TA11

LOGIC TEST 2

MD-11-DZTAB-C

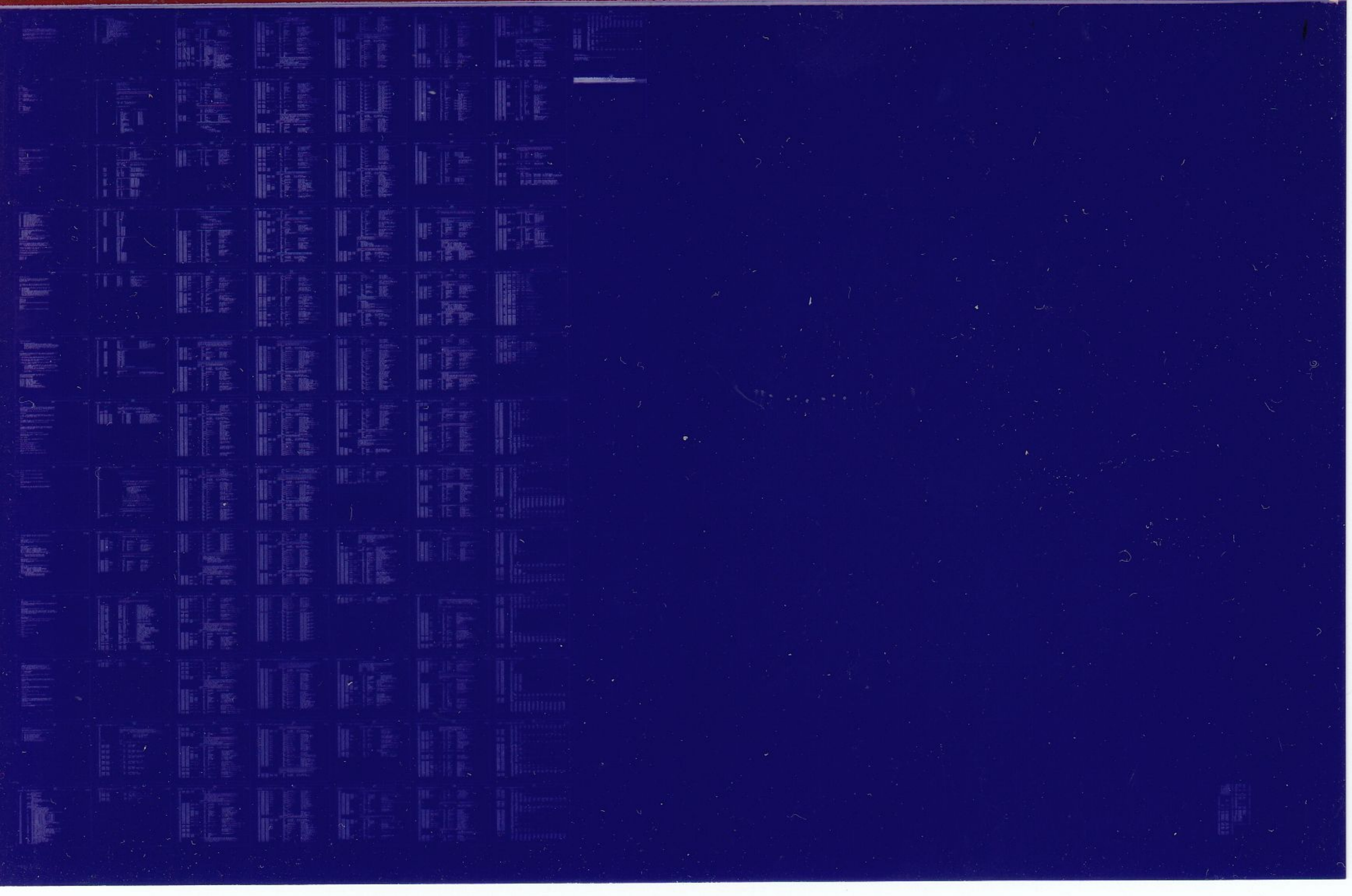
EP-DZTAB-C-DL-A

FICHE 1 OF 1

NOV 1976

digital

MADE IN USA



IDENTIFICATION

PRODUCT CODE: MAINDEC-11-DTAB- [illegible]

PRODUCT NAME: TAIL LOGIC TEST PART B

DATE REVISED: 21 JUNE 76

MAINTAINER: DIAGNOSTIC ENGINEERING

AUTHOR: JIM LACEY

CONTENTS

1. ABSTRACT

THIS PROGRAM CONTAINS A SERIES OF BASIC LOGIC TESTS
THAT CHECK THE TA11 FOR PROPER OPERATION.

2. REQUIREMENTS

2.1 EQUIPMENT

PDP-11 COMPUTER WITH OR WITHOUT HARDWARE SWITCH REGISTER
WITH CONSOLE TELETYPE, AND A TA11 CASSETTE

2.2 STORAGE

THIS PROGRAM REQUIRES APPROX. 4K STORAGE.

2.3 PRELIMINARY PROGRAMS

MAINDEC-11-DZTAA

3. LOADING PROCEDURE

USE STANDARD PROCEDURE FOR LOADING .ABS TAPES
OR A CASSETTE TAPE.

4. STARTING PROCEDURE

4.1 CONTROL SWITCH SETTINGS

SEE 5.1.

~.2 STARTING ADDRESSES

200	NORMAL STARTING ADDRESS
204	SELECT DRIVE(S) BEFORE STARTING TEST
210	SELECT DRIVE(S) AND ADDRESSES BEFORE STARTING TEST
214	SETUP FOR MANUAL LOOPING
220	WRITE FILE GAP FROM BOT TO EOT
224	WRITE CONTINOUS BLOCKS OF DATA
230	READ CONTINOUS BLOCKS OF DATA
234	WRITE FILE GAP AND A BLOCK OF DATA
240	READ BLOCK OF DATA AND INTO A FILE GAP
244	SPACE FWD FILE GAP FROM BOT TO EOT
250	BACK SPACE FILE GAPS
254	LOAD SWITCH REGISTER INTO THE TACS
260	WRITE SWITCH REGISTER ON TAPE FROM BOT TO EOT
300	READ FROM BOT TO EOT

~.3 PROGRAM & OPERATOR ACTION

1. LOAD PROGRAM INTO MEMORY (SEE SECTION 3.)
2. LOAD A WRITE ENABLED CASSETTE IN BOTH DRIVES
3. REWIND BOTH DRIVES
4. LOAD ADDRESS 200.
5. SET SWITCHES (SEE SECTION 5.1)
6. PRESS START.
7. THE PROGRAM WILL LOOP & TTY BELL WILL RING ONCE EVERY PASS, IF SW(10)=0.

*** NOTE: IF USING THE SOFTWARE SWITCH REGISTER PROGRAM WILL TYPE "SWR=XXXXXX NEW=", TO ALLOW SETTING OF REGISTER BEFORE BEGINNING TEST.

~.3.1 DRIVE SELECTION

STARTING THE PROGRAM AT 200 WILL RESULT IN AUTOMATIC SELECTION OF DRIVES "A" AND "B" TO BE TESTED.
NOTE: IF LOAD MEDIUM IS CASSETTE WITH STANDARD VECTOR PROGRAM WILL RESPOND AS IF STARTED AT 210.

