000040  
583 000100  
584 000200  
585 000400  
586 001000  
587 002000  
588 004000  
589 010000  
590 020000  
591 040000  
592 100000  
593  
594  
595  
596  
597  
598

PRI01== 40  
PRI00== 0  
: OPERATOR FLAG BITS  
: EVL== 4  
: LOT== 10  
: ADR== 20  
: IDU== 40  
: ISR== 100  
: UAM== 200  
: BOE== 400  
: PNT== 1000  
: PRI== 2000  
: IXE== 4000  
: IBE== 10000  
: IER== 20000  
: LOE== 40000  
: HOE== 100000

-----  
:SBTTL GLOBAL EQUATES FROM CZTRA  
-----



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GLOBAL EQUATES FROM CZTRA

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626

000000  
000001  
000002  
000003  
000004  
000005  
000006  
000007

177776

164000  
164002  
164004  
164006  
000170  
000172

;REGISTER DEFINITIONS

;-----

R0=%0 :GENERAL REGISTER  
R1=%1 :GENERAL REGISTER  
R2=%2 :GENERAL REGISTER  
R3=%3 :GENERAL REGISTER  
R4=%4 :GENERAL REGISTER  
R5=%5 :GENERAL REGISTER  
SP=%6 :PROCESSOR STACK POINTER  
PC=%7 :PROGRAM COUNTER

;LOCATION EQUIVALENCES

;-----

PS=177776 ;PROCESSOR STATUS WORD

;DEFAULT TR79 REGISTER ADDRESSES

TCR= 164000 ;DEFAULT CONTROL REGISTER ADDRESS  
TSR= 164002 ;DEFAULT STATUS REGISTER ADDRESS  
TWC= 164004 ;DEFAULT WORD COUNT ADDRESS  
TBA= 164006 ;DEFAULT BUS ADDRESS ADDRESS  
TVA= 170 ;DEFAULT TAPE VECTOR ADDRESS  
TSA= 172 ;DEFAULT TAPE STATUS ADDRESS

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GLOBAL EQUATES FROM CZTRA

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682

;TR79 FUNCTION DEFINITIONS

;TAPE TEST EQUALS

			:UNIT	COMMAND
	000000	ILC00 =0	:0	ILLEGAL COMMAND
	000402	WRITE =402	:1	WRITE FORWARD
	000004	READ =4	:0	READ FORWARD
	000406	ILC03 =406	:1	ILLEGAL COMMAND
	001410	SPACER =1410	:3	SPACE REVERSE 1 RECORD
	001012	ILC05 =1012	:2	ILLEGAL COMMAND
	001414	ILC06 =1414	:3	ILLEGAL COMMAND
	000016	ERASE =16	:0	ERASE WORD COUNT FORWARD
	001020	REWIND =1020	:1	REWIND TAPE
	000022	ILC11 =22	:0	ILLEGAL COMMAND
	000424	ILC12 =424	:1	ILLEGAL COMMAND
	001026	GOEOT =1026	:2	FAST FORWARD TO EOT
	001030	ILC14 =1030	:2	ILLEGAL COMMAND
	000432	WIDB =432	:1	WRITE I.D. BLOCK
	001034	WE0F =1034	:2	WRITE END OF FILE
	001436	OFLINE =1436	:3	TAKE UNIT OFF UNIT

.SBTTL BIT DEFINITIONS FOT TR79 REGISTERS

;TRCR COMMAND REGISTER BIT DEFINITIONS

	000001	GOBIT = 1
	000002	FNBO0 = 2
	000004	FNBO1 = 4
	000010	FNBO2 = 10
	000020	FNBO3 = 20
	000040	BUSY = 40
	000100	INTENB = 100
	000200	CURDY = 200
	000400	SBIT8 = 400
	001000	SBIT9 = 1000
	002000	MTRDY = 2000
	004000	PWRCLR = 4000
	010000	XBA16 = 10000
	020000	XBA17 = 20000
	040000	ILCMD = 40000
	100000	ERRBIT = 100000

;TR79 STATUS REGISTER BIT DEFINITIONS

	000001	INHBT = 1
	000002	RWDS = 2
	000004	FPTS = 4
	000010	EOFF = 10
	000020	IDBF = 20
	000040	LDPTS = 40
	000100	NXMF = 100
	000200	EOTS = 200

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BIT DEFINITIONS FOT TR79 REGISTERS

683 000400  
684 001000  
685 002000  
686 004000  
687 010000  
688 020000  
689 040000  
690 100000  
691

TMOUT = 400  
RDCNT = 1000  
ONLNS = 2000  
BGL = 4000  
STEF = 10000  
MTEF = 20000  
WPEF = 40000  
RPEF = 100000



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BIT DEFINITIONS FOR TR79 REGISTERS

692  
693  
694  
695  
696 000000  
697 000000  
698 000001  
699 000002  
700 000003  
701  
702  
703  
704  
705  
706  
707  
708  
709  
710  
711 002154  
712 002154  
713 002154 000000  
714 002156 000000  
715 002160 000000  
716 002162 000000  
717  
718 002164 000000  
719 002166 000000  
720 002170 000000  
721 002172 000000  
722 002174 000000  
723 002176 000000  
724 002200 000000  
725 002202 000000  
726 002204 000000  
727 002206 000000  
728 002210 000000  
729 002212 000000  
730 002214 000000  
731 002216 000000  
732  
733  
734  
735  
736  
737  
738 002220 000000  
739 002222 000036  
740 002224 000030  
741 002226 0000310  
742 002230 0000620  
743 002232 000062

.SBTTL MISCELLANEOUS EQUATES FOR ERROR CALLS

```

ENUM = 0           : INITIALIZE ERROR NUMBER
T.ESF = 0          : SYSTEM FATAL ERROR TYPE
T.EDF = 1          : DEVICE FATAL ERROR TYPE
T.EHRD = 2         : UNRECOVERABLE ERROR TYPE
T.ESFT = 3         : SOFT ERROR TYPE
    
```

.SBTTL GLOBAL DATA SECTION

```

: ////////////////////////////////////////////////////////////////////
: / THE GLOBAL DATA SECTION CONTAINS DATA THAT ARE USED
: / IN MORE THAN ONE TEST.
: ////////////////////////////////////////////////////////////////////
    
```

```

ERRTBL
L$ERRTBL::
ERRTYP::          .WORD  0
ERRNBR::          .WORD  0
ERRMSG::          .WORD  0
ERRBLK::          .WORD  0

ATRCR: .WORD  0           : COPY OF TR79 COMMAND REGISTER
ATRSR: .WORD  0           : COPY OF TR79 STATUS REGISTER
ATRCW: .WORD  0           : COPY OF TR79 WORD COUNT REGISTER
ATRBA: .WORD  0           : COPY OF TR79 BUS ADDRESS REGISTER
ETRCR: .WORD  0           : EXPECTED VALUE FOR TR79 COMMAND REGISTER
ETRSR: .WORD  0           : EXPECTED VALUE FOR TR79 STATUS REGISTER
ETRCW: .WORD  0           : EXPECTED VALUE FOR TR79 WORD COUNT REGISTER
ETRBA: .WORD  0           : EXPECTED VALUE FOR TR79 BUS ADDRESS REGISTER
AINPUT: .WORD  0          : COPY OF WORD FROM INPUT AREA
EINPUT: .WORD  0          : EXPECTED DATA IN INPUT AREA
LINPUT: .WORD  0          : LOCATION OF DATA WORD IN INPUT AREA
USEA: .WORD  0            : TR79 FUNCTION TO EXECUTE
USEB: .WORD  0            : TR79 WORD COUNT FOR FUNCTION TO EXECUTE
USEC: .WORD  0            : TR79 BUS ADDRESS FOR FUNCTION TO EXECUTE
: IF NEGATIVE THEN REPEAT LOOP UNTIL EOT
    
```

```

: DELAY CONSTANTS AND MULTIPLIERS
: THESE CONSTANTS ARE BASED ON 11/70 WITH CACHE, ALL HITS
: TIMING LOOPS (INC/DEC A REGISTER, BNE) = 0.9 MICROSECONDS/TICK
    
```

```

DLX: .WORD  0           : DELAY MULTIPLIER
DLXRW: .WORD  30.        : READ/WRITE DELAY MULTIPLIER(1.5 SECONDS)
DLXPWR: .WORD  24.        : POWER CLEAR DELAY MULTIPLIER(900 MILLISECONDS)
DLXBEL: .WORD  200.       : 10 SECOND DELAY MULTIPLIER
DLXTOF: .WORD  400.       : DELAY MULTIPLIER FOR PUTTING TAPE ON LINE
DLXLNG: .WORD  50.        : FORCE TIMEOUT DELAY MULTIPLIER
    
```

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## GLOBAL DATA SECTION

```

744                                     ;PROGRAM CONTROL PARAMETERS
745                                     :-----:
746
747 002234 000000 LOGDEV: .WORD 0 ;LOGICAL DEVICE NUMBER
748 002236 000000 PSTACK: .WORD 0 ;CONTAINS BASE LEVEL PROGRAM STACK POINTER
749 002240 000000 INTFLG: .WORD 0 ;INTERRUPT RECEIVED FLAG.SET = -1 WHEN
750                                     ; TR79 INTERRUPT ENABLE BIT IS SET, CLEARED
751                                     ; BY INTERRUPT HANDLER WHEN TR79 INTERRUPT
752                                     ; IS RECEIVED.
753
754                                     ;PROGRAM VARIABLES
755                                     :-----:
756
757                                     ;TR79 VECTOR AND REGISTER POINTERS
758
759
760
761 002242 164000 TRCR: 164000 ;ADDRESS OF TR79 COMMAND REGISTER
762 002244 164002 TRSR: 164002 ;ADDRESS OF TR79 STATUS REGISTER
763 002246 164004 TRWC: 164004 ;ADDRESS OF TR79 WORD COUNT REGISTER
764 002250 164006 TRBA: 164006 ;ADDRESS OF TR79 BUS ADDRESS REGISTER
765
766 002252 000170 TRVCT: 170 ;ADDRESS OF TR79 INTERRUPT VECTOR
767 002254 000240 TRPRT: PRI05 ;TR79 INTERRUPT PRIORITY LEVEL
768
769                                     :-----:
770 .SBTTL IOBUF INPUT-OUTOUT BUFFERS
771                                     :-----:

```

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IOBUF INPUT-OUTOUT BUFFERS

772  
773

002256 000000 000000  
002262

.NLIST BEX  
BADOUT: 0,0  
OUTPUT: ;OUTPUT BUFFER STARTS HERE

002262 000652 000525 000652 652,525,652,525,652,525,652,525,652,525,652,525,652,525,652,525  
002322 000652 000525 000652 652,525,652,525,652,525,652,525,652,525,652,525,652,525,652,525  
002362 000652 000525 000652 652,525,652,525,652,525,652,525,652,525,652,525,652,525,652,525  
002422 000652 000525 000652 652,525,652,525,652,525,652,525,652,525,652,525,652,525,652,525  
:100

002462 000001 000002 000403 001,002,403,004,405,406,007,010,411,412,013,414,015,016,417,020  
002522 000421 000422 000023 421,422,023,424,025,026,427,430,031,032,433,034,435,436,037,040  
002562 000441 000442 000043 441,442,043,444,045,046,447,450,051,052,453,054,455,456,057,460  
002622 000061 000062 000463 061,062,463,064,465,466,067,070,471,472,073,474,075,076,477,100  
:200

002662 000501 000502 000103 501,502,103,504,105,106,507,510,111,112,513,114,515,516,117,520  
002722 000121 000122 000523 121,122,523,124,525,526,127,130,531,532,133,534,135,136,537,540  
002762 000141 000142 000543 141,142,543,144,545,546,147,150,551,552,153,554,155,156,557,160  
003022 000561 000562 000163 561,562,163,564,165,166,567,570,171,172,573,174,575,576,177,200  
:300

003062 000601 000602 000203 601,602,203,604,205,206,607,610,211,212,613,214,615,616,217,620  
003122 000221 000222 000623 221,222,623,224,625,626,227,230,631,632,233,634,235,236,637,640  
003162 000241 000242 000643 241,242,643,244,645,646,247,250,651,652,253,654,255,256,657,260  
003222 000661 000662 000263 661,662,263,664,265,266,667,670,271,272,673,274,675,676,277,700  
:400

003262 000301 000302 000703 301,302,703,304,705,706,307,310,711,712,313,714,315,316,717,320  
003322 000721 000722 000323 721,722,323,724,325,326,727,730,331,332,733,334,735,736,337,340  
003362 000741 000742 000343 741,742,343,744,345,346,747,750,351,352,753,354,755,756,357,760  
003422 000361 000362 000763 361,362,763,364,765,766,367,370,771,772,373,774,375,376,777,400  
:500

003462 000652 000525 000652 652,525,652,525,652,525,652,525,652,525,652,525,652,525,652,525  
003522 000652 000525 000652 652,525,652,525,652,525,652,525,652,525,652,525,652,525,652,525  
003562 000652 000525 000652 652,525,652,525,652,525,652,525,652,525,652,525,652,525,652,525  
003622 000652 000525 000652 652,525,652,525,652,525,652,525,652,525,652,525,652,525,652,525  
:600

003662 000777 000400 000777 777,400,777,400,777,400,777,400,777,400,777,400,777,400,777,400  
003722 000001 000001 000001 001,001,001,001,001,001,001,001,001,001,001,001,001,001,001  
003762 000010 000010 000010 010,010,010,010,010,010,010,010,010,010,010,010,010,010,010  
004022 000100 000100 000100 100,100,100,100,100,100,100,100,100,100,100,100,100,100,100  
:700

004062 000777 000400 000777 777,400,777,400,777,400,777,400,777,400,777,400,777,400,777,400  
004122 000002 000002 000002 002,002,002,002,002,002,002,002,002,002,002,002,002,002,002  
004162 000020 000020 000020 020,020,020,020,020,020,020,020,020,020,020,020,020,020,020  
004222 000200 000200 000200 200,200,200,200,200,200,200,200,200,200,200,200,200,200,200  
:1000

004262 000777 000400 000777 777,400,777,400,777,400,777,400,777,400,777,400,777,400,777,400  
004322 000004 000004 000004 004,004,004,004,004,004,004,004,004,004,004,004,004,004,004  
004362 000040 000040 000040 040,040,040,040,040,040,040,040,040,040,040,040,040,040,040  
004422 000400 000400 000400 400,400,400,400,400,400,400,400,400,400,400,400,400,400,400



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IOBUF INPUT-OUTOUT BUFFERS

:1100

004462	000652	000525	000652	652,525,652,525,652,525,652,525,652,525,652,525,652,525,652,525
004522	000652	000525	000652	652,525,652,525,652,525,652,525,652,525,652,525,652,525,652,525
004562	000652	000525	000652	652,525,652,525,652,525,652,525,652,525,652,525,652,525,652,525
004622	000652	000525	000652	652,525,652,525,652,525,652,525,652,525,652,525,652,525,652,525

:1200

004662	000652	000525	000652	652,525,652,525,652,525,652,525,652,525,652,525,652,525,652,525
004722	000652	000525	000652	652,525,652,525,652,525,652,525,652,525,652,525,652,525,652,525
004762	000652	000525	000652	652,525,652,525,652,525,652,525,652,525,652,525,652,525,652,525
005022	000652	000525	000652	652,525,652,525,652,525,652,525,652,525,652,525,652,525,652,525

:1300

005062	000652	000525	000652	652,525,652,525,652,525,652,525,652,525,652,525,652,525,652,525
005122	000652	000525	000652	652,525,652,525,652,525,652,525,652,525,652,525,652,525,652,525
005162	000652	000525	000652	652,525,652,525,652,525,652,525,652,525,652,525,652,525,652,525
005222	000652	000525	000652	652,525,652,525,652,525,652,525,652,525,652,525,652,525,652,525

:1400

005262	000652	000525	000652	652,525,652,525,652,525,652,525,652,525,652,525,652,525,652,525
005322	000652	000525	000652	652,525,652,525,652,525,652,525,652,525,652,525,652,525,652,525
005362	000652	000525	000652	652,525,652,525,652,525,652,525,652,525,652,525,652,525,652,525
005422	000652	000525	000652	652,525,652,525,652,525,652,525,652,525,652,525,652,525,652,525

:1500

005462	000652	000525	000652	652,525,652,525,652,525,652,525,652,525,652,525,652,525,652,525
005522	000652	000525	000652	652,525,652,525,652,525,652,525,652,525,652,525,652,525,652,525
005562	000652	000525	000652	652,525,652,525,652,525,652,525,652,525,652,525,652,525,652,525
005622	000652	000525	000652	652,525,652,525,652,525,652,525,652,525,652,525,652,525,652,525

:1600

005662	000652	000525	000652	652,525,652,525,652,525,652,525,652,525,652,525,652,525,652,525
005722	000652	000525	000652	652,525,652,525,652,525,652,525,652,525,652,525,652,525,652,525
005762	000652	000525	000652	652,525,652,525,652,525,652,525,652,525,652,525,652,525,652,525
006022	000652	000525	000652	652,525,652,525,652,525,652,525,652,525,652,525,652,525,652,525

:1700

006062	000652	000525	000652	652,525,652,525,652,525,652,525,652,525,652,525,652,525,652,525
006122	000652	000525	000652	652,525,652,525,652,525,652,525,652,525,652,525,652,525,652,525
006162	000652	000525	000652	652,525,652,525,652,525,652,525,652,525,652,525,652,525,652,525
006222	000652	000525	000652	652,525,652,525,652,525,652,525,652,525,652,525,652,525,652,525

:2000

006262	000777	000777	000777	777,777,777,777,777,777,777,777,777,777,777,777,777,777,777,777
--------	--------	--------	--------	---

006322 002000

INPUT: .BLKW 2000

.LIST BEX  
.SBTTL GLOBAL TEXT SECTION

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GLOBAL TEXT SECTION

```

775
776 :XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
777 :X THE GLOBAL TEXT SECTION CONTAINS FORMAT STATEMENTS,
778 :X MESSAGES, AND ASCII INFORMATION THAT ARE USED IN
779 :X MORE THAN ONE TEST.
780 :XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
781
782
783 :*****
784 :* NAMES OF DEVICE TYPE SUPPORTED BY DIAGNOSTIC
785 :*****
786
787 012322 DEVTYP <TR79>
788 012322 LSDVTYP::
789 012322 051124 034467 000 .ASCIZ /TR79/
790 012330 .EVEN
791
792 :*****
793 :* TITLE OF PROGRAM
794 :*****
795
796 012330 DESCRIPT <TR79 MAG TAPE DIAGNOSTIC>
797 012330 LSDESC::
798 012330 051124 034467 046440 .ASCIZ /TR79 MAG TAPE DIAGNOSTIC/
799 012336 043501 052040 050101
800 012344 020105 044504 043501
801 012352 047516 052123 041511
802 012360 000
803 012362 .EVEN
804
805
806
807 012362 047045 022462 020101 .NLIST BEX
012416 NOTR79: .ASCIZ /%N2%A P-TABLE SAYS NO TR79/
.EVEN
.LIST BEX
808
809 .SBTTL GLOBAL SUBROUTINES
810

```

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GLOBAL SUBROUTINES

```

811
812 :////////////////////
813 :// THE GLOBAL SUBROUTINES ARE CALLED BY MORE THAN ONE TEST
814 :////////////////////
815

```

```

816
817 :-----
818 : .SBTTL RWIND GLOBAL SUBROUTINE --PERFORM REWIND--
819 :-----
820

```

```

821
822 012416 042777 000001 167620 RWIND: BIC #BIT0,@TRSR ;CLEAR TR79 INHIBIT BIT
823 012424 012777 000000 167614 MOV #0,@TRWC ;SET DATA WORD COUNT
824 012432 012777 000000 167610 MOV #0,@TRBA ;SET DATA ADDRESS
825 012440 012777 0C1020 167574 MOV #REWIND,@TRCR ;SET FUNCTION
826 012446 052777 000001 167566 BIS #BIT0,@TRCR ;SET GO BIT
827 012454 000240 NOP ;
828 012456 004737 013402 JSR PC,TESTA ;WAIT FOR OPERATION
829 012462 000207 RTS PC ;
830

```

```

831
832 :-----
833 : .SBTTL WTIDB GLOBAL SUBROUTINE --WRITE ID BLOCK--
834 :-----
835

```

```

836
837
838 012464 042777 000001 167552 WTIDB: BIC #BIT0,@TRSR ;CLEAR INHIBIT BIT
839 012472 012777 000000 167546 MOV #0,@TRWC ;SET DATA WORD COUNT
840 012500 012777 000000 167542 MOV #0,@TRBA ;SET DATA ADDRESS
841 012506 012777 000432 167526 MOV #WIDB,@TRCR ;SET FUNCTION
842 012514 052777 000001 167520 BIS #BIT0,@TRCR ;SET GO BIT IN FUNCTION
843 012522 000240 NOP ;
844 012524 004737 013402 JSR PC,TESTA ;WAIT FOR OPERATION
845 012530 000207 RTS PC ;
846

```

```

847
848 :-----
849 : .SBTTL OFFLN GLOBAL SUBROUTINE --PERFORM OFF LINE COMMAND--
850 :-----
851

```

```

852
853
854 012532 042777 000001 167504 OFFLN: BIC #BIT0,@TRSR ;CLEAR TR79 INHIBIT BIT
855 012540 012777 000000 167500 MOV #0,@TRWC ;SET DATA WORD COUNT
856 012546 012777 000000 167474 MOV #0,@TRBA ;SET DATA ADDRESS
857 012554 012777 001436 167460 MOV #OFFLINE,@TRCR ;SET FUNCTION
858 012562 052777 000001 167452 BIS #BIT0,@TRCR ;SET GO BIT
859 012570 000240 NOP ;
860 012572 004737 013402 JSR PC,TESTA ;WAIT FOR OPERATION
861 012576 000207 RTS PC ;
862

```

```

863
864 :-----
865 : .SBTTL GEOT GLOBAL SUBROUTINE --PERFORM FAST FORWARD TO EOT--
866 :-----

```



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GEOT GLOBAL SUBROUTINE --PERFORM FAST FORWARD TO EOT--

867

-----

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GEOT GLOBAL SUBROUTINE --PERFORM FAST FORWARD TO EOT--

```

868
869
870 012600 042777 000001 167436 GEOT: BIC #BIT0,@TRSR ;CLEAR TR79 INHIBIT BIT
871 012606 012777 000000 167432 MOV #0,@TRWC ;SET DATA WORD COUNT
872 012614 012777 000000 167426 MOV #0,@TRBA ;SET DATA ADDRESS
873 012622 012777 001026 167412 MOV #GOEOT,@TRCR ;SET FUNCTION
874 012630 052777 000001 167404 BIS #BIT0,@TRCR ;SET GO BIT
875 012636 000240 NOP ;
876 012640 000207 RTS PC ;
877

```

```

-----
:SBTTL WRT GLOBAL SUBROUTINE --PERFORM WRITE FROM OUTPUT--
-----

```

```

883
884 012642 042777 000001 167374 WRT: BIC #BIT0,@TRSR ;CLEAR TR79 INHIBIT BIT
885 012650 013777 002214 167370 MOV USEB,@TRWC ;SET DATA WORD COUNT
886 012656 012777 002262 167364 MOV #OUTPUT,@TRBA ;SET DATA ADDRESS
887 012664 012777 000402 167350 MOV #WRITE,@TRCR ;SET FUNCTION
888 012672 052777 000001 167342 BIS #BIT0,@TRCR ;SET GO BIT
889 012700 000240 NOP ;
890 012702 004737 013402 JSR PC,TESTA ;WAIT FOR OPERATION
891 012706 000207 RTS PC ;
892

```

```

-----
:SBTTL WRTC GLOBAL SUBROUTINE --PERFORM WRITE FROM @USEC--
-----

```

```

898
899 012710 042777 000001 167326 WRTC: BIC #BIT0,@TRSR ;CLEAR TR79 INHIBIT BIT
900 012716 013777 002214 167322 MOV USEB,@TRWC ;SET DATA WORD COUNT
901 012724 013777 002216 167316 MOV USEC,@TRBA ;SET DATA ADDRESS
902 012732 012777 000402 167302 MOV #WRITE,@TRCR ;SET FUNCTION
903 012740 052777 000001 167274 BIS #BIT0,@TRCR ;SET GO BIT
904 012746 000240 NOP ;
905 012750 004737 013402 JSR PC,TESTA ;WAIT FOR OPERATION
906 012754 000207 RTS PC ;
907

```

```

-----
:SBTTL RD GLOBAL SUBROUTINE --PERFORM READ FROM INPUT--
-----

```

912

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RD GLOBAL SUBROUTINE --PERFORM READ FROM INPUT--

```

913
914
915 012756 042777 000001 167260 RD:   BIC   #BIT0,@TRSR      ;CLEAR TR79 INHIBIT BIT
916 012764 013777 002214 167254     MOV   USEB,@TRWC      ;SET DATA WORD COUNT
917 012772 012777 006322 167250     MOV   #INPUT,@TRBA   ;SET DATA ADDRESS
918 013000 012777 000004 167234     MOV   #READ,@TRCR    ;SET FUNCTION
919 013006 052777 000001 167226     BIS   #BIT0,@TRCR    ;SET GO BIT
920 013014 000240                NOP
921 013016 004737 013402     JSR   PC,TESTA      ;WAIT FOR OPERATION
922 013022 000207                RTS   PC

```

```

-----
:SBTTL  SPR GLOBAL SUBROUTINE --PERFORM SPACE REVERSE--
-----

```

```

923
924
925
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928
929
930 013024 042777 000001 167212 SPR:   BIC   #BIT0,@TRSR      ;CLEAR TR79 INHIBIT BIT
931 013032 013777 002214 167206     MOV   USEB,@TRWC      ;SET DATA WORD COUNT
932 013040 012777 000000 167202     MOV   #0,@TRBA       ;SET DATA ADDRESS
933 013046 012777 001410 167166     MOV   #SPACER,@TRCR  ;SET FUNCTION
934 013054 052777 000001 167160     BIS   #BIT0,@TRCR    ;SET GO BIT
935 013062 000240                NOP
936 013064 004737 013402     JSR   PC,TESTA      ;WAIT FOR OPERATION
937 013070 000207                RTS   PC

```

```

-----
:SBTTL  WTEOF GLOBAL SUBROUTINE --WRITE EOF(TAPE MARK)--
-----

```

```

938
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940
941
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943
944
945 013072 042777 000001 167144 WTEOF: BIC   #BIT0,@TRSR      ;CLEAR TR79 INHIBIT BIT
946 013100 012777 000000 167140     MOV   #0,@TRWC       ;SET DATA WORD COUNT
947 013106 012777 000000 167134     MOV   #0,@TRBA       ;SET DATA ADDRESS
948 013114 012777 001034 167120     MOV   #WEOF,@TRCR    ;SET FUNCTION
949 013122 052777 000001 167112     BIS   #BIT0,@TRCR    ;SET GO BIT
950 013130 000240                NOP
951 013132 004737 013402     JSR   PC,TESTA      ;WAIT FOR OPERATION
952 013136 000207                RTS   PC

```

```

-----
:SBTTL  ERS GLOBAL SUBROUTINE --PERFORM ERASE--
-----

```

```

953
954
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956

```

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ERS GLOBAL SUBROUTINE --PERFORM ERASE--

```

957
958
959 013140 042777 000001 167076 ERS:  BIC      #BIT0,@TRSR      ;CLEAR TR79 INHIBIT BIT
960 013146 013777 002214 167072      MOV      USEB,@TRWC      ;SET DATA WORD COUNT
961 013154 012777 002262 167066      MOV      #OUTPUT,@TRBA   ;SET DATA ADDRESS
962 013162 012777 000016 167052      MOV      #ERASE,@TRCR    ;SET FUNCTION
963 013170 052777 000001 167044      BIS      #BIT0,@TRCR     ;SET GO BIT
964 013176 000240                NOP
965 013200 004737 013402      JSR      PC,TESTA        ;WAIT FOR OPERATION
966 013204 000207                RTS      PC                ;RETURN

```

```

-----
:SBTTL DOILC GLOBAL SUBROUTINE --PERFORM ILLEGAL OPERATION--
-----

```

```

967
968
969
970
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973
974 013206 042777 000001 167030 DOILC: BIC      #BIT0,@TRSR      ;CLEAR INHIBIT BIT
975 013214 012777 000000 167024      MOV      #0,@TRWC        ;SET DATA WORD COUNT
976 013222 012777 000000 167020      MOV      #0,@TRBA        ;SET DATA ADDRESS
977 013230 052737 000001 002212      BIS      #BIT0,USEA      ;SET GO BIT IN FUNCTION
978 013236 013777 002212 166776      MOV      USEA,@TRCR      ;INITIATE OPERATION
979 013244 000240                NOP
980 013246 004737 013402      JSR      PC,TESTA        ;WAIT FOR OPERATION
981 013252 000207                RTS      PC                ;RETURN

```

```

-----
:SBTTL CPYTRR COPY TR79 REGISTERS AND CLEAR EXPECTED RESULTS
-----

```

```

982
983
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985
986
987
988
989 013254                CPYTRR:
990 013254 012702 002164      MOV      #ATRCR,R2        ;POINT TO 1ST COPY LOCATION
991 013260 010246                MOV      R2,-(SP)         ;SAVE POINTER
992 013262 012701 000010      MOV      #10,R1          ;SPECIFY COUNTER
993 013266 005022      10$:  CLR      (R2)+           ;CLEAR COPY LOCATIONS
994 013270 077102                SOB      R1,10$          ;IF MORE TO CLEAR THEN REPEAT CLEAR
995 013272 012602                MOV      (SP)+,R2        ;RESTORE COPY LOCATION POINTER
996 013274 017722 166742      MOV      @TRCR,(R2)+     ;COPY TR79 COMMAND REGISTER
997 013300 017722 166740      MOV      @TRSR,(R2)+     ;COPY TR79 STATUS REGISTER
998 013304 017722 166736      MOV      @TRWC,(R2)+     ;COPY TR79 WORD COUNT REGISTER
999 013310 017722 166734      MOV      @TRBA,(R2)+     ;COPY TR79 BUS ADDRESS REGISTER
1000 013314 004737 013442      JSR      PC,CHKBRK       ;CHECK FOR OPERATOR INTERRUPT
1001 013320 005002                CLR      R2              ;CLEAR ERROR INDICATOR
1002 013322 000207                RTS      PC              ;RETURN

```

```

-----
:SBTTL CPWR SUBROUTINE TO CLEAR TR79 INTERFACE
-----

```

```

1003
1004
1005
1006
1007

```



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CPWR SUBROUTINE TO CLEAR TR79 INTERFACE

```

1008
1009 013324 052777 004000 166710 CPWR: BIS #PWRCLR,@TRCR ;CLEAR TR79 COMMAND AND STATUS
1010 013332 032777 004000 166702 10$: BIT #PWRCLR,@TRCR ;HAS CLEAR OPERATION COMPLETED?
1011 013340 001374 ;BNE 10$ ;IF NO, WAIT UNTIL IT DOES
1012 013342 000207 ;RTS PC ;RETURN
1013
1014
1015 -----
1016 :SBTTL WWAIT SUBROUTINE TO WAIT A SPECIFIED TIME INTERVAL
1017 :-----
1018
1019 013344 013737 002230 002220 TWAIT: MOV DLXTOF,DLX ;SPECIFY DELAY MULTIPLIER FOR TAPE OFF LINE
1020 013352 000403 ;BR WWAIT ;WAIT
1021
1022 013354 013737 002222 002220 RWAIT: MOV DLXRW,DLX ;SPECIFY READ/WRITE DELAY MULTIPLIER
1023 013362 005001 ;WAIT: CLR R1 ;CLEAR DELAY CONSTANT REGISTER
1024 013364 013702 002220 ;MOV DLX,R2 ;COPY DELAY MULTIPLIER
1025 013370 005201 ;10$: INC R1 ;COUNT A TICK
1026 013372 001376 ;BNE 10$ ;KEEP TICKING
1027 013374 005302 ;DEC R2 ;COUNT DOWN DELAY MULTIPLIER
1028 013376 001374 ;BNE 10$ ;KEEP TICKING
1029 013400 000207 ;RTS PC ;RETURN TO CALLER
1030
1031
1032
1033 -----
1034 :SBTTL TESTA GLOBAL SUBROUTINE WAIT FOR TR79 OPERATION
1035 :-----

```

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## TESTA GLOBAL SUBROUTINE WAIT FOR TR79 OPERATION

```

1036          :+
1037          :TESTA IS ENTERED AFTER A TR79 OPERATION IS INITIATED
1038          :IF TIME ELAPSED > 40 MICROSEC(ROUGHLY) THEN RETURN
1039          :IF TR79 ERROR BIT = 1 THEN RETURN
1040          :IF MTRDY = 1 AND CURDY = 1 THEN RETURN
1041          :ELSE KEEP CHECKING
1042          :-
1043
1044 013402 005001      TESTA: CLR      R1          ;SET DELAY CONSTANT
1045 013404          1$:          ;TICK
1046 013404 005201      INC      R1          ;IF DELAY CONSTANT = 0 THEN EXIT
1047 013406 001414      BEQ      2$          ;IF TR79 ERROR BIT = 1
1048 013410 032777 100000 166624  BIT      #BIT15,@TRCR ; THEN EXIT
1049 013416 001010      BNE      2$          ;IF MTRDY BIT = 0
1050 013420 032777 002000 166614  BIT      #BIT10,@TRCR ; THEN KEEP CHECKING
1051 013426 001766      BEQ      1$          ;IF CURDY BIT = 0
1052 013430 032777 000200 166604  BIT      #BIT7,@TRCR  ; THEN KEEP CHECKING
1053 013436 001762      BEQ      1$
1054 013440          2$:          ;RETURN
1055 013440 000207      RTS      PC
1056
1057
1058
1059          -----
1060          :SBTTL  CHKBRK  SUBROUTINE CHECKS FOR OPERATOR INTERRUPT
1061          -----
1062
1063 013442          CHKBRK:          ;CHECK FOR OPERATOR INTERRUPT
1064 013442          BREAK          ;CHECK FOR OPERATOR INTERRUPT
1065 013442 104422      TRAP      C$BRK
1066 013444 000207      RTS      PC
1067
1068
1069
1070
1071          -----
1072          :SBTTL  TESTC  GLOBAL SUBROUTINE ASK OPERATOR TO INSTALL WRITE ENABLE RING
1073          -----
1074
1075
1076 013446          TESTC:          ;ASK OPERATOR TO INSTALL RING
1077 013446 032777 000004 166570  BIT      #BIT2,@TRSR ;IF RING IS PRESENT
1078 013454 001426      BEQ      30$          ;THEN RETURN
1079 013456          10$:          ;ASK OPERATOR TO INSTALL RING
1080 013456 012746 022103  MOV      #FMTRGI,-(SP)
1081 013462 012746 020473  MOV      #FMTRGI,-(SP)
1082 013466 012746 000002  MOV      #2,-(SP)
1083 013472 010600      MOV      SP,R0
1084 013474 104417      TRAP      C$PNTF
1085 013476 062706 000006  ADD      #6,SP
1086 013502 013702 002230  MOV      DLXTOF,R2 ;SPECIFY DELAY MULTIPLIER
1087 013506 005001      CLR      R1          ;SPECIFY DELAY CONSTANT
1088 013510 032777 000004 166526 20$: BIT      #BIT2,@TRSR ;IF RING IS PRESENT
1089 013516 001405      BEQ      30$          ;THEN RETURN
1090 013520 005201      INC      R1          ;COUNT A TICK
1091 013522 001372      BNE      20$          ;KEEP CHECKING

```

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TESTC GLOBAL SUBROUTINE ASK OPERATOR TO INSTALL WRITE ENABLE RING

1092 013524 005302  
1093 013526 001370  
1094 013530 000752  
1095 013532  
1096 013532 000207  
1097  
1098  
1099  
1100  
1101

DEC R2 ;COUNT DOWN DELAY MULTIPLIER  
BNE 20\$ ;KEEP CHECKING  
BR 10\$ ;ASK AGAIN  
30\$: ;RING IS PRESENT  
RTS PC

-----  
:SBTTL CHEKI GLOBAL SUBROUTINE CHECKS TR79 REGISTERS AFTER VALID REWIND  
:-----

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CHEKI GLOBAL SUBROUTINE CHECKS TR79 REGISTERS AFTER VALID REWIND

```

1102
1103 013534
1104 013534 032777 000002 166502 CHEKI:
1105 013542 001374 1$: BIT #BIT1,@TRSR ;WAIT FOR REWIND IN PROGRESS BIT
1106 013544 032777 000040 166472 2$: BIT #BIT5,@TRSR ; TO CLEAR
1107 013552 001774 BEQ 2$ ;WAIT FOR AT LOAD POINT STATUS
1108 013554 004737 013254 JSR PC,CPYTRR ;TO BE ASSERTED
1109 013560 012737 003220 002174 MOV #3220,ETRCR ;COPY TR79 REGISTERS
1110 013566 012737 002041 002176 MOV #2041,ETRSR ;SPECIFY EXPECTED TRCR
1111 013574 023737 002174 002164 CMP ETRCR,ATRCR ;SPECIFY EXPECTED RESULT
1112 013602 001401 BEQ 10$ ;TEST COMMAND REGISTER
1113 013604 005202 INC R2 ;OK
1114 013606 10$: CMP ETRSR,ATRSR ;INDICATE ERROR
1115 013606 023737 002176 002166 BEQ 20$ ;TEST STATUS REGISTER
1116 013614 001401 INC R2 ;OK
1117 013616 005202 20$: TST R2 ;INDICATE ERROR
1118 013620 BEQ 30$ ;ANY ERRORS?
1119 013620 005702 ;NO.
1120 013622 001415 ENUM = ^D<ENUM + 1> ;INCREMENT ERROR NUMBER
1121 000001 MOV #T.ESFT,ERRTYP ;SPECIFY SOFT ERROR
1122 013624 012737 000003 002154 MOV #ENUM,ERRNBR ;SPECIFY ERROR NUMBER
1123 013632 012737 000001 002156 MOV #MRW,ERRMSG ;SPECIFY ERROR MESSAGE
1124 013640 012737 021156 002160 MOV #ERR4,ERRBLK ;SPECIFY ERROR HANDLER
1125 013646 012737 020064 002162 SEC ;SET C = 1
1126 013654 000261 30$: JSR PC,CPWR ;RESET TR79
1127 013656 004737 013324 RTS PC
1128 013662 000207
1129
1130 -----
1131 ;SBTTL TESTJ SUBROUTINE CHECKS TR79 REGISTERS AFTER ILLEGAL COMMANDS
;-----

```



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TESTJ SUBROUTINE CHECKS TR79 REGISTERS AFTER ILLEGAL COMMANDS

```

1132
1133 013664
1134 013664 004737 013354
1135 013670 004737 013254
1136 013674 012737 142200 002174
1137 013702 012737 002040 002176
1138 013710 042737 001436 002164
1139 013716 023737 002174 002164
1140 013724 001401
1141 013726 005202
1142 013730
1143 013730 023737 002176 002166
1144 013736 001401
1145 013740 005202
1146 013742
1147 013742 005702
1148 013744 001401
1149 013746 000261
1150 013750 004737 013324
1151 013754 000207
1152
1153
1154
1155
1156

```

```

CHEKJ:
      JSR    PC,RWAIT
      JSR    PC,CPYTRR
      MOV    #142200,ETRCR
      MOV    #2040,ETRSR
      BIC    #1436,ATRCR
      CMP    ETRCR,ATRCR
      BEQ    10$
      INC    R2
10$:  CMP    ETRSR,ATRSR
      BEQ    20$
      INC    R2
20$:  TST    R2
      BEQ    30$
      SEC
30$:  JSR    PC,CPWR
      RTS    PC