STARTING THE PROGRAM AT 204, 210, OR 214 ALLOWS THE OPERATOR TO SELECT THE DRIVE(S) TO BE TESTED.

THE PROGRAM WILL TYPE "DRIVE(S)?".

EITHER OR BOTH DRIVES CAN BE SELECTED BY TYPING "A" AND/OR "B" FOLLOWED BY A CARRIAGE RETURN.

~.3.1.1 DRIVE SELECTION EXAMPLES

```
DRIVE(S)? A,B
DRIVE(S)? AB
DRIVE(S)? B,A
DRIVE(S)? B
```

4.3.2 ADDRESS SELECTION

STARTING THE PROGRAM AT 210 OR 214 ALLOWS THE OPERATOR TO CHANGE THE "CONTROL AND STATUS" AND "DATA BUFFER" REGISTER ADDRESSES, THE VECTOR ADDRESS AND THE PRIORITY LEVEL.

THE PROGRAM WILL ASK FOR THE DRIVES TO BE TESTED AS PER 4.3.1. AFTER THE DRIVES HAVE BEEN SELECTED IT WILL ASK FOR:

1. BUS ADDRESS OF THE CONTROL AND STATUS REGISTER (TACS)
2. VECTOR ADDRESS
3. PRIORITY LEVEL

AND THE OPERATOR MUST RESPOND WITH THE DESIRED PARAMETER OR A CARRIAGE RETURN (WHICH IMPLIES LEAVE AS IS). WHEN ALL PARAMETERS HAVE BEEN DEFINED THE PROGRAM WILL TYPE THEM BACK OUT AND ASK IF THEY ARE OK AT WHICH TIME THE OPERATOR RESPONSES WITH A "Y" OR A "CARRIAGE RETURN" FOR "YES" ANYTHING ELSE IS A "NO".

4.3.2.1 ADDRESS SELECTION EXAMPLES

```
DRIVES(S) A
TACS? 177500
VECTOR? 260
PRIORITY? 6
TACS=177500 TADB=177502 VECTOR=000260 PRIORITY=000300
OK?

DRIVES(S) A,B
TACS? 470
VECTOR?
PRIORITY?
TACS=177470 TADB=177472 VECTOR=000260 PRIORITY=000300
OK?
```

5. OPERATING PROCEDURE

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

CONTROL:

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

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

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

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

   A) TYPE A NUMBER TO BE LOADED INTO LOC. 176 FOLLOWED BY A <CR>. (ONLY NUMBERS BETWEEN 0-7 WILL BE ACCEPTED AND ONLY 6 NUMBERS WILL BE ALLOWED)
   IF A <CR> IS THE FIRST KEY DEPRESSED THE SOFTWARE SWITCH REGISTER CONTENTS WILL NOT BE CHANGED.

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

WITH SW<15:08>=0 THE PROGRAM WILL PRINT OUT ON ERRORS AND CONTINUE IN TEST. BELL WILL RING AT COMPLETION OF A PASS.
THE SWITCH SETTINGS ARE:

SW<15>=1...HALT ON ERROR
SW<14>=1...LOOP ON TEST
SW<13>=1...INHIBIT ERROR TYPEOUTS
SW<11>=1...INHIBIT ITERATIONS
SW<10>=1...RING BELL ON ERROR
SW<10>=0...RING BELL ON PASS COMPLETE
SW<09>=1...LOOP ON ERROR
SW<08>=1...LOOP ON TEST AS PER SW<07:00>
SW<07>=1...LOCK ON CURRENT DRIVE (ONLY VALID FOR STARTING ADDRESSES 220 THRU 250..

5.2 SUBROUTINE ABSTRACTS

5.2.1 SCOPE

THIS SUBROUTINE CALL (VIA AN IOT INSTRUCTION) IS PLACED BETWEEN EACH TEST IN THE INSTRUCTION SECTION. IT RECORDS THE STARTING ADDRESS OF EACH TEST IN LOCATION "$LPADR" AND "$LPERR" AS IT IS BEING ENTERED.
;THIS ROUTINE SUPPORTS THE S/W SWITCH REG FUNCTIONS

5.2.2 TRAPCATCHER

A ".+2" - "HALT" SEQUENCE IS REPEATED FROM LOC. 0 TO LOC. 776 TO CATCH ANY UNEXPECTED TRAPS. THUS, ANY UNEXPECTED TRAPS WILL HALT AT THE DEVICE TRAP VECTOR +2.

5.2.3 ERROR

THIS SUBROUTINE CALL (VIA A EMT INSTRUCTION) IS USED TO REPORT ALL ERRORS. (REFER TO 6.)
;THIS ROUTINE SUPPORTS THE S/W SWITCH REG FUNCTIONS

5.2.4 TRAP

A NUMBER OF SUBROUTINES ARE CALLED BY THE TRAP INSTRUCTION. FOLLOWING IS THE CALLS USED AND THE LABEL OF THE STARTING ADDRESS OF THE SUBROUTINES.

5.2.4.1 TYPE ($TYPE)

ROUTINE TO TYPE AN ASCIZ STRING ON THE TTY

THE ROUTINE WILL INSERT A NUMBER OF NULL CHARACTERS AFTER A LINE FEED.

5.2.4.2 RDCHR ($RDCHR)

READ A SINGLE ASCII CHARACTER FROM THE TTY

5.2.4.3 RDLIN ($RDLIN)

READ AN ASCII STRING FROM THE TTY

5.2.4.4 WAITREADY (WAIT.ON.READY)

WAIT ON THE "TA11 READY" BIT TO SET

5.2.4.5 WAITXFER (WAIT.FOR.XFER.REQ)

WAIT ON THE "TA11 TRANSFER REQUEST" BIT TO SET

5.2.4.6 $TYPOC

CHANGE A BINARY NUMBER TO OCTAL ASCII AND TYPE IT.

5.2.5 THE FOLLOWING SUBROUTINES ARE CALLED BY [illegible]

5.2.5.1 $TYPEC

ROUTINE TO TYPE A SINGLE ASCII CHARACTER

5.2.5.2 TYPERR

THIS ROUTINE WILL TYPE THE ERROR MESSAGES

5.2.5.3 SELDRV

THIS ROUTINE IS USED TO ASK THE OPERATOR WHAT DRIVE(S) ARE TO BE TESTED

5.2.5.4 SELADR

THIS ROUTINE WILL ASK THE OPERATOR FOR THE ADDRESSES OF THE "CSR", "TADB" AND VECTOR AND THE PRIORITY TO USE.

5.2.6 THE FOLLOW ROUTINES ARE USED TO MAKE ADJUSTMENTS TO THE TU60. BEFORE USING ANY OF THEM LOAD AND START 214.

5.2.6.1 WFGSUB

WRITE FILE GAPS FROM "BOT" TO "EOT"
START AT 220
THIS ROUTINE CAN BE USED TO ADJUST THE "WRITE GAP MONO" AND THE "WRITE DELAY MONO".

5.2.6.2 WRTSUB

WRITE CONTINUOUS BLOCKS OF DATA
START AT 224
THE PROGRAM WILL HALT THREE(3) TIMES
AFTER EACH HALT SET THE SWR AND PRESS CONTINUE
HALT 1 --- SWR<7:0> = NUMBER OF BYTES PER BLOCK
HALT 2 ---SWR<7:0> = PATTERN DESIRED
HALT 3 --- SWR<15:0> = OPERATIONAL SWITCH SETTINGS
THIS ROUTINE CAN BE USED TO ADJUST THE "GAP TIME MONO"

** IF USING SOFTWARE SWITCH REGISTER, AFTER
EACH HALT OPERATOR WILL BE PROMPTED
FOR THE VALUE WITH "SWR=XXXXXX NEW="

5.2.6.3 RDSUB

READ CONTINUOUS BLOCKS OF DATA
START AT 230
THIS ROUTINE CAN BE USED TO ADJUST THE "SIGNAL MONO" AND THE "THRESHOLD POT"

5.2.6.4 WGPBLK

WRITE A FILE GAP AND A BLOCK OF DATA FROM BOT TO EOT
START AT 234
THE PROGRAM WILL HALT THREE (3) TIMES
AFTER EACH HALT SET THE SWR AND PRESS CONTINUE
HALT 1 --- SWR<7:0> = NUMBER OF BYTES PER BLOCK
HALT 2 --- SWR<7:0> = PATTERN DESIRED
HALT 3 --- SWR<15:0> = OPERATIONAL SWITCH SETTINGS
THIS ROUTINE CAN BE USED TO ADJUST THE "WRITE GAP MONO" AND THE "GAP TIME MONO".
** IF USING SOFTWARE SWITCH REGISTER, AFTER
EACH HALT OPERATOR WILL BE PROMPTED
FOR THE VALUE WITH "SWR=XXXXXX NEW="

5.2.6.5 RDBLK

READ A BLOCK OF DATA AND A FILE GAP
START AT 240
THIS ROUTINE IS USED AFTER "WRITE A BLOCK AND A FILE GAP" ROUTINE
IT CAN BE USED TO ADJUST THE "SIGNAL MON". THE "THRESHOLD POT"
AND THE "TAPE BLANK MONO".

5.2.6.6 SPFGSB

SPACE FORWARD FILE GAP FROM "BOT" TO "EOT"
START AT 244
THIS ROUTINE CAN BE USED AFTER "WRITE FILE GAP" FOR LOW SPEED
SPACE FOWARD (TAPE BLANK MONO CAN BE ADJUSTED). OR AFTER READ OR
WRITE A FILE GAP AND A BLOCK OF DATA FOR HIGH SPEED SPACE FORWARD
(SIGNAL MONO CAN BE CHECKED).

5.2.6.7 BSPGSB

BACK SPACE FILE GAP
START AT 250
THIS ROUTINE CAN BE USED TO ADJUST OR CHECK THE "SIGNAL MONO".

5.2.7 THE FOLLOWING SUBROUTINES ARE USED BY THE ADJUSTMENT ROUTINES

5.2.7.1 SETBUF

SETUP BLOCK SIZE AND PATTERN

5.2.7.2 WRTBLK

WRITES A BLOCK OF DATA

5.2.7.3 RDBLK

READS A BLOCK OF DATA

5.2.7.4 NXTDRV

CHANGE DRIVE

6. ERRORS

THERE ARE A NUMBER OF ERRORS THAT CAN OCCUR IN THIS PROGRAM. WHEN AN ERROR IS ENCOUNTERED THE CALL TO THE ERROR ROUTINE IS MADE AND IF SW<13> IS NOT SET AN ERROR MESSAGE PERTAINING TO THE ERROR WILL BE TYPED. EACH ERROR TYPE OUT WILL CONTAIN THE FOLLOWING:

1. AN ERROR MESSAGE
2. A DATA HEADER
3. A DATA STRING

REFER TO THE LISTING UNDER $ERRTB FOR THE DIFFERENT ERRORS THAT CAN OCCUR.

7. RESTRICTIONS

BEFORE STARTING THE PROGRAM THE OPERATOR MUST INSURE THAT A CASSETTE IS LOADED IN THE DRIVE(S) TO BE TESTED AND IS WRITE ENABLED.

8. MISCELLANEOUS

8.1 EXECUTION TIME

THE FIRST PASS TAKES APPROXIMATELY 100 SECONDS ALL SUBSEQUENT PASSES TAKE APPROXIMATELY 475 SECONDS.

8.2 STACK POINTER

STACK IS INITIALLY SET TO 1100.

8.3 PASS COUNT

A PROGRAM PASS THRU COUNT IS KEPT IN "$PASS".

8.4 ITERATIONS

THE FIRST PASS OF THE PROGRAM WILL AUTOMATICALLY INHIBIT ITERATIONS. ALL SUBSEQUENT PASSES WILL PERFORM FULL, (2000 DECIMAL UNLESS OTHERWISE SPECIFIED WITHIN A TEST), ITERATIONS.

8.5 SPECIAL REGISTERS

R3, R4 AND R5 ARE RESERVED FOR "DRIVE", "TACS" AND "TADB THROUGH OUT THE PROGRAM.

3. PROGRAM DESCRIPTION

THIS PROGRAM IS A SEQUENCE OF SMALL INDEPENDENT TESTS THAT CHECK THE TAII FOR PROPER OPERATION.

THE TESTS CAN BE GROUPED INTO THE FOLLOWING GENERAL GROUPS.

1. TEST THE TIMING ERROR CIRCUITPY
2. TEST THE INTERRUPT CIRCUITRY
3. TEST THE SPACING FUNCTIONS
4. TEST THE FILE GAP CIRCUITRY
5. TEST THAT DATA CAN BE WRITTEN AND READ
6. TEST CRC CIRCUITRY
7. INSURE THAT DATA CAN BE WRITTEN AND READ WHILE THE OTHER DRIVE IS REWINDING