```

```

;CHECKS TR79 REGISTERS AFTER ILLEGAL COMMANDS
;WAIT
;COPY TR79 REGISTERS
;SPECIFY EXPECTED TRCR
;EXPECTED STATUS
;CLEAR UNWANTED BITS IN COMMAND REGISTER
;TEST COMMAND REGISTER
;COMMAND REGISTER OK
;INDICATE ERROR
;TEST STATUS REGISTER
;STATUS OK
;INDICATE ERROR
;IF NO REGISTER ERRORS
;EXIT WITH C = 0
;SET C = 1
;TR79 POWER CLEAR

```

```

-----
:SBTTL CHEKL GLOBAL SUBROUTINE CHECKS REGISTERS AFTER WRITING EOF(TAPE MARK)
-----

```

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CHEKL GLOBAL SUBROUTINE CHECKS REGISTERS AFTER WRITING EOF(TAPE MARK)

```

1157
1158
1159 013756 004737 013354          CHEKL: JSR      PC,RWAIT          ;WAIT
1160 013762 004737 013254          JSR      PC,CPYTRR          ;COPY TR79 REGISTERS
1161 013766 012737 003234 002174  MOV      #3234,ETRCR        ;EXPECTED
1162 013774 012737 002011 002176  MOV      #2011,ETRSR        ;EXPECTED
1163 014002 023737 002174 002164  CMP      ETRCR,ATRCR        ;TEST COMMAND REGISTER
1164 014010 001401                      BEQ      10$                ;OK
1165 014012 005202                      INC      R2                  ;INDICATE ERROR
1166 014014
1167 014014 023737 002176 002166 10$:  CMP      ETRSR,ATRSR        ;TEST THE STATUS REGISTER
1168 014022 001401                      BEQ      20$                ;OK
1169 014024 005202                      INC      R2                  ;INDICATE ERROR
1170 014026
1171 014026 005702                      20$:  TST      R2              ;ANY ERRORS
1172 014030 001415                      BEQ      30$                ;NO
1173 000002                      ENUM = ^D<ENUM + 1>        ;INCREMENT ERROR NUMBER
1174 014032 012737 000003 002154  MOV      #T.ESFT,ERRTYP     ;SPECIFY SOFT ERROR
1175 014040 012737 000002 002156  MOV      #ENUM,ERRNBR       ;SPECIFY ERROR NUMBER
1176 014046 012737 022413 002160  MOV      #MWEFFL,ERRMSG     ;SPECIFY ERROR MESSAGE
1177 014054 012737 020064 002162  MOV      #ERR4,ERRBLK       ;SPECIFY ERROR HANDLER
1178 014062 000261                      SEC                          ;SET C = 1
1179 014064 000207                      30$:  RTS      PC            ;RETURN
1180
1181
1182
1183
-----*
      .SBTTL TESTN GLOBAL SUBROUTINE CHECK IF TR79 READY FOR OPERATION
-----*
```

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TESTN GLOBAL SUBROUTINE CHECK IF TR79 READY FOR OPERATION

```

1184      :TESTN:
1185      :IF TRANSPORT IS NOT ON LINE
1186      :   THEN RECORD ERROR
1187      :   RETURN WITH C = 1
1188      :   ELSE IF CONTROL UNIT OR TRANSPORT NOT READY
1189      :   THEN RECORD ERROR
1190      :   RETURN WITH C = 1
1191      :   ELSE RETURN WITH C = 0 (TR79 READY FOR OPERATION)
1192
1193      .ENABL  LSB                      ;BEGIN LOCAL SYMBOL BLOCK
1194
1195  014066  032777  002000  166150  TESTN: BIT      #BIT10,@TRSR      ;IF TRANSPORT IS ON LINE
1196  014074  001007                                BNE      10$          ; THEN CHECK READY
1197                                ;NOT ON LINE
1198      ENUM = ^D<ENUM + 1>
1199  014076  012737  020766  002160  MOV      #EM2,ERRMSG  ;INCREMENT ERROR NUMBER
1200  014104  012737  000003  002156  MOV      #ENUM,ERRNBR ;SPECIFY POINTER TO ERROR MESSAGE
1201  014112  000415                                BR       30$          ;SPECIFY ERROR NUMBER
1202  014114                                ;GOTO COMPLETE ERROR REPORT
1203  014114  032777  002000  166120  TSTRDY: BIT      #MTRDY,@TRCR  ;ON LINE
1204  014122  001403                                BEQ      20$          ;IF TRANSPORT NOT READY
1205  014124  105777  166112                                TSTB    @TRCR        ; THEN RECORD ERROR
1206  014130  100415                                BMI      40$          ;IF CONTROL UNIT READY
1207  014132                                ; THEN EXIT WITH C = 0
1208      20$:
1209      ENUM = ^D<ENUM + 1>
1210  014132  012737  021040  002160  MOV      #EM2A,ERRMSG ;NOT READY
1211  014140  012737  000004  002156  MOV      #ENUM,ERRNBR ;INCREMENT ERROR NUMBER
1212  014146                                ;SPECIFY POINTER TO ERROR MESSAGE
1213  014146  012737  000003  002154  MOV      #T.ESFT,ERRTYP ;SPECIFY ERROR NUMBER
1214  014154  012737  017754  002162  MOV      #ERR3,ERRBLK ;COMPLETE ERROR RECORD
1215  014162  000261                                SEC      ;SPECIFY 'SOFT' ERROR
1216  014164  000207                                RTS      #PC          ;SPECIFY POINTER TO ERROR HANDLER
1217                                ;SET C = 1
1218                                ;RETURN
1219                                ;END LOCAL SYMBOL BLOCK
1220
1221      -----
1221      .SBTTL TESTNN GLOBAL SUBROUTINE ASK OPERATOR TO PUT TAPE ON LINE
1221      -----

```

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TESTNN GLOBAL SUBROUTINE ASK OPERATOR TO PUT TAPE ON LINE

```

1222
1223
1224      :+
1225      :TESTNN:      IF TRANSPORT IS ON LINE THEN TEST IF READY
1226      :TESTN1:     IF 1 MINUTE HAS ELAPSED THEN
1227      :              ASK OPERATOR TO PUT TRANSPORT ON LINE
1228      :              GOTO TESTNN
1229      :-
1230
1231      .ENABL  LSB                      ;BEGIN LOCAL SYMBOL BLOCK
1232
1233      TESTNN:
1234      014166 013702 002230 10$:  MOV  DLXTOF,R2      ;WAIT FOR TRANSPORT ON LINE
1235      014172 005001                CLR  R1           ;SPECIFY DELAY MULTIPLIER
1236      014174 032777 002000 166042 20$: BIT  #BIT10,@TRSR ;SPECIFY DELAY CONSTANT
1237      014202 001017                BNE  30$         ;IF TRANSPORT IS ON LINE
1238      014204 005201                INC  R1           ; THEN CHECK ERROR INDICATOR
1239      014206 001372                BNE  20$         ;COUNT A TICK
1240      014210 005302                DEC  R2           ;KEEP CHECKING
1241      014212 001370                BNE  20$         ;COUNT DOWN DELAY MULTIPLIER
1242
1243      TESTN1: PRINTF #FMTTXT,#M2A ;ASK OPERATOR TO PUT TRANSPORT ON LINE
1244      014214 012746 021057          MOV  #M2A,-(SP)  ;ASK OPERATOR TO PUT TRANSPORT ON LINE
1245      014220 012746 020473          MOV  #FMTTXT,-(SP)
1246      014224 012746 000002          MOV  #2,-(SP)
1247      014230 010600                MOV  SP,R0
1248      014232 104417                TRAP C$PNTF
1249      014234 062706 000006          ADD  #6,SP
1250      014240 000752                BR   10$
1251      014242                30$: ;ON LINE ;CHECK IF ON LINE
1252      014242 005777 165774          TST  @TRCR      ;IF NO ERROR
1253      014246 100001                BPL  40$        ; THEN RETURN WITH C = 0
1254      014250 000261                SEC                ; ELSE RETURN WITH C = 1
1255      014252 000207                40$: RTS  PC
1256      .DSABL  LSB                      ;END LOCAL SYMBOL BLOCK
1257
1258      -----
1259      .SBTTL  CHEKO  TEST RESULT AFTER WRITE IDB FROM LOAD POINT
1260      -----

```



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CHEKO TEST RESULT AFTER WRITE IDB FROM LOAD POINT

```

1261
1262
1263 014254
1264 014254 004737 013354
1265 014260 004737 013254
1266 014264 012737 002632 002174
1267 014272 012737 002021 002176
1268 014300 023737 002174 002164
1269 014306 001401
1270 014310 005202
1271 014312
1272 014312 023737 002176 002166
1273 014320 001401
1274 014322 005202
1275 014324
1276 014324 005702
1277 014326 001415
1278 000005
1279 014330 012737 000003 002154
1280 014336 012737 000005 002156
1281 014344 012737 022504 002160
1282 014352 012737 020064 002162
1283 014360 000261
1284 014362 000207
1285
1286
1287
1288
1289

```

```

CHEKO:
JSR PC,RWAIT ;WAIT
JSR PC,CPYTRR ;COPY TR79 REGISTERS,CLEAR EXPECTED RESULTS
MOV #2632,ETRCR ;SPECIFY EXPECTED RESULT
MOV #2021,ETRSR ;SPECIFY EXPECTED RESULT
CMP ETRCR,ATRCR ;TEST COMMAND REGISTER
BEQ 10$ ;OK
INC R2 ;INDICATE ERROR
10$:
CMP ETRSR,ATRSR ;TEST THE STATUS REGISTER
BEQ 20$ ;OK
INC R2 ;INDICATE ERROR
20$:
TST R2 ;ANY ERRORS?
BEQ 30$ ;NO
ENUM = ^D<ENUM + 1> ;INCREMENT ERROR NUMBER
MOV #T.ESFT,ERRTYP ;SPECIFY 'SOFT' ERROR
MOV #ENUM,ERRNBR ;SPECIFY ERROR NUMBER
MOV #MWILPFL,ERRMSG ;SPECIFY POINTER TO ERROR MESSAGE
MOV #ERR4,ERRBLK ;SPECIFY POINTER TO ERROR HANDLER
SEC ;SET C = 1
30$: RTS PC ;RETURN

```

```

-----
:SBTTL CHEKS SUBROUTINE CHECKS DATA READ IN TEST4 AND TEST5
-----

```

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CHEKS SUBROUTINE CHECKS DATA READ IN TEST4 AND TEST5

```

1290
1291                                     ;COMPARE DATA WRITTEN FROM OUTPUT AREA
1292                                     ; WITH DATA READ INTO INPUT AREA
1293                                     ;IF ALL COMPARES YIELD 'EQUAL'
1294                                     ; THEN EXIT WITH C = 0
1295                                     ; ELSE RECORD ERROR AND EXIT WITH C = 1
1296
1297 014364 012701 006322 CHEKS: MOV #INPUT,R1 ;POINT TO DATA READ
1298 014370 012702 002262 MOV #OUTPUT,R2 ;POINT TO DATA WRITTEN
1299 014374 013703 002214 MOV USEB,R3 ;COPY COUNT
1300 014400 010137 002210 10$: MOV R1,LINPUT ;SPECIFY INPUT LOCATION
1301 014404 011137 002204 MOV @R1,AINPUT ;COPY DATA READ
1302 014410 011237 002206 MOV @R2,EINPUT ;COPY DATA WRITTEN
1303 014414 022122 CMP (R1)+,(R2)+ ;CHECK INPUT WITH OUTPUT
1304 014416 001003 BNE 20$ ;ERROR
1305 014420 005203 INC R3 ;OK.INCREMENT WORD COUNT
1306 014422 001366 BNE 10$ ;CHECK NEXT WORD OF DATA
1307 014424 000416 BR 30$ ;ALL DONE. NO ERRORS
1308 014426
1309 000006 20$: ENUM = ^D<ENUM + 1> ;INCREMENT ERROR NUMBER
1310 014426 012737 000003 002154 MOV #T.ESFT,ERRTYP ;SPECIFY 'SOFT' ERROR
1311 014434 012737 000006 002156 MOV #ENUM,ERRNBR ;SPECIFY ERROR NUMBER
1312 014442 012737 022643 002160 MOV #MRDERR,ERRMSG ;SPECIFY POINTER TO ERROR MESSAGE
1313 014450 012737 020202 002162 MOV #ERR14,ERRBLK ;SPECIFY POINTER TO ERROR HANDLER
1314 014456 000261 SEC ;SET C = 1
1315 014460 000401 BR 40$
1316 014462 30$: CLC ;SET C = 0
1317 014462 000241 40$: RTS PC ;RETURN
1318 014464 000207
1319
1320
1321 -----
1322 ;SBTTL CHEKS1 SUBROUTINE CLEARS INPUT AREA
1323 -----

```

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CHEKS1 SUBROUTINE CLEARS INPUT AREA

```

1324
1325 014466
1326 014466 012701 006322
1327 014472 012702 177000
1328 014476 005021
1329 014500 005202
1330 014502 001375
1331 014504 000207
1332
1333
1334
1335
1336

```

```

CHEKS1:
10$:  MOV    #INPUT,R1      ;POINT TO INPUT AREA
      MOV    #-1000,R2     ;SPECIFY COUNT FOR CLEAR INPUT
      CLR    (R1)+         ;CLEAR INPUT WORD
      INC    R2            ;COUNT
      BNE   10$           ;CONTINUE CLEARING
      RTS    PC           ;RETURN

```

```

-----
:SBTTL CHEKU GLOBAL SUBROUTINE CHECK REGISTERS AFTER SPACE REVERSE OVER EOF
-----

```



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CHEKU GLOBAL SUBROUTINE CHECK REGISTERS AFTER SPACE REVERSE OVER EOF

```

1337
1338 014506 004737 013354          CHEKU: JSR      PC,RWAIT          ;WAIT
1339 014512 004737 013254          JSR      PC,CPYTRR         ;COPY TR79 REGISTERS
1340 014516 012737 003610 002174  MOV      #3610,ETRCR       ;EXPECTED
1341 014524 012737 002011 002176  MOV      #2011,ETRSR       ;EXPECTED
1342 014532 023737 002174 002164  CMP      ETRCR,ATRCR       ;TEST COMMAND REGISTER
1343 014540 001401          BEQ      10$              ;OK
1344 014542 005202          INC      R2              ;INDICATE ERROR
1345 014544
1346 014544 023737 002176 002166 10$:    CMP      ETRSR,ATRSR       ;TEST THE STATUS REGISTER
1347 014552 001401          BEQ      20$              ;OK
1348 014554 005202          INC      R2              ;INDICATE ERROR
1349 014556
1350 014556 005737 002172          20$:    TST      ATRBA          ;TEST BUFFER ADDRESS
1351 014562 001401          BEQ      30$              ;OK
1352 014564 005202          INC      R2              ;INDICATE ERROR
1353 014566
1354 014566 005737 002170          30$:    TST      ATRWC          ;TEST WORD COUNT
1355 014572 001401          BEQ      40$              ;OK
1356 014574 005202          INC      R2              ;INDICATE ERROR
1357 014576
1358 014576 005702          40$:    TST      R2            ;ANY ERRORS?
1359 014600 001415          BEQ      50$              ;NO
1360 000007          ENUM = ^D<ENUM + 1>      ;INCREMENT ERROR NUMBER
1361 014602 012737 000003 002154  MOV      #T.ESFT,ERRTYP    ;SPECIFY SOFT ERROR
1362 014610 012737 000007 002156  MOV      #ENUM,ERRNBR      ;SPECIFY ERROR NUMBER
1363 014616 012737 022665 002160  MOV      #MSREFFL,ERRMSG   ;SPECIFY ERROR MESSAGE
1364 014624 012737 020102 002162  MOV      #ERR5,ERRBLK     ;SPECIFY ERROR HANDLER
1365 014632 000261          SEC                      ;SET C = 1
1366 014634 000207          50$:    RTS      PC          ;RETURN
1367
1368
1369
1370
1371
-----
:SBTTL CHEKV GLOBAL SUBROUTINE CHECK REGISTERS AFTER READING EOF (TAPE MARK)
-----

```

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CHEKV GLOBAL SUBROUTINE CHECK REGISTERS AFTER READING EOF(TAPE MARK)

```

1372
1373 014636 004737 013354
1374 014642 004737 013254
1375 014646 012737 002204 002174
1376 014654 012737 002011 002176
1377 014662 012737 006322 002202
1378 014670 023737 002174 002164
1379 014676 001401
1380 014700 005202
1381 014702
1382 014702 023737 002176 002166
1383 014710 001401
1384 014712 005202
1385 014714
1386 014714 023737 002202 002172
1387 014722 001401
1388 014724 005202
1389 014726
1390 014726 005737 002170
1391 014732 001401
1392 014734 005202
1393 014736
1394 014736 005702
1395 014740 001415
1396 014740 000010
1397 014742 012737 000003 002154
1398 014750 012737 000010 002156
1399 014756 012737 022726 002160
1400 014764 012737 020102 002162
1401 014772 000261
1402 014774 000207
1403
1404
1405
1406
1407

CHEKV: JSR PC,RWAIT ;WAIT
        JSR PC,CPYTRR ;COPY TR79 REGISTERS
        MOV #2204,ETRCR ;EXPECTED
        MOV #2011,ETRSR ;EXPECTED
        MOV #INPUT,ETRBA ;EXPECTED
        CMP ETRCR,ATRCR ;TEST COMMAND REGISTER
        BEQ 10$ ;OK
        INC R2 ;INDICATE ERROR
10$:    CMP ETRSR,ATRSR ;TEST THE STATUS REGISTER
        BEQ 20$ ;OK
        INC R2 ;INDICATE ERROR
20$:    CMP ETRBA,ATRBA ;TEST BUFFER ADDRESS
        BEQ 30$ ;OK
        INC R2 ;INDICATE ERROR
30$:    TST ATRWC ;TEST WORD COUNT
        BEQ 40$ ;OK
        INC R2 ;INDICATE ERROR
40$:    TST R2 ;ANY ERRORS?
        BEQ 50$ ;NO
        ENUM = ^D<ENUM + 1> ;INCREMENT ERROR NUMBER
        MOV #T.ESFT,ERRTYP ;SPECIFY SOFT ERROR
        MOV #ENUM,ERRNBR ;SPECIFY ERROR NUMBER
        MOV #MREFFL,ERRMSG ;SPECIFY ERROR MESSAGE
        MOV #ERRS,ERRBLK ;SPECIFY ERROR HANDLER
        SEC ;SET C = 1
50$:    RTS PC ;RETURN

-----
:SBTTL CHEKAC GLOBAL SUBROUTINE CHEK REGISTERS AFTER READ WITH LONG WORD COUNT
:-----

```

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## CHEKAC GLOBAL SUBROUTINE CHEK REGISTERS AFTER READ WITH LONG WORD COUNT

```

1408
1409 014776 004737 013354      CHEKAC: JSR    PC,RWAIT      ;WAIT
1410 015002 004737 013254      JSR    PC,CPYTRR      ;COPY TR79 REGISTERS
1411 015006 012737 102204 002174  MOV    #102204,ETRCR  ;EXPECTED
1412 015014 012737 003001 002176  MOV    #3001,ETRSR   ;EXPECTED
1413 015022 012737 006520 002202  MOV    #INPUT+176,ETRBA ;EXPECTED
1414 015030 023737 002174 002164  CMP    ETRCR,ATRCR   ;TEST COMMAND REGISTER
1415 015036 001401      BEQ    10$           ;OK
1416 015040 005202      INC    R2           ;INDICATE ERROR
1417 015042
1418 015042 023737 002176 002166 10$:  CMP    ETRSR,ATRSR   ;TEST THE STATUS REGISTER
1419 015050 001401      BEQ    20$           ;OK
1420 015052 005202      INC    R2           ;INDICATE ERROR
1421 015054
1422 015054 023737 002202 002172 20$:  CMP    ETRBA,ATRBA   ;TEST BUFFER ADDRESS
1423 015062 001401      BEQ    30$           ;OK
1424 015064 005202      INC    R2           ;INDICATE ERROR
1425 015066
1426 015066 005737 002170 30$:  TST    ATRWC        ;TEST THE WORD COUNT
1427 015072 001401      BEQ    40$           ;OK
1428 015074 005202      INC    R2           ;INDICATE ERROR
1429
1430 015076
1431 015076 005702 40$:  TST    R2           ;ANY ERRORS?
1432 015100 001415      BEQ    50$           ;NO
1433 000011      ENUM = ^D<ENUM + 1> ;INCREMENT ERROR NUMBER
1434 015102 012737 000003 002154  MOV    #T.ESFT,ERRTYP ;SPECIFY SOFT ERROR
1435 015110 012737 000011 002156  MOV    #ENUM,ERRNBR  ;SPECIFY ERROR NUMBER
1436 015116 012737 023166 002160  MOV    #MRCFL,ERRMSG ;SPECIFY ERROR MESSAGE
1437 015124 012737 020102 002162  MOV    #ERR5,ERRBLK  ;SPECIFY ERROR HANDLER
1438 015132 000261      SEC                ;SET C = 1
1439 015134 004737 013324 50$:  JSR    PC,CPWR      ;RESET TR79
1440 015140 000207      RTS    PC           ;RETURN
1441
1442
1443 -----
1444 :SBTTL CHEKAD GLOBAL SUBROUTINE CHECKS REGISTER AFTER READ WITH SHORT COUNT
1445 :-----

```



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## CHEKAD GLOBAL SUBROUTINE CHECKS REGISTER AFTER READ WITH SHORT COUNT

```

1446
1447 015142 004737 013354      CHEKAD: JSR      PC,RWAIT      ;WAIT
1448 015146 004737 013254      JSR      PC,CPYTRR     ;COPY TR79 REGISTERS
1449 015152 012737 102204 002174  MOV      #102204,ETRCR  ;EXPECTED
1450 015160 012737 003001 002176  MOV      #3001,ETRSR   ;EXPECTED
1451 015166 012737 006522 002202  MOV      #INPUT+200,ETRBA ;EXPECTED
1452 015174 012737 177777 002200  MOV      #-1,ETRWC     ;EXPECTED
1453 015202 023737 002174 002164  CMP      ETRCR,ATRCR   ;TEST COMMAND REGISTER
1454 015210 001401      BEQ      10$          ;OK
1455 015212 005202      INC      R2          ;INDICATE ERROR
1456 015214
1457 015214 023737 002176 002166 10$:    CMP      ETRSR,ATRSR   ;TEST THE STATUS REGISTER
1458 015222 001401      BEQ      20$          ;OK
1459 015224 005202      INC      R2          ;INDICATE ERROR
1460 015226
1461 015226 023737 002202 002172 20$:    CMP      ETRBA,ATRBA   ;TEST BUFFER ADDRESS
1462 015234 001401      BEQ      30$          ;OK
1463 015236 005202      INC      R2          ;INDICATE ERROR
1464 015240
1465 015240 023737 002200 002170 30$:    CMP      ETRWC,ATRWC   ;TEST THE WORD COUNT
1466 015246 001401      BEQ      40$          ;OK
1467 015250 005202      INC      R2          ;INDICATE ERROR
1468
1469 015252
1470 015252 005702      40$:    TST      R2          ;ANY ERRORS?
1471 015254 001415      BEQ      50$          ;NO
1472 000012      ENUM = ^D<ENUM + 1> ;INCREMENT ERROR NUMBER
1473 015256 012737 000003 002154  MOV      #T.ESFT,ERRTYP ;SPECIFY SOFT ERROR
1474 015264 012737 000012 002156  MOV      #ENUM,ERRNBR  ;SPECIFY ERROR NUMBER
1475 015272 012737 023166 002160  MOV      #MRCFL,ERRMSG ;SPECIFY ERROR MESSAGE
1476 015300 012737 020102 002162  MOV      #ERR5,ERRBLK  ;SPECIFY ERROR HANDLER
1477 015306 000261      SEC          ;SET C = 1
1478 015310 004737 013324      50$:    JSR      PC,CPWR      ;RESET TR79
1479 015314 000207      RTS      PC          ;RETURN
1480
1481
1482
1483
1484
-----
:SBTTL CHEKAE GLOBAL SUBROUTINE CHECK REGISTERS AFTER SPACE REVERSE WITH SHORT COUNT
-----

```



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CHEKAE GLOBAL SUBROUTINE CHECK REGISTERS AFTER SPACE REVERSE WITH SHORT COUNT

```

1485
1486 015316 004737 013354 CHEKAE: JSR PC,RWAIT ;WAIT
1487 015322 004737 013254 JSR PC,CPYTRR ;COPY TR79 REGISTERS
1488 015326 012737 003610 002174 MOV #3610,ETRCR ;EXPECTED
1489 015334 012737 002001 002176 MOV #2001,ETRSR ;EXPECTED
1490 015342 012737 177701 002200 MOV #177701,ETRWC ;EXPECTED
1491 015350 023737 002174 002164 CMP ETRCR,ATRCR ;TEST COMMAND REGISTER
1492 015356 001401 BEQ 10$ ;OK
1493 015360 005202 INC R2 ;INDICATE ERROR
1494 015362 10$:
1495 015362 023737 002176 002166 CMP ETRSR,ATRSR ;TEST THE STATUS REGISTER
1496 015370 001401 BEQ 20$ ;OK
1497 015372 005202 INC R2 ;INDICATE ERROR
1498 015374 20$:
1499 015374 005737 002172 TST ATRBA ;TEST BUFFER ADDRESS
1500 015400 001401 BEQ 30$ ;OK
1501 015402 005202 INC R2 ;INDICATE ERROR
1502 015404 30$:
1503 015404 023737 002200 002170 CMP ETRWC,ATRWC ;TEST THE WORD COUNT
1504 015412 001401 BEQ 40$ ;OK
1505 015414 005202 INC R2 ;INDICATE ERROR
1506 015416 40$:
1507 015416 005702 TST R2 ;ANY ERRORS?
1508 015420 001415 BEQ 50$ ;NO
1509 000013 ENUM = ^D<ENUM + 1> ;INCREMENT ERROR NUMBER
1510 015422 012737 000C03 002154 MOV #T,ESFT,ERRTYP ;SPECIFY SOFT ERROR
1511 015430 012737 000013 002156 MOV #ENUM,ERRNBR ;SPECIFY ERROR NUMBER
1512 015436 012737 023166 002160 MOV #MRCFL,ERRMSG ;SPECIFY ERROR MESSAGE
1513 015444 012737 020102 002162 MOV #ERRS,ERRBLK ;SPECIFY ERROR HANDLER
1514 015452 000261 SEC ;SET C = 1
1515 015454 004737 013324 50$: JSR PC,CPWR ;TR79 POWER CLEAR
1516 015460 000207 RTS PC ;RETURN
1517
1518
1519
1520 -----
1521 ;SBTTL CHEKAF SUBROUTINE CHECK REGISTERS AFTER SPACE REVERSE WITH LONG COUNT
;-----

```

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CHEKAF SUBROUTINE CHECK REGISTERS AFTER SPACE REVERSE WITH LONG COUNT

```

1522
1523 015462 004737 013354 CHEKAF: JSR PC,RWAIT ;WAIT
1524 015466 004737 013254 JSR PC,CPYTRR ;COPY TR79 REGISTERS
1525 015472 012737 003610 002174 MOV #3610,ETRCR ;EXPECTED
1526 015500 012737 002001 002176 MOV #2001,ETRSR ;EXPECTED
1527 015506 012737 177677 002200 MOV #177677,ETRWC ;EXPECTED
1528 015514 023737 002174 002164 CMP ETRCR,ATRCR ;TEST COMMAND REGISTER
1529 015522 001401 BEQ 10$ ;OK
1530 015524 005202 INC R2 ;INDICATE ERROR
1531 015526 10$:
1532 015526 023737 002176 002166 CMP ETRSR,ATRSR ;TEST THE STATUS REGISTER
1533 015534 001401 BEQ 20$ ;OK
1534 015536 005202 INC R2 ;INDICATE ERROR
1535 015540 20$:
1536 015540 005737 002172 TST ATRBA ;TEST BUFFER ADDRESS
1537 015544 001401 BEQ 30$ ;OK
1538 015546 005202 INC R2 ;INDICATE ERROR
1539 015550 30$:
1540 015550 023737 002200 002170 CMP ETRWC,ATRWC ;TEST THE WORD COUNT
1541 015556 001401 BEQ 40$ ;OK
1542 015560 005202 INC R2 ;INDICATE ERROR
1543 015562 40$:
1544 015562 005702 TST R2 ;ANY ERRORS?
1545 015564 001415 BEQ 50$ ;NO
1546 015566 000014 ENUM = ^D<ENUM + 1> ;INCREMENT ERROR NUMBER
1547 015566 012737 000003 002154 MOV #T.ESFT,ERRTYP ;SPECIFY SOFT ERROR
1548 015574 012737 000014 002156 MOV #ENUM,ERRNBR ;SPECIFY ERROR NUMBER
1549 015602 012737 023166 002160 MOV #MRCFL,ERRMSG ;SPECIFY ERROR MESSAGE
1550 015610 012737 020102 002162 MOV #ERR5,ERRBLK ;SPECIFY ERROR HANDLER
1551 015616 000261 SEC ;SET C = 1
1552 015620 004737 013324 50$: JSR PC,CPWR ;TR79 POWER CLEAR
1553 015624 000207 RTS PC ;RETURN
1554
1555
1556 -----
1557 ;SBTTL CHEKAG CHECK REGISTERS AFTER FAST FORWARD TO EOT
1558 -----

```

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CHEKAG CHECK REGISTERS AFTER FAST FORWARD TO EOT

```

1559
1560 015626
1561 015626 004737 013354
1562 015632 005777 164404
1563 015636 100407
1564 015640 032777 002000 164374
1565 015646 001403
1566 015650 105777 164366
1567 015654 100366
1568 015656 004737 013254
1569 015662 012737 003226 002174
1570 015670 012737 002201 002176
1571 015676 023737 002174 002164
1572 015704 001401
1573 015706 005202
1574 015710
1575 015710 023737 002176 002166
1576 015716 001401
1577 015720 005202
1578 015722
1579 015722 005737 002172
1580 015726 001401
1581 015730 005202
1582 015732
1583 015732 005737 002170
1584 015736 001401
1585 015740 005202
1586 015742
1587 015742 005702
1588 015744 001415
1589 000015
1590 015746 012737 000003 002154
1591 015754 012737 000015 002156
1592 015762 012737 023203 002160
1593 015770 012737 020102 002162
1594 015776 000261
1595 016000 000207
1596
1597
1598
1599
1600

```

```

CHEKAG:
10$: JSR PC,RWAIT ;WAIT
      TST @TRCR ;IF ERROR INDICATED
      BMI 15$ ; THEN RECORD TR79 REGISTERS
      BIT #MTRDY,@TRCR ;IF NOT MTRDY
      BEQ 15$ ; THEN RECORD TR79 REGISTERS
      TSTB @TRCR ;IF NOT CURDY
      BPL 10$ ;THEN KEEP CHECKING
15$: JSR PC,CPYTRR ;COPY TR79 REGISTERS
      MOV #3226,ETRCR ;EXPECTED
      MOV #2201,ETRSR ;EXPECTED
      CMP ETRCR,ATRCR ;TEST COMMAND REGISTER
      BEQ 20$ ;OK
      INC R2 ;INDICATE ERROR
20$: CMP ETRSR,ATRSR ;TEST THE STATUS REGISTER
      BEQ 30$ ;OK
      INC R2 ;INDICATE ERROR
30$: TST ATRBA ;TEST BUFFER ADDRESS
      BEQ 40$ ;OK
      INC R2 ;INDICATE ERROR
40$: TST ATRWC ;TEST THE WORD COUNT
      BEQ 50$ ;OK
      INC R2 ;INDICATE ERROR
50$: TST R2 ;ANY ERRORS?
      BEQ 60$ ;NO
      ENUM = ^D<ENUM + 1> ;INCREMENT ERROR NUMBER
      MOV #T,ESFT,ERRTYP ;SPECIFY SOFT ERROR
      MOV #ENUM,ERRNBR ;SPECIFY ERROR NUMBER
      MOV #METFL,ERRMSG ;SPECIFY ERROR MESSAGE
      MOV #ERR5,ERRBLK ;SPECIFY ERROR HANDLER
      SEC ;SET C = 1
60$: RTS PC ;RETURN

```

```

-----
:SBTTL CHKAG1 SUBROUTINE CHECKS REGISTERS AFTER WRITE BEYOND EOT
:-----

```



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CHKAG1 SUBROUTINE CHECKS REGISTERS AFTER WRITE BEYOND EOT

```

1601
1602 016002 004737 013354          CHKAG1: JSR      PC,RWAIT          ;WAIT
1603 016006 004737 013254          JSR      PC,CPYTRR          ;COPY TR79 REGISTERS
1604 016012 012737 002602 002174  MOV      #2602,ETRCR        ;EXPECTED
1605 016020 012737 002201 002176  MOV      #2201,ETRSR        ;EXPECTED
1606 016026 023737 002174 002164  CMP      ETRCR,ATRCR        ;TEST COMMAND REGISTER
1607 016034 001401          BEQ      60$                ;OK
1608 016036 005202          INC      R2                 ;INDICATE ERROR
1609 016040
1610 016040 023737 002176 002166 60$:    CMP      ETRSR,ATRSR        ;TEST THE STATUS REGISTER
1611 016046 001401          BEQ      70$                ;OK
1612 016050 005202          INC      R2                 ;INDICATE ERROR
1613 016052
1614 016052 005737 002170          70$:    TST      ATRWC            ;TEST THE WORD COUNT
1615 016056 001401          BEQ      80$                ;OK
1616 016060 005202          INC      R2                 ;INDICATE ERROR
1617 016062
1618 016062 005702          80$:    TST      R2              ;ANY ERRORS
1619 016064 001415          BEQ      90$                ;NO
1620          000016          ENUM = *D<ENUM + 1>        ;INCREMENT ERROR NUMBER
1621 016066 012737 000003 002154  MOV      #T.ESFT,ERRTYP     ;SPECIFY ERROR TYPE
1622 016074 012737 000016 002156  MOV      #ENUM,ERRNBR       ;ERROR NUMBER
1623 016102 012737 023301 002160  MOV      #MWPETFL,ERRMSG    ;ERROR MESSAGE
1624 016110 012737 020120 002162  MOV      #ERR6,ERRBLK       ;ERROR HANDLER
1625 016116 000261          SEC                          ;SET C = 1
1626 016120 000207          90$:    RTS      PC
1627
1628
1629
1630          :-----:
1631          :SBTTL CHEKAV SUBROUTINE CHECKS REGISTERS AFTER SPACE REVERSE OVER ID BLOCK
          :-----:

```



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## CHEKAV SUBROUTINE CHECKS REGISTERS AFTER SPACE REVERSE OVER ID BLOCK

```

1632
1633 016122 004737 013354      CHEKAV: JSR      PC,RWAIT      ;WAIT
1634 016126 004737 013254      JSR      PC,CPYTRR      ;COPY TR79 REGISTERS
1635 016132 012737 003610 002174  MOV      #3610,ETRCR     ;EXPECTED
1636 016140 012737 002061 002176  MOV      #2061,ETRSR     ;EXPECTED
1637 016146 013737 002214 002200  MOV      USEB,ETRCR     ;EXPECTED
1638 016154 023737 002174 002164  CMP      ETRCR,ATRCR    ;TEST COMMAND REGISTER
1639 016162 001401      BEQ      10$           ;OK
1640 016164 005202      INC      R2           ;INDICATE ERROR
1641 016166
1642 016166 023737 002176 002166 10$:    CMP      ETRSR,ATRSR    ;TEST THE STATUS REGISTER
1643 016174 001401      BEQ      20$           ;OK
1644 016176 005202      INC      R2           ;INDICATE ERROR
1645 016200
1646 016200 005737 002172      20$:    TST      ATRBA         ;TEST BUFFER ADDRESS
1647 016204 001401      BEQ      30$           ;OK
1648 016206 005202      INC      R2           ;INDICATE ERROR
1649 016210
1650 016210 023737 002200 002170 30$:    CMP      ETRWC,ATRWC    ;TEST THE WORD COUNT
1651 016216 001401      BEQ      40$           ;OK
1652 016220 005202      INC      R2           ;INDICATE ERROR
1653 016222
1654 016222 005702      40$:    TST      R2           ;ANY ERRORS?
1655 016224 001415      BEQ      50$           ;NO
1656 016226 000017      ENUM = ^D<ENUM + 1>    ;INCREMENT ERROR NUMBER
1657 016226 012737 000003 002154  MOV      #T.ESFT,ERRTYP ;SPECIFY SOFT ERROR
1658 016234 012737 000017 002156  MOV      #ENUM,ERRNBR   ;SPECIFY ERROR NUMBER
1659 016242 012737 023620 002160  MOV      #MSRIFL,ERRMSG ;SPECIFY ERROR MESSAGE
1660 016250 012737 020102 002162  MOV      #ERR5,ERRBLK   ;SPECIFY ERROR HANDLER
1661 016256 000261      SEC           ;SET C = 1
1662 016260 000207      50$:    RTS      PC         ;RETURN
1663
1664
1665
1666
-----*
:SBTTL CHEKAW SUBROUTINE CHECKS REGISTERS AFTER READING AN ID BLOCK
:-----*
```

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## CHEKAW SUBROUTINE CHECKS REGISTERS AFTER READING AN ID BLOCK

```

1667
1668 016262 004737 013354 CHEKAW: JSR PC,RWAIT ;WAIT
1669 016266 004737 013254 JSR PC,CPYTRR ;COPY TR79 REGISTERS
1670 016272 012737 002204 002174 MOV #2204,ETRCR ;EXPECTED
1671 016300 012737 002021 002176 MOV #2021,ETRSR ;EXPECTED
1672 016306 012737 006322 002202 MOV #INPUT,ETRBA ;EXPECTED
1673 016314 013737 002214 002200 MOV USEB,ETRCR ;EXPECTED
1674 016322 023737 002174 002164 CMP ETRCR,ATRCR ;TEST COMMAND REGISTER
1675 016330 001401 BEQ 10$ ;OK
1676 016332 005202 INC R2 ;INDICATE ERROR
1677 016334
1678 016334 023737 002176 002166 10$: CMP ETRSR,ATRSR ;TEST THE STATUS REGISTER
1679 016342 001401 BEQ 20$ ;OK
1680 016344 005202 INC R2 ;INDICATE ERROR
1681 016346
1682 016346 023737 002202 002172 20$: CMP ETRBA,ATRBA ;TEST BUFFER ADDRESS
1683 016354 001401 BEQ 30$ ;OK
1684 016356 005202 INC R2 ;INDICATE ERROR
1685 016360
1686 016360 023737 002200 002170 30$: CMP ETRWC,ATRWC ;TEST THE WORD COUNT
1687 016366 001401 BEQ 40$ ;OK
1688 016370 005202 INC R2 ;INDICATE ERROR
1689 016372
1690 016372 005037 002206 40$: CLR EINPUT ;CLEAR WORD FOR EXPECTED VALUE
1691 016376 005037 002204 CLR AINPUT ;CLEAR WORD FOR ACTUAL VALUE
1692 016402 005737 006322 TST INPUT ;TEST INPUT AREA
1693 016406 001404 BEQ 50$ ;OK
1694 016410 013737 006322 002204 MOV INPUT,AINPUT ;ACTUAL
1695 016416 005202 INC R2 ;INDICATE ERROR
1696 016420
1697 016420 005702 50$: TST R2 ;ANY ERRORS?
1698 016422 001415 BEQ 60$ ;NO
1699 000020 ENUM = ^D<ENUM + 1> ;INCREMENT ERROR NUMBER
1700 016424 012737 000003 002154 MOV #T,ESFT,ERRTYP ;SPECIFY SOFT ERROR
1701 016432 012737 000020 002156 MOV #ENUM,ERRNBR ;SPECIFY ERROR NUMBER
1702 016440 012737 023654 002160 MOV #MRIBFL,ERRMSG ;SPECIFY ERROR MESSAGE
1703 016446 012737 020244 002162 MOV #ERR15,ERRBLK ;SPECIFY ERROR HANDLER
1704 016454 000261 SEC ;SET C = 1
1705 016456 000207 60$: RTS PC ;RETURN
1706
1707
1708 -----
1709 ;SBTTL CHEKAX SUBROUTINE CHECKS REGISTERS AFTER WRITE DATA WITH EVEN PARITY
1710 ;-----