TABLE OF CONTENTS

```
.TITLE  TA11 BASIC LOGIC TEST (PART 2)  MAINDEC-11-DZTAB-C
;*COPYRIGHT (C) 1976
;*DIGITAL EQUIPMENT CORP.
;*MAYNARD, MASS. 01754
;*
;*PROGRAM BY JAMES LACEY
;*
;*THIS PROGRAM WAS ASSEMBLED USING THE PDP-11 MAINDEC SYSMAC
;*PACKAGE (MAINDEC-11-DZQAC-C1),MAR 24, 1976.
;*
;;**********************************************************************
;;**********************************************************************
;;**********************************************************************
.REM!

        GENERAL INFORMATION ABOUT THE TA11/TU60 CASSETTE

ADDRESS MNEMONIC DESCRIPTION
----------------------------


777500  TACS    CONTROL AND STATUS REGISTER
777502  TADB    DATA BUFFER REGISTER
   260  TAVEC   INTERRUPT VECTOR


TACS REGISTER DESCRIPTION
-------------------------

                                        INIT
BIT     NAME                            STATE   READ AND/OR WRITE
---     ----                            -----   -----------------

15      ERROR                           ?       READ ONLY
14      BLOCK CHECK ERROR               0       READ ONLY
13      CLEAR LEADER                    ?       READ ONLY
12      WRITE LOCK                      ?       READ ONLY
11      FILE GAP                        0       READ ONLY
10      TIMING ERROR                    0       READ ONLY
09      OFF LINE                        ?       READ ONLY
08      UNIT SELECT                     0       READ/WRITE
07      TRANSFER REQUEST                0       READ ONLY
06      INTERRUPT ENABLE                0       READ/WRITE
05      READY                           1       READ ONLY
04      ILBS                            0       READ/WRITE
03      FUNCTION BIT 02                 0       READ/WRITE
02      FUNCTION BIT 01                 0       READ/WRITE
01      FUNCTION BIT 00                 0       READ/WRITE
        0=WRITE-FILE-GAP
        1=WRITE
        2=READ
        3=BACK SPACE FILE GAP
        4=BACK SPACE BLOCK GAP
        5=SPACE FORWARD FILE GAP
        6=SPACE FORWARD BLOCK GAP
        7=REWIND
00      GO BIT                          0       WRITE ONLY!
```

```
                        ;;*****************************************************
                        .SBTTL  OPERATIONAL SWITCH SETTINGS
                        ;*
                        ;*      SWITCH                  USE
                        ;*      ------          ------------------
                        ;*        15            HALT ON ERROR
                        ;*        14            LOOP ON TEST
                        ;*        13            INHIBIT ERROR TYPEOUTS
                        ;*        11            INHIBIT ITERATIONS
                        ;*        10            BELL ON ERROR
                        ;*         9            LOOP ON ERROR
                        ;*         8            LOOP ON TEST IN SWR<7:0>
                        ;*         7            LOCK ON CURRENT DRIVE (ONLY VALID WITH MANUAL LOOPING.
                        ;;*****************************************************
                        .SBTTL  BASIC DEFINITIONS

                        ;*INITIAL ADDRESS OF THE STACK POINTER *** 1100 ***
001100                  STACK=  1100
                        .EQUIV  EMT,ERROR       ;;BASIC DEFINITION OF ERROR CALL
                        .EQUIV  IOT,SCOPE       ;;BASIC DEFINITION OF SCOPE CALL

                        ;*MISCELLANEOUS DEFINITIONS
000011                  HT=     11              ;;CODE FOR HORIZONTAL TAB
000012                  LF=     12              ;;CODE FOR LINE FEED
000015                  CR=     15              ;;CODE FOR CARRIAGE RETURN
000200                  CRLF=   200             ;;CODE FOR CARRIAGE RETURN-LINE FEED
177776                  PS=     177776          ;;PROCESSOR STATUS WORD
                        .EQUIV  PS,PSW

177774                  STKLMT= 177774          ;;STACK LIMIT REGISTER
177772                  PIRQ=   177772          ;;PROGRAM INTERRUPT REQUEST REGISTER
177570                  DSWR=   177570          ;;HARDWARE SWITCH REGISTER
177570                  DDISP=  177570          ;;HARDWARE DISPLAY REGISTER


                        ;*GENERAL PURPOSE REGISTER DEFINITIONS
000000                  R0=     %0              ;;GENERAL REGISTER
000001                  R1=     %1              ;;GENERAL REGISTER
000002                  R2=     %2              ;;GENERAL REGISTER
000003                  R3=     %3              ;;GENERAL REGISTER
000004                  R4=     %4              ;;GENERAL REGISTER
000005                  R5=     %5              ;;GENERAL REGISTER
000006                  R6=     %6              ;;GENERAL REGISTER
000007                  R7=     %7              ;;GENERAL REGISTER
                        .EQUIV  R6,SP           ;;STACK POINTER
                        .EQUIV  R7,PC           ;;PROGRAM COUNTER


                        ;*PRIORITY LEVEL DEFINITIONS
000000                  PR0=    0               ;;PRIORITY LEVEL 0
000040                  PR1=    40              ;;PRIORITY LEVEL 1
000100                  PR2=    100             ;;PRIORITY LEVEL 2
000140                  PR3=    140             ;;PRIORITY LEVEL 3
000200                  PR4=    200             ;;PRIORITY LEVEL 4
000240                  PR5=    240             ;;PRIORITY LEVEL 5
000300                  PR6=    300             ;;PRIORITY LEVEL 6
000340                  PR7=    340             ;;PRIORITY LEVEL 7


                        ;*"SWITCH REGISTER" SWITCH DEFINITIONS
```

```
                        100000          SW15=   100000
                        040000          SW14=   40000
                        020000          SW13=   20000
                        010000          SW12=   10000
                        004000          SW11=   4000
                        002000          SW10=   2000
                        001000          SW09=   1000
                        000400          SW08=   400
                        000200          SW07=   200
                        000100          SW06=   100
                        000040          SW05=   40
                        000020          SW04=   20
                        000010          SW03=   10
                        000004          SW02=   4
                        000002          SW01=   2
                        000001          SW00=   1
                                        .EQUIV  SW09,SW9
                                        .EQUIV  SW08,SW8
                                        .EQUIV  SW07,SW7
                                        .EQUIV  SW06,SW6
                                        .EQUIV  SW05,SW5
                                        .EQUIV  SW04,SW4
                                        .EQUIV  SW03,SW3
                                        .EQUIV  SW02,SW2
                                        .EQUIV  SW01,SW1
                                        .EQUIV  SW00,SW0

                                        ;*DATA BIT DEFINITIONS (BIT00 TO BIT15)
                        100000          BIT15=  100000
                        040000          BIT14=  40000
                        020000          BIT13=  20000
                        010000          BIT12=  10000
                        004000          BIT11=  4000
                        002000          BIT10=  2000
                        001000          BIT09=  1000
                        000400          BIT08=  400
                        000200          BIT07=  200
                        000100          BIT06=  100
                        000040          BIT05=  40
                        000020          BIT04=  20
                        000010          BIT03=  10
                        000004          BIT02=  4
                        000002          BIT01=  2
                        000001          BIT00=  1
                                        .EQUIV  BIT09,BIT9
                                        .EQUIV  BIT08,BIT8
                                        .EQUIV  BIT07,BIT7
                                        .EQUIV  BIT06,BIT6
                                        .EQUIV  BIT05,BIT5
                                        .EQUIV  BIT04,BIT4
                                        .EQUIV  BIT03,BIT3
                                        .EQUIV  BIT02,BIT2
                                        .EQUIV  BIT01,BIT1
                                        .EQUIV  BIT00,BIT0

                                        ;*BASIC "CPU" TRAP VECTOR ADDRESSES
```

```
                000004          ERRVEC= 4       ;;TIME OUT AND OTHER ERRORS
                000010          RESVEC= 10      ;;RESERVED AND ILLEGAL INSTRUCTIONS
                000014          TBITVEC=14      ;;"T" BIT
                000014          TRTVEC= 14      ;;TRACE TRAP
                000014          BPTVEC= 14      ;;BREAKPOINT TRAP (BPT)
                000020          IOTVEC= 20      ;;INPUT/OUTPUT TRAP (IOT) **SCOPE**
                000024          PWRVEC= 24      ;;POWER FAIL
                000030          EMTVEC= 30      ;;EMULATOR TRAP (EMT) **ERROR**
                000034          TRAPVEC=34      ;;"TRAP" TRAP
                000060          TKVEC=  60      ;;TTY KEYBOARD VECTOR
                000064          TPVEC=  64      ;;TTY PRINTER VECTOR
                000240          PIRQVEC=240     ;;PROGRAM INTERRUPT REQUEST VECTOR
```

```
                        ;TA11 FUNCTIONS
000000                  WFG=    0               ;WRITE FILE GAP FUNCTION
000002                  WRITE=  2               ;WRITE FUNCTION
000004                  READ=   4               ;READ FUNCTION
000006                  BSFG=   6               ;BACK SPACE FILE GAP FUNCTION
000010                  BSBG=   10              ;BACK SPACE BLOCK GAP FUNCTION
000012                  SFFG=   12              ;SPACE FWD FILE GAP FUNCTION
000014                  SFBG=   14              ;SPACE FWD BLOCK GAP FUNCTION
000016                  REWIND= 16              ;REWIND FUNCTION
                        ;;**************************************************************

                        ;TA11 BIT ASSIGNMENT
100000                  ERROR=  BIT15
040000                  CRCERR= BIT14
020000                  LEADER= BIT13
010000                  WRTLOCK=BIT12
004000                  FGAP=   BIT11
002000                  TIMERR= BIT10
001000                  OFFLINE=BIT09
000400                  UNIT=   BIT08
000200                  TR.REQ= BIT07
000100                  INT.EN= BIT06
000040                  READY=  BIT05
000020                  ILBS=   BIT04
000010                  FUNC2=  BIT03
000004                  FUNC1=  BIT02
000002                  FUNC0=  BIT01
000001                  GO=     BIT00
000016                  FUNCTION=       FUNC2+FUNC1+FUNC0
                        ;//////////////////////////////////////////////////////////////
                        ;//////////////////////////////////////////////////////////////
                        ;//////////////////////////////////////////////////////////////

                        ;SPECIAL REGISTERS
000003                  DRIVE=  %3                      ;R3 CONTAINS THE DRIVE UNDER TEST
000004                  TACS=   %4                      ;R4 IS USED AS A POINTER TO THE TACS REGISTER
000005                  TADB=   %5                      ;R5 IS USED AS A POINTER TO THE TADB REGISTER.

                        ;//////////////////////////////////////////////////////////////
                        ;//////////////////////////////////////////////////////////////
```

```
                                .SBTTL  TRAP CATCHER

                        000000          .=0
                                ;*ALL UNUSED LOCATIONS FROM 4 - 776 CONTAIN A ".+2,HALT"
                                ;*SEQUENCE TO CATCH ILLEGAL TRAPS AND INTERRUPTS
                                ;*LOCATION 0 CONTAINS 3 TO CATCH IMPROPERLY LOADED VECTORS
                        000174          .=174
000174  000000                  DISPREG: .WORD  0               ;;SOFTWARE DISPLAY REGISTER
000176  000000                  SWREG:   .WORD  0               ;;SOFTWARE SWITCH REGISTER
                                .SBTTL  STARTING ADDRESS(ES)
000200  000137  001336                  JMP     @#BEGIN1        ;;JUMP TO STARTING ADDRESS OF PROGRAM
000204  000137  001370                  JMP     @#BEGIN2                ;SELECT DRIVE(S) BEFORE STARTING TEST
000210  000137  001376                  JMP     @#BEGIN3                ;SELECT DRIVE(S) AND ADDRESSES BEFORE TESTING
000214  000137  001404                  JMP     @#BEGIN4                ;SETUP FOR MANUAL LOOPING
000220  000137  013776                  JMP     @#WFGSUB                ;WRITE FILE GAP FROM BOT TO EOT
000224  000137  014062                  JMP     @#WRTSUB                ;WRITE CONTINUOUS BLOCKS OF DATA
000230  000137  014150                  JMP     @#RDSUB                 ;READ CONTINUOUS BLOCKS OF DATA
000234  000137  014230                  JMP     @#WGPBLK                ;WRITE FILE GAP AND A BLOCK OF DATA
000240  000137  014332                  JMP     @#RGPBLK                ;READ BLOCK OF DATA AND INTO A FILE GAP
000244  000137  014426                  JMP     @#SFFGSB                ;SPACE FWD FILE GAP FROM BOT TO EOT
000250  000137  014512                  JMP     @#BSFGSB                ;BACK SPACE FILE GAPS
```

```
                        ;*************************************************************
                        ;*************************************************************

                        ;THE FOLLOWING ROUTINES CAN BE TOGGLED IN.

                        ;*************************************************************

                                .REM    !


                                THE FOLLOWING ROUTINES (LOOP1, LOOP2, & LOOP3) CAN BE TOGGLED
                                IN WHEN IT IS IMPOSSIBLE TO LOAD THE DIAGNOSTICS

                                NOTE:   BEFORE USING THESE ROUTINES INSURE THAT R3,R4,& R5
                                        ARE SETUP PROPERLY.

                                ** NOTE:        IF USING SOFTWARE SWITCH REGISTER
                                        LOCATION SWR (=1140) MUST CONTAIN
                                        ADDRESS "SWREG" (=176).
                                        *** PUT VALUE INTO 176 ***
                                        ** REGISTERS 3,4,&5 MUST BE SETUP**
                                        ** VIA MOVE INSTRUCTIONS **
                                R3=       0 IF USING DRIVE A
                                        400 IF USING DRIVE B

                                R4=     TA11 STATUS REG ADDRESS (TACS 177500)

                                R5=     TA11 DATA BUFFER ADDRESS (TADB 177502)

                                LOOP1 WILL LOAD THE SWITCH REGISTER INTO THE TACS.

                                LOOP2 WILL WRITE THE CONTENTS OF THE SWITCH REGISTER
                                ALL THE WAY TO END-OF-TAPE(EOT).

                                LOOP3 WILL READ TO EOT. DATA WILL GO TO R0.