```

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## CHEKAX SUBROUTINE CHECKS REGISTERS AFTER WRITE DATA WITH EVEN PARITY

```

1711
1712 016460 004737 013354 CHEKAX: JSR PC,RWAIT ;WAIT
1713 016464 004737 013254 JSR PC,CPYTRR ;COPY TR79 REGISTERS
1714 016470 012737 102602 002174 MOV #102602,ETRCR ;EXPECTED
1715 016476 012737 162001 002176 MOV #162001,ETRSR ;EXPECTED
1716 016504 023737 002174 002164 CMP ETRCR,ATRCR ;TEST COMMAND REGISTER
1717 016512 001401 BEQ 10$ ;OK
1718 016514 005202 INC R2 ;INDICATE ERROR
1719 016516 10$: CMP ETRSR,ATRSR ;TEST THE STATUS REGISTER
1720 016516 023737 002176 002166 BEQ 20$ ;OK
1721 016524 001401 INC R2 ;INDICATE ERROR
1722 016526 005202 20$: MOV USEB,R1 ;GET WORD COUNT
1723 016530 013701 002214 COM R1 ;FIX IT
1724 016530 013701 002214 INC R1 ;INCREMENT IT
1725 016534 005101 ASL R1 ;DOUBLE IT
1726 016536 005201 ADD #BADOUT,R1 ;FINISH IT
1727 016540 006301 MOV R1,ETRBA ;EXPECTED
1728 016542 062701 002256 CMP R1,ATRBA ;TEST BUFFER ADDRESS
1729 016546 010137 002202 BEQ 30$ ;OK
1730 016552 020137 002172 INC R2 ;INDICATE ERROR
1731 016556 001401 30$: TST ATRWC ;TEST THE WORD COUNT
1732 016560 005202 BEQ 40$ ;OK
1733 016562 005737 002170 INC R2 ;INDICATE ERROR
1734 016562 005737 002170 40$: TST R2 ;ANY ERRORS?
1735 016566 001401 BEQ 50$ ;NO
1736 016570 005202 ENUM = ^D<ENUM + 1> ;INCREMENT ERROR NUMBER
1737 016572 005702 MOV #T.ESFT,ERRTYP ;SPECIFY SOFT ERROR
1738 016574 001415 MOV #ENUM,ERRNBR ;SPECIFY ERROR NUMBER
1739 016574 000021 MOV #MPARFL,ERRMSG ;SPECIFY ERROR MESSAGE
1740 016576 012737 000003 002154 MOV #ERR5,ERRBLK ;SPECIFY ERROR HANDLER
1741 016604 012737 000021 002156 SEC ;SET C = 1
1742 016612 012737 023674 002160 50$: JSR PC,CPWR ;RESET TR79
1743 016620 012737 020102 002162 RTS PC ;RETURN
1744 016626 000261
1745 016630 004737 013324
1746 016634 000207
1747
1748
1749
1750
1751
1752

```

```

-----
:SBTTL CHEKAY SUBROUTINE CHECKS REGISTERS AFTERREVERSE OVER EVEN PARITY DATA
-----

```



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## CHEKAY SUBROUTINE CHECKS REGISTERS AFTER REVERSE OVER EVEN PARITY DATA

```

1753
1754 016636 004737 013354          CHEKAY: JSR      PC,RWAIT          ;WAIT
1755 016642 004737 013254          JSR      PC,CPYTRR         ;COPY TR79 REGISTERS
1756 016646 012737 103610 002174  MOV      #103610,ETRCR     ;EXPECTED
1757 016654 012737 122001 002176  MOV      #122001,ETRSR     ;EXPECTED
1758 016662 012737 177700 002200  MOV      #177700,ETRWC     ;EXPECTED
1759 016670 023737 002174 002164  CMP      ETRCR,ATRCR       ;TEST COMMAND REGISTER
1760 016676 001401          BEQ      10$              ;OK
1761 016700 005202          INC      R2              ;INDICATE ERROR
1762 016702
1763 016702 023737 002176 002166 10$:    CMP      ETRSR,ATRSR       ;TEST THE STATUS REGISTER
1764 016710 001401          BEQ      20$              ;OK
1765 016712 005202          INC      R2              ;INDICATE ERROR
1766 016714
1767 016714 005737 002172          20$:    TST      ATRBA           ;TEST BUFFER ADDRESS
1768 016720 001401          BEQ      30$,            ;OK
1769 016722 005202          INC      R2              ;INDICATE ERROR
1770 016724
1771 016724 023737 002200 002170 30$:    CMP      ETRWC,ATRWC       ;TEST THE WORD COUNT
1772 016732 001401          BEQ      40$              ;OK
1773 016734 005202          INC      R2              ;INDICATE ERROR
1774 016736
1775 016736 005702          40$:    TST      R2              ;ANY ERRORS?
1776 016740 001415          BEQ      50$              ;NO
1777 000022          ENUM = ^D<ENUM + 1>     ;INCREMENT ERROR NUMBER
1778 016742 012737 000003 002154  MOV      #T.ESFT,ERRTYP    ;SPECIFY SOFT ERROR
1779 016750 012737 000022 002156  MOV      #ENUM,ERRNBR      ;SPECIFY ERROR NUMBER
1780 016756 012737 023712 002160  MOV      #MEPSRFL,ERRMSG   ;SPECIFY ERROR MESSAGE
1781 016764 012737 020102 002162  MOV      #ERR5,ERRBLK     ;SPECIFY ERROR HANDLER
1782 016772 000261          SEC                      ;SET C = 1
1783 016774 004737 013324          50$:    JSR      PC,CPWR         ;RESET TR79
1784 017000 000207          RTS      PC              ;RETURN
1785
1786
1787
1788

```

```

.SBTTL CHEKAZ SUBROUTINE CHECK REGISTERS AFTER READING EVEN PARITY DATA
;-----

```



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## CHEKAZ SUBROUTINE CHECK REGISTERS AFTER READING EVEN PARITY DATA

```

1789
1790 017002
1791 017002 004737 013354
1792 017006 004737 013254
1793 017012 012737 102204 002174
1794 017020 012737 163001 002176
1795 017026 012737 006324 002202
1796 017034 012737 177701 002200
1797 017042 023737 002174 002164
1798 017050 001401
1799 017052 005202
1800 017054
1801 017054 023737 002176 002166
1802 017062 001401
1803 017064 005202
1804 017066
1805 017066 023737 002202 002172
1806 017074 001401
1807 017076 005202
1808 017100
1809 017100 023737 002200 002170
1810 017106 001401
1811 017110 005202
1812 017112
1813 017112 005702
1814 017114 001415
1815 000023
1816 017116 012737 000003 002154
1817 017124 012737 000023 002156
1818 017132 012737 023746 002160
1819 017140 012737 020102 002162
1820 017146 000261
1821 017150 004737 013324
1822 017154 000207
1823
1824
1825
1826

```

```

CHEKAZ:
      JSR      PC,RWAIT          ;WAIT
      JSR      PC,CPYTRR        ;COPY TR79 REGISTERS
      MOV      #102204,ETRCR     ;EXPECTED
      MOV      #163001,ETRSR     ;EXPECTED
      MOV      #INPUT+2,ETRBA    ;EXPECTED
      MOV      #177701,ETRWC     ;EXPECTED
      CMP      ETRCR,ATRCR       ;TEST COMMAND REGISTER
      BEQ      10$              ;OK
      INC      R2                ;INDICATE ERROR
10$:
      CMP      ETRSR,ATRSR       ;TEST THE STATUS REGISTER
      BEQ      20$              ;OK
      INC      R2                ;INDICATE ERROR
20$:
      CMP      ETRBA,ATRBA       ;TEST BUFFER ADDRESS
      BEQ      30$              ;OK
      INC      R2                ;INDICATE ERROR
30$:
      CMP      ETRWC,ATRWC       ;TEST THE WORD COUNT
      BEQ      40$              ;OK
      INC      R2                ;INDICATE ERROR
40$:
      TST      R2                ;ANY ERRORS?
      BEQ      50$              ;NO
      MOV      #D<ENUM + 1>      ;INCREMENT ERROR NUMBER
      MOV      #T,ESFT,ERRTYP    ;SPECIFY SOFT ERROR
      MOV      #ENUM,ERRNBR      ;SPECIFY ERROR NUMBER
      MOV      #MREPFL,ERRMSG    ;SPECIFY ERROR MESSAGE
      MOV      #ERR5,ERRBLK      ;SPECIFY ERROR HANDLER
      SEC
      JSR      PC,CPWR           ;SET C = 1
      RTS      PC                ;TR79 POWER CLEAR
                                  ;RETURN

```

```

.SBTTL CHEKCX SUBROUTINE CHECKS TR79 REGISTERS AFTER WRITE
;-----*

```

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CHEKCX SUBROUTINE CHECKS TR79 REGISTERS AFTER WRITE

```

1827
1828
1829 017156 004737 013354          CHEKCX: JSR      PC,RWAIT      ;WAIT
1830 017162 004737 013254          JSR      PC,CPYTRR     ;COPY TR79 REGISTERS
1831 017166 012737 002602 002174  MOV      #2602,ETRCR   ;EXPECTED
1832 017174 012737 002001 002176  MOV      #2001,ETRSR   ;EXPECTED
1833 017202 023737 002174 002164  CMP      ETRCR,ATRCR   ;TEST COMMAND REGISTER
1834 017210 001401          BEQ      10$          ;OK
1835 017212 005202          INC      R2          ;INDICATE ERROR
1836 017214
1837 017214 023737 002176 002166 10$:    CMP      ETRSR,ATRSR   ;TEST THE STATUS REGISTER
1838 017222 001401          BEQ      20$          ;OK
1839 017224 005202          INC      R2          ;INDICATE ERROR
1840 017226
1841 017226 005737 002170 20$:    TST      ATRWC        ;TEST WORD COUNT
1842 017232 001401          BEQ      30$          ;OK
1843 017234 005202          INC      R2          ;INDICATE ERROR
1844 017236
1845 017236 005702 30$:    TST      R2          ;ANY ERRORS?
1846 017240 001415          BEQ      40$          ;NO
1847 017242 000024          ENUM = ^D<ENUM + 1> ;INCREMENT ERROR NUMBER
1848 017242 012737 000003 002154  MOV      #T,ESFT,ERRTYP ;SPECIFY SOFT ERROR
1849 017250 012737 000024 002156  MOV      #ENUM,ERRNBR  ;SPECIFY ERROR NUMBER
1850 017256 012737 021755 002160  MOV      #MWRTFL,ERRMSG ;SPECIFY ERROR MESSAGE
1851 017264 012737 020120 002162  MOV      #ERR6,ERRBLK  ;SPECIFY ERROR HANDLER
1852 017272 000261          SEC
1853 017274 000207 40$:    RTS      PC          ;SET C = 1
1854                                     ;RETURN
1855
1856
1857

```

.SBTTL CHEKDX SUBROUTINE CHECKS TR79 REGISTERS AFTER READ

;-----\*

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## CHEKDX SUBROUTINE CHECKS TR79 REGISTERS AFTER READ

```

1858
1859 017276 004737 013354      CHEKDX: JSR      PC,RWWAIT      ;WAIT
1860 017302 004737 013254      JSR      PC,CPYTRR      ;COPY TR79 REGISTERS
1861 017306 012737 002204 002174  MOV      #2204,ETRCR    ;EXPECTED
1862 017314 012737 002001 002176  MOV      #2001,ETRSR    ;EXPECTED
1863 017322 023737 002174 002164  CMP      ETRCR,ATRCR    ;TEST COMMAND REGISTER
1864 017330 001401      BEQ      10$           ;OK
1865 017332 005202      INC      R2           ;INDICATE ERROR
1866 017334      10$:
1867 017334 023737 002176 002166  CMP      ETRSR,ATRSR    ;TEST THE STATUS REGISTER
1868 017342 001401      BEQ      20$           ;OK
1869 017344 005202      INC      R2           ;INDICATE ERROR
1870 017346      20$:
1871 017346 005737 002170      TST      ATRWC         ;TEST WORD COUNT
1872 017352 001401      BEQ      30$           ;OK
1873 017354 005202      INC      R2           ;INDICATE ERROR
1874 017356      30$:
1875 017356 005702      TST      R2           ;ANY ERRORS?
1876 017360 001415      BEQ      40$           ;NO
1877      000025      ENUM = ^D<ENUM + 1> ;INCREMENT ERROR NUMBER
1878 017362 012737 000003 002154  MOV      #T.ESFT,ERRTYP ;SPECIFY SOFT ERROR
1879 017370 012737 000025 002156  MOV      #ENUM,ERRNBR  ;SPECIFY ERROR NUMBER
1880 017376 012737 021765 002160  MOV      #MRDFL,ERRMSG ;SPECIFY ERROR MESSAGE
1881 017404 012737 020120 002162  MOV      #ERR6,ERRBLK  ;SPECIFY ERROR HANDLER
1882 017412 000261      SEC           ;SET C = 1
1883 017414 000207      40$: RTS      PC      ;RETURN
1884
1885
1886      .SBTTL  CHEKEX SUBROUTINE CHECKS TR79 REGISTERS AFTER SPACE REVERSE
1887      ;-----

```

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## CHEKEX SUBROUTINE CHECKS TR79 REGISTERS AFTER SPACE REVERSE

```

1888
1889
1890 017416 004737 013354          CHEKEX: JSR      PC,RWAIT          ;WAIT
1891 017422 004737 013254          JSR      PC,CPYTRR          ;COPI TR79 REGISTERS
1892 017426 012737 003610 002174  MOV      #3610,ETRCR        ;EXPECTED
1893 017434 012737 002001 002176  MOV      #2001,ETRSR        ;EXPECTED
1894 017442 013737 002214 002200  MOV      USEB,ETRWC         ;EXPECTED
1895 017450 023737 002174 002164  CMP      ETRCR,ATRCR        ;TEST COMMAND REGISTER
1896 017456 001401          BEQ      10$                ;OK
1897 017460 005202          INC      R2                  ;INDICATED
1898 017462
1899 017462 023737 002176 002166 10$:    CMP      ETRSR,ATRSR        ;TEST THE STATUS REGISTER
1900 017470 001401          BEQ      20$                ;OK
1901 017472 005202          INC      R2                  ;INDICATE ERROR
1902 017474
1903 017474 023737 002200 002170 20$:    CMP      ETRWC,ATRWC        ;TEST WORD COUNT
1904 017502 001401          BEQ      30$                ;OK
1905 017504 005202          INC      R2                  ;INDICATE ERROR
1906 017506
1907 017506 005702          30$:    TST      R2                  ;ANY ERRORS?
1908 017510 001415          BEQ      40$                ;NO
1909          000026          ENUM = ^D<ENUM + 1>        ;INCREMENT ERROR NUMBER
1910 017512 012737 000003 002154  MOV      #T.ESFT,ERRTYP     ;SPECIFY SOFT ERROR
1911 017520 012737 000026 002156  MOV      #ENUM,ERRNBR       ;SPECIFY ERROR NUMBER
1912 017526 012737 021774 002160  MOV      #MSRVFL,ERRMSG     ;SPECIFY ERROR MESSAGE
1913 017534 012737 020120 002162  MOV      #ERR6,ERRBLK       ;SPECIFY ERROR HANDLER
1914 017542 000261          SEC                          ;SET C = 1
1915 017544 000207          40$:    RTS      PC              ;RETURN
1916
1917
1918
1919
1920
-----
:SBTTL CHEKFX GLOBAL SUBROUTINE --TEST TR79 REGISTERS AFTER ERASE--
-----

```



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CHEKFX GLOBAL SUBROUTINE --TEST TR79 REGISTERS AFTER ERASE--

```

1921
1922 017546 004737 013354      CHEKFX: JSR      PC,RWWAIT      ;WAIT
1923 017552 004737 013254      JSR      PC,CPYTRR      ;COPY TR79 REGISTERS,CLEAR EXPECTED RESULT
1924 017556 012737 002216 002174  MOV      #2216,ETRCR     ;SPECIFY EXPECTED RESULT
1925 017564 012737 002001 002176  MOV      #2001,ETRSR     ;SPECIFY EXPECTED RESULT
1926 017572 023737 002174 002164  CMP      ETRCR,ATRCR     ;TEST COMMAND REGISTER
1927 017600 001401      BEQ      10$            ;OK
1928 017602 005202      INC      R2            ;INDICATE ERROR
1929 017604
1930 017604 023737 002176 002166 10$:    CMP      ETRSR,ATRSR     ;TEST THE STATUS REGISTER
1931 017612 001401      BEQ      20$            ;OK
1932 017614 005202      INC      R2            ;INDICATE ERROR
1933 017616
1934 017616 013701 002214      20$:    MOV      USEB,R1        ;GET WORD COUNT
1935 017622 005101      COM      R1            ;FIX IT
1936 017624 005201      INC      R1
1937 017626 006301      ASL      R1            ;DOUBLE IT
1938 017630 062701 002262      ADD      #OUTPUT,R1     ;COMPUTE BUS ADDRESS
1939 017634 010137 002202      MOV      R1,ETRBA       ;SPECIFY EXPECTED RESULT
1940 017640 020137 002172      CMP      R1,ATRBA       ;TEST BUFFER ADDRESS
1941 017644 001401      BEQ      30$            ;OK
1942 017646 005202      INC      R2            ;INDICATE ERROR
1943 017650
1944 017650 005737 002170      30$:    TST      ATRWC          ;TEST THE WORD COUNT
1945 017654 001401      BEQ      40$            ;OK
1946 017656 005202      INC      R2            ;INDICATE ERROR
1947 017660
1948 017660 005702      40$:    TST      R2            ;ANY ERRORS?
1949 017662 001415      BEQ      50$            ;NO
1950 017664 000027      ENUM = ^D<ENUM + 1>    ;INCREMENT ERROR NUMBER
1951 017664 012737 000003 002154  MOV      #T,ESFT,ERRTYP ;SPECIFY SOFT ERROR
1952 017672 012737 000027 002156  MOV      #ENUM,ERRNBR   ;SPECIFY ERROR NUMBER
1953 017700 012737 022014 002160  MOV      #MERFL,ERRMSG  ;SPECIFY ERROR MESSAGE
1954 017706 012737 020102 002162  MOV      #ERR5,ERRBLK   ;SPECIFY ERROR HANDLER
1955 017714 000261      SEC
1956 017716 000207      50$:    RTS      PC          ;SET C = 1
1957
1958
1959
1960
1961
1962
1963
:SBTTL INTIN-----GLOBAL SUBROUTINE==TR79 INTERRUPT HANDLER==
:-----

```

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INTIN GLOBAL SUBROUTINE--TR79 INTERRUPT HANDLER--

```

1964
1965
1966
1967
1968
1969
1970
1971
1972
1973
1974
1975
1976
1977
1978
1979
1980
1981
1982

```

```

:*****
: CLEAR TR79 INTERRUPT ENABLE BIT
: CLEAR TR79 INTERRUPT INDICATOR (INTFLG)
:*****

```

```

017720
017720
042777 000100 162314
017726 005037 002240
017732 000240
017734
017734
017734 000002

```

```

BGNSRV INTIN
INTIN:: BIC #100,@TRCR ;DISABLE INTERRUPT
CLR INTFLG ;CLEAR THE FLAG
NOP
ENDSRV
L10002: RTI

```

```

:-----
:SBTTL ERRORS GLOBAL ERROR REPORTS
:-----

```

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## ERRORS GLOBAL ERROR REPORTS

```

1983
1984
1985
1986
1987
1988
1989
1990
1991
1992
1993
1994 017736
1995 017736
1996 017736 004737 020432
1997 017742
1998 017742
1999 017742 104423
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010 017744
2011 017744
2012 017744 004737 013446
2013 017750 000401
2014 017752
2015 017752
2016 017752 104423
2017
2018
2019
2020
2021
2022
2023
2024
2025 017754
2026 017754
2027 017754
2028 017754 004737 014166
2029 017760 103012
2030 017762
2031 017762 012746 021140
2032 017766 012746 020473
2033 017772 012746 000002
2034 017776 010600
2035 020000 104414
2036 020002 062706 000006
2037 020006 004737 013354
2038 020012 004737 013324

```

```

:////////////////////
:/ THE GLOBAL ERROR REPORT SECTION CONTAINS ERROR MESSAGES
:/ THAT ARE USED IN MORE THAN ONE TEST.
:////////////////////
.EVEN

:-----
:SBTTL ERROR HANDLER --ERR1 -- 'NO NOTHING' HANDLER
:-----
BGNMSG ERR1
ERR1::
ER1: JSR PC,NULERR ;USE COMMON ROUTINE TO TERMINATE ERROR MESSAGE
ENDMSG
L10003:
TRAP C$MSG

:-----
: .SBTTL ERROR HANDLER --ERR2 -- INSTALL WRITE ENABLE RING
:-----

: IF WRITE ENABLE RING IS PRESENT THEN EXIT
: ASK OPERATOR TO INSTALL RING
: WHILE RING NOT PRESENT KEEP CHECKING
: IF RING IS PRESENT THEN EXIT

BGNMSG ERR2
ERR2::
ER2: JSR PC,TESTC ;MAKE SURE RING IS INSTALLED
BR ER3 ;MAKE SURE ON LINE AND READY
ENDMSG
L10004:
TRAP C$MSG

:-----
:SBTTL ERROR HANDLER --ERR3 -- TR79 NOT ON LINE OR NOT READY
:-----

BGNMSG ERR3
ERR3::
ER3:
10$: JSR PC,TESTNN ;MAKE SURE ON LINE
BCC 20$ ;OK. ON LINE WITH NO ERROR
PRINTB #FMTTXT,#M2A1 ; ELSE SEND ERROR MESSAGE
MOV #M2A1,-(SP)
MOV #FMTTXT,-(SP)
MOV #2,-(SP)
MOV SP,R0
TRAP C$PNTB
ADD #6,SP
20$: JSR PC,RWAIT ;WAIT A BIT
JSR PC,CPWR ;RESET TR79

```



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ERROR HANDLER --ERR3 -- TR79 NOT ON LINE OR NOT READY

```

2039
2040 020016 004737 014114
2041 020022 103015
2042 020024
2043 020024 012746 021040
2044 020030 012746 020473
2045 020034 012746 000002
2046 020040 010600
2047 020042 104414
2048 020044 062706 000006
2049 020050 004737 013442
2050 020054 000737
2051 020056
2052 020056 004737 020432
2053 020062
2054 020062
2055 020062 104423
2056
2057
2058
2059
2060

;TEST READY
JSR PC,TSTRDY ;TEST READY BITS
BCC 30$ ;READY. RETURN
PRINTB #FMTTXT,#EM2A ;PRINT ERROR MESSAGE
MOV #EM2A,-(SP)
MOV #FMTTXT,-(SP)
MOV #2,-(SP)
MOV SP,R0
TRAP C$PNTB
ADD #6,SP
JSR PC,CHKBRK ;CHECK FOR OPERATOR INTERRUPT
BR 10$ ;REPEAT TEST ON LINE AND READY

30$: JSR PC,NULERR ;TERMINATE ERROR MESSAGE
ENDMSG

L10005: TRAP C$MSG

-----
:SBTTL ERROR HANDLER --ERR4-- PRINT COMMAND AND STATUS RESULTS
:-----

```

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ERROR HANDLER --ERR4-- PRINT COMMAND AND STATUS RESULTS

;PRINT TRCR AND TRSR RESULTS

2061  
2062  
2063 020064  
2064 020064  
2065 020064 012702 000004  
2066 020070 004737 020324  
2067 020074 004737 020432  
2068 020100  
2069 020100  
2070 020100 104423

ERR4:: BGNMSG ERR4  
MOV #4,R2 ;SPECIFY REGISTER COUNT = 2 FOR PRINT  
JSR PC,PRTREG ;PRINT RESULTS  
JSR PC,NULERR ;TERMINATE ERROR MESSAGE  
ENDMSG  
L10006: TRAP C\$MSG

```
-----
:SBTTL ERROR HANDLER --ERR5-- PRINT TR79 REGISTER RESULTS
:-----
```

;PRINT TRCR,TRSR,TRWC,TRBA RESULTS

2071  
2072  
2073  
2074  
2075  
2076  
2077  
2078 020102  
2079 020102  
2080 020102 012702 000010  
2081 020106 004737 020324  
2082 020112 004737 020432  
2083 020116  
2084 020116  
2085 020116 104423

ERR5:: BGNMSG ERR5  
MOV #10,R2 ;SPECIFY REGISTER COUNT = 4 FOR PRINT  
JSR PC,PRTREG ;PRINT RESULTS  
JSR PC,NULERR ;TERMINATE ERROR MESSAGE  
ENDMSG  
L10007: TRAP C\$MSG

```
-----
:SBTTL ERROR HANDLER --ERR6-- PRINT TR79 REGISTER RESULTS
:-----
```

;PRINT TRCR,TRSR,TRWC, RESULTS

2086  
2087  
2088  
2089  
2090  
2091  
2092  
2093 020120  
2094 020120  
2095 020120 012702 000006  
2096 020124 004737 020324  
2097 020130 004737 020432  
2098 020134  
2099 020134  
2100 020134 104423

ERR6:: BGNMSG ERR6  
MOV #6,R2 ;SPECIFY REGISTER COUNT = 3 FOR PRINT  
JSR PC,PRTREG ;PRINT RESULTS  
JSR PC,NULERR ;TERMINATE ERROR MESSAGE  
ENDMSG  
L10010: TRAP C\$MSG

```
-----
:SBTTL ERROR HANDLER --ERR11-- FAILED TO LOAD VALUE INTO BUS ADDRESS REGISTER
:-----
```

2101  
2102  
2103  
2104  
2105  
2106

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ERROR HANDLER --ERR11-- FAILED TO LOAD VALUE INTO BUS ADDRESS REGISTER

2107 020136  
 2108 020136  
 2109 020136 004737 020346  
 2110 020142 012701 000006  
 2111 020146 004737 020370  
 2112 020152 004737 020432  
 2113 020156  
 2114 020156  
 2115 020156 104423  
 2116  
 2117  
 2118  
 2119  
 2120  
 2121 020160  
 2122 020160  
 2123 020160 004737 020346  
 2124 020164 012701 000004  
 2125 020170 004737 020370  
 2126 020174 004737 020432  
 2127 020200  
 2128 020200  
 2129 020200 104423  
 2130  
 2131  
 2132  
 2133

BGNMSG ERR11

ERR11::

```

JSR PC,XHDR      ;PRINT EXPECTED RESULT HEADER
MOV #6,R1        ;SPECIFY BUS ADDRESS REGISTER
JSR PC,XPRT      ;PRINT EXPECTED RESULT
JSR PC,NULERR    ;USE COMMON ROUTINE TO TERMINATE ERROR MESSAGE
ENDMSG

```

L10011:

TRAP C\$MSG

```

-----
:SBTTL ERROR HANDLER --ERR12-- FAILED TO LOAD VALUE INTO WORD COUNT REGISTER
:-----

```

BGNMSG ERR12

ERR12::

```

JSR PC,XHDR      ;PRINT EXPECTED RESULT HEADER
MOV #4,R1        ;SPECIFY TRWC REGISTER
JSR PC,XPRT      ;PRINT EXPECTED RESULT
JSR PC,NULERR    ;USE COMMON ROUTINE TO TERMINATE ERROR MESSAGE
ENDMSG

```

L10012:

TRAP C\$MSG

```

-----
:SBTTL ERROR HANDLER --ERR14__ DATA ERROR ON READ
:-----

```



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ERROR HANDLER --ERR14\_\_ DATA ERROR ON READ

2134 020202  
 2135 020202  
 2136 020202  
 2137 020202 013746 002206  
 2138 020206 013746 002204  
 2139 020212 013746 002210  
 2140 020216 012746 020500  
 2141 020222 012746 000004  
 2142 020226 010600  
 2143 020230 104414  
 2144 020232 062706 000012  
 2145 020236 004737 020432  
 2146 020242  
 2147 020242  
 2148 020242 104423  
 2149  
 2150  
 2151  
 2152

```

BGNMSG  ERR14
ERR14::  PRINTB  #FMT31,LINPUT,AINPUT,EINPUT  ;PRINT INPUT AREA RESULT
          MOV    EINPUT,-(SP)
          MOV    AINPUT,-(SP)
          MOV    LINPUT,-(SP)
          MOV    #FMT31,-(SP)
          MOV    #4,-(SP)
          MOV    SP,R0
          TRAP   C$PNTB
          ADD    #12,SP
          JSR   PC,NULERR      ;TERMINATE ERROR MESSAGE
          ENDMSG
L10013:  TRAP   C$MSG
  
```

```

-----
:SBTTL  ERROR HANDLER --ERR15--  ERROR ON READ IDB
:-----
  
```

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ERROR HANDLER --ERR15-- ERROR ON READ IDB

```

2153 020244
2154 020244
2155 020244 012702 000010
2156 020250 004737 020324
2157 020254 012737 006322 002210
2158 020262
2159 020262 013746 002206
2160 020266 013746 002204
2161 020272 013746 002210
2162 020276 012746 020500
2163 020302 012746 000004
2164 020306 010600
2165 020310 104414
2166 020312 062706 000012
2167 020316 004737 020432
2168 020322
2169 020322
2170 020322 104423
2171
2172
2173
2174
2175 020324
2176 020324 004737 020346
2177 020330 005001
2178 020332 004737 020370
2179 020336 005721
2180 020340 020201
2181 020342 101373
2182 020344 000207
2183
2184
2185
2186
2187
2188 020346
2189 020346 012746 020566
2190 020352 012746 000001
2191 020356 010600
2192 020360 104414
2193 020362 062706 000004
2194 020366 000207
2195
2196
2197
2198
2199
2200
2201
2202 020370
2203 020370
2204 020370 016146 002164
2205 020374 016146 002174
2206 020400 016146 002242
2207 020404 016146 020454
2208 020410 012746 020653

```

```

BGNMSG ERR15
ERR15::
MOV #10,R2 ;SPECIFY COUNT TO PRINT 4 REGISTERS
JSR PC,PRTREG ;PRINT REGISTERS
MOV #INPUT,LINPUT ;SPECIFY INPUT LOCATION FOR PRINT
PRINTB #FMT31,LINPUT,AINPUT,EINPUT ;PRINT INPUT AREA RESULT
MOV EINPUT,-(SP)
MOV AINPUT,-(SP)
MOV LINPUT,-(SP)
MOV #FMT31,-(SP)
MOV #4,-(SP)
MOV SP,R0
TRAP C$PNTB
ADD #12,SP
JSR PC,NULERR ;COMMON ERROR MESSAGE TERMINATOR
ENDMSG
L10014:
TRAP C$MSG
-----
.SBTTL PRTREG SUBROUTINE TO PRINT SEVERAL REGISTER RESULTS
-----
PRTREG: ;PRINT SEVERAL TR79 REGISTER RESULTS
JSR PC,XHDR ;PRINT RESULT HEADER
CLR R1 ;CLEAR PRINT INDEX
10$: JSR PC,XPRT ;PRINT RESULT
TST (R1)+ ;INCREMENT PRINT INDEX
CMP R2,R1 ;IF MORE REGISTERS TO PRINT
BHI 10$ ; THEN PRINT NEXT REGISTER
RTS PC
-----
.SBTTL XHDR SUBROUTINE TO PRINT RESULTS HEADER
-----
XHDR: PRINTB #FMT51 ;PRINT RESULTS HEADER
MOV #FMT51,-(SP)
MOV #1,-(SP)
MOV SP,R0
TRAP C$PNTB
ADD #4,SP
RTS PC
-----
.SBTTL XPRT SUBROUTINE TO PRINT ONE REGISTER RESULT
-----
XPRT:
PRINTB #FMT52,TPT52(R1),TRCR(R1),ETRCR(R1),ATRCR(R1)
MOV ATRCR(R1),-(SP)
MOV ETRCR(R1),-(SP)
MOV TRCR(R1),-(SP)
MOV TPT52(R1),-(SP)
MOV #FMT52,-(SP)

```

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XPRT SUBROUTINE TO PRINT ONE REGISTER RESULT

2209 020414 012746 000005  
 2210 020420 010600  
 2211 020422 104414  
 2212 020424 062706 000014  
 2213 020430 000207  
 2214  
 2215  
 2216  
 2217  
 2218  
 2219 020432  
 2220 020432 012746 020464  
 2221 020436 012746 000001  
 2222 020442 010600  
 2223 020444 104414  
 2224 020446 062706 000004  
 2225 020452 000207  
 2226  
 2227

MOV #5,-(SP)  
 MOV SP,R0  
 TRAP C\$PNTB  
 ADD #14,SP  
 RTS PC

-----  
 :SBTTL SUBROUTINE TO PERFORM 'PRINTB #ENDEMB'  
 :-----

NULERR: PRINTB #ENDEMB ;TERMINATE ERROR MESSAGE

MOV #ENDEMB,-(SP)  
 MOV #1,-(SP)  
 MOV SP,R0  
 TRAP C\$PNTB  
 ADD #4,SP  
 RTS PC

-----  
 :SBTTL FORMAT SPEC'S FOR ERROR HANDLERS -- 'FMT\_\_\_'  
 :-----



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FORMAT SPEC'S FOR ERROR HANDLERS -- 'FMT\_---'

```

2228
2229
2230 ;-----TEXT POINTERS USED IN FORMAT SPECS-----
2231
2232 020454 020702 020717 020734 TPT52: .WORD T52A,T52B,T52C,T52D ;POINTERS TO REGISTER NAME TEXT
2233 020462 020751
2234
2235 ;----- FORMAT SPEC'S USED BY ERROR HANDLERS -----
2236
2237
020464 047045 000062 .NLIST BEX
020470 047045 000 ENDEMB: .ASCIZ /%N2/
020473 045 022516 000124 NEWLIN: .ASCIZ /%N/
020500 040445 044440 050116 FMTTXT: .ASCIZ /%N%T/
020566 047045 051445 022464 FMT31: .ASCIZ /%A INPUT AT LOCATION %06%A IS %06%A EXPECTED %06/
020653 045 022516 032123 FMT51: .ASCIZ /%N%S4%AREGISTER%S4%ALOCATION%S4%AEXPECTED%S4%AACTUAL/
020702 047503 046515 047101 FMT52: .ASCIZ /%N%S4%T%06%S6%06%S6%06/
020717 123 040524 052524 T52A: .ASCIZ /COMMAND /
020734 047527 042122 041440 T52B: .ASCIZ /STATUS /
020751 102 051525 040440 T52C: .ASCIZ /WORD COUNT /
T52D: .ASCIZ /BUS ADDRESS /

.SBTTL ERROR MESSAGES

```

## ERROR MESSAGES

```

-----
----- ERROR MESSAGES USED BY ERROR CALL'S -----
-----

```

020766	047516	020124	047117	EM2:	.ASCIZ	/NOT ON LINE/
021002	051127	052111	020105	EM4A:	.ASCIZ	/WRITE ENABLE RING NOT PRESENT/
021040	051124	034467	047040	EM2A:	.ASCIZ	/TR79 NOT READY/
021057	120	040514	042503	M2A:	.ASCIZ	/PLACE UNIT ON LINE AFTER TAPE MOTION HAS STOPPED/
021140	047117	046040	047111	M2A1:	.ASCIZ	/ON LINE ERROR/
021156	051040	053505	047111	MRW:	.ASCIZ	/REWIND ERROR/ ;NOT FROM TEST REWIND AT LOAD POINT
021174	042440	052130	047105	M16SFL:	.ASCIZ	/EXTENSION BIT 16 FAILED TO SET/
021235	040	054105	042524	M16CFL:	.ASCIZ	/EXTENSION BIT 16 FAILED TO CLEAR/
021277	040	054105	042524	M17SFL:	.ASCIZ	/EXTENSION BIT 17 FAILED TO SET/
021337	040	054105	042524	M17CFL:	.ASCIZ	/EXTENSION BIT 17 FAILED TO CLEAR/
021402	054105	042524	051516	MXCFL:	.ASCIZ	/EXTENSION BIT(S) FAILED TO CLEAR/
021443	040	053520	041522	MPWCL:	.ASCIZ	/PWRCLR BIT CLEARED TOO SOON/
021500	050040	051127	046103	MPWST:	.ASCIZ	/PWRCLR BIT NOT CLEAR AFTER 900 MIIILISEC/
021551	040	040506	046111	EM7:	.ASCIZ	/FAILED TO LOAD VALUE INTO WORD COUNT REGISTER/
021630	040506	046111	042105	EM6:	.ASCIZ	/FAILED TO LOAD VALUE INTO BUS ADDRESS REGISTER/
021707	040	051124	034467	MINTFL:	.ASCIZ	/TR79 FAILED TO INTERRUPT/
021741	040	037440	000	MQM:	.ASCIZ	/ ?/
021745	122	051505	052105	MRSTFL:	.ASCIZ	/RESET /
021755	127	044522	042524	MWRTFL:	.ASCIZ	/WRITE /
021765	122	040505	020104	MRDFL:	.ASCIZ	/READ /
021774	050123	041501	020105	MSRVFL:	.ASCIZ	/SPACE REVERSE /
022014	051105	051501	020105	MERFL:	.ASCIZ	/ERASE /
022024	051040	046505	053117	MRMVRG:	.ASCIZ	/REMOVE WRITE ENABLE RING LOAD & PLACE ONLINE /
022103	040	047111	042523	FMTRGI:	.ASCIZ	/INSERT WRITE ENABLE RING LOAD & PLACE ONLINE/
022161	111	052116	051105	MIENFL:	.ASCIZ	/INTERRUPT ENABLE /
022204	047111	042524	051122	MIDSFL:	.ASCIZ	/INTERRUPT DISABLE /
022227	120	053517	051105	MPCFL:	.ASCIZ	/POWER CLEAR /
022245	127	044522	042524	MWIPFL:	.ASCIZ	/WRITE ID BLOCK PAST LOAD POINT /
022306	042522	044527	042116	MRWLPFL:	.ASCIZ	/REWIND FROM LOAD POINT /
022337	111	046114	043505	MILFFL:	.ASCIZ	/ILLEGAL FUNCTION /
022362	051127	052111	020105	MWLPFL:	.ASCIZ	/WRITE FROM LOAD POINT /
022413	127	044522	042524	MWEFFL:	.ASCIZ	/WRITE END OF FILE /
022437	127	044522	042524	MWELPFL:	.ASCIZ	/WRITE END OF FILE FROM LOAD POINT /
022504	051127	052111	020105	MWILPFL:	.ASCIZ	/WRITE ID BLOCK FROM LOAD POINT /
022545	125	044516	020124	MUNOFLN:	.ASCIZ	/UNIT DID NOT GO OFF LINE /
022600	043117	020106	044514	MOFLEFL:	.ASCIZ	/OFF LINE ERROR /
022621	122	053505	047111	MRWOFL:	.ASCIZ	/REWIND OFF LINE /
022643	122	040505	020104	MRDERR:	.ASCIZ	/READ DATA ERROR /
022665	123	040520	042503	MSREFFL:	.ASCIZ	/SPACE REVERSE OVER END OF FILE /
022726	042522	042101	042440	MREFFL:	.ASCIZ	/READ END OF FILE /
022751	127	044522	042524	MWTOFL:	.ASCIZ	/WRITE TIME OUT /
022772	042522	042101	052040	MRTOFL:	.ASCIZ	/READ TIME OUT /
023012	051127	052111	020105	MWNXFL:	.ASCIZ	/WRITE NON-EXISTENT MEMORY /
023046	054105	042524	051516	MNXBFL:	.ASCIZ	/EXTENSION BIT 13 NON EXISTENT MEMORY /
023115	105	020101	044502	MNXMFL:	.ASCIZ	/EA BITS 12 AND 13- NON EXISTENT MEMORY /
023166	042522	042101	041440	MRCFL:	.ASCIZ	/READ COUNT /
023203	105	042116	047440	METFL:	.ASCIZ	/END OF TAPE /
023221	120	051525	020110	MRSTU:	.ASCIZ	/PUSH RESET BUTTON ON TAPE UNIT /
023262	040515	052516	046101	MMRSFL:	.ASCIZ	/MANUAL RESET /
023301	127	044522	042524	MWPETFL:	.ASCIZ	/WRITE PAST END OF TAPE /
023333	123	040520	042503	MSRETFL:	.ASCIZ	/SPACE REVERSE PAST END OF TAPE /
023374	042522	042101	050040	MRPETFL:	.ASCIZ	/READ PAST END OF TAPE /

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## ERROR MESSAGES

023424	051127	052111	020105	MWETF: .ASCIZ	/WRITE END OF FILE PAST END OF TAPE /
023474	042522	042101	042440	MREFET: .ASCIZ	/READ END OF FILE PAST END OF TAPE /
023543	127	044522	042524	MWENFL: .ASCIZ	/WRITE ENABLE /
023562	050123	041501	020105	MSRLPFL: .ASCIZ	/SPACE REVERSE AT LOAD POINT /
023620	050123	041501	020105	MSRIFL: .ASCIZ	/SPACE REVERSE AT ID BLOCK /
023654	042522	042101	044440	MRIBFL: .ASCIZ	/READ ID BLOCK /
023674	053105	047105	050040	MPARFL: .ASCIZ	/EVEN PARITY /
023712	053105	047105	050040	MEPSRFL: .ASCIZ	/EVEN PARITY SPACE REVERSE /
023746	042522	042101	042440	MREPFL: .ASCIZ	/READ EVEN PARITY /
023771	122	053505	047111	MEOT: .ASCIZ	/REWINDING...GOING OFF LINE /

-----  
 .LIST BEX  
 .EVEN

.SBTTL LOAD DEVICE PROTECTION TABLE

2238  
 2239  
 2240

024026



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## LOAD DEVICE PROTECTION TABLE

```
2241 ://////////////////////////////////////////////////////////////////
2242 :// THIS TABLE IDENTIFIES THE LOAD DEVICE TO THE SUPERVISOR, SO THAT IT CAN BE
2243 :// PROTECTED FROM TESTING. IF DESIRED.
2244 ://////////////////////////////////////////////////////////////////
2245
2246
2247 024026      BGNPROT
2248 024026
2249 024026 177777  L$PROT::
2250 024030 177777      .WORD   -1      ;DON'T CHK CSR ADRS
2251 024032 177777      .WORD   -1      ;DON'T CHK VECTOR ADRS
2252 024034      .WORD   -1      ;DON'T CHK PRIORITY LEVEL
2253      ENDPROT
2254 .SBTTL INITIALIZE SECTION
```

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## INITIALIZE SECTION

```

2255 :////////////////////
2256 :// THE INITIALIZE SECTION CONTAINS THE CODING THAT IS PERFORMED
2257 :// AT THE BEGINNING OF THE TEST SEQUENCE ON THE NEXT UNIT.
2258 :////////////////////
2259
2260
2261 024034 BGNINIT
2262 024034 LSINIT::
2263 024034 010637 002236 MOV SP,PSTACK ;SAVE BASE LEVEL STACK POINTER
2264 ;GET TR79 ADDRESS, VECTOR, PRIORITY LEVEL
2265 024040 005037 002234 CLR LOGDEV ;SET LOGICAL DEVICE NUMBER = 0
2266 024044 MOV GPWARD LOGDEV,R1 ;GET P-TABLE POINTER
2267 024044 013700 002234 MOV LOGDEV,R0
2268 024050 104442 TRAP CS$GPHRD
2269 024052 010001 MOV R0,R1
2270 024054 012102 MOV (R1)+,R2 ;GET THE TR79 CSR ADDRESS
2271 024056 010237 002242 MOV R2,TRCR ;COPY COMMAND REGISTER ADDRESS
2272 024062 005722 TST (R2)+ ;GET TR79 STATUS REGISTER ADDRESS
2273 024064 010237 002244 MOV R2,TRSR ;COPY STATUS REGISTER ADDRESS
2274 024070 005722 TST (R2)+ ;GET TR79 WORD COUNT REGISTER ADDRESS
2275 024072 010237 002246 MOV R2,TRWC ;COPY WORD COUNT REGISTER ADDRESS
2276 024076 005722 TST (R2)+ ;GET TR79 BUS ADDRESS REGISTER ADDRESS
2277 024100 010237 002250 MOV R2,TRBA ;COPY BUS ADDRESS REGISTER ADDRESS
2278 024104 012137 002252 MOV (R1)+,TRVCT ;SAVE INTERRUPT VECTOR ADDRESS
2279 024110 012137 002254 MOV (R1)+,TRPRT ;SAVE TR79 DEVICE PRIORITY
2280 024114 SETPRI PRI07 ;SET PRIORITY TO INHIBIT TR79 INTERRUPTS
2281 024114 013700 000340 MOV PRI07,R0
2282 024120 104441 TRAP CSSPRI
2283 024122 042777 000100 156112 BIC #BIT6,@TRCR ;CLEAR TR79 INERRUPT ENABLE BIT
2284 024130 005037 002240 CLR INTFLG ;CLEAR TR79 INTERRUPT FLAG
2285 024134 SETVEC TRVCT,#INTIN,TRPRT ;SET UP TR79 VECTOR
2286 024134 013746 002254 MOV TRPRT,-(SP)
2287 024140 012746 017720 MOV #INTIN,-(SP)
2288 024144 013746 002252 MOV TRVCT,-(SP)
2289 024150 012746 000003 MOV #3,-(SP)
2290 024154 104437 TRAP CSSVEC
2291 024156 062706 000010 ADD #10,SP
2292 024162 005737 002152 TST RPTCNT ;IS TEST4 REPEAT COUNT = 0
2293 024166 001003 BNE ENDIN ;NO. EXIT INIT
2294 024170 012737 177777 002152 MOV #-1,RPTCNT ;YES. SET REPEAT COUNT = -1
2295 024176 ENDIN: ENDINIT ;END OF "INIT" CODE
2296 024176 L10016:
2297 024176 104411 TRAP CS$INIT
2298
2299
2300 .SBTTL AUTO DROP UNIT SECTION

```

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AUTO DROP UNIT SECTION

```

2301 :////////////////////
2302 :// THE AUTO DROP CODING DETERMINES WHETHER OR NOT THE DEVICE WHOSE P-TABLE
2303 :// WAS JUST OBTAINED IS READY FOR TESTING, AND IT IS DROPPED IF NOT READY.
2304 :////////////////////
2305
2306

```

```

2307 024200          BGNAUTO
2308 024200 LSAUTO::
2309 024200          ENDAUTO
2310 024200 L10017:
2311 024200 104461 TRAP   C$AUTO
2312

```

.SBTTL CLEANUP CODING SECTION

```

2313 :////////////////////
2314 :// THE CLEANUP CODING SECTION CONTAINS THE CODING THAT IS PERFORMED
2315 :// AT THE END OF THE TEST SEQUENCE ON A PARTICULAR UNIT.
2316 :////////////////////
2317
2318
2319

```

```

2320 024202          BGNCLN
2321 024202 LSCLEAN::
2322 024202          ENDCLN
2323 024202 L10020:
2324 024202 104412 TRAP   C$CLEAN
2325
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```

.SBTTL TEST1 NULL TEST



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TEST1 NULL TEST

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024204  
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024204 104401

////////////////////////////////////  
:TEST1 THIS IS A NULL TEST INCLUDED TO PRESERVE THE TEST NUMBERING  
: USED IN CZTRAB. MANUAL INTERVENTION TESTS ARE INCLUDED IN TEST6  
:////////////////////////////////////

T1:: BGNTST  
          ENDTST  
L10021: TRAP C\$ETST

.SBTTL TEST2 CHECK CONTROL LOGIC WITH MINIMUM TAPE MOTION

TEST2 CHECK CONTROL LOGIC WITH MINIMUM TAPE MOTION

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024206  
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024206 042777 000100 156026  
024214  
024214 004737 013324  
024220 004737 014066  
024224 103001  
024226 104460  
024230  
024230 032777 000040 156006  
024236 001010  
024240 004737 013324  
024244 004737 012416  
024250 004737 013534  
024254 103001  
024256 104460  
024260  
024260 004737 014066  
024264 103001  
024266 104460  
024270  
024270 004737 013324  
024274 004737 012416  
024300 004737 013254  
024304 012737 003220 002174  
024312 012737 002040 002176  
024320 023737 002174 002164  
024326 001401

```

////////////////////////////////////
TEST2 CHECKS THE INTERFACE LOGIC WITH MINIMUM TAPE MOTION
TEST2 INCLUDES:
TEST NAME IN CZTRAB
REWIND FROM LOAD POINT TESTI
INSURE WRITE RING TESTC
UNIBUS EXTENSION BIT TEST TESTD
INTERRUPT BIT SET TEST TESTE
INTERRUPT BIT CLEAR TEST TESTF
ILLEGAL COMMAND TEST TESTJ
WRITE FROM LOAD POINT TESTK
WRITE EOF FROM LOAD POINT TESTM
TEST TR79 POWER CLEAR TESTG
SPACE REVERSE AT LOAD POINT TESTAT
NXM TEST TESTAB
BUS ADDRESS BIT TEST TESTAU
WORD COUNT BIT TEST TESTBA
////////////////////////////////////

```

```

BGNTST
T2::
TEST2: BIC #BIT6,@TRCR ;NEGATE INTERRUPT ENABLE
;CLEAR TR79 INTERRUPT ENABLE BIT
T2I: JSR PC,CPWR ;TEST REWIND AT LOAD POINT
;RESET TR79
JSR PC,TESTN ;MAKE SURE TRANSPORT ON LINE AND READY
BCC 10$ ;NO ERROR
ERROR ;REPORT ERROR
TRAP C$ERROR
10$: ;ON LINE AND READY
BIT #LDPTS,@TRSR ;IF AT LOAD POINT
BNE 30$ ; THEN SKIP PRELIMINARY REWIND
JSR PC,CPWR ;RESET TR79
JSR PC,RWIND ;REWIND
JSR PC,CHEKI ;CHECK REGISTERS
BCC 30$ ;NO ERRORS.
ERROR ;REPORT ERROR
TRAP C$ERROR
30$: ;AT LOAD POINT
JSR PC,TESTN ;MAKE SURE TRANSPORT ON LINE AND READY
BCC 35$ ;NO ERROR
ERROR ;REPORT ERROR
TRAP C$ERROR
35$: ;REWIND AT LOAD POINT
JSR PC,CPWR ;RESET TR79
JSR PC,RWIND ;REWIND AT LOAD POINT
JSR PC,CPYTRR ;COPY TR79 REGISTERS
MOV #3220,ETRCR ;EXPECTED
MOV #2040,ETRSR ;EXPECTED
CMP ETRCR,ATRCR ;CHECK COMMAND REGISTER
BEQ 40$ ;OK

```

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## TEST2 CHECK CONTROL LOGIC WITH MINIMUM TAPE MOTION

```

2409 024330 005202          INC      R2          ;INDICATE ERROR
2410 024332                40$:          CMP      ETRSR,ATRSR      ;CHECK STATUS REGISTER
2411 024332 023737 002176 002166      BEQ     50$          ;OK
2412 024340 001401                INC      R2          ;INDICATE ERROR
2413 024342 005202                50$:          TST     R2          ;ANY ERRORS?
2414 024344                BEQ     60$          ;NO
2415 024344 005702          ENUM = ^D<ENUM + 1>      ;INCREMENT ERROR NUMBER
2416 024346 001404          ERRSOF T ENUM,MRWLPFL,ERR4      ;REPORT ERROR
2417 024346 000030          TRAP   CSERSOFT
2418 024350                .WORD   24
2419 024350 104457                .WORD   MRWLPFL
2420 024352 000030                .WORD   ERR4
2421 024354 022306                60$:
2422 024356 020064          T2C:          ;CHECK FOR WRITE ENABLE RING
2423 024360                BIT     #FPTS,@ATRSR      ;IF WRITE ENABLE RING IS PRESENT
2424 024360 032777 000004 155656      BEQ     10$          ; THEN CONTINUE
2425 024360 001404          ENUM = ^D<ENUM + 1>      ;INCREMENT ERROR NUMBER
2426 024366 000031          ERRSOF T ENUM,EM4A,ERR2      ;REPORT ERROR. GET RING INSTALLED
2427 024370                TRAP   CSERSOFT
2428 024370 104457                .WORD   25
2429 024370 000031                .WORD   EM4A
2430 024372 000031                .WORD   ERR2
2431 024374 021002                10$:          ;RING IS PRESENT
2432 024376 017744          JSR     PC,TESTN      ;MAKE SURE ON LINE
2433 024400                BCC    20$          ;OK
2434 024400 004737 014066          ERROR  ;REPORT ERROR
2435 024404 103001          TRAP   CSERROR
2436 024406 104460                20$:
2437 024406 104460          T2D:          ;TEST SET AND CLEAR UNIBUS EXTENSION BITS
2438 024410                JSR     PC,CPWR      ;RESET TR79
2439 024410 004737 013324          BIS    #010000,@TRCR      ;SET UNIBUS EXTENSION BIT 16
2440 024410 004737 013324          BIT    #010000,@TRCR      ;TEST UNIBUS EXTENSION BIT 16
2441 024414 052777 010000 155620      BNE    10$          ;SKIP IF OK
2442 024422 032777 010000 155612      ENUM = ^D<ENUM + 1>      ;INCREMENT ERROR NUMBER
2443 024430 001004          ERRSOF T ENUM,M16SFL      ;REPORT ERROR
2444 024430 000032          TRAP   CSERSOFT
2445 024432                .WORD   26
2446 024432 104457                .WORD   M16SFL
2447 024434 000032                .WORD   0
2448 024436 021174                10$:          BIC    #010000,@TRCR      ;CLEAR THE BIT
2449 024440 000000          BIT    #010000,@TRCR      ;TEST THE BIT
2450 024442 042777 010000 155572      BEQ    20$          ;SKIP IF CLEAR
2451 024442 042777 010000 155572      ERRSOF T ENUM,M16CFL      ;REPORT ERROR
2452 024450 032777 010000 155564      TRAP   CSERSOFT
2453 024456 001404                .WORD   26
2454 024460                .WORD   M16CFL
2455 024460 104457                .WORD   0
2456 024462 000032                20$:          BIS    #020000,@TRCR      ;SET UNIBUS EXTENSION BIT 17
2457 024464 021235          BIT    #020000,@TRCR      ;TEST UNIBUS EXTENSION BIT 17
2458 024466 000000          BNE    30$          ;SKIP IF OK
2459 024470                ERRSOF T ENUM,M17SFL      ;REPORT ERROR
2460 024470 052777 020000 155544      TRAP   CSERSOFT
2461 024476 032777 020000 155536      .WORD   30
2462 024504 001004                30$:
2463 024506                .WORD   M17SFL
2464 024506 104457          TRAP   CSERSOFT

```



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## TEST2 CHECK CONTROL LOGIC WITH MINIMUM TAPE MOTION

```

2465 024510 000032          .WORD 26
2466 024512 021277          .WORD M17SFL
2467 024514 000000          .WORD 0
2468 024516
2469 024516 042777 020000 155516 30$: BIC #020000,@TRCR ;CLEAR THE BIT
2470 024524 032777 020000 155510 BIT #020000,@TRCR ;TEST THE BIT
2471 024532 001404 BEQ 40$ ;SKIP IF OK
2472 024534 ERRSOFT ENUM,M17CFL ;REPORT ERROR
2473 024534 104457 TRAP C$ERSOFT
2474 024536 000032          .WORD 26
2475 024540 021337          .WORD M17CFL
2476 024542 000000          .WORD 0
2477 024544
2478 024544 052777 030000 155470 40$: BIS #30000,@TRCR ;SET BOTH EA BITS
2479 024552 032777 010000 155462 BIT #10000,@TRCR ;TEST BIT
2480 024560 001004 BNE 50$ ;OK
2481 024562 000033 ENUM = ^D<ENUM + -1> ;INCREMENT ERROR NUMBER
2482 024562 ERRSOFT ENUM,M16SFL ;REPORT ERROR
2483 024562 104457 TRAP C$ERSOFT
2484 024564 000033          .WORD 27
2485 024566 021174          .WORD M16SFL
2486 024570 000000          .WORD 0
2487 024572
2488 024572 032777 020000 155442 50$: BIT #20000,@TRCR ;TEST SECOND BIT
2489 024600 001004 BNE 60$ ;OK
2490 024602 ERRSOFT ENUM,M17SFL ;REPORT ERROR
2491 024602 104457 TRAP C$ERSOFT
2492 024604 000033          .WORD 27
2493 024606 021277          .WORD M17SFL
2494 024610 000000          .WORD 0
2495 024612
2496 024612 042777 030000 155422 60$: BIC #30000,@TRCR ;CLEAR EA BITS
2497 024620 032777 030000 155414 BIT #30000,@TRCR ;MAKE SURE
2498 024626 001404 BEQ 70$ ;OK
2499 024630 ERRSOFT ENUM,MXCFL ;REPORT ERROR
2500 024630 104457 TRAP C$ERSOFT
2501 024632 000033          .WORD 27
2502 024634 021402          .WORD MXCFL
2503 024636 000000          .WORD 0
2504 024640
2505 024640 70$:
2506 024640 T2E: ;TEST SET INTERRUPT ENABLE BIT
2507 024640 013700 000340 SETPRI PRI07 ;SET PRIORITY TO INHIBIT INTERRUPTS
2508 024644 104441 MOV PRI07,R0
2509 024646 052777 000100 155366 TRAP C$SPRI
2510 024654 032777 000100 155360 BIS #BIT6,@TRCR ;SET INTERRUPT ENABLE BIT
2511 024662 001004 BIT #BIT6,@TRCR ;CHECK IF SET
2512 024664 000034 BNE 20$ ;OK
2513 024664 ENUM = ^D<ENUM + 1> ;INCREMENT ERROR NUMBER
2514 024664 104457 ERRSOFT ENUM,MIENFL ;REPORT FAILURE
2515 024666 000034 TRAP C$ERSOFT
2516 024670 022161          .WORD 28
2517 024672 000000          .WORD MIENFL
2518 024674          .WORD 0
2519 024674 20$:
2520 024674 042777 000100 155340 T2F: BIC #BIT6,@TRCR ;TEST CLEAR INTERRUPT ENABLE BIT
;CLEAR INTERRUPT ENABLE

```

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## TEST2 CHECK CONTROL LOGIC WITH MINIMUM TAPE MOTION

```

2521 024702 032777 000100 155332      BIT      #BIT6,@TRCR      ;CHECK IF CLEAR
2522 024710 001404                      BEQ      10$              ;SKIP IF ZERO
2523      000035                      ENUM = ^D<ENUM + 1>      ;INCREMENT ERROR NUMBER
2524 024712                      ERRSOFT  ENUM,MIDSFL     ;REPORT FAILURE
2525 024712 104457                      TRAP    CSERSOFT
2526 024714 000035                      .WORD   29
2527 024716 022204                      .WORD   MIDSFL
2528 024720 000000                      .WORD   0
2529 024722
2530 024722                      10$:
T2J:                                ;TEST ILLEGAL COMMANDS
2531 024722 004737 014066                      JSR     PC,TESTN        ;MAKE SURE TRANSPORT ON LINE
2532 024726 103001                      BCC     10$              ;ON LINE, NO ERROR
2533 024730                      ERROR   TRAP            ;REPORT ERROR
2534 024730 104460                      TRAP    CSERROR
2535 024732                      10$:
2536 024732 032777 000040 155304                      ;READY
2537 024740 001010                      BIT     #BITS,@TRSR     ;IF AT LOAD POINT
2538 024742 004737 013324                      BNE     20$              ; THEN SKIP REWIND
2539 024746 004737 012416                      JSR     PC,CPWR          ;RESET TR79
2540 024752 004737 013534                      JSR     PC,RWIND         ;REWIND
2541 024756 103001                      JSR     PC,CHEK1        ;CHECK FOR ERROR
2542 024760                      BCC     20$              ;OK
2543 024760 104460                      ERROR   TRAP            ;REPORT ERROR
2544 024762
2545 024762 012737 025052 025050                      20$:
2546 024770 004737 014066                      MOV     #55$,50$        ;AT LOAD POINT
2547 024774 103001                      JSR     PC,TESTN        ;POINT TO FIRST ILLEGAL FUNCTION
2548 024776                      BCC     30$              ;MAKE SURE TRANSPORT ON LINE
2549 024776 104460                      ERROR   TRAP            ;ON LINE, NO ERROR
2550 025000                      30$:
2551 025000 013703 025050                      MOV     50$,R3          ;REPORT ERROR
2552 025004 012337 002212                      MOV     (R3)+,USEA      ;SELECT NEXT FUNCTION
2553 025010 010337 025050                      MOV     R3,50$         ;POINT TO NEXT ILLEGAL FUNCTION
2554 025014 004737 013206                      JSR     PC,DOILC        ;SPECIFY FUNCTION TO TRY
2555 025020 004737 013664                      JSR     PC,CHEKJ        ;UPDATE POINTER
2556 025024 103004                      BCC     40$              ;INITIATE OPERATION
2557 025026 000036                      ENUM = ^D<ENUM + 1>      ;CHECK RESULT
2558 025026 104457                      ERRSOFT  ENUM,MILFFL,ERR4 ;OK
2559 025030 000036                      TRAP    CSERSOFT        ;INCREMENT ERROR NUMBER
2560 025032 022337                      .WORD   30              ;REPORT ERROR
2561 025034 020064                      .WORD   MILFFL
2562 025036 020064                      .WORD   ERR4
2563 025036
2564 025036 023727 025050 025066                      40$:
2565 025044 001351                      CMP     50$,#60$        ;IS THERE ANOTHER FUNCTION TO TRY
2566 025046 000407                      BNE     30$              ;YES. GO TRY IT
2567                      BR      60$              ;NO. CONTINUE WITH NEXT SUBTEST
2568 025050 025052                      50$:
2569 025052 000406 001012 001414                      .WORD   #55$           ;POINTER TO NEXT FUNCTION TO TRY
2570 025060 000022 000424 001030                      55$:
2571 025066                      .WORD   ILC03,ILC05,ILC06,ILC11,ILC12,ILC14 ;LIST OF ILLEGAL FUNCTIONS
2572

```

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TEST2 CHECK CONTROL LOGIC WITH MINIMUM TAPE MOTION

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 2574 025066  
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 2594 025066 000137 025222  
 2595  
 2596 025072 004737 014066  
 2597 025076 103001  
 2598 025100  
 2599 025100 104460  
 2600 025102  
 2601 025102 012737 000406 002212  
 2602 025110 052737 000101 002212  
 2603 025116 042777 000001 155120  
 2604 025124 012777 177777 155114  
 2605 025132 012777 006322 155110  
 2606 025140 012737 177777 002240  
 2607 025146  
 2608 025146 013700 000140  
 2609 025152 104441  
 2610 025154 013777 002212 155060  
 2611 025162 004737 013354  
 2612 025166 004737 013254  
 2613 025172 005737 002240  
 2614 025176 001404  
 2615 000037  
 2616 025200  
 2617 025200 104457  
 2618 025202 000037  
 2619 025204 021707  
 2620 025206 000000  
 2621 025210  
 2622 025210 013700 000340  
 2623 025214 104441  
 2624 025216 004737 013324  
 2625 025222  
 2626 025222 004737 014066  
 2627 025226 103001  
 2628 025230

```

TSTINT:                                ;TEST TR79 INTERRUPT
;NOTE:
THE FOLLOWING CODE TO TEST TR79 INTERRUPTS IS INCLUDED FOR
COMPLETENESS. THIS SECTION OPENS WITH A JUMP SO THAT, AS WRITTEN,
THE INTERRUPT TEST IS NOT EXECUTED.

TO EXECUTE THE INTERRUPT TEST, THE JUMP CAN BE CHANGED TO A NOP,NOP
USING OD OR CONSOLE SWITCHES WHEN THE DIAGNOSTIC IS RUN.

THIS APPROACH IS ADOPTED TO ACCOMADATE THE FACT THAT TR79 GENERATED
INTERRUPTS ALLWAYS HUNG THE PROCESSOR DURING TESTING OF THIS DRS
COMPATIBLE VERSION OF THE DIAGNOSTIC.
10-NOV-81
GLORIA MEREDITH
MERRIMACK DIAGNOSTIC ENGINEERING
MAIL: MK1-1/L38
DTN: 264-6146
ENET: VAX4::MEREDITH

40$: JMP TESTK ;OMIT EXECUTION IF INTERRUPT TEST
;SET UP TO INTERRUPT ON ILLEGAL COMMAND
JSR PC,TESTN ;MAKE SURE TRANSPORT ON LINE
BCC 50$ ;ON LINE. NO ERROR
ERROR ;REPORT ERROR
TRAP CSERROR

50$: ;ENABLE INTERRUPT AND PERFORM ILLEGAL FUNCTION
MOV #ILCO3,USEA ;SPECIFY ILLEGAL FUNCTION
BIS #INTENB!GOBIT,USEA ;SPECIFY INTERRUPT ENABLE AND GO
BIC #BIT0,@TRSR ;NEGATE INHIBIT TR79 OPERATION
MOV #-1,@TRWC ;SPECIFY WORD COUNT
MOV #INPUT,@TRBA ;SPECIFY BUS ADDRESS
MOV #-1,INTFLG ;SPECIFY "EXPECTING INTERRUPT"
SETPRI PRI03 ;SET PRIORITY TO ALLOW TR79 INTERRUPTS
MOV PRI03,RO
TRAP CSSPRI

MOV USEA,@TRCR ;INITIATE TR79 OPERATION
JSR PC,RWAIT ;WAIT
JSR PC,CPYTRR ;COPY REGISTERS
TST INTFLG ;TEST "INTERRUPT OCCURRED" INDICATOR
BEQ 60$ ;O.K. INTERRUPT OCCURRED
ENUM = ^D<ENUM + 1> ;INCREMENT ERROR NUMBER
ERRSOFT ENUM,MINTFL ;REPORT ERROR
TRAP CSERRSOFT
.WORD 31
.WORD MINTFL
.WORD 0

60$: SETPRI PRI07 ;INHIBIT TR79 INTERRUPTS
MOV PRI07,RO
TRAP CSSPRI
JSR PC,CPWR

TESTK: ;TR79 POWER CLEAR
JSR PC,TESTN ;TEST WRITE FROM LOAD POINT
BCC 10$ ;MAKE SURE TRANSPORT ON LINE
ERROR ;ON LINE. NO ERROR
;REPORT ERROR
    
```



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TEST2 CHECK CONTROL LOGIC WITH MINIMUM TAPE MOTION

```

2629 025230 104460
2630 025232
2631 025232 032777 000040 155004
2632 025240 001010
2633 025242 004737 013324
2634 025246 004737 012416
2635 025252 004737 013534
2636 025256 103001
2637 025260
2638 025260 104460
2639 025262
2640 025262 012737 177700 002214
2641 025270 004737 012642
2642 025274 004737 013254
2643 025300 012737 142602 002174
2644 025306 012737 002040 002176
2645 025314 023737 002174 002164
2646 025322 001401
2647 025324 005202
2648 025326
2649 025326 023737 002176 002166
2650 025334 001401
2651 025336 005202
2652 025340
2653 025340 005702
2654 025342 001404
2655 025342 000040
2656 025344
2657 025344 104457
2658 025346 000040
2659 025350 022362
2660 025352 020064
2661 025354 004737 013324
2662 025360
2663 025360 004737 014066
2664 025364 103001
2665 025366
2666 025366 104460
2667 025370
2668 025370 032777 000040 154646
2669 025376 001010
2670 025400 004737 013324
2671 025404 004737 012416
2672 025410 004737 013534
2673 025414 103001
2674 025416
2675 025416 104460
2676 025420
2677 025420 004737 014066
2678 025424 103001
2679 025426
2680 025426 104460
2681 025430
2682 025430 004737 013072
2683 025434 004737 013254
2684 025440 012737 143234 002174

10$: TRAP CSERROR
      BIT #BITS,@TRSR ;IF AT LOAD POINT
      BNE 20$ ; THEN SKIP REWIND
      JSR PC,CPWR ;RESET TR79
      JSR PC,RWIND ;REWIND
      JSR PC,CHEKI ;CHECK FOR ERROR
      BCC 20$ ;OK
      ERROR ;REPORT ERROR
      TRAP CSERROR

20$: MOV #-100,USEB ;WRITE AT LOAD POINT
      JSR PC,WRT ;SPECIFY WORD COUNT FOR WRITE
      JSR PC,CPYTRR ;TRY TO WRITE AT LOAD POINT
      MOV #142602,ETRCR ;COPY TR79 REGISTERS
      MOV #2040,ETRSR ;SPECIFY EXPECTED RESULT
      CMP ETRCR,ATRCR ;TEST COMMAND REGISTER
      BEQ 30$ ;OK
      INC R2 ;INDICATE ERROR

30$: CMP ETRSR,ATRSR ;TEST STATUS REGISTER
      BEQ 40$ ;OK
      INC R2 ;INDICATE ERROR

40$: TST R2 ;ANY ERRORS?
      BEQ 50$ ;NO
      ENUM = ^D<ENUM + 1> ;INCREMENT ERROR NUMBER
      ERRSOFT ENUM,MWLPFL,ERR4 ;REPORT ERROR
      TRAP CSERSOFT

50$: JSR PC,CPWR ;TR79 POWER CLEAR
      TESTM: ;TEST WRITE EOF FROM LOAD POINT
      JSR PC,TESTN ;MAKE SURE TRANSPORT ON LINE
      BCC 10$ ;ON LINE. NO ERROR
      ERROR ;REPORT ERROR
      TRAP CSERROR

10$: ;READY
      BIT #BITS,@TRSR ;IF AT LOAD POINT
      BNE 20$ ; THEN SKIP REWIND
      JSR PC,CPWR ;RESET TR79
      JSR PC,RWIND ;REWIND
      JSR PC,CHEKI ;CHECK FOR ERROR
      BCC 20$ ;OK
      ERROR ;REPORT ERROR
      TRAP CSERROR

20$: ;AT LOAD POINT
      JSR PC,TESTN ;MAKE SURE TRANSPORT ON LINE
      BCC 30$ ;ON LINE. NO ERROR
      ERROR ;REPORT ERROR
      TRAP CSERROR

30$: ;WRITE EOF AT LOAD POINT
      JSR PC,WTEOF ;TRY TO WRITE EOF AT LOAD POINT
      JSR PC,CPYTRR ;COPY TR79 REGISTERS
      MOV #143234,ETRCR ;SPECIFY EXPECTED RESULT

```

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## TEST2 CHECK CONTROL LOGIC WITH MINIMUM TAPE MOTION

```

2685 025446 012737 002040 002176      MOV      #2040,ETRSR      ;SPECIFY EXPECTED RESULT
2686 025454 023737 002174 002164      CMP      ETRCR,ATRCR    ;TEST COMMAND REGISTER
2687 025462 001401                      BEQ      40$            ;OK
2688 025464 005202                      INC      R2             ;INDICATE ERROR
2689 025466                                40$:
2690 025466 023737 002176 002166      CMP      ETRSR,ATRSR    ;TEST THE STATUS REGISTER
2691 025474 001401                      BEQ      50$            ;OK
2692 025476 005202                      INC      R2             ;INDICATE ERROR
2693 025500                                50$:
2694 025500 005702                      TST     R2              ;ANY ERRORS?
2695 025502 001404                      BEQ      60$            ;NO
2696 025504 000041                      ENUM = ^D<ENUM + 1>     ;INCREMENT ERROR NUMBER
2697 025504                      ERRSOFT ENUM,MWELPFL,ERR4 ;REPORT ERROR
2698 025504 104457                      TRAP    CSERSOFT
2699 025506 000041                      .WORD  33
2700 025510 022437                      .WORD  MWELPFL
2701 025512 020064                      .WORD  ERR4
2702 025514                                60$:
2703                                ;TEST TR79 RESET (TR79 POWER CLEAR)
2704 025514                                T2G:  BRESET          ;PDP-11 RESET
2705 025514 104433                      TRAP    CSRESET
2706 025516 012777 000026 154516      MOV     #26,@TRCR      ;SET A FUNCTION IN COMMAND REGISTER
2707                                ;THIS IS A DUMMY COMMAND TO SEE IF
2708                                ; IT WILL CLEAR
2709 025524 052777 004000 154510      BIS     #BIT11,@TRCR   ;SET TR79 PWRCLR BIT
2710 025532 012701 177300                      MOV     #-500,R1       ;SET DELAY CONSTANT
2711 025536                                10$:
2712 025536 005201                      INC     R1              ;COUNT A DELAY TICK
2713 025540 001376                      BNE    10$             ;KEEP TICKING
2714 025542 032777 004000 154472      BIT     #BIT11,@TRCR   ;IF TR79 POWER CLEAR BIT IS SET
2715 025550 001004                      BNE    20$             ;CONTINUE
2716 025552 000042                      ENUM = ^D<ENUM + 1>     ;INCREMENT ERROR NUMBER
2717 025552                      ERRSOFT ENUM,MPWCL     ;ELSE REPORT ERROR.POWER CLEAR BIT
2718 025552 104457                      TRAP    CSERSOFT
2719 025554 000042                      .WORD  34
2720 025556 021443                      .WORD  MPWCL
2721 025560 000000                      .WORD  0
2722 025562                                20$:
2723 025562 012737 002224 002220      MOV     #DLXPWR,DLX    ;SET POWER CLEAR DELAY CONSTANT
2724 025570 004737 013362                      JSR    PC,WAIT         ;WAIT
2725 025574 032777 004000 154440      BIT     #BIT11,@TRCR   ;TEST PWRCLR BIT
2726 025602 001404                      BEQ    30$             ;OK
2727 025604 000043                      ENUM = ^D<ENUM + 1>     ;INCREMENT ERROR NUMBER
2728 025604                      ERRSOFT ENUM,MPWST     ;REPORT ERROR
2729 025604 104457                      TRAP    CSERSOFT
2730 025606 000043                      .WORD  35
2731 025610 021500                      .WORD  MPWST
2732 025612 000000                      .WORD  0
2733 025614                                30$:
2734 025614 032777 002000 154422      BIT     #BIT10,@TRSR   ;IF NOT ON LINE
2735 025622 001435                      BEQ    60$             ; THEN OMIT CHECKING REGISTERS
2736 025624 004737 013254                      JSR    PC,CPYTRR      ;COPY TR79 REGISTERS
2737 025630 042737 000036 002164      BIC    #00036,ATRCR    ;CLEAR UNWANTED BITS
2738 025636 012737 002200 002174      MOV     #2200,ETRCR    ;SPECIFY EXPECTED RESULT
2739 025644 012737 002247 002176      MOV     #2247,ETRSR    ;SPECIFY EXPECTED RESULT
2740 025652 023737 002174 002164      CMP     ETRCR,ATRCR    ;TEST COMMAND REGISTER

```



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## TEST2 CHECK CONTROL LOGIC WITH MINIMUM TAPE MOTION

2741	025660	001401			BEQ	40\$			;SKIP IF OK
2742	025662	005202			INC	R2			;INDICATE ERROR
2743	025664				40\$:				
2744	025664	043737	002176	002166	BIC	ETRSR,ATRSR			;CLEAR UNWANTED BITS
2745	025672	005737	002166		TST	ATRSR			;TEST STATUS REGISTER
2746	025676	001401			BEQ	50\$			;SKIP IF OK
2747	025700	005202			INC	R2			;INDICATE ERROR
2748	025702				50\$:				
2749	025702	005702			TST	R2			;ANY ERRORS?
2750	025704	001404			BEQ	60\$			;NO
2751		000044			ENUM =	D<ENUM + 1>			;INCREMENT ERROR NUMBER
2752	025706				ERRSOFT	ENUM,MPCFL,ERR4			;REPORT ERROR
2753	025706	104457			TRAP	CSERSOFT			
2754	025710	000044			.WORD	36			
2755	025712	022227			.WORD	MPCFL			
2756	025714	020064			.WORD	ERR4			
2757	025716	004737	013324		60\$:	JSR	PC,CPWR		;TR79 POWER CLEAR
2758	025722				T2AT:				;TEST SPACE REVERSE AT LOAD POINT
2759	025722	004737	014066		JSR	PC,TESTN			;MAKE SURE TRANSPORT ON LINE
2760	025726	103001			BCC	10\$			;ON LINE. NO ERROR
2761	025730				ERROR				;REPORT ERROR
2762	025730	104460			TRAP	CSERROR			
2763	025732				10\$:				;READY
2764	025732	032777	000040	154304	BIT	#BITS,@TRSR			;IF AT LOAD POINT
2765	025740	001010			BNE	20\$			;SKIP REWIND
2766	025742	004737	013324		JSR	PC,CPWR			;RESET TR79
2767	025746	004737	012416		JSR	PC,RWIND			;REWIND
2768	025752	004737	013534		JSR	PC,CHEKI			;CHECK FOR ERROR
2769	025756	103001			BCC	20\$			;OK
2770	025760				ERRJR				;REPORT ERROR
2771	025760	104460			TRAP	CSERROR			
2772	025762				20\$:				;AT LOAD POINT
2773	025762	004737	014066		JSR	PC,TESTN			;MAKE SURE TRANSPORT ON LINE
2774	025766	103001			BCC	30\$			;ON LINE. NO ERROR
2775	025770				ERROR				;REPORT ERROR
2776	025770	104460			TRAP	CSERROR			
2777	025772				30\$:				;SPACE REVERSE AT LOAD POINT
2778	025772	012737	177777	002214	MOV	#-1,USEB			;SPECIFY COUNT
2779	026000	004737	013024		JSR	PC,SPR			;SPACE REVERSE AT LOAD POINT
2780	026004	004737	013254		JSR	PC,CPYTRR			;COPY TR79 REGISTERS
2781	026010	012737	143610	002174	MOV	#143610,ETRCR			;SPECIFY EXPECTED RESULT
2782	026016	012737	002040	002176	MOV	#2040,ETRSR			;EXPECTED RESULT
2783	026024	012737	177777	002200	MOV	#-1,ETRWC			;EXPECTED
2784	026032	023737	002174	002164	CMP	ETRCR,ATRCR			;TEST COMMAND REGISTER
2785	026040	001401			BEQ	40\$			;OK
2786	026042	005202			INC	R2			;INDICATE ERROR
2787	026044				40\$:				
2788	026044	023737	002176	002166	CMP	ETRSR,ATRSR			;TEST THE STATUS REGISTER
2789	026052	001401			BEQ	50\$			;OK
2790	026054	005202			INC	R2			;INDICATE ERROR
2791	026056				50\$:				
2792	026056	005737	002172		TST	ATRBA			;TEST BUFFER ADDRESS
2793	026062	001401			BEQ	60\$			;OK
2794	026064	005202			INC	R2			;INDICATE ERROR
2795	026066				60\$:				
2796	026066	023737	002200	002170	CMP	ETRWC,ATRWC			;TEST THE WORD COUNT



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## TEST2 CHECK CONTROL LOGIC WITH MINIMUM TAPE MOTION

2797	026074	001401			BEQ	70\$		:JK
2798	026076	005202			INC	R2		:INDICATE ERROR
2799	026100				70\$:			
2800	026100	005702			TST	R2		:ANY ERRORS?
2801	026102	001404			BEQ	80\$		:NO
2802		000045			ENUM =	^D<ENUM + 1>		:INCREMENT ERROR NUMBER
2803	026104				ERRSOFT	ENUM,MSRLPFL,ERR5		:REPORT ERROR
2804	026104	104457			TRAP	C\$ERSOFT		
2805	026106	000045			.WORD	37		
2806	026110	023562			.WORD	MSRLPFL		
2807	026112	020102			.WORD	ERR5		
2808	026114	004737	013324		80\$:	JSR	PC,CPWR	:TR79 POWER CLEAR
2809	026120				T2AB:			:TEST NXM ADDRESS ERROR USING TRCR BITS 12-13
2810	026120	004737	014066		JSR	PC,TESTN		:MAKE SURE TRANSPORT ON LINE
2811	026124	103001			BCC	10\$		:ON LINE. NO ERROR
2812	026126				ERROR			:REPORT ERROR
2813	026126	104460			TRAP	C\$ERROR		
2814	026130				10\$:			
2815	026130	032777	000040	154106	BIT	#BIT5,@TRSR		:IF A.T LOAD POINT
2816	026136	001006			BNE	15\$		:SKIP REWIND
2817	026140	004737	012416		JSR	PC,RWIND		:REWIND
2818	026144	004737	013534		JSR	PC,CHEKI		:CHECK FOR ERROR
2819	026150	103001			BCC	15\$		:OK
2820	026152				ERROR			:REPORT ERROR
2821	026152	104460			TRAP	C\$ERROR		
2822	026154				15\$:			:WRITE IDB
2823	026154	004737	012464		JSR	PC,WTIDB		:WRITE IDB
2824	026160	004737	014254		JSR	PC,CHEKO		:CHECK TR79 REGISTERS
2825	026164	103001			BCC	20\$		:NO ERRORS
2826	026166				ERROR			:REPORT ERROR
2827	026166	104460			TRAP	C\$ERROR		
2828	026170				20\$:			
2829	026170	004737	014066		JSR	PC,TESTN		:MAKE SURE TRANSPORT ON LINE
2830	026174	103001			BCC	30\$		:ON LINE. NO ERROR
2831	026176				ERROR			:REPORT ERROR
2832	026176	104460			TRAP	C\$ERROR		
2833	026200				30\$:			:ERASE
2834	026200	012737	177400	002214	MOV	#-400,USEB		:SET ERASE COUNT
2835	026206	004737	013140		JSR	PC,ERS		:ERASE
2836	026212	004737	017546		JSR	PC,CHEKFX		:CHECK REGISTERS
2837	026216	103001			BCC	40\$		:OK
2838	026220				ERROR			:REPORT ERROR
2839	026220	104460			TRAP	C\$ERROR		
2840	026222				40\$:			:WRITE TO NXM ADDRESS
2841	026222	042777	000001	154014	BIC	#BIT0,@TRSR		:CLEAR INHIBIT BIT
2842	026230	012777	000402	154004	MOV	#WRITE,@TRCR		:SET COMMAND
2843	026236	052777	030000	153776	BIS	#BIT12!BIT13,@TRCR		:SET THE EXTENDED ADDRESS BITS
2844	026244	005077	153776		CLR	@TRWC		:CLEAR THE WORD COUNT
2845	026250	012777	160000	153772	MOV	#160000,@TRBA		:SET UP AN I/O PAGE REFERENCE
2846	026256	005277	153760		INC	@TRCR		:SET GO BIT
2847	026262	013737	002222	002220	MOV	DLXRW,DLX		:SPECIFY DELAY MULTIPLIER
2848	026270	004737	013362		JSR	PC,WAIT		:WAIT
2849	026274	004737	013254		JSR	PC,CPYTRR		:COPY TR79 REGISTERS & CLEAR EXPECTED RESULTS
2850	026300	012737	132602	002174	MOV	#132602,ETRCR		:EXPECTED
2851	026306	012737	006101	002176	MOV	#6101,ETRSR		:EXPECTED
2852	026314	012737	000002	002202	MOV	#2,ETRBA		:EXPECTED

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TEST2 CHECK CONTROL LOGIC WITH MINIMUM TAPE MOTION