                                NOTE:   LOOP2 AND LOOP3 WILL REWIND WHEN EOT IS REACHED AND
                                        THEN START OVER.
                        !

                        ;;*************************************************************

                                ;LOAD SWITCH REGISTER INTO THE TACS
                        ;;*************************************************************

                                .=500

 000500                 LOOP1:  MOV     @SWR,@TACS              ;LOAD TACS
 000500  017714  000434         BR      LOOP1                   ;LOOP
 000504  000775
```

```
                                ;;**************************************************
                                ;WRITE SWITCH REGISTER ON TAPE FROM BOT TO EOT
                                ;;**************************************************
                        000600          .=600
                        000600 000005   LOOP2:  RESET                   ;CLEAR ALL FLAGS
                        000602 010314           MOV     DRIVE,@TACS     ;SELECT DRIVE
                        000604 112714 000017    MOVB    #REWIND!GO,@TACS ;GO TO BOT
                        000610 032714 000040 1$:        BIT     #READY,@TACS    ;WAIT TILL READY COMES UP
                        000614 001775           BEQ     1$
                        000616 112714 000003    MOVB    #WRITE!GO,@TACS ;START A WRITE
                        000622 105714   2$:     TSTB    @TACS           ;CHECK FOR TRANSFER REQUEST
                        000624 100003           BPL     3$              ;BR IF NOT SET
                        000626 017715 000306    MOV     @SWR,@TADB      ;SEND DATA TO TA11
                        000632 000773           BR      2$              ;LOOP
                        000634 032714 000040 3$:        BIT     #READY,@TACS    ;DID READY SET?
                        000640 001357           BNE     LOOP2           ;START OVER IF YES
                        000642 000767           BR      2$              ;LOOP


                                ;;**************************************************
                                ;READ FROM BOT TO EOT
                                ;;**************************************************
                        000700          .=700
                        000700 000005   LOOP3:  RESET                   ;CLEAR ALL FLAGS
                        000702 010314           MOV     DRIVE,@TACS     ;SELECT DRIVE
                        000704 112714 000017    MOVB    #REWIND!GO,@TACS ;START A REWIND
                        000710 032714 000040 1$:        BIT     #READY,@TACS    ;WAIT ON REWIND TO FINISH
                        000714 001775           BEQ     1$
                        000716 112714 000005    MOVB    #READ!GO,@TACS  ;START A READ
                        000722 105714   2$:     TSTB    @TACS           ;CHECK TRANSFER REQ
                        000724 100002           BPL     3$              ;BR IF NOT SET
                        000726 011500           MOV     @TADB,R0        ;PICKUP THE DATA
                        000730 000774           BR      2$              ;LOOP
                        000732 032714 000040 3$:        BIT     #READY,@TACS    ;CHECK READY
                        000736 001360           BNE     LOOP3           ;START OVER
                        000740 000770           BR      2$              ;LOOP
```

```
                                .SBTTL  COMMON TAGS

                                ;;*****************************************************************
                                ;*THIS TABLE CONTAINS VARICUS COMMON STORAGE LOCATIONS
                                ;*USED IN THE PROGRAM.

                    001100                  .=1100
001100                          $CMTAG:                 ;;START OF COMMON TAGS
001100  000000                  $PASS:  .WORD   0        ;;CONTAINS PASS COUNT
001102     000                  $TSTNM: .BYTE   0        ;;CONTAINS THE TEST NUMBER
001103     000                  $ERFLG: .BYTE   0        ;;CONTAINS ERROR FLAG
001104  000000                  $ICNT:  .WORD   0        ;;CONTAINS SUBTEST ITERATION COUNT
001106  000000                  $LPADR: .WORD   0        ;;CONTAINS SCOPE LOOP ADDRESS
001110  000000                  $LPERR: .WORD   0        ;;CONTAINS SCOPE RETURN FOR ERRORS
001112  000000                  $ERTTL: .WORD   0        ;;CONTAINS TOTAL ERRORS DETECTED
001114     000                  $ITEMB: .BYTE   0        ;;CONTAINS ITEM CONTROL BYTE
001115     001                  $ERMAX: .BYTE   1        ;;CONTAINS MAX. ERRORS PER TEST
001116  000000                  $ERRPC: .WORD   0        ;;CONTAINS PC OF LAST ERROR INSTRUCTION
001120  000000                  $GDADR: .WORD   0        ;;CONTAINS ADDRESS OF 'GOOD' DATA
001122  000000                  $BDADR: .WORD   0        ;;CONTAINS ADDRESS OF 'BAD' DATA
001124  000000                  $GDDAT: .WORD   0        ;;CONTAINS 'GOOD' DATA
001126  000000                  $BDDAT: .WORD   0        ;;CONTAINS 'BAD' DATA
001130  000000                          .WORD   0        ;;RESERVED--NOT TO BE USED
001132  000000                          .WORD   0
001134     000                  $AUTOB: .BYTE   0        ;;AUTOMATIC MODE INDICATOR
001135     000                  $INTAG: .BYTE   0        ;;INTERRUPT MODE INDICATOR
001136  000000                          .WORD   0
001140  177570                  SWR:    .WORD   DSWR     ;;ADDRESS OF SWITCH REGISTER
001142  177570                  DISPLAY: .WORD  DDISP    ;;ADDRESS OF DISPLAY REGISTER
001144  177560                  $TKS:   177560           ;;TTY KBD STATUS
001146  177562                  $TKB:   177562           ;;TTY KBD BUFFER
001150  177564                  $TPS:   177564           ;;TTY PRINTER STATUS REG. ADDRESS
001152  177566                  $TPB:   177566           ;;TTY PRINTER BUFFER REG. ADDRESS
001154     000                  $NULL:  .BYTE   0        ;;CONTAINS NULL CHARACTER FOR FILLS
001155     002                  $FILLS: .BYTE   2        ;;CONTAINS # OF FILLER CHARACTERS REQUIRED
001156     012                  $FILLC: .BYTE   12       ;;INSERT FILL CHARS. AFTER A "LINE FEED"
001157     000                  $TPFLG: .BYTE   0        ;;"TERMINAL AVAILABLE" FLAG (BIT<07>=0=YES)
001160  000000                  $REGAD: .WORD   0        ;;CONTAINS THE ADDRESS FROM
                                                         ;;WHICH  ($REGO) WAS OBTAINED
001162  000000                  $REGO:  .WORD   0        ;;CONTAINS (($REGAD)+0)
001164  000000                  $REG1:  .WORD   0        ;;CONTAINS (($REGAD)+2)
001166  000000                  $TIMES: 0                ;;MAX. NUMBER OF ITERATIONS
001170  000000                  $ESCAPE:0                ;;ESCAPE ON ERROR ADDRESS
001172  177607  000377          $BELL:  .ASCIZ  <207><377><377>  ;;CODE FOR BELL
001176     077                  $QUES:  .ASCII  /?/      ;;QUESTION MARK
001177     015                  $CRLF:  .ASCII  <15>     ;;CARRIAGE RETURN
001200  000012                  $LF:    .ASCIZ  <12>     ;;LINE FEED
                                ;;*****************************************************************
001202  000000                  SAVPC:  .WORD   0                ;STOPAGE FOR THE PC
001204  000000                  SAVPS:  .WORD   0                ;STORAGE FOR THE PS

001206  177500                  TACSL:  177500                   ;LOW BYTE ADDRESS OF TACS
001210  177501                  TACSH:  177501                   ;HIGH BYTE ADDRESS OF TACS