```

2853 026322 012737 000001 002200      MOV    #1,ETRWC      ;EXPECTED
2854 026330 023737 002174 002164      CMP    ETRCR,ATRCR  ;TEST COMMAND REGISTER
2855 026336 001401                BEQ    50$          ;OK
2856 026340 005202                INC    R2          ;INDICATE ERROR
2857 026342                50$:
2858 026342 023737 002176 002166      CMP    ETRSR,ATRSR  ;TEST THE STATUS REGISTER
2859 026350 001401                BEQ    60$          ;OK
2860 026352 005202                INC    R2          ;INDICATE ERROR
2861 026354                60$:
2862 026354 033737 002202 002172      BIT    ETRBA,ATRBA  ;TEST BUFFER ADDRESS
2863 026362 001001                BNE    70$          ;OK
2864 026364 005202                INC    R2          ;INDICATE ERROR
2865 026366                70$:
2866 026366 023737 002200 002170      CMP    ETRWC,ATRCW  ;TEST THE WORD COUNT
2867 026374 001401                BEQ    80$          ;OK
2868 026376 005202                INC    R2          ;INDICATE ERROR
2869 026400                80$:
2870 026400 005702                TST    R2          ;ANY ERRORS?
2871 026402 001404                SEQ    90$          ;NO
2872 026402 000046      ENUM = ^D<ENUM + 1> ;INCREMENT ERROR NUMBER
2873 026404                ERRSOFT ENUM,MNXMFL,ERR5 ;REPORT ERROR
2874 026404 104457                TRAP  CSERSOFT
2875 026406 000046                .WORD 38
2876 026410 023115                .WORD MNXMFL
2877 026412 020102                .WORD ERR5
2878 026414                90$:
2879 026414 004737 013324      JSR    PC,CPWR      ;RESET TR79
2880                ;TEST THE BUS ADDRESS BITS BY USING A COUNT PATTERN
2881 026420 005001      T2AU:  CLR    R1          ;CLEAR COUNT
2882 026422 010177 153622      10$:  MOV    R1,@ATRBA   ;SET BUS ADDRESS
2883 026426 020177 153616      CMP    R1,@ATRBA   ;TEST BUS ADDRESS
2884 026432 001410                BEQ    20$          ;OK
2885 026434 004737 013254      JSR    PC,CPYTRR   ;COPY TR79 REGISTERS,CLEAR EXPECTED RESULTS
2886 026440 010137 002202      MOV    R1,ETRBA    ;EXPECTED
2887 026440 000047      ENUM = ^D<ENUM + 1> ;INCREMENT ERROR NUMBER
2888 026444                ERRSOFT ENUM,EM6,ERR11 ;REPORT ERROR
2889 026444 104457                TRAP  CSERSOFT
2890 026446 000047                .WORD 39
2891 026450 021630                .WORD EM6
2892 026452 020136                .WORD ERR11
2893 026454                20$:
2894 026454 005201                INC    R1          ;INCREMENT COUNT
2895 026456 001361                BNE    10$         ;CONTINUE
2896
2897 026460                T2BA:  ;TEST THE BITS IN THE WORD COUNT USING A COUNT PATTERN
2898 026460 005001      10$:  CLR    R1          ;CLEAR COUNT
2899 026462 010177 153560      MOV    R1,@TRWC    ;SET WORD COUNT
2900 026466 020177 153554      CMP    R1,@TRWC    ;TEST WORD COUNT
2901 026472 001410                BEQ    20$          ;OK
2902 026474 004737 013254      JSR    PC,CPYTRR   ;COPY REGISTERS,CLEAR EXPECTED RESULT
2903 026500 010137 002200      MOV    R1,ETRWC    ;EXPECTED
2904 026500 000050      ENUM = ^D<ENUM + 1> ;INCREMENT ERROR NUMBER
2905 026504                ERRSOFT ENUM,EM7,ERR12 ;REPORT ERROR
2906 026504 104457                TRAP  CSERSOFT
2907 026506 000050                .WORD 40
2908 026510 021551                .WORD EM7

```

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TEST2 CHECK CONTROL LOGIC WITH MINIMUM TAPE MOTION

2909 026512 020160  
2910 026514  
2911 026514 005201  
2912 026516 001361  
2913 026520  
2914 026520  
2915 026520 104401  
2916  
2917

20\$: .WORD ERR12

INC R1  
BNE 10\$; INCREMENT COUNT  
; CONTINUE

L10022: ENDTST

TRAP C\$ETST

.SBTTL TEST3 CHECK IDB AND EOF OPERATIONS,COUNT AND PARITY ERRORS



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TEST3 CHECK IDB AND EOF OPERATIONS,COUNT AND PARITY ERRORS

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```

////////////////////////////////////
:TEST3 CHECKS IDB AND EOF OPERATIONS
CHECKS COUNT AND PARITY ERROR DETECTION

TEST3 INCLUDES:                                TEST NAME IN CZTRAC

INSURE WRITE ENABLE RING                        TESTC
REWIND THE TAPE                                TESTI
WRITE ID BLOCK                                  TESTO
ILLEGAL ID BLOCK TEST                          TESTH
SPACE REVERSE OVER ID BLOCK                    TESTAV
READ ID BLOCK                                  TESTAW
WRITE EOF MARKS                                RUNL
SPACE REVERSE OVER EOF MARKS                  RUNU
READ EOF MARKS                                RUNV
TIME OUT TEST                                  TESTW
READ WITH COUNT LONG                           TESTAC
READ WITH COUNT SHORT                          TESTAD
SPACE REVERSE WITH COUNT SHORT                 TESTAE
SPACE REVERSE WITH COUNT LONG                 TESTAF
WRITE EVEN PARITY                              TESTAX
SPACE REVERSE OVER EVEN PARITY                TESTAY
READ EVEN PARITY                              TESTAZ
////////////////////////////////////

```

```

026522
026522
042777 000100 153512
026530 004737 013324
026534
032777 000004 153502
026542 001404
000051
026544
026544 104457
026546 000051
026550 021002
026552 017744
026554
026554 004737 014066
026560 103001
026562
026562 104460
026564
026564
032777 000040 153452
026572 001010
026574 004737 013324
026600 004737 012416
026604 004737 013534
026610 103001
026612

```

```

BGNTST
T3:: BIC #BIT6,@TRCR ;CLEAR TR79 INTERRUPT ENABLE BIT
JSR PC,CPWR ;RESET TR79
T3C: ;CHECK FOR WRITE ENABLE RING
BIT #FPTS,@TRSR ;IF WRITE ENABLE RING IS PRESENT
BEQ 10$ ; THEN CONTINUE
ENUM = *D<ENUM + 1> ;INCREMENT ERROR NUMBER
ERRSOFT ENUM,EM4A,ERR2 ;REPORT ERROR. GET RING INSTALLED
TRAP CSERSOFT
.WORD 41
.WORD EM4A
.WORD ERR2
10$: ;RING IS PRESENT
JSR PC,TESTN ;MAKE SURE TRANSPORT ON LINE AND READY
BCC 20$ ;NO ERROR
ERROR ;REPORT ERROR
TRAP CSERROR
20$:
T3O: ;TEST WRITE IDB AT LOAD POINT
BIT #LDPTS,@TRSR ;IF AT LOAD POINT
BNE 30$ ; THEN SKIP PRELIMINARY REWIND
JSR PC,CPWR ;RESET TR79
JSR PC,RWIND ;REWIND
JSR PC,CHEKI ;CHECK REGISTERS
BCC 30$ ;OK.NO ERRORS. TAPE AT 'LOAD POINT
ERROR ;REPORT ERROR

```

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TEST3 CHECK IDB AND EOF OPERATIONS,COUNT AND PARITY ERRORS

```

2974 026612 104460
2975 026614
2976 026614 004737 014066
2977 026620 103001
2978 026622
2979 026622 104460
2980 026624
2981 026624 004737 012464
2982 026630 004737 014254
2983 026634 103001
2984 026636
2985 026636 104460
2986 026640
2987
2988 026640 012737 177400 002214
2989 026646 004737 013140
2990 026652 004737 017546
2991 026656 103001
2992 026660
2993 026660 104460
2994 026662
2995 026662
2996 026662 004737 014066
2997 026666 103001
2998 026670
2999 026670 104460
3000 026672
3001 026672 012737 177700 002214
3002 026700 004737 012642
3003 026704 004737 017156
3004 026710 103001
3005 026712
3006 026712 104460
3007 026714
3008 026714 004737 014066
3009 026720 103001
3010 026722
3011 026722 104460
3012 026724
3013 026724 004737 012464
3014 026730 004737 013254
3015 026734 012737 142632 002174
3016 026742 012737 002000 002176
3017 026750 023737 002174 002164
3018 026756 001401
3019 026760 005202
3020 026762
3021 026762 023737 002176 002166
3022 026770 001401
3023 026772 005202
3024 026774
3025 026774 005702
3026 026776 001404
3027 026776 000052
3028 027000
3029 027000 104457

```

```

TRAP CSERROR
30$: JSR PC,TESTN ;AT LOAD POINT
      BCC 10$ ;MAKE SURE TRANSPORT ON LINE AND READY
      ERROR ;NO ERROR
      TRAP CSERROR ;REPORT ERROR
10$: JSR PC,WTIDB ;WRITE IDB
      JSR PC,CHEKO ;WRITE IDB
      BCC 20$ ;CHECK REGISTERS
      ERROR ;OK
      TRAP CSERROR ;REPORT ERROR
20$: MOV #-400,USEB ;ERASE
      JSR PC,ERS ;SPECIFY ERASE COUNT
      JSR PC,CHEKFX ;ERASE
      BCC 40$ ;CHECK REGISTERS
      ERROR ;OK
      TRAP CSERROR ;REPORT ERROR
40$: JSR PC,TESTN ;TEST WRITE IDB BEYOND LOAD POINT
      BCC 10$ ;MAKE SURE TRANSPORT ON LINE AND READY
      ERROR ;NO ERROR
      TRAP CSERROR ;REPORT ERROR
10$: MOV #-100,USEB ;WRITE
      JSR PC,WRT ;SPECIFY WORD COUNT FOR WRITE
      JSR PC,CHEKCX ;WRITE
      BCC 30$ ;CHECK TR79 REGISTERS
      ERROR ;OK
      TRAP CSERROR ;REPORT ERROR
30$: JSR PC,TESTN ;MAKE SURE TRANSPORT ON LINE AND READY
      BCC 40$ ;NO ERROR
      ERROR ;REPORT ERROR
      TRAP CSERROR
40$: JSR PC,WTIDB ;WRITE IDB BEYOND LOAD POINT
      JSR PC,CPYTRR ;WRITE IDB
      MOV #142632,ETRCR ;COPY TR79 REGISTERS
      MOV #2000,ETRSR ;EXPECTED
      CMP ETRCR,ATRCR ;EXPECTED
      BEQ 50$ ;CHECK COMMAND REGISTER
      INC R2 ;OK
      ;INDICATE ERROR
50$: CMP ETRSR,ATRSR ;CHECK STATUS REGISTER
      BEQ 60$ ;OK
      INC R2 ;INDICATE ERROR
60$: TST R2 ;ANY ERRORS?
      BEQ 70$ ;NO
      ;INCREMENT ERROR COUNT
      ENUM = ^D<ENUM + 1>
      ERRSOFT ENUM,MWIPLFL,ERR4
      TRAP CSERSOFT ;REPORT ERROR

```

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TEST3 CHECK IDB AND EOF OPERATIONS,COUNT AND PARITY ERRORS

3030	027002	000052			.WORD	42		
3031	027004	022245			.WORD	MWIPLFL		
3032	027006	020064			.WORD	ERR4		
3033	027010	004737	013324		JSR	PC,CPWR		:TR79 POWER CLEAR
3034	027014			70\$:				:TEST SPACE REVERSE OVER IDB
3035	027014	004737	014066	T3AV:	JSR	PC,TESTN		:MAKE SURE TRANSPORT ON LINE AND READY
3036	027020	103001			BCC	10\$		:NO ERROR
3037	027022				ERROR			:REPORT ERROR
3038	027022	104460			TRAP	C\$ERROR		
3039	027024			10\$:				:ON LINE AND READY
3040	027024	032777	000040	153212	BIT	#LDPTS,@TRSR		:IF AT LOAD POINT
3041	027032	001006			BNE	20\$		: THEN SKIP PRELIMINARY REWIND
3042	027034	004737	012416		JSR	PC,RWIND		:REWIND
3043	027040	004737	013534		JSR	PC,CHEKI		:CHECK REGISTERS
3044	027044	103001			BCC	20\$		:OK,NO ERRORS. TAPE AT LOAD POINT
3045	027046				ERROR			:REPORT ERROR
3046	027046	104460			TRAP	C\$ERROR		
3047	027050			20\$:				:AT LOAD POINT
3048	027050	004737	014066		JSR	PC,TESTN		:MAKE SURE TRANSPORT ON LINE AND READY
3049	027054	103001			BCC	30\$		:NO ERROR
3050	027056				ERROR			:REPORT ERROR
3051	027056	104460			TRAP	C\$ERROR		
3052	027060			30\$:				:WRITE IDB
3053	027060	004737	012464		JSR	PC,WTIDB		:WRITE IDB
3054	027064	004737	014254		JSR	PC,CHEKO		:CHECK REGISTERS
3055	027070	103001			BCC	40\$		:OK
3056	027072				ERROR			:REPORT ERROR
3057	027072	104460			TRAP	C\$ERROR		
3058	027074			40\$:				:SPACE REVERSE OVER IDB
3059	027074	012737	177777	002214	MOV	#-1,USEB		:SPECIFY WORD COUNT
3060	027102	004737	013024		JSR	PC,SPR		:SPACE REVERSE
3061	027106	013737	002222	002220	MOV	DLXRW,DLX		:SPECIFY DELAU MULTIPLIER
3062	027114	004737	013362		JSR	PC,WWAIT		:WAIT
3063	027120	004737	016122		JSR	PC,CHEKAV		:CHECK REGISTERS
3064	027124	103001			BCC	50\$		:OK
3065	027126				ERROR			:REPORT ERROR
3066	027126	104460			TRAP	C\$ERROR		
3067	027130			50\$:				:TEST READ IDB
3068	027130			T3AW:				
3069	027130	004737	014066		JSR	PC,TESTN		:MAKE SURE TRANSPORT ON LINE AND READY
3070	027134	103001			BCC	10\$		:NO ERROR
3071	027136				ERROR			:REPORT ERROR
3072	027136	104460			TRAP	C\$ERROR		
3073	027140			10\$:				:ON LINE AND READY
3074	027140	032777	000040	153076	BIT	#LDPTS,@TRSR		:IF AT LOAD POINT
3075	027146	001006			BNE	20\$		: THEN SKIP PRELIMINARY REWIND
3076	027150	004737	012416		JSR	PC,RWIND		:REWIND
3077	027154	004737	013534		JSR	PC,CHEKI		:CHECK REGISTERS
3078	027160	103001			BCC	20\$		:OK,NO ERRORS. TAPE AT LOAD POINT
3079	027162				ERROR			:REPORT ERROR
3080	027162	104460			TRAP	C\$ERROR		
3081	027164			20\$:				:AT LOAD POINT
3082	027164	004737	014066		JSR	PC,TESTN		:MAKE SURE TRANSPORT ON LINE AND READY
3083	027170	103001			BCC	30\$		:NO ERROR
3084	027172				ERROR			:REPORT ERROR
3085	027172	104460			TRAP	C\$ERROR		



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TEST3 CHECK IDB AND EOF OPERATIONS,COUNT AND PARITY ERRORS

3086	027174				30\$:				;READ IDB
3087	027174	005037	006322			CLR	INPUT		;CLEAR INPUT WORD
3088	027200	012737	177777	002214		MOV	#-1,USEB		;SPECIFY COUNT FOR READ
3089	027206	004737	012756			JSR	PC,RD		;READ
3090	027212	004737	016262			JSR	PC,CHEKAW		;CHECK REGISTERS
3091	027216	103001				BCC	40\$		;OK
3092	027220					ERROR			;REPORT ERROR
3093	027220	104460				TRAP	CSERROR		
3094	027222				40\$:				
3095	027222				T3L:				;TEST WRITE EOF(TAPE MARK)
3096	027222	004737	013324			JSR	PC,CPWR		;RESET TR79
3097	027226	004737	014066			JSR	PC,TESTN		;MAKE SURE TRANSPORT ON LINE AND READY
3098	027232	103001				BCC	10\$		;NO ERROR
3099	027234					ERROR			;REPORT ERROR
3100	027234	104460				TRAP	CSERROR		
3101	027236				10\$:				;ON LINE AND READY
3102	027236	032777	000040	153000		BIT	#LDPTS,@TRSR		;IF AT LOAD POINT
3103	027244	001006				BNE	20\$		; THEN SKIP PRELIMINARY REWIND
3104	027246	004737	012416			JSR	PC,RWIND		;REWIND
3105	027252	004737	013534			JSR	PC,CHEKI		;CHECK REGISTERS
3106	027256	103001				BCC	20\$		;OK.NO ERRORS. TAPE AT LOAD POINT
3107	027260					ERROR			;REPORT ERROR
3108	027260	104460				TRAP	CSERROR		
3109	027262				20\$:				;AT LOAD POINT
3110	027262	004737	014066			JSR	PC,TESTN		;MAKE SURE TRANSPORT ON LINE AND READY
3111	027266	103001				BCC	30\$		;NO ERROR
3112	027270					ERROR			;REPORT ERROR
3113	027270	104460				TRAP	CSERROR		
3114	027272				30\$:				;WRITE IDB
3115	027272	004737	012464			JSR	PC,WTIDB		;WRITE IDB
3116	027276	004737	014254			JSR	PC,CHEKO		;CHECK REGISTERS
3117	027302	103001				BCC	40\$		;OK
3118	027304					ERROR			;REPORT ERROR
3119	027304	104460				TRAP	CSERROR		
3120	027306				40\$:				;ERASE
3121	027306	012737	177400	002214		MOV	#-400,USEB		;SPECIFY ERASE COUNT
3122	027314	004737	013140			JSR	PC,ERS		;ERASE
3123	027320	004737	017546			JSR	PC,CHEKFX		;CHECK REGISTERS
3124	027324	103001				BCC	50\$		;OK
3125	027326					ERROR			;REPORT ERROR
3126	027326	104460				TRAP	CSERROR		
3127	027330				50\$:				;WRITE EOF(TAPE MARK)
3128	027330	004737	013072			JSR	PC,WTEOF		;WRITE EOF
3129	027334	004737	013756			JSR	PC,CHEKL		;CHECK REGISTERS
3130	027340	103001				BCC	60\$		;OK
3131	027342					ERROR			;REPORT ERROR
3132	027342	104460				TRAP	CSERROR		
3133	027344				60\$:				
3134	027344				T3U:				;TEST SPACE REVERSE OVER EOF
3135	027344	004737	014066			JSR	PC,TESTN		;MAKE SURE TRANSPORT ON LINE AND READY
3136	027350	103001				BCC	10\$		;NO ERROR
3137	027352					ERROR			;REPORT ERROR
3138	027352	104460				TRAP	CSERROR		
3139	027354				10\$:				
3140	027354	005037	002214			CLR	USEB		;SPECIFY COUNT
3141	027360	004737	013024			JSR	PC,SPR		;SPACE REVERSE

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TEST3 CHECK IDB AND EOF OPERATIONS,COUNT AND PARITY ERRORS

3142	027364	004737	014506		JSR	PC,CHEKU		;CHECK REGISTERS
3143	027370	103001			BCC	20\$		;OK
3144	027372				ERROR			;REPORT ERROR
3145	027372	104460			TRAP	C\$ERROR		
3146	027374			20\$:				
3147	027374			T3V:			;TEST READ EOF	
3148	027374	004737	014066		JSR	PC,TESTN		;MAKE SURE TRANSPORT ON LINE AND READY
3149	027400	103001			BCC	10\$		;NO ERROR
3150	027402				ERROR			;REPORT ERROR
3151	027402	104460			TRAP	C\$ERROR		
3152	027404			10\$:				
3153	027404	005037	002214		CLR	USEB		;SPECIFY COUNT FOR READ
3154	027410	004737	012756		JSR	PC,RD		;READ
3155	027414	004737	014636		JSR	PC,CHEKV		;CHECK REGISTERS
3156	027420	103001			BCC	20\$		;OK
3157	027422				ERROR			;REPORT ERROR
3158	027422	104460			TRAP	C\$ERROR		
3159	027424			20\$:				
3160	027424			T3W:			;TEST TIMEOUT WHILE WRITING	
3161	027424	004737	013324		JSR	PC,CPWR		;RESET TR79
3162	027430	004737	014066		JSR	PC,TESTN		;MAKE SURE TRANSPORT ON LINE AND READY
3163	027434	103001			BCC	10\$		;NO ERROR
3164	027436				ERROR			;REPORT ERROR
3165	027436	104460			TRAP	C\$ERROR		
3166	027440			10\$:			;ON LINE AND READY	
3167	027440	032777	000040	152576	BIT	#LDPTS,@TRSR		;IF AT LOAD POINT
3168	027446	001006			BNE	20\$		; THEN SKIP PRELIMINARY REWIND
3169	027450	004737	012416		JSR	PC,RWIND		;REWIND
3170	027454	004737	013534		JSR	PC,CHEKI		;CHECK REGISTERS
3171	027460	103001			BCC	20\$		;OK,NO ERRORS. TAPE AT LOAD POINT
3172	027462				ERROR			;REPORT ERROR
3173	027462	104460			TRAP	C\$ERROR		
3174	027464			20\$:			;AT LOAD POINT	
3175	027464	004737	014066		JSR	PC,TESTN		;MAKE SURE TRANSPORT ON LINE AND READY
3176	027470	103001			BCC	30\$		;NO ERROR
3177	027472				ERROR			;REPORT ERROR
3178	027472	104460			TRAP	C\$ERROR		
3179	027474			30\$:			;WRITE IDB	
3180	027474	004737	012464		JSR	PC,WTIDB		;WRITE IDB
3181	027500	004737	014254		JSR	PC,CHEKO		;CHECK REGISTERS
3182	027504	103001			BCC	40\$		;OK
3183	027506				ERROR			;REPORT ERROR
3184	027506	104460			TRAP	C\$ERROR		
3185	027510			40\$:			;ERASE	
3186	027510	012737	177400	002214	MOV	#-400,USEB		;SPECIFY ERASE COUNT
3187	027516	004737	013140		JSR	PC,ERS		;ERASE
3188	027522	004737	017546		JSR	PC,CHEKFX		;CHECK REGISTERS
3189	027526	103001			BCC	50\$		;OK
3190	027530				ERROR			;REPORT ERROR
3191	027530	104460			TRAP	C\$ERROR		
3192	027532			50\$:			;FORCE WRITE FOR LONGER THAN 1.5 SEC	
3193	027532	013702	002232		MOV	DLXLNG,R2		;SPECIFY DELAY MULTIPLIER
3194	027536	005001			CLR	R1		;SPECIFY DELAY CONSTANT
3195	027540	042777	000001	152476	BIC	#BIT0,@TRSR		;CLEAR TR79 INHIBIT BIT
3196	027546	005077	152474		CLR	@TRWC		;SPECIFY MAXIMUM WORD COUNT
3197	027552	012777	002262	152470	MOV	#OUTPUT,@TRBA		;SPECIFY BUS ADDRESS



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TEST3 CHECK IDB AND EOF OPERATIONS,COUNT AND PARITY ERRORS

3198	027560	012777	000402	152454		MOV	#WRITE,@TRCR	;SPECIFY WRITE OPERATION
3199	027566	052777	000001	152446		BIS	#BITO,@TRCR	;SET TR79 GO BIT
3200	027574				60\$:			
3201	027574	005077	152446			CLR	@TRWC	;RESET COUNT
3202	027600	012777	002262	152442		MOV	#OUTPUT,@TRBA	;RESET BUS ADDRESS
3203	027606	005201				INC	R1	;COUNT A TICK
3204	027610	001371				BNE	60\$	;KEEP TICKING
3205	027612	005302				DEC	R2	;COUNT DOWN MULTIPLIER
3206	027614	001367				BNE	60\$	;KEEP TICKING
3207	027616	004737	013254			JSR	PC,CPYTRR	;COPY TR79 REGISTERS
3208	027622	012737	102602	002174		MOV	#102602,ETRSR	;EXPECTED
3209	027630	012737	002401	002176		MOV	#2401,ETRSR	;EXPECTED
3210	027636	012737	002262	002202		MOV	#OUTPUT,ETRBA	;EXPECTED
3211	027644	023737	002174	002164		CMP	ETRCR,ATRCR	;CHECK COMMAND REGISTER
3212	027652	001401				BEQ	70\$	;OK
3213	027654	005202				INC	R2	;INDICATE ERROR
3214	027656				70\$:			
3215	027656	042737	170000	002166		BIC	#170000,ATRSR	;CLEAR UNWANTED BITS
3216	027664	023737	002176	002166		CMP	ETRSR,ATRSR	;CHECK STATUS
3217	027672	001401				BEQ	80\$	;OK
3218	027674	005202				INC	R2	;INDICATE ERROR
3219	027676				80\$:			
3220	027676	023737	002202	002172		CMP	ETRBA,ATRBA	;CHECK BUS ADDRESS
3221	027704	001401				BEQ	90\$	;OK
3222	027706	005202				INC	R2	;INDICATE ERROR
3223	027710				90\$:			
3224	027710	005737	002170			TST	ATRCR	;CHECK COUNT
3225	027714	001401				BEQ	100\$	;OK
3226	027716	005202				INC	R2	;INDICATE ERROR
3227	027720				100\$:			
3228	027720	005702				TST	R2	;ANY ERRORS?
3229	027722	001404				BEQ	110\$	;NO
3230		000053			ENUM =	^D<ENUM + 1>		;INCREMENT ERROR COUNT
3231	027724					ERRSOFT	ENUM,MWTOFL,ERR5	;REPORT ERROR
3232	027724	104457				TRAP	C\$ERRSOFT	
3233	027726	000053				.WORD	43	
3234	027730	022751				.WORD	MWTOFL	
3235	027732	020102				.WORD	ERR5	
3236	027734				110\$:			
3237	027734	004737	013324			JSR	PC,CPWR	;RESET TR79
3238								
3239								
3240	027740				T3AC:			;TEST READ COUNT ERROR. COUNT TOO LARGE
3241	027740	004737	013324			JSR	PC,CPWR	;RESET TR79
3242	027744	004737	014066			JSR	PC,TESTN	;MAKE SURE TRANSPORT ON LINE AND READY
3243	027750	103001				BCC	10\$	;NO ERROR
3244	027752					ERROR		;REPORT ERROR
3245	027752	104460				TRAP	C\$ERROR	
3246	027754				10\$:			;ON LINE AND READY
3247	027754	032777	000040	152262		BIT	#LDPTS,@TRSR	;IF AT LOAD POINT
3248	027762	001006				BNE	20\$	;THEN SKIP PRELIMINARY REWIND
3249	027764	004737	012416			JSR	PC,RWIND	;REWIND
3250	027770	004737	013534			JSR	PC,CHEKI	;CHECK REGISTERS
3251	027774	103001				BCC	20\$	;OK.NO ERRORS. TAPE AT LOAD POINT
3252	027776					ERROR		;REPORT ERROR
3253	027776	104460				TRAP	C\$ERROR	



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TEST3 CHECK IDB AND EOF OPERATIONS,COUNT AND PARITY ERRORS

3254	030000						
3255	0300C0	004737	014066				
3256	030004	103001					
3257	030006						
3258	030006	104460					
3259	030010						
3260	030010	004737	012464				
3261	030014	004737	014254				
3262	030020	103001					
3263	030022						
3264	030022	104460					
3265	030024						
3266	030024	004737	014066				
3267	030030	103001					
3268	030032						
3269	030032	104460					
3270	030034						
3271	030034	012737	177400	002214			
3272	030042	004737	013140				
3273	030046	004737	017546				
3274	030052	103001					
3275	030054						
3276	030054	104460					
3277	030056						
3278	030056	004737	014066				
3279	030062	103001					
3280	030064						
3281	030064	104460					
3282	030066						
3283	030066	012737	177700	002214			
3284	030074	004737	012642				
3285	030100	004737	017156				
3286	030104	103001					
3287	030106						
3288	030106	104460					
3289	030110						
3290	030110	004737	014066				
3291	030114	103001					
3292	030116						
3293	030116	104460					
3294	030120						
3295	030120	004737	013024				
3296	030124	004737	017416				
3297	030130	103001					
3298	030132						
3299	030132	104460					
3300	030134						
3301	030134	004737	014066				
3302	030140	103001					
3303	030142						
3304	030142	104460					
3305	030144						
3306	030144	012737	177701	002214			
3307	030152	004737	012756				
3308	030156	004737	014776				
3309	030162	103001					

```

;AT LOAD POINT
:MAKE SURE TRANSPORT ON LINE AND READY
:NO ERROR
:REPORT ERROR
;WRITE IDB
:WRITE IDB
:CHECK REGISTERS
:OK
:REPORT ERROR
;ERASE
:MAKE SURE TRANSPORT ON LINE AND READY
:NO ERROR
:REPORT ERROR
;SPECIFY ERASE COUNT
:ERASE
:CHECK REGISTERS
:OK
:REPORT ERROR
;WRITE
:MAKE SURE TRANSPORT ON LINE AND READY
:NO ERROR
:REPORT ERROR
;SPECIFY COUNT FOR WRITE
:WRITE
:CHECK REGISTERS
:OK
:REPORT ERROR
;SPACE REVERSE
:MAKE SURE TRANSPORT ON LINE AND READY
:NO ERROR
:REPORT ERROR
;SPACE REVERSE
:CHECK REGISTERS
:OK
:REPORT ERROR
;READ WITH LONG COUNT
:MAKE SURE TRANSPORT ON LINE AND READY
:NO ERROR
:REPORT ERROR
;SPECIFY COUNT
:READ
:CHECK REGISTERS
:OK
    
```

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TEST3 CHECK IDB AND EOF OPERATIONS,COUNT AND PARITY ERRORS

```

3310 030164          ERROR TRAP          ;REPORT ERROR
3311 030164 104460 90$:          CSERROR
3312 030166
3313
3314
3315
3316 030166          T3AD:          ;TEST READ COUNT ERROR, COUNT TOO SMALL
3317 030166 004737 013324 JSR PC,CPWR          ;RESET TR79
3318 030172 004737 014066 JSR PC,TESTN        ;MAKE SURE TRANSPORT ON LINE AND READY
3319 030176 103001 BCC 10$            ;NO ERROR
3320 030200          ERROR TRAP          ;REPORT ERROR
3321 030200 104460 10$:          CSERROR          ;ON LINE AND READY
3322 030202          BIT #LDPTS,@TRSR        ;IF AT LOAD POINT
3323 030202 032777 000040 152034 BNE 20$            ; THEN SKIP PRELIMINARY REWIND
3324 030210 001006 JSR PC,RWIND        ;REWIND
3325 030212 004737 012416 JSR PC,CHEKI        ;CHECK REGISTERS
3326 030216 004737 013534 BCC 20$            ;OK,NO ERRORS. TAPE AT LOAD POINT
3327 030222 103001 ERROR TRAP          ;REPORT ERROR
3328 030224          CSERROR
3329 030224 104460 20$:          ;AT LOAD POINT
3330 030226          JSR PC,TESTN        ;MAKE SURE TRANSPORT ON LINE AND READY
3331 030226 004737 014066 BCC 30$            ;NO ERROR
3332 030232 103001 ERROR TRAP          ;REPORT ERROR
3333 030234          CSERROR
3334 030234 104460 30$:          ;WRITE IDB
3335 030236          JSR PC,WTIDB        ;WRITE IDB
3336 030236 004737 012464 JSR PC,CHEKO        ;CHECK REGISTERS
3337 030242 004737 014254 BCC 40$            ;OK
3338 030246 103001 ERROR TRAP          ;REPORT ERROR
3339 030250          CSERROR
3340 030250 104460 40$:          ;ERASE
3341 030252          JSR PC,TESTN        ;MAKE SURE TRANSPORT ON LINE AND READY
3342 030252 004737 014066 BCC 45$            ;NO ERROR
3343 030256 103001 ERROR TRAP          ;REPORT ERROR
3344 030260          CSERROR
3345 030260 104460 45$:          ;SPECIFY ERASE COUNT
3346 030262          MOV #-400,USEB        ;ERASE
3347 030262 012737 177400 002214 JSR PC,ERS          ;CHECK REGISTERS
3348 030270 004737 013140 JSR PC,CHEKFX        ;OK
3349 030274 004737 017546 BCC 50$            ;REPORT ERROR
3350 030300 103001 ERROR TRAP          CSERROR
3351 030302          ;WRITE
3352 030302 104460 50$:          ;MAKE SURE TRANSPORT ON LINE AND READY
3353 030304          JSR PC,TESTN        ;NO ERROR
3354 030304 004737 014066 BCC 55$            ;REPORT ERROR
3355 030310 103001 ERROR TRAP          CSERROR
3356 030312          ;SPECIFY COUNT FOR WRITE
3357 030312 104460 55$:          ;WRITE
3358 030314          MOV #-100,USEB        ;CHECK REGISTERS
3359 030314 012737 177700 002214 JSR PC,WRT          ;OK
3360 030322 004737 012642 JSR PC,CHEKCX        ;REPORT ERROR
3361 030326 004737 017156 BCC 70$
3362 030332 103001 ERROR TRAP          CSERROR
3363 030334          ;SPACE REVERSE
3364 030334 104460 70$:
3365 030336

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TEST3 CHECK IDB AND EOF OPERATIONS,COUNT AND PARITY ERRORS

3366	030336	004737	014066		JSR	PC,TESTN		:MAKE SURE TRANSPORT ON LINE AND READY
3367	030342	103001			BCC	75\$		:NO ERROR
3368	030344				ERROR			:REPORT ERROR
3369	030344	104460			TRAP	C\$ERROR		
3370	030346			75\$:				
3371	030346	004737	013024		JSR	PC,SPR		:SPACE REVERSE
3372	030352	004737	017416		JSR	PC,CHEKEX		:CHECK REGISTERS
3373	030356	103001			BCC	80\$		:OK
3374	030360				ERROR			:REPORT ERROR
3375	030360	104460			TRAP	C\$ERROR		
3376	030362			80\$:				:READ WITH SHORT COUNT
3377	030362	004737	014066		JSR	PC,TESTN		:MAKE SURE TRANSPORT ON LINE AND READY
3378	030366	103001			BCC	85\$		:NO ERROR
3379	030370				ERROR			:REPORT ERROR
3380	030370	104460			TRAP	C\$ERROR		
3381	030372			85\$:				
3382	030372	012737	177677	002214	MOV	#-101,USEB		:SPECIFY COUNT
3383	030400	004737	012756		JSR	PC,RD		:READ
3384	030404	004737	015142		JSR	PC,CHEKAD		:CHECK REGISTERS
3385	030410	103001			BCC	90\$		:OK
3386	030412				ERROR			:REPORT ERROR
3387	030412	104460			TRAP	C\$ERROR		
3388	030414			90\$:				
3389								
3390								
3391								
3392	030414			T3AE:				:TEST SPACE REVERSE COUNT ERROR. SHORT COUNT
3393	030414	004737	013324		JSR	PC,CPWR		:RESET TR79
3394	030420	004737	014066		JSR	PC,TESTN		:MAKE SURE TRANSPORT ON LINE AND READY
3395	030424	103001			BCC	10\$		:NO ERROR
3396	030426				ERROR			:REPORT ERROR
3397	030426	104460			TRAP	C\$ERROR		
3398	030430			10\$:				:ON LINE AND READY
3399	030430	032777	000040	151606	BIT	#LDPTS,@TRSR		:IF AT LOAD POINT
3400	030436	001006			BNE	20\$		: THEN SKIP PRELIMINARY REWIND
3401	030440	004737	012416		JSR	PC,RWIND		:REWIND
3402	030444	004737	013534		JSR	PC,CHEKI		:CHECK REGISTERS
3403	030450	103001			BCC	20\$		:OK.NO ERRORS. TAPE AT LOAD POINT
3404	030452				ERROR			:REPORT ERROR
3405	030452	104460			TRAP	C\$ERROR		
3406	030454			20\$:				:AT LOAD POINT
3407	030454	004737	014066		JSR	PC,TESTN		:MAKE SURE TRANSPORT ON LINE AND READY
3408	030460	103001			BCC	30\$		:NO ERROR
3409	030462				ERROR			:REPORT ERROR
3410	030462	104460			TRAP	C\$ERROR		
3411	030464			30\$:				:WRITE IDB
3412	030464	004737	012464		JSR	PC,WTIDB		:WRITE IDB
3413	030470	004737	014254		JSR	PC,CHEKO		:CHECK REGISTERS
3414	030474	103001			BCC	40\$		:OK
3415	030476				ERROR			:REPORT ERROR
3416	030476	104460			TRAP	C\$ERROR		
3417	030500			40\$:				:ERASE
3418	030500	004737	014066		JSR	PC,TESTN		:MAKE SURE TRANSPORT ON LINE AND READY
3419	030504	103001			BCC	45\$		:NO ERROR
3420	030506				ERROR			:REPORT ERROR
3421	030506	104460			TRAP	C\$ERROR		



```

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3422 030510
3423 030510 012737 177400 002214 45$: MOV #-400,USEB ;SPECIFY ERASE COUNT
3424 030516 004737 013140 JSR PC,ERS ;ERASE
3425 030522 004737 017546 JSR PC,CHEKFX ;CHECK REGISTERS
3426 030526 103001 BCC 50$ ;OK
3427 030530 ERROR ;REPORT ERROR
3428 030530 104460 TRAP C$ERROR
3429 030532 50$: JSR PC,TESTN ;WRITE ;MAKE SURE TRANSPORT ON LINE AND READY
3430 030532 004737 014066 BCC 55$ ;NO ERROR
3431 030536 103001 ERROR ;REPORT ERROR
3432 030540 TRAP C$ERROR
3433 030540 104460
3434 030542 55$: MOV #-100,USEB ;SPECIFY COUNT FOR WRITE
3435 030542 012737 177700 002214 JSR PC,WRT ;WRITE
3436 030550 004737 012642 JSR PC,CHEKCX ;CHECK REGISTERS
3437 030554 004737 017156 BCC 70$ ;OK
3438 030560 103001 ERROR ;REPORT ERROR
3439 030562 TRAP C$ERROR
3440 030562 104460
3441 030564 70$: JSR PC,TESTN ;SPACE REVERSE WITH SHORT COUNT
3442 030564 004737 014066 BCC 75$ ;MAKE SURE TRANSPORT ON LINE AND READY
3443 030570 103001 ERROR ;NO ERROR
3444 030572 TRAP C$ERROR ;REPORT ERROR
3445 030572 104460
3446 030574 75$: MOV #-77,USEB ;SPECIFY COUNT
3447 030574 012737 177701 002214 JSR PC,SPR ;SPACE REVERSE
3448 030602 004737 013024 JSR PC,CHEKAE ;CHECK REGISTERS
3449 030606 004737 015316 BCC 80$ ;OK
3450 030612 103001 ERROR ;REPORT ERROR
3451 030614 TRAP C$ERROR
3452 030614 104460
3453 030616 80$:
3454
3455
3456
3457 030616 T3AF: ;TEST SPACE REVERSE COUNT ERROR. COUNT TOO LARGE
3458 030616 004737 013324 JSR PC,CPWR ;RESET TR79
3459 030622 004737 014066 JSR PC,TESTN ;MAKE SURE TRANSPORT ON LINE AND READY
3460 030626 103001 BCC 10$ ;NO ERROR
3461 030630 ERROR ;REPORT ERROR
3462 030630 104460 TRAP C$ERROR
3463 030632 10$: ;ON LINE AND READY
3464 030632 032777 000040 151404 BIT #LDPTS,@TRSR ;IF AT LOAD POINT
3465 030640 001006 BNE 20$ ; THEN SKIP PRELIMINARY REWIND
3466 030642 004737 012416 JSR PC,RWIND ;REWIND
3467 030646 004737 013534 JSR PC,CHEKI ;CHECK REGISTERS
3468 030652 103001 BCC 20$ ;OK.NO ERRORS. TAPE AT LOAD POINT
3469 030654 ERROR ;REPORT ERROR
3470 030654 104460 TRAP C$ERROR
3471 030656 20$: ;AT LOAD POINT
3472 030656 004737 014066 JSR PC,TESTN ;MAKE SURE TRANSPORT ON LINE AND READY
3473 030662 103001 BCC 30$ ;NO ERROR
3474 030664 ERROR ;REPORT ERROR
3475 030664 104460 TRAP C$ERROR
3476 030666 30$: ;WRITE IDB
3477 030666 004737 012464 JSR PC,WTIDB ;WRITE IDB

```

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TEST3 CHECK IDB AND EOF OPERATIONS,COUNT AND PARITY ERRORS

3478	030672	004737	014254		JSR	PC,CHEKO		;CHECK REGISTERS
3479	030676	103001			BCC	40\$		;OK
3480	030700				ERROR			;REPORT ERROR
3481	030700	104460			TRAP	C\$ERROR		
3482	030702			40\$:			;ERASE	
3483	030702	004737	014066		JSR	PC,TESTN		;MAKE SURE TRANSPORT ON LINE AND READY
3484	030706	103001			BCC	45\$		;NO ERROR
3485	030710				ERROR			;REPORT ERROR
3486	030710	104460			TRAP	C\$ERROR		
3487	030712			45\$:				
3488	030712	012737	177400	002214	MOV	#-400,USEB		;SPECIFY ERASE COUNT
3489	030720	004737	013140		JSR	PC,ERS		;ERASE
3490	030724	004737	017546		JSR	PC,CHEKFX		;CHECK REGISTERS
3491	030730	103001			BCC	50\$		;OK
3492	030732				ERROR			;REPORT ERROR
3493	030732	104460			TRAP	C\$ERROR		
3494	030734			50\$:			;WRITE	
3495	030734	004737	014066		JSR	PC,TESTN		;MAKE SURE TRANSPORT ON LINE AND READY
3496	030740	103001			BCC	55\$		;NO ERROR
3497	030742				ERROR			;REPORT ERROR
3498	030742	104460			TRAP	C\$ERROR		
3499	030744			55\$:				
3500	030744	012737	177700	002214	MOV	#-100,USEB		;SPECIFY COUNT FOR WRITE
3501	030752	004737	012642		JSR	PC,WRT		;WRITE
3502	030756	004737	017156		JSR	PC,CHEKCX		;CHECK REGISTERS
3503	030762	103001		60\$:	BCC	70\$		;OK
3504	030764				ERROR			;REPORT ERROR
3505	030764	104460			TRAP	C\$ERROR		
3506	030766			70\$:			;SPACE REVERSE WITH LONG COUNT	
3507	030766	004737	014066		JSR	PC,TESTN		;MAKE SURE TRANSPORT ON LINE AND READY
3508	030772	103001			BCC	75\$		;NO ERROR
3509	030774				ERROR			;REPORT ERROR
3510	030774	104460			TRAP	C\$ERROR		
3511	030776			75\$:				
3512	030776	012737	177677	002214	MOV	#-101,USEB		;SPECIFY COUNT
3513	031004	004737	013024		JSR	PC,SPR		;SPACE REVERSE
3514	031010	004737	015462		JSR	PC,CHEKAF		;CHECK REGISTERS
3515	031014	103001			BCC	80\$		;OK
3516	031016				ERROR			;REPORT ERROR
3517	031016	104460			TRAP	C\$ERROR		
3518	031020			80\$:				
3519								
3520								
3521	031020			T3AX:			;TEST OPERATIONS WITH EVEN PARITY DATA	
3522	031020	004737	013324		JSR	PC,CPWR		;RESET TR79
3523	031024	004737	014066		JSR	PC,TESTN		;MAKE SURE TRANSPORT ON LINE AND READY
3524	031030	103001			BCC	10\$		;NO ERROR
3525	031032				ERROR			;REPORT ERROR
3526	031032	104460			TRAP	C\$ERROR		
3527	031034			10\$:			;ON LINE AND READY	
3528	031034	032777	000040	151202	BIT	#LDPTS,@TRSR		;IF AT LOAD POINT
3529	031042	001006			BNE	20\$		; THEN SKIP PRELIMINARY REWIND
3530	031044	004737	012416		JSR	PC,RWIND		;REWIND
3531	031050	004737	013534		JSR	PC,CHEKI		;CHECK REGISTERS
3532	031054	103001			BCC	20\$		;OK.NO ERRORS. TAPE AT LOAD POINT
3533	031056				ERROR			;REPORT ERROR







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TEST3 CHECK IDB AND EOF OPERATIONS,COUNT AND PARITY ERRORS

```

3590 031246
3591 031246 104460
3592 031250
3593 031250 004737 014066
3594 031254 103001
3595 031256
3596 031256 104460
3597 031260
3598 031260 012737 177700 002214
3599 031266 012737 006322 002216
3600 031274 004737 012756
3601 031300 004737 017002
3602 031304 103001
3603 031306
3604 031306 104460
3605 031310 004737 013324
3606
3607 031314
3608 031314
3609 031314 104401
3610
3611
3612
3613

```

```

ERROR
TRAP C$ERROR ;REPORT ERROR
10$: JSR PC,TESTN ;ON LINE AND READY
      BCC 75$ ;MAKE SURE TRANSPORT ON LINE AND READY
      ERROR ;NO ERROR
      TRAP C$ERROR ;REPORT ERROR
75$: MOV #-100,USEB ;SPECIFY COUNT
      MOV #INPUT,USEC ;SPECIFY DATA ADDRESS
      JSR PC,RD ;READ
      JSR PC,CHEKAZ ;CHECK REGISTERS
      BCC 80$ ;OK
      ERROR ;REPORT ERROR
TRAP C$ERROR
80$: JSR PC,CPWR ;TR79 FOWER CLEAR
ENDTST
L10023: TRAP C$ETST

```

```

.SBTTL TEST4 WRITE, READ AND TEST DATA WRITTEN TO TAPE

```

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TEST4 WRITE, READ AND TEST DATA WRITTEN TO TAPE

3614  
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031316				
031316				
031316				
031316	042777	000100	150716	
031324	032777	000004	150712	
031332	001404			
	000054			
031334				
031334	104457			
031336	000054			
031340	021002			
031342	017744			
031344				
031344	004737	013324		
031350	004737	014066		
031354	103001			
031356				
031356	104460			
031360				
031360	032777	000040	150656	
031366	001006			
031370	004737	012416		
031374	004737	013534		
031400	103001			
031402				
031402	104460			
031404				
031404	004737	014066		
031410	103001			
031412				
031412	104460			

```

:////////////////////
:TEST4 WRITES, READS AND TESTS DATA WRITTEN ON TAPE
:
:TEST4 WRITES A FILE OF DATA TO TAPE A NUMBER OF TIMES.
:THE FILE CONTAINS 15 BLOCKS OF DATA. EACH TIME A BLOCK
:IS WRITTEN THE DATA IS READ BACK AND CHECKED. THE NUMBER
:OF TIMES WRITING AND CHECKING A FILE IS REPEATED IS
:SPECIFIED IN THE SOFTWARE P-TABLE. THE DEFAULT VALUE
:FOR THIS REPEAT COUNT IS 10.(DECIMAL).
:
:TEST4 INCLUDES:
:
:INSURE WRITE RING
:REWIND AND WRITE ID BLOCK
:WRITE,SPACE REV, READ AND TEST DATA
:
:TEST NAME IN CZTRAB
:TESTC
:TESTO
:TESTXX
:////////////////////
    
```

```

BGNTST
T4::
TEST4: ;TEST REPEATED WRITE, SPACE REVERSE, READ
;NEGATE TR79 INTERRUPT ENABLE
;CLEAR TR79 INTERRUPT ENABLE BIT
;CHECK FOR WRITE ENABLE RING
;IF WRITE ENABLE RING IS PRESENT
; THEN CONTINUE
;INCREMENT ERROR NUMBER
;REPORT ERROR. GET RING INSTALLED

ENUM = *D<ENUM + 1>
ERRSOFT ENUM,EM4A,ERR2
TRAP CSERSOFT
.WORD 44
.WORD EM4A
.WORD ERR2

10$: ;MAKE SURE TAPE IS AT LOAD POINT
JSR PC,CPWR ;RESET TR79
JSR PC,TESTN ;MAKE SURE TRANSPORT ON LINE AND READY
BCC 15$ ;NO ERROR
ERROR ;REPORT ERROR
TRAP CSERROR

15$: ;IF AT LOAD POINT
; THEN SKIP PRELIMINARY REWIND
;REWIND
;CHECK REGISTERS
;NO ERRORS.
;REPORT ERROR
BIT #LDPTS,@TRSR
BNE 20$
JSR PC,RWIND
JSR PC,CHEKI
BCC 20$
ERROR ;REPORT ERROR
TRAP CSERROR

20$: ;AT LOAD POINT
JSR PC,TESTN ;MAKE SURE ON LINE
BCC 25$ ;OK
ERROR ;REPORT ERROR
TRAP CSERROR
    
```

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TEST4 WRITE, READ AND TEST DATA WRITTEN TO TAPE

3670	031414				25\$:				
3671	031414	004737	012464			JSR	PC,WTIDB		;WRITE IDB
3672	031420	004737	014254			JSR	PC,CHEKO		;WRITE IDB
3673	031424	103001				BCC	30\$		;CHECK REGISTERS
3674	031426					ERROR			;OK
3675	031426	104460				TRAP	C\$ERROR		;REPORT ERROR
3676	031430				30\$:				;ERASE
3677	031430	004737	014066			JSR	PC,TESTN		;MAKE SURE TRANSPORT ON LINE AND READY
3678	031434	103001				BCC	35\$		;NO ERROR
3679	031436					ERROR			;REPORT ERROR
3680	031436	104460				TRAP	C\$ERROR		
3681	031440				35\$:				
3682	031440	012737	177400	002214		MOV	#-400,USEB		;SPECIFY ERASE COUNT
3683	031446	004737	013140			JSR	PC,ERS		;ERASE
3684	031452	004737	017546			JSR	PC,CHEKFX		;CHECK REGISTERS
3685	031456	103001				BCC	40\$		;OK
3686	031460					ERROR			;REPORT ERROR
3687	031460	104460				TRAP	C\$ERROR		
3688	031462				40\$:				;TEST REPEATED SEQUENCE OF WRITE,SPACE REVERSE,READ
3689	031462	013746	002152			MOV	RPTCNT,-(SP)		;COPY LOOP REPEAT COUNT
3690	031466	012704	000017		T4XX:	MOV	#15,R4		;SPECIFY NUMBER OF BLOCKS PER LOOP
3691	031472	012703	032000			MOV	#SIZTAB,R3		;POINT TO TABLE OF BLOCK SIZES
3692	031476	012337	002214		10\$:	MOV	(R3)+,USEB		;SPECIFY WORD COUNT
3693	031502	010346				MOV	R3,-(SP)		;SAVE R3 AND R4
3694	031504	010446				MOV	R4,-(SP)		
3695									;WRITE
3696	031506	004737	014066			JSR	PC,TESTN		;MAKE SURE ON LINE AND READY
3697	031512	103001				BCC	15\$		;OK
3698	031514					ERROR			;REPORT ERROR
3699	031514	104460				TRAP	C\$ERROR		
3700	031516				15\$:				
3701	031516	004737	012642			JSR	PC,WRT		;EXECUTE WRITE
3702	031522	105777	150516			TSTB	@TRSR		;IF AT EOT
3703	031526	100506				BMI	100\$		; THEN REWIND AND EXIT TEST
3704	031530	004737	017156			JSR	PC,CHEKCX		;CHECK REGISTERS
3705	031534	103001				BCC	20\$		;OK
3706	031536					ERROR			;REPORT ERROR
3707	031536	104460				TRAP	C\$ERROR		
3708	031540				20\$:				;SPACE REVERSE
3709	031540	004737	014066			JSR	PC,TESTN		;MAKE SURE ON LINE AND READY
3710	031544	103001				BCC	25\$		;OK
3711	031546					ERROR			;REPORT ERROR
3712	031546	104460				TRAP	C\$ERROR		
3713	031550				25\$:				
3714	031550	004737	013024			JSR	PC,SPR		;SPACE REVERSE
3715	031554	004737	017416			JSR	PC,CHEKEX		;CHECK REGISTERS
3716	031560	103001				BCC	30\$		;OK
3717	031562					ERROR			;REPORT ERROR
3718	031562	104460				TRAP	C\$ERROR		
3719	031564				30\$:				;READ
3720	031564	004737	014066			JSR	PC,TESTN		;MAKE SURE ON LINE AND READY
3721	031570	103001				BCC	35\$		;OK
3722	031572					ERROR			;REPORT ERROR
3723	031572	104460				TRAP	C\$ERROR		
3724	031574				35\$:				
3725	031574	004737	012756			JSR	PC,RD		;EXECUTE READ



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TEST4 WRITE, READ AND TEST DATA WRITTEN TO TAPE

3726	031600	004737	017276		JSR	PC,CHEKDX		;CHECK REGISTERS
3727	031604	103001			BCC	40\$		;OK
3728	031606				ERRR			;REPORT ERROR
3729	031606	104460			TRAP	C\$ERROR		
3730	031610			40\$:				
3731	031610	004737	014364		JSR	PC,CHEKS		;CHECK DATA JUST READ
3732	031614	103001			BCC	50\$		;OK
3733	031616				ERROR			;REPORT ERROR
3734	031616	104460			TRAP	C\$ERROR		
3735	031620	004737	014466	50\$:	JSR	PC,CHEKS1		;CLEAR INPUT AREA
3736								;CHECK FOR REPEAT SEQUENCE
3737	031624	012604			MOV	(SP)+,R4		;RESTORE R3 AND R4
3738	031626	012603			MOV	(SP)+,R3		
3739	031630	005304			DEC	R4		;IF NOT ALL BLOCK SIZES DONE
3740	031632	001321			BNE	10\$		; THEN DO THE NEXT ONE
3741								;WRITE EOF
3742	031634	004737	014066		JSR	PC,TESTN		;MAKE SURE ON LINE AND READY
3743	031640	103001			BCC	55\$		;OK
3744	031642				ERROR			;REPORT ERROR
3745	031642	104460			TRAP	C\$ERROR		
3746	031644			55\$:				
3747	031644	004737	013072		JSR	PC,WTEOF		;WRITE EOF(TAPE MARK)
3748	031650	105777	150370		TSTB	@TRSR		;IF AT EOT
3749	031654	100435			BMI	110\$		; THEN REWIND AND EXIT
3750	031656	004737	013756		JSR	PC,CHEKL		;CHECK REGISTERS
3751	031662	103001			BCC	60\$		;OK
3752	031664				ERROR			;REPORT ERROR
3753	031664	104460			TRAP	C\$ERROR		
3754	031666			60\$:				;SPACE REVERSE OVER EOF
3755	031666	004737	014066		JSR	PC,TESTN		;MAKE SURE ON LINE AND READY
3756	031672	103001			BCC	65\$		;OK
3757	031674				ERROR			;REPORT ERROR
3758	031674	104460			TRAP	C\$ERROR		
3759	031676			65\$:				
3760	031676	005037	002214		CLR	USEB		;SPECIFY COUNT
3761	031702	004737	013024		JSR	PC,SPR		;SPACE REVERSE OVER EOF
3762	031706	004737	014506		JSR	PC,CHEKU		;CHECK REGISTERS
3763	031712	103001			BCC	70\$		;OK
3764	031714				ERROR			;REPORT ERROR
3765	031714	104460			TRAP	C\$ERROR		
3766	031716			70\$:				;READ EOF
3767	031716	004737	012756		JSR	PC,RD		;READ
3768	031722	004737	014636		JSR	PC,CHEKV		;CHECK REGISTERS
3769	031726	103001			BCC	80\$		;OK
3770	031730				ERROR			;REPORT ERROR
3771	031730	104460			TRAP	C\$ERROR		
3772	031732			80\$:				
3773	031732	005716			TST	(SP)		;IF LOOP REPEAT COUNT IS NEGATIVE
3774	031734	100401			BMI	90\$		; THEN REPEAT LOOP TO EOT
3775	031736	005316			DEC	(SP)		;SUBTRACT 1 FROM LOOP REPEAT COUNT
3776	031740	001252		90\$:	BNE	T4XX		;IF COUNT NOT ZERO THEN REPEAT LOOP
3777	031742	000402			BR	110\$		;REWIND AND EXIT TEST4
3778	031744			100\$:				;REWIND AND EXIT TEST
3779	031744	012604			MOV	(SP)+,R4		;RESTORE R4 AND R3
3780	031746	012603			MOV	(SP)+,R3		
3781	031750	005726		110\$:	TST	(SP)+		;DISCARD LOOP REPEAT COUNT

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TEST4 WRITE, READ AND TEST DATA WRITTEN TO TAPE

```

3782 031752
3783 031752 004737 014066
3784 031756 103001
3785 031760
3786 031760 104460
3787 031762
3788 031762 004737 012416
3789 031766 004737 013534
3790 031772 103001
3791 031774
3792 031774 104460
3793 031776 000417
3794 032000 177777 177776 177775
3795 032006 177774 177773 177772
3796 032014 177771 177770 177760
3797 032022 177740 177700 177600
3798 032030 177400 177000 176000
3799 032036
3800 032036
3801 032036
3802 032036 104401
3803
3804

```

```

T4EX:          ;REWIND
          JSR   PC,TESTN      ;MAKE SURE ON LINE AND READY
          BCC   10$           ;OK
          ERROR TRAP         ;REPORT ERROR
          C$ERROR
10$:        JSR   PC,RWIND     ;REWIND
          JSR   PC,CHEKI      ;CHECK REGISTERS
          BCC   20$           ;OK
          ERROR TRAP         ;REPORT ERROR
          C$ERROR
20$:        BR    ENDT4       ;EXIT TEST
SIZTAB:     .WORD  -1,-2,-3,-4,-5,-6,-7,-10,-20,-40,-100,-200,-400,-1000,-2000

ENDT4:
L10024:     ENDTST
          TRAP  C$SETST
.SBTTL     TEST5  READ DATA WRITTEN BY TEST4

```

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TEST5 READ DATA WRITTEN BY TEST4

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032040 042777 000100 150174  
032046 004737 013324  
032052 004737 014066  
032056 103001  
032060  
032060 104460  
032062  
032062 032777 000040 150154  
032070 001006  
032072 004737 012416  
032076 004737 013534  
032102 103001  
032104  
032104 104460  
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032106 004737 014066  
032112 103001  
032114  
032114 104460  
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032116 004737 014066  
032122 103001  
032124  
032124 104460  
032126  
032126 012737 177777 002214  
032134 004737 012756  
032140 004737 016262  
032144 103001  
032146  
032146 104460  
032150  
032150 013746 002152  
032154 012704 000017  
032160 012703 032000

```

://////
:TEST5 READ DATA WRITTEN BY TEST4
:
:TEST5 INCLUDES:
:REWIND THE TAPE
:READ THE ID BLOCK
:READ THE TAPE
:
:TEST NAME IN CZTRAB
:TESTI
:TESTAW
:TESTXY
://////

```

```

T5:: BGNTST
TEST5: ;TEST READING DATA WRITTEN BY TEST4
;NEGATE TR79 INTERRUPT ENABLE
;CLEAR TR79 INTERRUPT ENABLE BIT
;MAKE SURE AT LOAD POINT
;RESET TR79
;MAKE SURE TRANSPORT ON LINE AND READY
;NO ERROR
;REPORT ERROR
10$: ;ON LINE AND READY
;IF AT LOAD POINT
; THEN SKIP PRELIMINARY REWIND
;REWIND
;CHECK REGISTERS
;NO ERRORS.
;REPORT ERROR
20$: ;AT LOAD POINT
;MAKE SURE TRANSPORT ON LINE AND READY
;NO ERROR
;REPORT ERROR
25$: ;READ IDB
;MAKE SURE ON LINE
;OK
;REPORT ERROR
10$: ;SPECIFY COUNT FOR READ IDB
;READ
;CHECK REGISTERS
;OK
;REPORT ERROR
20$: ;READ DATA WRITTEN BY TEST4
;COPY LOOP REPEAT COUNT
;SPECIFY NUMBER OF BLOCKS PER LOOP
;POINT TO THE TABLE OF BLOCK SIZES
T5XY:

```



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TEST5 READ DATA WRITTEN BY TEST4

```

3861 032164 012337 002214 10$: MOV (R3)+,USEB ;SPECIFY WORD COUNT
3862 032170 010346 MOV R3,-(SP) ;SAVE REGISTERS
3863 032172 010446 MOV R4,-(SP)
3864 ;READ
3865 032174 004737 014066 JSR PC,TESTN ;MAKE SURE ON LINE AND READY
3866 032200 103001 BCC 20$ ;OK
3867 032202 ERROR ;REPORT ERROR
3868 032202 104460 TRAP C$ERROR
3869 032204 20$: JSR PC,RD ; READ
3870 032204 004737 012756 TSTB @TRSR ;IF AT EOT
3871 032210 105777 150030 BMI 60$ ; THEN REWIND AND EXIT TEST
3872 032214 100435 JSR PC,CHEKS ;CHECK DATA JUST READ
3873 032216 004737 014364 BCC 30$ ;OK
3874 032222 103001 ERROR ;REPORT ERROR
3875 032224 TRAP C$ERROR
3876 032224 104460 JSR PC,CHEKS1 ;CLEAR INPUT AREA
3877 032226 004737 014466 MOV (SP)+,R4 ;RESTORE REGISTERS.
3878 032232 012604 MOV (SP)+,R3
3879 032234 012603 DEC R4 ;REDUCE COUNT. ALL BLOCK SIZES DONE?
3880 032236 005304 BNE 10$ ;IF NO, GO DO THE NEXT ONE
3881 032240 001351 ;READ EOF
3882 JSR PC,TESTN ;MAKE SURE ON LINE AND READY
3883 032242 004737 014066 BCC 40$ ;OK
3884 032246 103001 ERROR ;REPORT ERROR
3885 032250 TRAP C$ERROR
3886 032250 104460
3887 032252 40$: MOV #-1,USEB ;SPECIFY COUNT FOR READ EOF
3888 032252 012737 177777 002214 JSR PC,RD ;READ EOF
3889 032260 004737 012756 TSTB @TRSR ;IF AT EOT
3890 032264 105777 147754 BMI 70$ ; THEN REWIND AND EXIT TEST
3891 032270 100411 JSR PC,CHEKV ;CHECK REGISTERS
3892 032272 004737 014636 TST (SP) ;IF LOOP REPEAT COUNT NEGATIVE
3893 032276 005716 BMI 50$ ; THEN REPEAT TO EOT
3894 032300 100401 DEC (SP) ;SUBTRACT 1 FROM LOOP REPEAT COUNT
3895 032302 005316 BNE T$XY ;REPEAT LOOP
3896 032304 001323 BR 70$ ;REWIND AND EXIT TEST
3897 032306 000402
3898
3899 032310 60$: ;AT EOT. REWIND AND EXIT TEST
3900 032310 012604 MOV (SP)+,R4 ;RESTORE REGISTERS.
3901 032312 012603 MOV (SP)+,R3
3902 032314 005726 70$: TST (SP)+ ;DISCARD LOOP REPEAT COUNT
3903 032316 004737 014066 JSR PC,TESTN ;MAKE SURE ON LINE AND READY
3904 032322 103001 BCC 75$ ;OK
3905 032324 ERROR ;REPORT ERROR
3906 032324 104460 TRAP C$ERROR
3907 032326 75$: JSR PC,RWIND ;REWIND
3908 032326 004737 012416 JSR PC,CHEKI ;CHECK REGISTERS
3909 032332 004737 013534 BCC 80$ ;OK
3910 032336 103001 ERROR ;REPORT ERROR
3911 032340 TRAP C$ERROR
3912 032340 104460
3913 032342 80$:
3914 032342
3915 032342 L10025: ENDTST
3916 032342 104401 TRAP C$ETST

```

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TEST5 READ DATA WRITTEN BY TEST4

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.SBTTL TEST6 CHECK MANUAL INTERVENTION OPERATIONS

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TEST6 CHECK MANUAL INTERVENTION OPERATIONS

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```

////////////////////////////////////
:TEST6 CHECKS MANUAL INTERVENTION OPERATIONS
:
:TEST6 CORRESPONDS TO TEST GROUP 1 FROM CZTRAB
:
:TEST6 INCLUDES:                                TEST NAME IN CZTRAB
:
:REMOVE WRITE RING                                TESTB
:TRY TO WRITE WITHOUT RING                        RUNAS
:INSERT WRITE RING                                TESTC
:DELAY 10 SECONDS                                TESTAJ
:TAKE UNIT OFF LINE                              TESTP
:TELL OPERATOR TO RESET                          TESTAK
:REWIND THE TAPE                                  TESTI
:WRITE PAST EOT                                    TESTAL
:SPACE REVERSE PAST EOT                          TESTAM
:READ PAST EOT                                    TESTAN
:WRITE EOF PAST EOT                               TESTAO
:SPACE REVERSE OVER EOF PAST EOT                TESTAP
:READ EOF PAST EOT                               TESTAQ
:REWIND AND GO OFF LINE                          TESTQ
////////////////////////////////////

```

```

032344
032344
032344
032344 042777 000100 147670
032352
032352 032777 000004 147664
032360 001026
032362 012746 022024
032366 012746 020473
032372 012746 000002
032376 010600
032400 104417
032402 062706 000006
032406 013702 002230
032412 005001
032414 032777 000004 147622
032422 001005
032424 005201
032426 001372
032430 005302
032432 001370
032434 000752

```

```

BGNTST
T6::
TEST6:
;TEST WRITE IDB WITHOUT WRITE ENABLE RING
;NEGATE TR79 INTERRUPT ENABLE
;CLEAR INTERRUPT ENABLE BIT
;REMOVE WRITE ENABLE RING
;IF WRITE ENABLE RING NOT PRESENT
; THEN CONTINUE TEST
; ELSE ASK OPERATOR TO REMOVE RING

BIC #BIT6,@TRCR
T1B:
BIT #BIT2,@TRSR
BNE 30$
10$: PRINTF #FMTTXT,#MRMVRG
MOV #MRMVRG,-(SP)
MOV #FMTTXT,-(SP)
MOV #2,-(SP)
MOV SP,R0
TRAP C$PNTF
ADD #6,SP
MOV DLXTOF,R2
CLR R1
20$: BIT #BIT2,@TRSR
BNE 30$
INC R1
BNE 20$
DEC R2
BNE 20$
BR 10$

;SPECIFY DELAY MULTIPLIER
;SPECIFY DELAY CONSTANT
;IF RING IS NOT PRESENT
; THEN KEEP CONTINUE TEST
;TICK
;KEEP CHECKING
;COUNT DOWN MULTIPLIER
;KEEP CHECKING
;REMIND OPERATOR
;MAKE SURE ON LINE

```



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TEST6 CHECK MANUAL INTERVENTION OPERATIONS

```

3976 032436 004737 014166
3977 032442 103004
3978 000055
3979 032444
3980 032444 104457
3981 032446 000055
3982 032450 021140
3983 032452 017736
3984 032454 004737 013354
3985 032460 004737 013324
3986
3987 032464
3988
3989 032464 004737 014114
3990 032470 103001
3991 032472
3992 032472 104460
3993 032474 004737 012464
3994 032500 013737 002222 002220
3995 032506 004737 013362
3996 032512 004737 013254
3997 032516 012737 142632 002174
3998 032524 012737 002004 002176
3999 032532 023737 002174 002164
4000 032540 001401
4001 032542 005202
4002 032544
4003 032544 042737 000040 002166
4004 032552 023737 002176 002166
4005 032560 001401
4006 032562 005202
4007 032564
4008 032564 005702
4009 032566 001404
4010 000056
4011 032570
4012 032570 104457
4013 032572 000056
4014 032574 023543
4015 032576 020064
4016 032600
4017 032600 004737 013324
4018 032604
4019 032604 004737 013446
4020 032610 004737 014166
4021 032614 103004
4022 000057
4023 032616
4024 032616 104457
4025 032620 000057
4026 032622 021140
4027 032624 017736
4028 032626 004737 013354
4029 032632 004737 013324
4030 032636 013737 002226 002220
4031 032644 004737 013362

30$: JSR PC,TESTNN ;WAIT FOR TRANSPORT ON LINE
      BCC 40$ ;OK, ON LINE WITH NO ERROR
ENUM = ^D<ENUM + 1> ;INCREMENT ERROR COUNT
      ERRSOFTRAP ENUM,M2A1,ERR1 ;REPORT ERROR
      CSERSOFT
      .WORD 45
      .WORD M2A1
      .WORD ERR1
40$: JSR PC,RWAIT ;WAIT
      JSR PC,CPWR ;RESET TR79

T1AS: ;WRITE IDB WITHOUT WRITE ENABLE RING
      ;WRITE IDB
      JSR PC,TSTRDY ;MAKE SURE READY
      BCC 10$ ;OK
      ERROR ;REPORT NCT READY
      TRAP CSERROR
10$: JSR PC,WTIDB ;WRITE IDB
      MOV DLXRW,DLX ;SET DELAY CONSTANT FOR WAIT
      JSR PC,WWAIT ;WAIT
      JSR PC,CPYTRR ;COPY TR79 REGISTERS
      MOV #142632,ETRCR ;INDICATE EXPECTED RESULT
      MOV #2004,ETRSR ;INDICATE EXPECTED RESULTS
      CMP ETRCR,ATRCR ;TEST COMMAND REGISTER
      BEQ 40$ ;COMMAND REGISTER OK
      INC R2 ;INDICATE ERROR
40$: BIC #BITS5,ATRSR ;CLEAR UNWANTED BITS
      CMP ETRSR,ATRSR ;TEST THE STATUS REGISTER
      BEQ 50$ ;STATUS REGISTER OK
      INC R2 ;INDICATE ERROR
50$: TST R2 ;ANY ERRORS?
      BEQ 80$ ;NO
ENUM = ^D<ENUM + 1> ;INCREMENT ERROR COUNT
      ERRSOFTRAP ENUM,MWENFL,ERR4 ;REPORT ERROR
      CSERSOFT
      .WORD 46
      .WORD MWENFL
      .WORD ERR4
80$: JSR PC,CPWR ;RESET TR79
T1C: ;INSTALL WRITE ENABLE RING
      JSR PC,TESTC ;GET WRITE ENABLE RING INSTALLED
30$: JSR PC,TESTNN ;WAIT FOR TRANSPORT ON LINE
      BCC 40$ ;OK, ON LINE, NO ERROR
ENUM = ^D<ENUM + 1> ;INCREMENT ERROR COUNT
      ERRSOFTRAP ENUM,M2A1,ERR1 ;REPORT ERROR
      CSERSOFT
      .WORD 47
      .WORD M2A1
      .WORD ERR1
40$: JSR PC,RWAIT ;WAIT
      JSR PC,CPWR ;RESET TR79
T1AJ: MOV DLXBEL,DLX ;SET 10 SECOND DELAY MULTIPLIER
      JSR PC,WWAIT ;WAIT 10 SECONDS

```

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TEST6 CHECK MANUAL INTERVENTION OPERATIONS

```

4032 032650
4033 032650 004737 012532
4034 032654 032777 002000 147362
4035 032662 001404
4036 032662 000060
4037 032664
4038 032664 104457
4039 032666 000060
4040 032670 022545
4041 032672 017736
4042 032674
4043 032674 032777 100000 147340
4044 032702 001004
4045
4046
4047 000061
4048 032704
4049 032704 104457
4050 032706 000060
4051 032710 022600
4052 032712 017736
4053 032714
4054 032714 004737 013324
4055 032720
4056 032720 004737 014214
4057 032724 103004
4058 032724 000061
4059 032726
4060 032726 104457
4061 032730 000061
4062 032732 021140
4063 032734 017736
4064 032736 004737 013354
4065 032742 004737 013324
4066 032746 004737 014114
4067 032752 103001
4068 032754
4069 032754 104460
4070 032756
4071
4072 032756 004737 013324
4073 032762
4074 032762 012746 023221
4075 032766 012746 020473
4076 032772 012746 000002
4077 032776 010600
4078 033000 104417
4079 033002 062706 000006
4080 033006 013702 002230
4081 033012 005001
4082 033014 032777 002000 147222 40$:
4083 033022 001405
4084 033024 005201
4085 033026 001372
4086 033030 005302
4087 033032 001370

T1P: ;TAKE TRANSPORT OFF LINE USING OFF LINE COMMAND
      JSR PC,OFFLN ;EXECUTE OFF LINE COMMAND
      BIT #BIT10,@TRSR ;IF TRANSPORT OFF LINE
      BEQ 20$ ; THEN CONTINUE TEST
ENUM = ^D<ENUM + 1> ;INCREMENT ERROR NUMBER
      ERRSOFT ENUM,MUNOFL,ERR1 ;REPORT ERROR
      TRAP CSERSOFT
      .WORD 48
      .WORD MUNOFL
      .WORD ERR1

20$:
      BIT #BIT15,@TRCR ;IF TR79 ERROR BIT = 1
      BNE 30$ ; THEN CONTINUE TEST
      ; ERROR BIT SHOULD SET WHEN TAKE UNIT
      ; OFF LINE OPERATION IS PERFORMED
      ;INCREMENT ERROR NUMBER
      ;REPORT ERROR
ENUM = ^D<ENUM + 1>
      ERRSOFT ENUM,MOFLEFL,ERR1
      TRAP CSERSOFT
      .WORD 48
      .WORD MOFLEFL
      .WORD ERR1

30$:
      JSR PC,CPWR ;RESET TR79
T1AK: ;TEST OPERATOR RESET
      JSR PC,TESTN1 ;GET TRANSPORT ON LINE
      BCC 10$ ;OK
      ;INCREMENT ERROR COUNT
      ;REPORT ERROR
ENUM = ^D<ENUM + 1>
      ERRSOFT ENUM,M2A1,ERR1
      TRAP CSERSOFT
      .WORD 49
      .WORD M2A1
      .WORD ERR1

10$:
      JSR PC,RWAIT ;WAIT
      JSR PC,CPWR ;TR79 POWER CLEAR
      JSR PC,TSTRDY ;MAKE SURE READY
      BCC 15$ ;IF NO ERROR THEN CONTINUE TEST
      ; ELSE REPORT ERROR
      ERROR
      TRAP CSERROR

15$:
      ;REQUEST OPERATOR RESET
      ;RESET TR79
      ;ASK OPERATOR TO RESET TRANSPORT
30$:
      JSR PC,CPWR
      PRINTF #FMTTXT,#MRSTU
      MOV #MRSTU,-(SP)
      MOV #FMTTXT,-(SP)
      MOV #2,-(SP)
      MOV SP,R0
      TRAP CSPNTF
      ADD #6,SP
      MOV DLXTOF,R2
      CLR R1
      ;SPECIFY DELAY MULTIPLIER
      ;SPECIFY DELAY CONSTANT
      BIT #BIT10,@TRSR ;IF TRANSPORT IS OFF LINE
      BEQ 50$ ; THEN CONTINUE TEST
      ; TICK
      INC R1 ;KEEP CHECKING
      BNE 40$ ;COUNT DOWN MULTIPLIER
      DEC R2 ;KEEP CHECKING
      BNE 40$