001212  177502                  TADBL:  177502                   ;LOW BYTE ADDRESS OF TADB
001214  177503                  TADBH:  177503                   ;HIGH BYTE ADDRESS OF TADB
001216  000260  000262          TAVEC:  260,262                  ;TA11 VECTOR ADDRESS
```

```
   393  001222  000300                 TAPRIO: 3U0                    ;TA11 BR LEVEL &
   394  001224  000000  000000         DRVKEY: 0,0                    ;DRIVE SELECT KEY:
   395  001230  001224                 DRVPNT: DRVKEY
   396  001232  000000                 ASKKEY: 0
   397  001234  000000                 CURDRV: 0                      ;CURRENT DRIVE BEING TESTED
```

```
                                .SBTTL  ERROR POINTER TABLE

                                ;*THIS TABLE CONTAINS THE INFORMATION FOR EACH ERROR THAT CAN OCCUR.
                                ;*THE INFORMATION IS OBTAINED BY USING THE INDEX NUMBER FOUND IN
                                ;*LOCATION $ITEMB. THIS NUMBER INDICATES WHICH ITEM IN THE TABLE IS PERTINENT.
                                ;*NOTE1:        IF $ITEMB IS 0 THE ONLY PERTINENT DATA IS ($ERRPC).
                                ;*NOTE2:        EACH ITEM IN THE TABLE CONTAINS 4 POINTERS EXPLAINED AS FOLLOWS:

                                ;*      EM              ;;POINTS TO THE ERROR MESSAGE
                                ;*      DH              ;;POINTS TO THE DATA HEADER
                                ;*      DT              ;;POINTS TO THE DATA
                                ;*      DF              ;;POINTS TO THE DATA FORMAT


001236                          $ERRTB:

                                ;NOTE:  ALL NUMBERS ARE TYPED AS 6-DIGIT OCTAL NUMBERS

                                ;ITEM   1
001236  017066                          EM1     ;STATUS PROBLEM
001240  017256                          DH1     ;PC     TACS
001242  017420                          DT1     ;$ERRPC $REGO
001244  000000                          0

                                ;ITEM   2
001246  017105                          EM2     ;READY FAILED TO SET
001250  017273                          DH2     ;PC     TACS    WAIT ADDRESS
001252  017426                          DT2     ;$ERRPC $REGO   SAVPC
001254  000000                          0

                                ;ITEM   3
001256  017133                          EM3     ;TRANSFER REQUEST FAILED TO SET
001260  017273                          DH2     ;PC     TACS    WAIT ADDRESS
001262  017426                          DT2     ;$ERRPC $REGO   SAVPC
001264  000000                          0

                                ;ITEM   4
001266  017174                          EM4     ;THE WRONG FLAG SET
001270  017273                          DH2     ;PC     TACS    WAIT ADDRESS
001272  017426                          DT2     ;$ERRPC $REGO   SAVPC
001274  000000                          0

                                ;ITEM   5
001276  017217                          EM5     ;DATA PROBLEM
001300  017330                          DH5     ;PC     TACS    EXPECT  RCV'D
001302  017436                          DT5     ;$ERRPC $REGO   $GDDAT  $BDDAT
001304  000000                          0

                                ;ITEM   6
001306  017234                          EM6     ;INTERRUPT PROBLEM
001310  017366                          DH6     ;PC     TACS    BR LEVEL
001312  017450                          DT6     ;$ERRPC $REGO   $GDDAT
001314  000000                          0
```

```
                                ITEMS2:         ;ITEMS 201-202

001316                                  EM201   ;TA11 FAILED TO RESPOND
001320  017472                          CM201   ;PC     TACS
001322  017540                          DT201   ;$ERRPC TACS
001324  017460                          0       ;BOTH NUMBERS ARE TYPED AS OCTAL NUMBERS

001326  000000                          EM202   ;NO DRIVES AVAILABLE
001330  017521                          CM202   ;PC
001332  017561                          DT202   ;$ERRPC
001334  017466                          0       :
001336  000000
```

```
                                        ;*************************************************************
                                        ;
                                        ;BEGIN1 IS FOR NORMAL START
                                        ;BEGIN2 IS FOR DRIVE SELECTION
                                        ;BEGIN3 IS FOR DRIVE & ADDRESS SELECTION
                                        ;BEGIN4 IS FOR MANUAL OPERATION
                                        ;
                                        ;*************************************************************

001336  005035                BEGIN1: CLR     R5                      ;NORMAL START
001340  012737  041101  001224          MOV     #"AB,@#DRVKEY
001346  122737  000005  000041          CMPB    #5,@#41                 ;CASSETTE DDP?
001354  001015                        BNE     BGNCMN                  ;GO BEGIN COMMON CODE IF NO
001356  022737  000260  001216          CMP     #260,@#TAVEC            ;STANDARD VECTOR?
001364  001011                        BNE     BGNCMN                  ;GO BEGIN COMMON CODE IF NO
001366  000403                        BR      BEGIN3                  ;GET DRIVES AND ADDRESSES
001370  012705  000001        BEGIN2: MOV     #1,R5                   ;ASK FOR DRIVES FLAG
001374  000405                        BR      BGNCMN                  ;BEGIN COMMON CODE
001376  012705  000002        BEGIN3: MOV     #2,R5                   ;ASK FOR DRIVES AND ADDRESSES
001402  000402                        BR      BGNCMN
001404  012705  000003        BEGIN4: MOV     #3,R5
001410                          BGNCMN:
                                        .SBTTL  INITIALIZE THE COMMON TAGS
                                        ;;CLEAR THE COMMON TAGS ($CMTAG) AREA
001410  012706  001100                MOV     #$CMTAG,R6      ;;FIRST LOCATION TO BE CLEARED
001414  005026                        CLR     (R6)+           ;;CLEAR MEMORY LOCATION
001416  022706  001140                CMP     #SWR,R6 ;;DONE?
001422  001374                        BNE     .-6             ;;LOOP BACK IF NO
001424  012706  001100                MOV     #STACK,SP       ;;SETUP THE STACK POINTER
                                        ;;INITIALIZE A FEW VECTORS
001430  012737  012264  000020        MOV     #$SCOPE,@#IOTVEC ;;IOT VECTOR FOR SCOPE ROUTINE
001436  012737  000340  000022        MOV     #340,@#IOTVEC+2 ;;LEVEL 7
001444  012737  012536  000030        MOV     #$ERROR,@#EMTVEC ;;EMT VECTOR FOR ERROR ROUTINE
001452  012737  000340  000032        MOV     #340,@#EMTVEC+2 ;;LEVEL 7
001460  012737  016476  000034        MOV     #$TRAP,@#TRAPVEC ;;TRAP VECTOR FOR TRAP CALLS
001466  012737  000340  000036        MOV     #340,@#TRAPVEC+2;LEVEL 7
001474  012737  016562  000024        MOV     #$PWRDN,@#PWRVEC ;;POWER FAILURE VECTOR
001502  012737  000340  000026        MOV     #340,@#PWRVEC+2 ;;LEVEL 7
001510  016767  010476  010466        MOV     $ENDCT,$EOPCT   ;;SETUP END-OF-PROGRAM COUNTER
001516  005067  177444                CLR     $TIMES          ;;INITIALIZE NUMBER OF ITERATIONS
001522  005067  177442                CLR     $ESCAPE         ;;CLEAR THE ESCAPE ON ERROR ADDRESS
001526  112767  000001  177361        MOVB    #1,$ERMAX       ;;ALLOW ONE ERROR PER TEST
001534  012767  001534  177345        MOV     #.,$LPADR       ;;INITIALIZE THE LOOP ADDRESS FOR SCOPE
001542  012767  001542  177340        MOV     #.,$LPERR       ;;SETUP THE ERROR LOOP ADDRESS