```



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TEST6 CHECK MANUAL INTERVENTION OPERATIONS

```

4088 033034 000752          BR      30$          ;REMINDE OPERATOR
4089
4090 033036          50$:
4091 033036 004737 013354      JSR    PC,RWAIT      ;WAIT
4092 033042 004737 013254      JSR    PC,CPYTRR     ;COPY TR79 REGISTERS
4093 033046 012737 100036 002174  MOV    #100036,ETRCR ;INDICATE EXPECTED RESULT
4094 033054 012737 000001 002176  MOV    #1,ETRSR      ;INDICATE EXPECTED RESULT
4095 033062 032737 100000 002164  BIT    #100000,ATRCR ;TEST COMMAND REGISTER
4096 033070 001001          BNE    60$          ;COMMAND REGISTER OK
4097 033072 005202          INC    R2           ;NOTE ERROR
4098 033074
4099 033074 042737 000040 002166  BIC    #BIT5,ATRSR   ;CLEAR BIT 5(LOAD POINT)
4100 033102 023737 002176 002166  CMP    ETRSR,ATRSR  ;TEST THE STATUS(INHIBIT BIT)
4101 033110 001401          BEQ    70$          ;OK
4102 033112 005202          INC    R2           ;INDICATE ERROR
4103 033114
4104 033114 005737 002172          TST    ATRBA        ;TEST BUFFER ADDRESS
4105 033120 001401          BEQ    80$          ;ADDRESS OK
4106 033122 005202          INC    R2           ;INDICATE ERROR
4107 033124
4108 033124 005737 002170          TST    ATRWC        ;TEST THE WORD COUNT
4109 033130 001401          BEQ    90$          ;OK
4110 033132 005202          INC    R2           ;INDICATE ERROR
4111 033134
4112 033134 005702          TST    R2           ;ANY ERRORS?
4113 033136 001404          BEQ    95$          ;NO
4114          000062      ENUM = ^D<ENUM + 1> ;INCREMENT ERROR NUMBER
4115 033140          ERRSOFT ENUM,MMRSFL,ERR5 ;REPORT ERROR
4116 033140 104457          TRAP  CSERSOFT
4117 033142 000062          .WORD 50
4118 033144 023262          .WORD MMRSFL
4119 033146 020102          .WORD ERR5
4120 033150 004737 013324          JSR    PC,CPWR      ;TR79 POWER CLEAR
4121
4122 033154          T1AL: ;TEST TAPE FUNCTIONS EXECUTED WHILE TAPE IS BEYOND EOT
4123 033154 004737 014214          T1AG: JSR    PC,TESTN1 ;ASK OPERATOR TO PUT TRANSPORT ON LINE
4124 033160 103004          BCC    10$         ;OK
4125          000063      ENUM = ^D<ENUM + 1> ;INCREMENT ERROR COUNT
4126 033162          ERRSOFT ENUM,M2A1,ERR1 ;REPORT ERROR
4127 033162 104457          TRAP  CSERSOFT
4128 033164 000063          .WORD 51
4129 033166 021140          .WORD M2A1
4130 033170 017736          .WORD ERR1
4131 033172 004737 013354          10$: JSR    PC,RWAIT      ;WAIT
4132 033176 004737 013324          JSR    PC,CPWR      ;TR79 POWER CLEAR
4133 033202 004737 014114          JSR    PC,TSTRDY    ;MAKE SURE READY
4134 033206 103001          BCC    15$         ;IF NO ERROR THEN CONTINUE TEST
4135 033210          ERROR          ;ELSE REPORT ERROR
4136 033210 104460          TRAP  CSERROR
4137 033212 004737 013324          15$: JSR    PC,CPWR      ;TR79 POWER CLEAR
4138 033216 032777 000040 147020  BIT    #BIT5,ATRSR  ;IF AT LOAD POINT
4139 033224 001006          BNE    20$         ;SKIP REWIND
4140 033226 004737 012416          JSR    PC,RWIND     ;REWIND
4141 033232 004737 013534          JSR    PC,CHEKI     ;CHECK REGISTERS
4142 033236 103001          BCC    20$         ;OK
4143 033240          ERROR          ;REPORT ERROR

```





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TEST6 CHECK MANUAL INTERVENTION OPERATIONS

```

4200 033454 005737 002172          TST   ATRBA          ;TEST BUS ADDRESS
4201 033460 001401                BEQ   55$           ;OK
4202 033462 005202                INC   R2            ;INDICATE ERROR
4203 033464                        55$:
4204 033464 023737 002200 002170    CMP   ETRWC,ATRWC   ;TEST THE WORD COUNT
4205 033472 001401                BEQ   60$           ;OK
4206 033474 005202                INC   R2            ;INDICATE ERROR
4207 033476                        60$:
4208 033476 005702                TST   R2            ;ANY ERRORS
4209 033500 001404                BEQ   70$           ;NO
4210 033500 000064                ENUM = ^D<ENUM + 1> ;INCREMENT ERROR NUMBER
4211 033502                        ERRSOFT ENUM,MSRETFL,ERR5 ;REPORT ERROR
4212 033502 104457                TRAP CSERSOFT
4213 033504 000064                .WORD 52
4214 033506 023333                .WORD MSRETFL
4215 033510 020102                .WORD ERR5
4216 033512                        70$:
4217 033512                T1A0:                ;READ AFTER EOT
4218 033512 004737 014066          JSR   PC,TESTN      ;MAKE SURE ON LINE AND READY
4219 033516 103001                BCC  10$           ;OK
4220 033520                        ERROR
4221 033520 104460                TRAP CSERROR       ;REPORT ERROR
4222 033522                        10$:
4223 033522 004737 012756          JSR   PC,RD         ;READ
4224 033526 004737 013354          JSR   PC,RWAIT      ;WAIT
4225 033532 004737 013254          JSR   PC,CPYTRR     ;COPY TR79 REGISTERS
4226 033536 012737 002204 002174    MOV   #2204,ETRCR   ;EXPECTED
4227 033544 012737 002201 002176    MOV   #2201,ETRSR   ;EXPECTED
4228 033552 023737 002174 002164    CMP   ETRCR,ATRCR   ;TEST COMMAND REGISTER
4229 033560 001401                BEQ   20$           ;OK
4230 033562 005202                INC   R2            ;INDICATE ERROR
4231 033564                        20$:
4232 033564 023737 002176 002166    CMP   ETRSR,ATRSR   ;TEST THE STATUS REGISTER
4233 033572 001401                BEQ   30$           ;OK
4234 033574 005202                INC   R2            ;INDICATE ERROR
4235 033576                        30$:
4236 033576 005737 002170          TST   ATRWC         ;TEST THE WORD COUNT
4237 033602 001401                BEQ   40$           ;OK
4238 033604 005202                INC   R2            ;INDCATE ERROR
4239 033606                        40$:
4240 033606 005702                TST   R2            ;ANY ERRORS?
4241 033610 001404                BEQ   50$           ;NO
4242 033610 000065                ENUM = ^D<ENUM + 1> ;INCREMENT ERROR NUMBER
4243 033612                        ERRSOFT ENUM,MRPETFL,ERR6 ;REPORT ERROR
4244 033612 104457                TRAP CSERSOFT
4245 033614 000065                .WORD 53
4246 033616 023374                .WORD MRPETFL
4247 033620 020120                .WORD ERR6
4248 033622                        50$:
4249
4250
4251
4252 033622                T1A0:                ;TEST EOF AFTER EOT FUNCTIONS
4253 033622 004737 014066          JSR   PC,TESTN      ;GET TRANSPORT ON LINE
4254 033626 103001                BCC  10$           ;OK
4255 033630                        ERROR
;REPORT ERROR

```

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TEST6 CHECK MANUAL INTERVENTION OPERATIONS

```

4256 033630 104460
4257 033632
4258 033632 005037 002214
4259 033636 004737 013072
4260 033642 004737 013354
4261 033646 004737 013254
4262 033652 012737 003234 002174
4263 033660 012737 002211 002176
4264 033666 023737 002174 002164
4265 033674 001401
4266 033676 005202
4267 033700
4268 033700 023737 002176 002166
4269 033706 001401
4270 033710 005202
4271 033712
4272 033712 005737 002172
4273 033716 001401
4274 033720 005202
4275 033722
4276 033722 005737 002170
4277 033726 001401
4278 033730 005202
4279 033732
4280 033732 005702
4281 033734 001404
4282 033734 000066
4283 033736
4284 033736 104457
4285 033740 000066
4286 033742 023424
4287 033744 020102
4288 033746
4289 033746
4290 033746 004737 013024
4291 033752 004737 013354
4292 033756 004737 013254
4293 033762 012737 003610 002174
4294 033770 012737 002211 002176
4295 033776 013737 002214 002200
4296 034004 023737 002174 002164
4297 034012 001401
4298 034014 005202
4299 034016
4300 034016 023737 002176 002166
4301 034024 001401
4302 034026 005202
4303 034030
4304 034030 005737 002172
4305 034034 001401
4306 034036 005202
4307 034040
4308 034040 023737 002200 002170
4309 034046 001401
4310 034050 005202
4311 034052

TRAP CSERROR
10$: ;WRITE EOF AFTER EOT
CLR USEB ;SPECIFY WORD COUNT
JSR PC,WTEOF ;WRITE EOF
JSR PC,RWAIT ;WAIT
JSR PC,CPYTRR ;COPY TR79 REGISTERS
MOV #3234,ETRCR ;EXPECTED
MOV #2211,ETRSR ;EXPECTED
CMP ETRCR,ATRCR ;TEST COMMAND REGISTER
BEQ 20$ ;OK
INC R2 ;INDICATE ERROR
20$:
CMP ETRSR,ATRSR ;TEST THE STATUS REGISTER
BEQ 30$ ;OK
INC R2 ;INDICATE ERROR
30$:
TST ATRBA ;TEST BUFFER ADDRESS
BEQ 40$ ;OK
INC R2 ;INDICATE ERROR
40$:
TST ATRWC ;TEST THE WORD COUNT
BEQ 50$ ;OK
INC R2 ;INDICATE ERROR
50$:
TST R2 ;ANY ERRORS
BEQ 60$ ;NO
ENUM = ^D<ENUM + 1> ;INCREMENT ERROR NUMBER
ERRSOFT ENUM,MWETF,ERR5 ;REPORT ERROR
TRAP CSERSOFT
.WORD 54
.WORD MWETF
.WORD ERR5
60$:
T1AP: ;TEST SPACE REVERSE OVER EOF BEYOND EOT
JSR PC,SPR ;SPACE REVERSE
JSR PC,RWAIT ;WAIT
JSR PC,CPYTRR ;COPY TR79 REGISTERS
MOV #3610,ETRCR ;EXPECTED
MOV #2211,ETRSR ;EXPECTED
MOV USEB,ETRCR ;EXPECTED
CMP ETRCR,ATRCR ;TEST COMMAND REGISTER
BEQ 20$ ;OK
INC R2 ;INDICATE ERROR
20$:
CMP ETRSR,ATRSR ;TEST THE STATUS REGISTER
BEQ 30$ ;OK
INC R2 ;INDICATE ERROR
30$:
TST ATRBA ;TEST BUFFER ADDRESS
BEQ 40$ ;OK
INC R2 ;INDICATE ERROR
40$:
CMP ETRWC,ATRCR ;TEST THE WORD COUNT
BEQ 50$ ;OK
INC R2 ;INDICATE ERROR
50$:

```



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TEST6 CHECK MANUAL INTERVENTION OPERATIONS

4312	034052	005702				TST	R2		:ANY ERRORS?
4313	034054	001404				BEQ	60\$		:NO
4314		000067				ENUM =	^D<ENUM + 1>		:INCREMENT ERROR NUMBER
4315	034056					ERRSOFT	ENUM,MREFETF,ERR5		:REPORT ERROR
4316	034056	104457				TRAP	C\$ERSOFT		
4317	034060	000067				.WORD	55		
4318	034062	023474				.WORD	MREFETF		
4319	034064	020102				.WORD	ERR5		
4320	034066					60\$:			
4321	034066					T1AQ:			:READ EOF BEYOND EOT
4322	034066	004737	012756			JSR	PC,RD		:READ
4323	034072	004737	013354			JSR	PC,RWAIT		:WAIT
4324	034076	004737	013254			JSR	PC,CPYTRR		:COPY TR79 REGISTERS
4325	034102	012737	002204	002174		MOV	#2204,ETRCR		:EXPECTED
4326	034110	012737	002211	002176		MOV	#2211,ETRSR		:EXPECTED
4327	034116	012737	006322	002202		MOV	#INPUT,ETRBA		:EXPECTED
4328	034124	013737	002214	002200		MOV	USEB,ETRWC		:EXPECTED
4329	034132	023737	002174	002164		CMP	ETRCR,ATRCR		:TEST COMMAND REGISTER
4330	034140	001401				BEQ	20\$		:OK
4331	034142	005202				INC	R2		:INDICATE ERROR
4332	034144					20\$:			
4333	034144	023737	002176	002166		CMP	ETRSR,ATRSR		:TEST THE STATUS REGISTER
4334	034152	001401				BEQ	30\$		:OK
4335	034154	005202				INC	R2		:INDICATE ERROR
4336	034156					30\$:			
4337	034156	023737	002202	002172		CMP	ETRBA,ATRBA		:TEST BUFFER ADDRESS
4338	034164	001401				BEQ	40\$		:OK
4339	034166	005202				INC	R2		:INDICATE ERROR
4340	034170					40\$:			
4341	034170	023737	002200	002170		CMP	ETRWC,ATRWC		:TEST THE WORD COUNT
4342	034176	001401				BEQ	50\$		:OK
4343	034200	005202				INC	R2		:INDICATE ERROR
4344	034202					50\$:			
4345	034202	005702				TST	R2		:ANY ERRORS?
4346	034204	001404				BEQ	60\$		:NO
4347		000070				ENUM =	^D<ENUM + 1>		:INCREMENT ERROR NUMBER
4348	034206					ERRSOFT	ENUM,MREFETF,ERR5		:REPORT ERROR
4349	034206	104457				TRAP	C\$ERSOFT		
4350	034210	000070				.WORD	56		
4351	034212	023474				.WORD	MREFETF		
4352	034214	020102				.WORD	ERR5		
4353	034216					60\$:			
4354						T1Q:			:TEST TR79 RESET WHILE REWINDING
4355	034216	004737	014066			JSR	PC,TESTN		:MAKE SURE ON LINE AND READY
4356	034216	004737	014066			BCC	10\$		:OK
4357	034222	103001				ERROR			:REPORT ERROR
4358	034224					TRAP	C\$ERROR		
4359	034224	104460				10\$:			:POSITION TAPE AT EOT
4360	034226					BIT	#BIT7,@TRSR		:IF AT EOT
4361	034226	032777	000200	146010		BNE	40\$		: THEN OMIT REWIND AND GO EOT
4362	034234	001024				BIT	#BIT10,@TRSR		:IF AT LOAD POINT
4363	034236	032777	002000	146000		BNE	20\$		: THEN OMIT REWIND
4364	034244	001006				JSR	PC,RWIND		:REWIND
4365	034246	004737	012416			JSR	PC,CHEKI		:CHECK REGISTERS
4366	034252	004737	013534			BCC	20\$		:OK
4367	034256	103001							

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TEST6 CHECK MANUAL INTERVENTION OPERATIONS

```

4368 034260
4369 034260 104460
4370 034262
4371 034262 004737 014066
4372 034266 103001
4373 034270
4374 034270 104460
4375 034272
4376 034272 004737 012600
4377 034276 032777 000200 145740
4378 034304 001774
4379 034306
4380 034306 004737 013324
4381 034312 004737 012416
4382 034316 004737 013354
4383
4384 034322 052777 004000 145712
4385 034330 004737 013254
4386 034334 012737 004020 002174
4387 034342 012737 000001 002176
4388 034350 023737 002174 002164
4389 034356 001401
4390 034360 005202
4391 034362
4392 034362 023737 002176 002166
4393 034370 001401
4394 034372 005202
4395 034374
4396 034374 005737 002172
4397 034400 001401
4398 034402 005202
4399 034404
4400 034404 005737 002170
4401 034410 001401
4402 034412 005202
4403 034414
4404 034414 005702
4405 034416 001404
4406 034416 000071
4407 034420
4408 034420 104457
4409 034422 000071
4410 034424 022621
4411 034426 020102
4412 034430
4413 034430
4414 034430 012746 023771
4415 034434 012746 020473
4416 034440 012746 000002
4417 034444 010600
4418 034446 104417
4419 034450 062706 000006
4420 034454
4421 034454
4422 034454 104401
4423

```

```

ERROR TRAP CSERROR ;REPORT ERROR
20$: JSR PC,TESTN ;AT LOAD POINT
      BCC 25$ ;MAKE SURE ON LINE AND READY
      ERROR TRAP CSERROR ;OK
      ;REPORT ERROR
25$: JSR PC,GEOT ;GOEOT
      BIT #BIT7,@TRSR ;FAST FORWARD TO EOT
      BEQ 30$ ;WAIT FOR EOT
40$: JSR PC,CPWR ;REWIND FROM EOT
      JSR PC,RWIND ;PRELIMINARY TR79 RESET
      JSR PC,RWAIT ;REWIND
      ;WAIT
      ;RESET WHILE REWINDING
      BIS #BIT11,@TRCR ;RESET TR79
      JSR PC,CPYTRR ;COPY REGISTERS
      MOV #4020,ETRCR ;EXPECTED
      MOV #1,ETRSR ;EXPECTED
      CMP ETRCR,ATRCR ;TEST COMMAND REGISTER
      BEQ 50$ ;OK
      INC R2 ;INDICATE ERROR
50$: CMP ETRSR,ATRSR ;TEST STATUS REGISTER
      BEQ 60$ ;OK
      INC R2 ;INDICATE ERROR
60$: TST ATRBA ;TEST BUS ADDRESS REGISTER
      BEQ 70$ ;OK
      INC R2 ;INDICATE ERROR
70$: TST ATRWC ;TEST COUNT REGISTER
      BEQ 80$ ;OK
      INC R2 ;INDICATE ERROR
80$: TST R2 ;ANY ERRORS?
      BEQ 90$ ;NO
      ENUM = *D<ENUM + 1> ;INCREMENT ERROR NUMBER
      ERRSOFT ENUM,MRWOFL,ERR5 ;REPORT ERROR
      TRAP CSERSOFT
      .WORD 57
      .WORD MRWOFL
      .WORD ERR5
90$: PRINTF #FMTTXT,#MEOT ;REPORT REWINDING,GOING OFF LINE
      MOV #MEOT,-(SP)
      MOV #FMTTXT,-(SP)
      MOV #2,-(SP)
      MOV SP,R0
      TRAP C$PNTF
      ADD #6,SP
      ENDTST
L10026: TRAP C$ETST

```

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TEST6 CHECK MANUAL INTERVENTION OPERATIONS

4424  
4425

.SBTTL HARDWARE PARAMETER CODING SECTION



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HARDWARE PARAMETER CODING SECTION

4426  
4427  
4428  
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4431  
4432  
4433  
4434  
4435  
4436 034456  
4437 034456 000015  
4438 034460  
4439 034460  
4440 034460 000031  
4441 034462 034512  
4442 034464 164000  
4443 034466 175500  
4444 034470  
4445 034470 001031  
4446 034472 034540  
4447 034474 000170  
4448 034476 000174  
4449 034500  
4450 034500 002032  
4451 034502 034571  
4452 034504 000340  
4453 034506 000004  
4454 034510 000007  
4455 034512  
4456  
4457 034512  
4458  
4459  
4460  
  
4461  
4462  
4463  
4464  
4465

```

:////////////////////
:/ THE HARDWARE PARAMETER CODING SECTION CONTAINS MACROS
:/ THAT ARE USED BY THE SUPERVISOR TO BUILD P-TABLES. THE
:/ MACROS ARE NOT EXECUTED AS MACHINE INSTRUCTIONS BUT ARE
:/ INTERPRETED BY THE SUPERVISOR AS DATA STRUCTURES. THE
:/ MACROS ALLOW THE SUPERVISOR TO ESTABLISH COMMUNICATIONS
:/ WITH THE OPERATOR.
:////////////////////

```

```

      BGNHRD
      .WORD L10027-L$HARD/2
L$HARD::
      GPRMA  ADDRES,0,0,164000,175500,YES
      .WORD  T$CODE
      .WORD  ADDRES
      .WORD  T$LOLIM
      .WORD  T$HILIM
      GPRMA  VECTOR,2,0,170,174,YES
      .WORD  T$CODE
      .WORD  VECTOR
      .WORD  T$LOLIM
      .WORD  T$HILIM
      GPRMD  PRIRTY,4,0,340,4,7,YES
      .WORD  T$CODE
      .WORD  PRIRTY
      .WORD  340
      .WORD  T$LOLIM
      .WORD  T$HILIM
      ENDHRD
      .EVEN
L10027:
      .EVEN

      .NLIST  BEX
      ADDRES: .ASCIZ /DEVICE CSR ADDRESS : /
      VECTOR: .ASCIZ /DEVICE VECTOR ADDRESS : /
      PRIRTY: .ASCIZ /DEVICE PRIORITY LEVEL : /
      .LIST  BEX
      .EVEN

```

.SBTTL SOFTWARE PARAMETER CODING SECTION

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SOFTWARE PARAMETER CODING SECTION

4466  
4467  
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4476  
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4489  
4490  
4491  
4492  
4493

034622  
034622 000007  
034624  
034624 000003  
034626 034642  
034630  
034630 000052  
034632 035206  
034634 177777  
034636 000000  
034640 000764  
034642  
034642  
034642 042524 052123 020064  
034724 042524 052123 020065  
034775 124 042510 043040  
035061 127 046111 020114  
035130 047105 042524 020122  
035205 000  
035206 042522 042520 052101

:/ THE SOFTWARE PARAMETER CODING SECTION CONTAINS MACROS  
:/ THAT ARE USED BY THE SUPERVISOR TO BUILD P-TABLES. THE  
:/ MACROS ARE NOT EXECUTED AS MACHINE INSTRUCTIONS BUT ARE  
:/ INTERPRETED BY THE SUPERVISOR AS DATA STRUCTURES. THE  
:/ MACROS ALLOW THE SUPERVISOR TO ESTABLISH COMMUNICATIONS  
:/ WITH THE OPERATOR.  
:/

BGNSFT  
.WORD L10030-L\$SOFT/2  
L\$SOFT::  
DISPLAY SFTTXT  
.WORD T\$CODE  
.WORD SFTTXT  
GPRMD WCOUNT,0,D,177777,0,500.,YES  
.WORD T\$CODE  
.WORD WCOUNT  
.WORD 177777  
.WORD T\$LOLIM  
.WORD T\$HILIM  
ENDSFT  
.EVEN  
L10030:  
.NLIST BEX  
SFTTXT: .ASCIZ /TEST4 REPEATEDLY WRITES A 15 BLOCK FILE TO TAPE. /  
.ASCIZ /TEST5 READS THE FILES WRITTEN BY TEST4. /  
.ASCIZ /THE FOLLOWING ENTRY SPECIFIES HOW MANY FILES TEST4 /  
.ASCIZ /WILL WRITE. THE DEFAULT IS 10. FILES. /  
.ASCIZ /ENTER 0 TO WRITE FILES UNTIL EOT IS REACHED /  
.BYTE 0  
WCOUNT: .ASCIZ /REPEAT COUNT FOR TEST4 (0-500.), 0=REPEAT TO EOT /  
.LIST BEX  
.EVEN

4494  
4495  
4496  
4497

.SBTTL PATCH AREA FOR DEBUG

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PATCH AREA FOR DEBUG

```
4498
4499 035270
4500      035370
4501 035370 000240
4502 035372 000240
4503 035374 000240
4504
4505
4506 035376
4507 035376
4508
4509 035376 000000
4510 035400 000000
4511 035402
4512
4513
4514      000001
```

```
;*
PATCH:
      .= +100
      NOP
      NOP
      NOP

.SBTTL 'ENDMOD' & 'LASTAD'
      ENDMOD
      LASTAD
      .EVEN
      .WORD 0
      .WORD 0

L$LAST::

;* NOTE: LAST ADDRESS STORAGE APPENDED
.END
```





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CROSS REFERENCE TABLE -- USER SYMBOLS

CHEKAX	016460	1712#	3567											
CHEKAY	016636	1754#	3581											
CHEKAZ	017002	1790#	3601											
CHEKCX	017156	1829#	3003	3285	3361	3437	3502	3704						
CHEKDX	017276	1859#	3726											
CHEKEX	017416	1890#	3296	3372	3715									
CHEKFX	017546	1922#	2836	2990	3123	3188	3273	3349	3425	3490	3554	3684		
CHEKI	013534	1103#	2392	2540	2635	2672	2768	2818	2971	3043	3077	3105	3170	3250
		3326	3402	3467	3531	3661	3789	3835	3909	4141	4366			
CHEKJ	013664	1133#	2555											
CHEKL	013756	1159#	3129	3750										
CHEKO	014254	1263#	2824	2982	3054	3116	3181	3261	3337	3413	3478	3542	3672	
CHEKS	014364	1297#	3731	3873										
CHEKS1	014466	1325#	3735	3877										
CHEKU	014506	1338#	3142	3762										
CHEKV	014636	1373#	3155	3768	3892									
CHKAG1	016002	1602#	4175											
CHKBRK	013442	1000	1063#	2049										
CPWR	013324	1009#	1127	1150	1439	1478	1515	1552	1746	1783	1821	2038	2382	2390
		2402	2440	2538	2624	2633	2661	2670	2757	2766	2808	2879	2950	2969
		3033	3096	3161	3237	3241	3317	3393	3458	3522	3573	3587	3605	3652
		3826	3985	4017	4029	4054	4065	4072	4120	4132	4137	4151	4380	
CPYTRR	013254	989#	1108	1135	1160	1265	1339	1374	1410	1448	1487	1524	1568	1603
		1634	1669	1713	1755	1792	1830	1860	1891	1923	2404	2612	2642	2683
		2736	2780	2849	2885	2902	3014	3207	3996	4092	4188	4225	4261	4292
		4324	4385											
CURDY =	000200	663#												
C\$AU =	000052	319#												
C\$AUTO=	000061	319#	2311											
C\$BRK =	000022	319#	1065											
C\$BSEG=	000004	319#												
C\$BSUB=	000002	319#												
C\$CEFG=	000045	319#												
C\$CLCK=	000062	319#												
C\$CLEA=	000012	319#	2324											
C\$CLOS=	000035	319#												
C\$CLP1=	000006	319#												
C\$CVEC=	000036	319#												
C\$DCLN=	000044	319#												
C\$DODU=	000051	319#												
C\$DRPT=	000024	319#												
C\$DU =	000053	319#												
C\$EDIT=	000003	319#	410											
C\$ERDF=	000055	319#												
C\$ERHR=	000056	319#												
C\$ERRO=	000060	319#	2386	2395	2400	2437	2534	2543	2549	2599	2629	2638	2666	2675
		2680	2762	2771	2776	2813	2821	2827	2832	2839	2964	2974	2979	2985
		2993	2999	3006	3011	3038	3046	3051	3057	3066	3072	3080	3085	3093
		3100	3108	3113	3119	3126	3132	3138	3145	3151	3158	3165	3173	3178
		3184	3191	3245	3253	3258	3264	3269	3276	3281	3288	3293	3299	3304
		3311	3321	3329	3334	3340	3345	3352	3357	3364	3369	3375	3380	3387
		3397	3405	3410	3416	3421	3428	3433	3440	3445	3452	3462	3470	3475
		3481	3486	3493	3498	3505	3510	3517	3526	3534	3539	3545	3550	3557
		3562	3570	3577	3584	3591	3596	3604	3656	3664	3669	3675	3680	3687
		3699	3707	3712	3718	3723	3729	3734	3745	3753	3758	3765	3771	3786
		3792	3830	3838	3843	3849	3856	3868	3876	3886	3906	3912	3992	4069





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CROSS REFERENCE TABLE -- USER SYMBOLS

EM4A	021002	2237#	2431	2958	3649										
EM6	021630	2237#	2891												
EM7	021551	2237#	2908												
ENDEMB	020464	2220	2237#												
ENDIN	024176	2293	2295#												
ENDT4	032036	3793	3799#												
ENUM =	000071	696#	1121#	1123	1173#	1175	1198#	1200	1208#	1210	1278#	1280	1309#	1311	
		1360#	1362	1396#	1398	1433#	1435	1472#	1474	1509#	1511	1546#	1548	1589#	
		1591	1620#	1622	1656#	1658	1699#	1701	1740#	1742	1777#	1779	1815#	1817	
		1847#	1849	1877#	1879	1909#	1911	1950#	1952	2417#	2420	2427#	2430	2444#	
		2447	2456	2465	2474	2481#	2484	2492	2501	2512#	2515	2523#	2526	2557#	
		2560	2615#	2618	2655#	2658	2696#	2699	2716#	2719	2727#	2730	2751#	2754	
		2802#	2805	2872#	2875	2887#	2890	2904#	2907	2954#	2957	3027#	3030	3230#	
		3233	3645#	3648	3978#	3981	4010#	4013	4022#	4025	4036#	4039	4047	4050	
		4058#	4061	4114#	4117	4125#	4128	4210#	4213	4242#	4245	4282#	4285	4314#	
		4317	4347#	4350	4406#	4409									
		678#													
EOTS =	000200	682#													
ERASE =	000016	641#	962												
ERRBIT =	100000	671#													
ERRBLK	002162	G	716#	1125*	1177*	1213*	1282*	1313*	1364*	1400*	1437*	1476*	1513*	1550*	1593*
			1624*	1660*	1703*	1744*	1781*	1819*	1851*	1881*	1913*	1954*			
ERRMSG	002160	G	715#	1124*	1176*	1199*	1209*	1281*	1312*	1363*	1399*	1436*	1475*	1512*	1549*
			1592*	1623*	1659*	1702*	1743*	1780*	1818*	1850*	1880*	1912*	1953*		
ERRNBR	002156	G	714#	1123*	1175*	1200*	1210*	1280*	1311*	1362*	1398*	1435*	1474*	1511*	1548*
			1591*	1622*	1658*	1701*	1742*	1779*	1817*	1849*	1879*	1911*	1952*		
ERRTYP	002154	G	713#	1122*	1174*	1212*	1279*	1310*	1361*	1397*	1434*	1473*	1510*	1547*	1590*
			1621*	1657*	1700*	1741*	1778*	1816*	1848*	1878*	1910*	1951*			
ERR1	017736	G	1995#	3983	4027	4041	4052	4063	4130						
ERR11	020136	G	2108#	2892											
ERR12	020160	G	2122#	2909											
ERR14	020202	G	1313	2135#											
ERR15	020244	G	1703	2154#											
ERR2	017744	G	2011#	2432	2959	3650									
ERR3	017754	G	1213	2026#											
ERR4	020064	G	1125	1177	1282	2064#	2422	2562	2660	2701	2756	3032	4015		
ERR5	020102	G	1364	1400	1437	1476	1513	1550	1593	1660	1744	1781	1819	1954	2079#
			2807	2877	3235	4119	4215	4287	4319	4352	4411				
ERR6	020120	G	1624	1851	1881	1913	2094#	4247							
ERS	013140		959#	2835	2989	3122	3187	3272	3348	3424	3489	3553	3683	4166	
ER1	017736		1996#												
ER2	017744		2012#												
ER3	017754		2013	2027#											
ETRBA	002202		725#	1377*	1386	1413*	1422	1451*	1461	1672*	1682	1729*	1795*	1805	1939*
			2852*	2862	2886*	3210*	3220	4327*	4337						
ETRCR	002174		722#	1109*	1111	1136*	1139	1161*	1163	1266*	1268	1340*	1342	1375*	1378
			1411*	1414	1449*	1453	1488*	1491	1525*	1528	1569*	1571	1604*	1606	1635*
			1638	1670*	1674	1714*	1716	1756*	1759	1793*	1797	1831*	1833	1861*	1863
			1892*	1895	1924*	1926	2205	2405*	2407	2643*	2645	2684*	2686	2738*	2740
			2781*	2784	2850*	2854	3015*	3017	3208*	3211	3997*	3999	4093*	4189*	4192
			4226*	4228	4262*	4264	4293*	4296	4325*	4329	4386*	4388			
ETRSR	002176		723#	1110*	1115	1137*	1143	1162*	1167	1267*	1272	1341*	1346	1376*	1382
			1412*	1418	1450*	1457	1489*	1495	1526*	1532	1570*	1575	1605*	1610	1636*
			1642	1671*	1678	1715*	1720	1757*	1763	1794*	1801	1832*	1837	1862*	1867
			1893*	1899	1925*	1930	2406*	2411	2644*	2649	2685*	2690	2739*	2744	2782*
			2788	2851*	2858	3016*	3021	3209*	3216	3998*	4004	4094*	4100	4190*	4196







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LOGDEV	002234	747#	2265*	2267
LOT =	000010 G	580#		
LSACP	002110 G	440#		
LSAPT	002036 G	398#		
LSAUT	002070 G	424#		
LSAUTO	024200 G	441	2308#	
LSCCP	002106 G	438#		
LSCLEA	024202 G	439	2321#	
LSCO	002032 G	394#		
LSDEPO	002011 G	376#		
LSDESC	012330 G	431	797#	
LSDESP	002076 G	430#		
LSDEVP	002060 G	416#		
LSDISP	002124 G	401	464#	
LSDLY	002116 G	446#		
LSDTP	002040 G	400#		
LSDTYP	002034 G	396#		
LSDUT	002072 G	426#		
LSDVTY	012322 G	417	788#	
LSEF	002052 G	411#		
LSEVI	002044 G	404#		
LSERRT	002154 G	435	712#	
LSETP	002102 G	434#		
LSEXP1	002046 G	406#		
LSEXP4	002064 G	420#		
LSEXP5	002066 G	422#		
LSHARD	034460 G	383	4437	4438#
LSHIME	002120 G	448#		
LSHPCP	002016 G	382#		
LSHPTP	002022 G	386#		
LSHW	002142 G	387	484	485#
LSICP	002104 G	436#		
LSINIT	024034 G	437	2262#	
LSLADP	002026 G	390#		
LSLAST	035402 G	391	4511#	
LSLOAD	002100 G	432#		
LSLUN	002074 G	428#		
LSMREV	002050 G	408#		
LSNAME	002000 G	365#		
LSPRIO	002042 G	402#		
LSPROT	024026 G	443	2248#	
LSPRT	002112 G	442#		
LSREPP	002062 G	418#		
LSREV	002010 G	374#		
LSSOFT	034624 G	385	4478	4479#
LSSPC	002056 G	414#		
LSSPCP	002020 G	384#		
LSSPTP	002024 G	388#		
LSSTA	002030 G	392#		
LSSW	002152 G	389	506	507#
LSTEST	002114 G	444#		
LSTIML	002014 G	380#		
LSUNIT	002012 G	378#		
L10000	002150	484	493#	
L10001	002154	506	512#	
L10002	017734	1977#		

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## CROSS REFERENCE TABLE -- USER SYMBOLS

L10003	017742	1998#			
L10004	017752	2015#			
L10005	020062	2054#			
L10006	020100	2069#			
L10007	020116	2084#			
L10010	020134	2099#			
L10011	020156	2114#			
L10012	020200	2128#			
L10013	020242	2147#			
L10014	020322	2169#			
L10016	024176	2296#			
L10017	024200	2310#			
L10020	024202	2323#			
L10021	024204	2344#			
L10022	026520	2914#			
L10023	031314	3608#			
L10024	032036	3801#			
L10025	032342	3915#			
L10026	034454	4421#			
L10027	034512	4437	4457#		
L10030	034642	4478	4491#		
MEOT	023771	2237#	4414		
MEPSRF	023712	1780	2237#		
MERFL	022014	1953	2237#		
METFL	023203	1592	2237#		
MIDSFL	022204	2237#	2527		
MIENFL	022161	2237#	2516		
MILFFL	022337	2237#	2561		
MINTFL	021707	2237#	2619		
MMRSFL	023262	2237#	4118		
MNXBFL	023046	2237#			
MNXMFL	023115	2237#	2876		
MOFLEF	022600	2237#	4051		
MPARFL	023674	1743	2237#		
MPCFL	022227	2237#	2755		
MPWCL	021443	2237#	2720		
MPWST	021500	2237#	2731		
MQM	021741	2237#			
MRCFL	023166	1436	1475	1512	1549 2237#
MRDERR	022643	1312	2237#		
MRDFL	021765	1880	2237#		
MREFET	023474	2237#	4318	4351	
MREFFL	022726	1399	2237#		
MREPFL	023746	1818	2237#		
MRIBFL	023654	1702	2237#		
MRMVRG	022024	2237#	3960		
MRPETF	023374	2237#	4246		
MRSTFL	021745	2237#			
MRSTU	023221	2237#	4074		
MRTOFL	022772	2237#			
MRW	021156	1124	2237#		
MRWLPF	022306	2237#	2421		
MRWOFL	022621	2237#	4410		
MSREFF	022665	1363	2237#		
MSRETF	023333	2237#	4214		
MSRIFL	023620	1659	2237#		





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CROSS REFERENCE TABLE -- USER SYMBOLS

RD	012756	915#	3089	3154	3307	3383	3600	3725	3767	3852	3870	3889	4223	4322
RDCNT =	001000	684#												
READ =	000004	636#	918											
REWIND=	001020	642#	825											
RPEF =	100000	690#												
RPTCNT	002152	509#	2292	2294*	3689	3858								
RWDS =	000002	676#												
RWIND	012416	822#	2391	2403	2539	2634	2671	2767	2817	2970	3042	3076	3104	3169
		3249	3325	3401	3466	3530	3660	3788	3834	3908	4140	4365	4381	
RWAIT	013354	1022#	1134	1159	1264	1338	1373	1409	1447	1486	1523	1561	1602	1633
		1668	1712	1754	1791	1829	1859	1890	1922	2037	2611	3984	4028	4064
		4091	4131	4167	4187	4224	4260	4291	4323	4382				
		664#												
SBIT8 =	000400	665#												
SBIT9 =	001000	508#												
SFPTBL	002152	4482	4493#											
SFTTXX	034642	3691	3794#	3860										
SIZTAB	032000	638#	933											
SPACER=	001410	930#	2779	3060	3141	3295	3371	3448	3513	3580	3714	3761	4186	4290
SPR	013024	687#												
STEF =	010000	319#	322	329#	365	366	374	375	376	377	378	379	380	381
SVCGBL=	000000	382	383	384	385	386	387	388	389	390	391	392	393	394
		395	396	397	398	399	400	401	402	403	404	405	406	407
		408	409	411	412	414	415	416	417	418	419	420	421	422
		423	424	425	426	427	428	429	430	431	432	433	434	435
		436	437	438	439	440	441	442	443	444	445	446	447	448
		449	464	465	485	486	487	507	508	509	712	713	788	789
		797	798	1972	1973	1995	1996	2011	2012	2026	2027	2064	2065	2079
		2080	2094	2095	2108	2109	2122	2123	2135	2136	2154	2155	2248	2249
		2262	2263	2308	2309	2321	2322	4438	4439	4479	4480	4511#	4512	
SVCINS=	000000	319#	326#	366	367	368	369	370	371	372	373	374	375	376
		377	378	379	380	381	382	383	384	385	386	387	388	389
		390	391	392	393	394	395	396	397	398	399	400	401	402
		403	404	405	406	407	408	409	410	411	412	413	414	'15
		416	417	418	419	420	421	422	423	424	425	426	427	428
		429	430	431	432	433	434	435	436	437	438	439	440	441
		442	443	444	445	446	447	448	449	450	463	464	465	466
		467	468	469	470	471	484	485	506	507	789	790	791	798
		803	804	1065	1066	1080	1081	1082	1083	1084	1085	1086	1244	1245
		1246	1247	1248	1249	1250	1978	1979	1999	2000	2016	2017	2031	2032
		2033	2034	2035	2036	2037	2043	2044	2045	2046	2047	2048	2049	2055
		2056	2070	2071	2085	2086	2100	2101	2115	2116	2129	2130	2137	2138
		2139	2140	2141	2142	2143	2144	2145	2148	2149	2159	2160	2161	2162
		2163	2164	2165	2166	2167	2170	2171	2189	2190	2191	2192	2193	2194
		2204	2205	2206	2207	2208	2209	2210	2211	2212	2213	2220	2221	2222
		2223	2224	2225	2267	2268	2269	2270	2281	2282	2283	2286	2287	2288
		2289	2290	2291	2292	2297	2298	2311	2312	2324	2325	2345	2346	2386
		2387	2395	2396	2400	2401	2419	2420	2421	2422	2423	2429	2430	2431
		2432	2433	2437	2438	2446	2447	2448	2449	2450	2455	2456	2457	2458
		2459	2464	2465	2466	2467	2468	2473	2474	2475	2476	2477	2483	2484
		2485	2486	2487	2491	2492	2493	2494	2495	2500	2501	2502	2503	2504
		2507	2508	2509	2514	2515	2516	2517	2518	2525	2526	2527	2528	2529
		2534	2535	2543	2544	2549	2550	2559	2560	2561	2562	2563	2599	2600
		2608	2609	2610	2617	2618	2619	2620	2621	2622	2623	2624	2629	2630
		2638	2639	2657	2658	2659	2660	2661	2666	2667	2675	2676	2680	2681
		2698	2699	2700	2701	2702	2705	2706	2718	2719	2720	2721	2722	2729

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CROSS REFERENCE TABLE -- USER SYMBOLS

2730	2731	2732	2733	2753	2754	2755	2756	2757	2762	2763	2771	2772
2776	2777	2804	2805	2806	2807	2808	2813	2814	2821	2822	2827	2828
2832	2833	2839	2840	2874	2875	2876	2877	2878	2889	2890	2891	2892
2893	2906	2907	2908	2909	2910	2915	2916	2956	2957	2958	2959	2960
2964	2965	2974	2975	2979	2980	2985	2986	2993	2994	2999	3000	3006
3007	3011	3012	3029	3030	3031	3032	3033	3038	3039	3046	3047	3051
3052	3057	3058	3066	3067	3072	3073	3080	3081	3085	3086	3093	3094
3100	3101	3108	3109	3113	3114	3119	3120	3126	3127	3132	3133	3138
3139	3145	3146	3151	3152	3158	3159	3165	3166	3173	3174	3178	3179
3184	3185	3191	3192	3232	3233	3234	3235	3236	3245	3246	3253	3254
3258	3259	3264	3265	3269	3270	3276	3277	3281	3282	3288	3289	3293
3294	3299	3300	3304	3305	3311	3312	3321	3322	3329	3330	3334	3335
3340	3341	3345	3346	3352	3353	3357	3358	3364	3365	3369	3370	3375
3376	3380	3381	3387	3388	3397	3398	3405	3406	3410	3411	3416	3417
3421	3422	3428	3429	3433	3434	3440	3441	3445	3446	3452	3453	3462
3463	3470	3471	3475	3476	3481	3482	3486	3487	3493	3494	3498	3499
3505	3506	3510	3511	3517	3518	3526	3527	3534	3535	3539	3540	3545
3546	3550	3551	3557	3558	3562	3563	3570	3571	3577	3578	3584	3585
3591	3592	3596	3597	3604	3605	3609	3610	3647	3648	3649	3650	3651
3656	3657	3664	3665	3669	3670	3675	3676	3680	3681	3687	3688	3699
3700	3707	3708	3712	3713	3718	3719	3723	3724	3729	3730	3734	3735
3745	3746	3753	3754	3758	3759	3765	3766	3771	3772	3786	3787	3792
3793	3802	3803	3830	3831	3838	3839	3843	3844	3849	3850	3856	3857
3868	3869	3876	3877	3886	3887	3906	3907	3912	3913	3916	3917	3960
3961	3962	3963	3964	3965	3966	3980	3981	3982	3983	3984	3992	3993
4012	4013	4014	4015	4016	4024	4025	4026	4027	4028	4038	4039	4040
4041	4042	4049	4050	4051	4052	4053	4060	4061	4062	4063	4064	4069
4070	4074	4075	4076	4077	4078	4079	4080	4116	4117	4118	4119	4120
4127	4128	4129	4130	4131	4136	4137	4144	4145	4149	4150	4158	4159
4163	4164	4171	4172	4178	4179	4184	4185	4212	4213	4214	4215	4216
4221	4222	4244	4245	4246	4247	4248	4256	4257	4284	4285	4286	4287
4288	4316	4317	4318	4319	4320	4349	4350	4351	4352	4353	4359	4360
4369	4370	4374	4375	4408	4409	4410	4411	4412	4414	4415	4416	4417
4418	4419	4420	4422	4423	4437	4438	4440	4441	4442	4443	4444	4445
4446	4447	4448	4449	4450	4451	4452	4453	4454	4455	4456	4457	4478
4479	4481	4482	4483	4484	4485	4486	4487	4488	4489	4490	4491	4508
4509	4510	4511										
319#	328#											
319#	330#	493	494	512	513	1977	1978	1998	1999	2015	2016	2054
2055	2069	2070	2084	2085	2099	2100	2114	2115	2128	2129	2147	2148
2169	2170	2296	2297	2310	2311	2323	2324	2344	2345	2914	2915	3608
3609	3801	3802	3915	3916	4421	4422	4457	4458	4491	4492		
319#	327#	2342	2343	2378	2379	2948	2949	3638	3639	3821	3822	3951
3952												
319#	494#	513#	1978#	1999#	2016#	2055#	2070#	2085#	2100#	2115#	2129#	2148#
2170#	2297#	2311#	2324#	2345#	2915#	3609#	3802#	3916#	4422#	4458#	4492#	
623#												
620#												
828	844	860	890	905	921	936	951	965	980	1044#		
1076#	2012	4019										
2594	2625#											
2662#												
1195#	2383	2397	2434	2531	2546	2596	2626	2663	2677	2759	2773	2810
2829	2961	2976	2996	3008	3035	3048	3069	3082	3097	3110	3135	3148
3162	3175	3242	3255	3266	3278	3290	3301	3318	3331	3342	3354	3366
3377	3394	3407	3418	3430	3442	3459	3472	3483	3495	3507	3523	3536

SVCSUB= 000000  
SVCTAG= 000000

SVCTST= 000000

S\$LSYM= 010000

TBA = 164006  
TCR = 164000  
TESTA 013402  
TESTC 013446  
TESTK 025222  
TESTM 025360  
TESTN 014066



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## CROSS REFERENCE TABLE -- USER SYMBOLS

		3547	3559	3574	3588	3593	3653	3666	3677	3696	3709	3720	3742	3755
		3783	3827	3840	3846	3865	3883	3903	4146	4160	4168	4181	4218	4253
		4356	4371											
TESTNM	014166	1233#	2028	3976	4020									
TESTN1	014214	1243#	4056	4123										
TEST2	024206	2379#												
TEST4	031316	3639#												
TEST5	032040	3822#												
TEST6	032344	3952#												
TMOUT =	000400	683#												
TPT52	020454	2207	2232#											
TRBA	002250	764#	824*	840*	856*	872*	886*	901*	917*	932*	947*	961*	976*	999
		2277*	2605*	2845*	2882*	2883	3197*	3202*						
TRCR	002242	761#	825*	826*	841*	842*	857*	858*	873*	874*	887*	888*	902*	903*
		918*	919*	933*	934*	948*	949*	962*	963*	978*	996	1009*	1010	1048
		1050	1052	1203	1205	1252	1562	1564	1566	1973*	2206	2271*	2283*	2380*
		2441*	2442	2451*	2452	2460*	2461	2469*	2470	2478*	2479	2488	2496*	2497
		2509*	2510	2520*	2521	2610*	2706*	2709*	2714	2725	2842*	2843*	2846*	2949*
		3198*	3199*	3641*	3824*	3955*	4043	4384*						
TRPRT	002254	767#	2279*	2286										
TRSR	002244	762#	822*	838*	854*	870*	884*	899*	915*	930*	945*	959*	974*	997
		1077	1088	1104	1106	1195	1236	2273*	2388	2425	2536	2603*	2631	2668
		2734	2764	2815	2841*	2952	2967	3040	3074	3102	3167	3195*	3247	3323
		3399	3464	3528	3643	3658	3702	3748	3832	3871	3890	3957	3968	4034
		4082	4138	4153	4361	4363	4377							
TRVCT	002252	766#	2278*	2288										
TRWC	002246	763#	823*	839*	855*	871*	885*	900*	916*	931*	946*	960*	975*	998
		2275*	2604*	2844*	2899*	2900	3196*	3201*						
TR79	002000 G	322#												
TSA =	000172	625#												
TSR =	164002	621#												
TSTINT	025066	2574#												
TSTRDY	014114	1203#	2040	3989	4066	4133								
TVA =	000170	624#												
TWAIT	013344	1019#												
TWC =	164004	622#												
TSARGC=	000002	366#	367#	368#	369#	370#	371#	1080#	1085	1244#	1249	2031#	2036	2043#
		2048	2137#	2144	2159#	2166	2189#	2193	2204#	2212	2220#	2224	3960#	3965
		4074#	4079	4414#	4419									
T\$CODE=	000052	4440#	4445#	4450#	4481#	4484#								
T\$ERRN=	000071	319#	2420#	2430#	2447#	2456#	2465#	2474#	2484#	2492#	2501#	2515#	2526#	2560#
		2618#	2658#	2699#	2719#	2730#	2754#	2805#	2875#	2890#	2907#	2957#	3030#	3233#
		3648#	3981#	4013#	4025#	4039#	4050#	4061#	4117#	4128#	4213#	4245#	4285#	4317#
		4350#	4409#											
T\$EXCP=	000000	4440#	4444	4445#	4449	4450#	4455	4484#	4489					
T\$GMAN=	000000	319#												
T\$HILI=	000764	4440#	4443	4445#	4448	4450#	4454	4484#	4488					
T\$LAST=	000001	319#	4509#											
T\$LOLI=	000000	4440#	4442	4445#	4447	4450#	4453	4484#	4487					
T\$LSYM=	010000	319#	494	513	1978	1999	2016	2055	2070	2085	2100	2115	2129	2148
		2170	2297	2311	2324	2345	2915	3609	3802	3916	4422	4458	4492	
T\$LTNO=	000006	4512#												
T\$NEST=	177777	319#	322#	484#	493#	506#	512#	1972#	1977#	1995#	1998#	2011#	2015#	2026#
		2054#	2064#	2069#	2079#	2084#	2094#	2099#	2108#	2114#	2122#	2128#	2135#	2147#
		2154#	2169#	2248#	2253#	2262#	2296#	2308#	2310#	2321#	2323#	2343#	2344#	2379#
		2914#	2949#	3608#	3639#	3801#	3822#	3915#	3952#	4421#	4437#	4456#	4478#	4490#







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## CROSS REFERENCE TABLE -- USER SYMBOLS

	2778*	2834*	2988*	3001*	3059*	3088*	3121*	3140*	3153*	3186*	3271*	3283*	3306*
	3347*	3359*	3382*	3423*	3435*	3447*	3488*	3500*	3512*	3552*	3564*	3599*	3598*
	3682*	3692*	3760*	3851*	3861*	3888*	4165*	4173*	4191	4258*	4295	4328	
USEC	002216	731#	901	3565*	3599*								
VECTOR	034540	4446	4460#										
WCOUNT	035206	4485	4493#										
WEOF =	001034	648#	948										
WIDB =	000432	647#	841										
WPEF =	040000	689#											
WRITE =	000402	635#	887	902	2842	3198							
WRT	012642	884#	2641	3002	3284	3360	3436	3501	3701	4174			
WRTC	012710	899#	3566										
WTEOF	013072	945#	2682	3128	3747	4259							
WTIDB	012464	838#	2823	2981	3013	3053	3115	3180	3260	3336	3412	3477	3541
		3993											3671
WWAIT	013362	1020	1023#	2724	2848	3062	3995	4031					
XBA16 =	010000	668#											
XBA17 =	020000	669#											
XHDR	020346	2109	2123	2176	2188#								
XPRT	020370	2111	2125	2178	2202#								
XSALWA=	000000	319#											
XSALS=	000040	319#											
XSOFFS=	000400	319#											
XSTRUE=	000020	319#											
SLSTIN=	000001	324#											
SLSTTA=	000001	325#											
.	= 035402	315#	773#	790#	803#	807#	2238#	4500#					





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## CROSS REFERENCE TABLE -- MACRO NAMES

ENDSW	1#	319#	511												
ENDTST	1#	319#	2343	2913	3607	3800	3914	4420							
EQUALS	1#	319#	524												
ERRDF	1#	319#													
ERRHRD	1#	319#													
ERROR	1#	319#	2385	2394	2399	2436	2533	2542	2548	2598	2628	2637	2665	2674	2679
	2761	2770	2775	2812	2820	2826	2831	2838	2963	2973	2978	2984	2992	2998	3005
	3010	3037	3045	3050	3056	3065	3071	3079	3084	3092	3099	3107	3112	3118	3125
	3131	3137	3144	3150	3157	3164	3172	3177	3183	3190	3244	3252	3257	3263	3268
	3275	3280	3287	3292	3298	3303	3310	3320	3328	3333	3339	3344	3351	3356	3363
	3368	3374	3379	3386	3396	3404	3409	3415	3420	3427	3432	3439	3444	3451	3461
	3469	3474	3480	3485	3492	3497	3504	3509	3516	3525	3533	3538	3544	3549	3556
	3561	3569	3576	3583	3590	3595	3603	3655	3663	3668	3674	3679	3686	3698	3706
	3711	3717	3722	3728	3733	3744	3752	3757	3764	3770	3785	3791	3829	3837	3842
	3848	3855	3867	3875	3885	3905	3911	3991	4068	4135	4143	4148	4157	4162	4170
	4177	4183	4220	4255	4358	4368	4373								
ERRSF	1#	319#													
ERRSOF	1#	319#	2418	2428	2445	2454	2463	2472	2482	2490	2499	2513	2524	2558	2616
	2656	2697	2717	2728	2752	2803	2873	2888	2905	2955	3028	3231	3646	3979	4011
	4023	4037	4048	4059	4115	4126	4211	4243	4283	4315	4348	4407			
ERRTBL	1#	319#	711												
ESCAPE	1#	319#													
EXIT	1#	319#													
FEQUAL	1#	319#													
GETBYT	1#	319#													
GETPRI	1#	319#													
GETWOR	1#	319#													
GPIA	1#	319#													
GPIAID	1#	319#													
GPIAIL	1#	319#													
GPHARD	1#	319#	2266												
GPRMA	1#	319#	4439	4444											
GPRMD	1#	319#	4449	4483											
GPRML	1#	319#													
HEADER	1#	319#	364												
INLOOP	1#	319#													
IOSETU	1#	319#													
IOSTAR	1#	319#													
KT11	1#	319#													
LASTAD	1#	319#	4507												
MANUAL	1#	319#													
MEMORY	1#	319#													
MSBYTE	1#	319#	365#	371	372	373									
MSCHEC	1#	319#													
MSCNTO	1#	319#	4440#	4445#	4450#	4484#									
MSCOUN	1#	319#	1080#	1244#	2031#	2043#	2137#	2159#	2189#	2204#	2220#	3960#	4074#	4414#	
MSDATA	1#	319#	365#	374	376	378	380	382	384	386	388	390	392	394	396
	398	400	402	404#	406	408	411	414	416	418	420	422	424	426	428
	430	432	434	436	438	440	442	444	446	448	788#	797#			
MSDECR	1#	319#	493#	512#	1977#	1998#	2015#	2054#	2069#	2084#	2099#	2114#	2128#	2147#	2169#
	2253#	2296#	2310#	2323#	2344#	2914#	3608#	3801#	3915#	4421#	4456#	4490#	4507#		
MSDEFA	1#	319#	4440#	4445#	4450#	4484#									
MSENDE	1#	319#	493#	512#	1977#	1998#	2015#	2054#	2069#	2084#	2099#	2114#	2128#	2147#	2169#
	2296#	2310#	2323#	2344#	2914#	3608#	3801#	3915#	4421#	4456#	4490#	4507#			
MSERRI	1#	319#	2419#	2429#	2446#	2455#	2464#	2473#	2483#	2491#	2500#	2514#	2525#	2559#	2617#
	2657#	2698#	2718#	2729#	2753#	2804#	2874#	2889#	2906#	2956#	3029#	3232#	3647#	3980#	4012#



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CROSS REFERENCE TABLE -- MACRO NAMES

	4024#	4038#	4049#	4060#	4116#	4127#	4212#	4244#	4284#	4316#	4349#	4408#			
MSESCA	1#	319#													
MSESCS	1#	319#													
MSEXCP	1#	319#	4440#	4445#	4450#	4484#									
MSEXIT	1#	319#													
MSFXSE	1#	319#													
MSEXTJ	1#	319#													
MSGEN	1#	319#	322#	365#	374#	376#	378#	380#	382#	384#	386#	388#	390#	392#	394#
	396#	398#	400#	402#	404#	406#	408#	411#	414#	416#	418#	420#	422#	424#	426#
	428#	430#	432#	434#	436#	438#	440#	442#	444#	446#	448#	464#	485#	486#	493#
	507#	508#	512#	712#	788#	797#	1972#	1977#	1995#	1998#	2011#	2015#	2026#	2054#	2064#
	2069#	2079#	2084#	2094#	2099#	2108#	2114#	2122#	2128#	2135#	2147#	2154#	2169#	2248#	2262#
	2296#	2308#	2310#	2321#	2323#	2342#	2344#	2378#	2914#	2948#	3608#	3638#	3801#	3821#	3915#
	3951#	4421#	4438#	4457#	4479#	4491#	4511#								
MSGENB	1#	319#													
MSGETS	1#	319#	493#	512#	1977#	1998#	2015#	2054#	2069#	2084#	2099#	2114#	2128#	2147#	2169#
	2253#	2296#	2310#	2323#	2344#	2914#	3608#	3801#	3915#	4421#	4456#	4490#	4507#		
MSGETT	1#	319#													
MSGNGB	1#	319#	322#	365#	374#	376#	378#	380#	382#	384#	386#	388#	390#	392#	394#
	396#	398#	400#	402#	404#	406#	408#	411#	414#	416#	418#	420#	422#	424#	426#
	428#	430#	432#	434#	436#	438#	440#	442#	444#	446#	448#	463#	464	484#	485
	486	506#	507	508	712#	788#	797#	1972#	1995#	2011#	2026#	2064#	2079#	2094#	2108#
	2122#	2135#	2154#	2248#	2262#	2308#	2321#	4437#	4438	4478#	4479	4508#	4511		
MSGNIN	1#	319#	365#	366	367	368	369	370	371#	372#	373#	374#	375	376#	377
	378#	379	380#	381	382#	383	384#	385	386#	387	388#	389	390#	391	392#
	393	394#	395	396#	397	398#	399	400#	401	402#	403	404#	405	406#	407
	408#	409	410	411#	412	413#	414#	415	416#	417	418#	419	420#	421	422#
	423	424#	425	426#	427	428#	429	430#	431	432#	433	434#	435	436#	437
	438#	439	440#	441	442#	443	444#	445	446#	447	448#	449	463#	465#	466#
	467#	468#	469#	470#	484#	506#	788#	789	790	797#	798	803	1065#	1080#	1081#
	1082#	1083	1084#	1085	1244#	1245#	1246#	1247	1248#	1249	1977#	1978	1999#	2016#	2031#
	2032#	2033#	2034	2035#	2036	2043#	2044#	2045#	2046	2047#	2048	2055#	2070#	2085#	2100#
	2115#	2129#	2137#	2138#	2139#	2140#	2141#	2142	2143#	2144	2148#	2159#	2160#	2161#	2162#
	2163#	2164	2165#	2166	2170#	2189#	2190#	2191	2192#	2193	2204#	2205#	2206#	2207#	2208#
	2209#	2210	2211#	2212	2220#	2221#	2222	2223#	2224	2267#	2268#	2269#	2281#	2282#	2286#
	2287#	2288#	2289#	2290#	2291	2297#	2311#	2324#	2345#	2386#	2395#	2400#	2419#	2420#	2421#
	2422#	2429#	2430#	2431#	2432#	2437#	2446#	2447#	2448#	2449#	2455#	2456#	2457#	2458#	2464#
	2465#	2466#	2467#	2473#	2474#	2475#	2476#	2483#	2484#	2485#	2486#	2491#	2492#	2493#	2494#
	2500#	2501#	2502#	2503#	2507#	2508#	2514#	2515#	2516#	2517#	2525#	2526#	2527#	2528#	2534#
	2543#	2549#	2559#	2560#	2561#	2562#	2599#	2608#	2609#	2617#	2618#	2619#	2620#	2622#	2623#
	2629#	2638#	2657#	2658#	2659#	2660#	2666#	2675#	2680#	2698#	2699#	2700#	2701#	2705#	2718#
	2719#	2720#	2721#	2729#	2730#	2731#	2732#	2753#	2754#	2755#	2756#	2762#	2771#	2776#	2804#
	2805#	2806#	2807#	2813#	2821#	2827#	2832#	2839#	2874#	2875#	2876#	2877#	2889#	2890#	2891#
	2892#	2906#	2907#	2908#	2909#	2915#	2956#	2957#	2958#	2959#	2964#	2974#	2979#	2985#	2993#
	2999#	3006#	3011#	3029#	3030#	3031#	3032#	3038#	3046#	3051#	3057#	3066#	3072#	3080#	3085#
	3093#	3100#	3108#	3113#	3119#	3126#	3132#	3138#	3145#	3151#	3158#	3165#	3173#	3178#	3184#
	3191#	3232#	3233#	3234#	3235#	3245#	3253#	3258#	3264#	3269#	3276#	3281#	3288#	3293#	3299#
	3304#	3311#	3321#	3329#	3334#	3340#	3345#	3352#	3357#	3364#	3369#	3375#	3380#	3387#	3397#
	3405#	3410#	3416#	3421#	3428#	3433#	3440#	3445#	3452#	3462#	3470#	3475#	3481#	3486#	3493#
	3498#	3505#	3510#	3517#	3526#	3534#	3539#	3545#	3550#	3557#	3562#	3570#	3577#	3584#	3591#
	3596#	3604#	3609#	3647#	3648#	3649#	3650#	3656#	3664#	3669#	3675#	3680#	3687#	3699#	3707#
	3712#	3718#	3723#	3729#	3734#	3745#	3753#	3758#	3765#	3771#	3786#	3792#	3802#	3830#	3838#
	3843#	3849#	3856#	3868#	3876#	3886#	3906#	3912#	3916#	3960#	3961#	3962#	3963	3964#	3965
	3980#	3981#	3982#	3983#	3992#	4012#	4013#	4014#	4015#	4024#	4025#	4026#	4027#	4038#	4039#
	4040#	4041#	4049#	4050#	4051#	4052#	4060#	4061#	4062#	4063#	4069#	4074#	4075#	4076#	4077
	4078#	4079	4116#	4117#	4118#	4119#	4127#	4128#	4129#	4130#	4136#	4144#	4149#	4158#	4163#



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## CROSS REFERENCE TABLE -- MACRO NAMES

	4171#	4178#	4184#	4212#	4213#	4214#	4215#	4221#	4244#	4245#	4246#	4247#	4256#	4284#	4285#
	4286#	4287#	4316#	4317#	4318#	4319#	4349#	4350#	4351#	4352#	4359#	4369#	4374#	4408#	4409#
	4410#	4411#	4414#	4415#	4416#	4417	4418#	4419	4422#	4437#	4440#	4441	4442	4443	4445#
	4446	4447	4448	4450#	4451	4452	4453	4454	4456#	4478#	4481#	4482#	4484#	4485	4486
	4487	4488	4490#	4508#	4509#	4510#									
MSGNLS	1#	319#													
MSGNSU	1#	319#													
MSGNTA	1#	319#	493#	512#	1977#	1998#	2015#	2054#	2069#	2084#	2099#	2114#	2128#	2147#	2169#
	2296#	2310#	2323#	2344#	2914#	3608#	3801#	3915#	4421#	4456#	4457	4490#	4491		
MSGNTE	1#	319#	2342#	2378#	2948#	3638#	3821#	3951#							
MSHAPT	1#	319#	365#												
MSHNAP	1#	319#	365#	404											
MSINCR	1#	319#	322#	484#	506#	1065#	1084#	1248#	1972#	1995#	1999#	2011#	2016#	2026#	2035#
	2047#	2055#	2064#	2070#	2079#	2085#	2094#	2100#	2108#	2115#	2122#	2129#	2135#	2143#	2148#
	2154#	2165#	2170#	2192#	2211#	2223#	2248#	2262#	2268#	2282#	2290#	2297#	2308#	2311#	2321#
	2324#	2342#	2343#	2345#	2378#	2379#	2386#	2395#	2400#	2419#	2429#	2437#	2446#	2455#	2464#
	2473#	2483#	2491#	2500#	2508#	2514#	2525#	2534#	2543#	2549#	2559#	2599#	2609#	2617#	2623#
	2629#	2638#	2657#	2666#	2675#	2680#	2698#	2705#	2718#	2729#	2753#	2762#	2771#	2776#	2804#
	2813#	2821#	2827#	2832#	2839#	2874#	2889#	2906#	2915#	2948#	2949#	2956#	2964#	2974#	2979#
	2985#	2993#	2999#	3006#	3011#	3029#	3038#	3046#	3051#	3057#	3066#	3072#	3080#	3085#	3093#
	3100#	3108#	3113#	3119#	3126#	3132#	3138#	3145#	3151#	3158#	3165#	3173#	3178#	3184#	3191#
	3232#	3245#	3253#	3258#	3264#	3269#	3276#	3281#	3288#	3293#	3299#	3304#	3311#	3321#	3329#
	3334#	3340#	3345#	3352#	3357#	3364#	3369#	3375#	3380#	3387#	3397#	3405#	3410#	3416#	3421#
	3428#	3433#	3440#	3445#	3452#	3462#	3470#	3475#	3481#	3486#	3493#	3498#	3505#	3510#	3517#
	3526#	3534#	3539#	3545#	3550#	3557#	3562#	3570#	3577#	3584#	3591#	3596#	3604#	3609#	3638#
	3639#	3647#	3656#	3664#	3669#	3675#	3680#	3687#	3699#	3707#	3712#	3718#	3723#	3729#	3734#
	3745#	3753#	3758#	3765#	3771#	3786#	3792#	3802#	3821#	3822#	3830#	3838#	3843#	3849#	3856#
	3868#	3876#	3886#	3906#	3912#	3916#	3951#	3952#	3964#	3980#	3992#	4012#	4024#	4038#	4049#
	4060#	4069#	4078#	4116#	4127#	4136#	4144#	4149#	4158#	4163#	4171#	4178#	4184#	4212#	4221#
	4244#	4256#	4284#	4316#	4349#	4359#	4369#	4374#	4408#	4418#	4422#	4437#	4478#		
MSIOSE	1#	319#													
MSLDRO	1#	319#	2267#	2281#	2507#	2608#	2622#								
MSMASK	1#	319#													
MSMCHI	1#	319#													
MSMCLO	1#	319#													
MSMSK1	1#	319#													
MSPOP	1#	319#	493#	512#	1977#	1998#	2015#	2054#	2069#	2084#	2099#	2114#	2128#	2147#	2169#
	2253#	2296#	2310#	2323#	2344#	2914#	3608#	3801#	3915#	4421#	4456#	4490#	4507#		
MSPRIN	1#	319#	1080#	1244#	2031#	2043#	2137#	2159#	2189#	2204#	2220#	3960#	4074#	4414#	
MSPUSH	1#	319#	322#	484#	506#	1972#	1995#	2011#	2026#	2064#	2079#	2094#	2108#	2122#	2135#
	2154#	2248#	2262#	2308#	2321#	2342#	2343	2378#	2379	2948#	2949	3638#	3639	3821#	3822
	3951#	3952	4437#	4478#											
MSPUT	1#	319#	1080#	1244#	2031#	2043#	2137#	2159#	2189#	2204#	2220#	2286#	3960#	4074#	4414#
MSPUT1	1#	319#	1080#	1081	1082	1244#	1245	1246	2031#	2032	2033	2043#	2044	2045	2137#
	2138	2139	2140	2141	2159#	2160	2161	2162	2163	2189#	2190	2204#	2205	2206	2207
	2208	2209	2220#	2221	2286#	2287	2288	2289	3960#	3961	3962	4074#	4075	4076	4414#
	4415	4416													
MSRADI	1#	319#	4440#	4445#	4450#	4484#									
MSRBRO	1#	319#													
MSRNRO	1#	319#	2267#	2269											
MSSETS	1#	319#	322#	484#	506#	1972#	1995#	2011#	2026#	2064#	2079#	2094#	2108#	2122#	2135#
	2154#	2248#	2262#	2308#	2321#	2343#	2379#	2949#	3639#	3822#	3952#	4437#	4478#		
MSSTAR	1#	319#													
MS SVC	1#	319#	1065#	1080#	1084	1244#	1248	1998#	1999	2015#	2016	2031#	2035	2043#	2047
	2054#	2055	2069#	2070	2084#	2085	2099#	2100	2114#	2115	2128#	2129	2137#	2143	2147#
	2148	2159#	2165	2169#	2170	2189#	2192	2204#	2211	2220#	2223	2267#	2268	2281#	2282

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CROSS REFERENCE TABLE -- MACRO NAMES

	2286#	2290	2296#	2297	2310#	2311	2323#	2324	2344#	2345	2386#	2395#	2400#	2419	2429
	2437#	2446	2455	2464	2473	2483	2491	2500	2507#	2508	2514	2525	2534#	2543#	2549#
	2559	2599#	2608#	2609	2617	2622#	2623	2629#	2638#	2657	2666#	2675#	2680#	2698	2705#
	2718	2729	2753	2762#	2771#	2776#	2804	2813#	2821#	2827#	2832#	2839#	2874	2889	2906
	2914#	2915	2956	2964#	2974#	2979#	2985#	2993#	2999#	3006#	3011#	3029	3038#	3046#	3051#
	3057#	3066#	3072#	3080#	3085#	3093#	3100#	3108#	3113#	3119#	3126#	3132#	3138#	3145#	3151#
	3158#	3165#	3173#	3178#	3184#	3191#	3232	3245#	3253#	3258#	3264#	3269#	3276#	3281#	3288#
	3293#	3299#	3304#	3311#	3321#	3329#	3334#	3340#	3345#	3352#	3357#	3364#	3369#	3375#	3380#
	3387#	3397#	3405#	3410#	3416#	3421#	3428#	3433#	3440#	3445#	3452#	3462#	3470#	3475#	3481#
	3486#	3493#	3498#	3505#	3510#	3517#	3526#	3534#	3539#	3545#	3550#	3557#	3562#	3570#	3577#
	3584#	3591#	3596#	3604#	3608#	3609	3647	3656#	3664#	3669#	3675#	3680#	3687#	3699#	3707#
	3712#	3718#	3723#	3729#	3734#	3745#	3753#	3758#	3765#	3771#	3786#	3792#	3801#	3802	3830#
	3838#	3843#	3849#	3856#	3868#	3876#	3886#	3906#	3912#	3915#	3916	3960#	3964	3980	3992#
	4012	4024	4038	4049	4060	4069#	4074#	4078	4116	4127	4136#	4144#	4149#	4158#	4163#
	4171#	4178#	4184#	4212	4221#	4244	4256#	4284	4316	4349	4359#	4369#	4374#	4408	4414#
	4418	4421#	4422												
MSTLAB	1#	319#	1065#	1084#	1248#	1999#	2016#	2035#	2047#	2055#	2070#	2085#	2100#	2115#	2129#
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	2395#	2400#	2419#	2429#	2437#	2446#	2455#	2464#	2473#	2483#	2491#	2500#	2508#	2514#	2525#
	2534#	2543#	2549#	2559#	2599#	2609#	2617#	2623#	2629#	2638#	2657#	2666#	2675#	2680#	2698#
	2705#	2718#	2729#	2753#	2762#	2771#	2776#	2804#	2813#	2821#	2827#	2832#	2839#	2874#	2889#
	2906#	2915#	2956#	2964#	2974#	2979#	2985#	2993#	2999#	3006#	3011#	3029#	3038#	3046#	3051#
	3057#	3066#	3072#	3080#	3085#	3093#	3100#	3108#	3113#	3119#	3126#	3132#	3138#	3145#	3151#
	3158#	3165#	3173#	3178#	3184#	3191#	3232#	3245#	3253#	3258#	3264#	3269#	3276#	3281#	3288#
	3293#	3299#	3304#	3311#	3321#	3329#	3334#	3340#	3345#	3352#	3357#	3364#	3369#	3375#	3380#
	3387#	3397#	3405#	3410#	3416#	3421#	3428#	3433#	3440#	3445#	3452#	3462#	3470#	3475#	3481#
	3486#	3493#	3498#	3505#	3510#	3517#	3526#	3534#	3539#	3545#	3550#	3557#	3562#	3570#	3577#
	3584#	3591#	3596#	3604#	3609#	3647#	3656#	3664#	3669#	3675#	3680#	3687#	3699#	3707#	3712#
	3718#	3723#	3729#	3734#	3745#	3753#	3758#	3765#	3771#	3786#	3792#	3802#	3830#	3838#	3843#
	3849#	3856#	3868#	3876#	3886#	3906#	3912#	3916#	3964#	3980#	3992#	4012#	4024#	4038#	4049#
	4060#	4069#	4078#	4116#	4127#	4136#	4144#	4149#	4158#	4163#	4171#	4178#	4184#	4212#	4221#
	4244#	4256#	4284#	4316#	4349#	4359#	4369#	4374#	4408#	4418#	4422#				
MSTSTL	1#	319#	1065#	1084#	1248#	1999#	2016#	2035#	2047#	2055#	2070#	2085#	2100#	2115#	2129#
	2143#	2148#	2165#	2170#	2192#	2211#	2223#	2268#	2282#	2290#	2297#	2311#	2324#	2345#	2386#
	2395#	2400#	2419#	2429#	2437#	2446#	2455#	2464#	2473#	2483#	2491#	2500#	2508#	2514#	2525#
	2534#	2543#	2549#	2559#	2599#	2609#	2617#	2623#	2629#	2638#	2657#	2666#	2675#	2680#	2698#
	2705#	2718#	2729#	2753#	2762#	2771#	2776#	2804#	2813#	2821#	2827#	2832#	2839#	2874#	2889#
	2906#	2915#	2956#	2964#	2974#	2979#	2985#	2993#	2999#	3006#	3011#	3029#	3038#	3046#	3051#
	3057#	3066#	3072#	3080#	3085#	3093#	3100#	3108#	3113#	3119#	3126#	3132#	3138#	3145#	3151#
	3158#	3165#	3173#	3178#	3184#	3191#	3232#	3245#	3253#	3258#	3264#	3269#	3276#	3281#	3288#
	3293#	3299#	3304#	3311#	3321#	3329#	3334#	3340#	3345#	3352#	3357#	3364#	3369#	3375#	3380#
	3387#	3397#	3405#	3410#	3416#	3421#	3428#	3433#	3440#	3445#	3452#	3462#	3470#	3475#	3481#
	3486#	3493#	3498#	3505#	3510#	3517#	3526#	3534#	3539#	3545#	3550#	3557#	3562#	3570#	3577#
	3584#	3591#	3596#	3604#	3609#	3647#	3656#	3664#	3669#	3675#	3680#	3687#	3699#	3707#	3712#
	3718#	3723#	3729#	3734#	3745#	3753#	3758#	3765#	3771#	3786#	3792#	3802#	3830#	3838#	3843#
	3849#	3856#	3868#	3876#	3886#	3906#	3912#	3916#	3964#	3980#	3992#	4012#	4024#	4038#	4049#
	4060#	4069#	4078#	4116#	4127#	4136#	4144#	4149#	4158#	4163#	4171#	4178#	4184#	4212#	4221#
	4244#	4256#	4284#	4316#	4349#	4359#	4369#	4374#	4408#	4418#	4422#				
MSWORD	1#	319#	404#	413	463#	465	466	467	468	469	470	2419#	2420	2421	2422
	2429#	2430	2431	2432	2446#	2447	2448	2449	2455#	2456	2457	2458	2464#	2465	2466
	2467	2473#	2474	2475	2476	2483#	2484	2485	2486	2491#	2492	2493	2494	2500#	2501
	2502	2503	2514#	2515	2516	2517	2525#	2526	2527	2528	2559#	2560	2561	2562	2617#
	2618	2619	2620	2657#	2658	2659	2660	2698#	2699	2700	2701	2718#	2719	2720	2721
	2729#	2730	2731	2732	2753#	2754	2755	2756	2804#	2805	2806	2807	2874#	2875	2876
	2877	2889#	2890	2891	2892	2906#	2907	2908	2909	2956#	2957	2958	2959	3029#	3030
	3031	3032	3232#	3233	3234	3235	3647#	3648	3649	3650	3980#	3981	3982	3983	4012#



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## CROSS REFERENCE TABLE -- MACRO NAMES

	4013	4014	4015	4024#	4025	4026	4027	4038#	4039	4040	4041	4049#	4050	4051	4052
	4060#	4061	4062	4063	4116#	4117	4118	4119	4127#	4128	4129	4130	4212#	4213	4214
	4215	4244#	4245	4246	4247	4284#	4285	4286	4287	4316#	4317	4318	4319	4349#	4350
	4351	4352	4408#	4409	4410	4411	4440#	4445#	4450#	4481#	4482	4484#	4509	4510	
MSXFER	1#	319#													
OPEN	1#	319#													
POINTE	1#	319#	346												
PRINTB	1#	319#	2030	2042	2136	2158	2188	2203	2219						
PRINTF	1#	319#	1079	1243	3959	4073	4413								
PRINTS	1#	319#													
PRINTX	1#	319#													
READBU	1#	319#													
REDEF	1#	319#													
RFLAGS	1#	319#													
SETPRI	1#	319#	2280	2506	2607	2621									
SETVEC	1#	319#	2285												
SLASH	1#	319#													
STARS	1#	319#													
SVC	1#	317#	318												
XFER	1#	319#													
XFERF	1#	319#													
XFERT	1#	319#													

. ABS. 035402 000

ERRORS DETECTED: 0

CZTRAC.BIN/I,CZTRAC.SEQ/CRF/SOL/NL:TOC=SVC34R.MLB,CZTRAC.P11

RUN-TIME: 16 21 2 SECONDS

RUN-TIME RATIO: 64/39=1.6

CORE USED: 16K (31 PAGES)