                                        ;;SIZE FOR A HARDWARE SWITCH REGISTER. IF NOT FOUND OR IT IS
                                        ;;EQUAL TO A "-1", SETUP FOR A SOFTWARE SWITCH REGISTER.
001550  013746  000004                MOV     @#ERRVEC,-(SP)  ;;SAVE ERROR VECTOR
001554  012737  001610  000004        MOV     #64$,@#ERRVEC   ;;SET UP ERROR VECTOR
001562  012767  177570  177350        MOV     #DSWR,SWR       ;;SETUP FOR A HARDWARE SWICH REGISTER
001570  012767  177570  177344        MOV     #DDISP,DISPLAY  ;;AND A HARDWARE DISPLAY REGISTER
001576  022777  177777  177334        CMP     #-1,@SWR        ;;TRY TO REFERENCE HARDWARE SWR
001604  001012                        BNE     66$             ;;BRANCH IF NO TIMEOUT TRAP OCCURRED
                                                                ;;AND  THE HARDWARE SWR IS NOT = -1
001606  000403                        BR      65$             ;;BRANCH IF NO TIMEOUT
```

```
001610  012716  001616          64$:    MOV     #65$,(SP)       ;;SET UP FOR TRAP RETURN
001614  000002                          RTI
001616  012767  000176  177314  65$:    MOV     #SWREG,SWR      ;;POINT TO SOFTWARE SWP
001624  012767  000174  177310          MOV     #DISPREG,DISPLAY
001632  012637  000004          66$:    MOV     (SP)+,@#ERRVEC  ;;RESTORE ERROR VECTOR

                                .SBTTL  TYPE PROGRAM NAME
                                ;;TYPE THE NAME OF THE PROGRAM IF FIRST PASS
001636  005227  177777                  INC     #-1             ;;FIRST TIME?
001642  001036                          BNE     HERE            ;;BRANCH IF NO
001644  022737  012232  000042          CMP     #$ENDAD,@#42    ;;ACT-11?
001652  001432                          BEQ     HERE            ;;BRANCH IF YES
001654  104401  001712                  TYPE    ,MSGID          ;;TYPE ASCIZ STRING
                                .SBTTL  GET VALUE FOR SOFTWARE SWITCH REGISTER
001660  005737  000042                  TST     @#42            ;;ARE WE RUNNING UNDER XYDP/ACT?
001664  001006                          BNE     67$             ;;BRANCH IF YES
001666  026727  177246  000176          CMP     SWR,#SWREG      ;;SOFTWARE SWITCH REG SELECTED?
001674  001005                          BNE     68$             ;;BRANCH IF NO
001676  104405                          GTSWR                   ;;GET SOFT-SWR SETTINGS
001700  000405                          BR      68$
001702  112767  000001  177224  67$:    MOVB    #1,$AUTOB       ;;SET AUTO-MODE INDICATOR
001710                          68$:
001710  000413                          BR      HERE            ;;GET OVER THE ASCIZ
                                ;;MSGID:        .ASCIZ  <CRLF>/MAINDEC-11-DZTAB-C/<CRLF>
001740                          HERE:
                                ;;**************************************************************
                                ;;**************************************************************

                                ;THE CONTENTS OF R5 DETERMINES WHAT WILL BE DONE
                                ;
                                ;       R5=3    MANUAL OPERATIONS
                                ;       R5=2    ASK FOR DRIVE(S) AND ADDRESSES (TACS AND VECTOR)
                                ;       R5=1    ASK FOR DRIVE(S)
                                ;       R5=0    DON'T ASK FOR ANYTHING
                                ;
                                ;**************************************************************
001740  010504          BEGINX: MOV     R5,R4                   ;COPY R5
001742  005305                  DEC     R5                      ;ASK FOR DRIVES?
001744  002406                  BLT     CHKADR                  ;BR IF NO
001746  004737  013254          JSR     PC,@#ASKDRV             ;GO GET DRIVES TO BE TESTED
001752  005305                  DEC     R5                      ;ASK FOR ADDRESSES?
001754  002402                  BLT     CHKADR                  ;BR IF NO
001756  004737  013364          JSR     PC,@#ASKADR             ;GO GET TA11 ADDRESSES
                                ;;**************************************************************
                                ;;**************************************************************

                                ;CHECK THAT "TACS" WILL RESPOND TO ADDRESSING
                                ;
                                ;I.     TIMEOUT OCCURRED
                                ;       A. TYPE ERROR MESSAGE
                                ;       B. EXAMINE R4
                                ;               1. R4>0 GOTO BEGINX
                                ;               2. R4=0 EXAMINE (42)
                                ;                       A. (42)=0 GOTO BEGINX
                                ;                       B. (42)>0 GOTO $ENDAD
                                ;
```

```
                                    ;II.     TIMEOUT DIDN'T OCCUR
                                    ;        A. CONTINUE
                                    ;
                                    ;;*************************************************************
001762  012737  002000  000004  CHKADR: MOV     #1$,@#ERRVEC            ;IN CASE OF TIMEOUTS
001770  005000                          CLR     R0                      ;USE AS A SWITCH
001772  005777  177210                  TST     @TACSL                  ;SEE IF TA11 RESPONDS
001776  000402                          BR      2$                      ;BR IF NO TIMEOUT
002000  005200                  1$:     INC     R0                      ;COME HERE ON TIMEOUT
002002  022626                          CMP     (SP)+,(SP)+             ;CLEANUP THE STACK
002004  012737  000006  000004  2$:     MOV     #ERRVEC+2,@#ERRVEC      ;RESTORE TIMEOUT VECTOR
002012  005700                          TST     R0                      ;DID A TIMEOUT OCCUR?
002014  001414                          BEQ     3$                      ;BR IF NO
002016  104201                          ERROR   201                     ;TA11 FAILED TO RESPOND
002020  012705  000002                  MOV     #2,R5                   ;DRIVES & ADDRESSES
002024  005704                          TST     R4                      ;OPERATOR INPUTS?
002026  001344                          BNE     BEGINX                  ;BR IF YES
002030  013700  000042                  MOV     @#42,R0                 ;GET MONITOR RETURN ADDRESS
002034  001741                          BEG     BEGINX                  ;BR IF NO MONITOR
002036  000137  012232                  JMP     @#$ENDAD                ;GO TO END
002042  005077  177152                  CLR     @TAVEC+2
002046                          3$:
```

```
                        ;;*****************************************************************
                        ;;*****************************************************************
                        ;
                        ;MAKE SURE THE DRIVES IN THE DRIVE TABLE CAN BE TESTED
                        ;
                        ;I.     DESIRED DRIVES CAN NOT BE TESTED
                        ;       A. TYPE ERROR MESSAGE
                        ;       B. EXAMINE R4
                        ;               1. R4<0 GOTO BEGINX
                        ;               2. R4=0 EXAMINE (42)
                        ;                       A. (42)=0 GOTO BEGINX
                        ;                       B. (42)>0 GOTO $ENDAD
                        ;
                        ;II.    BOTH DRIVES IN THE TABLE BUT ONLY ONE OF THEM CAN BE TESTED
                        ;       A. CLEAR BAD DRIVE FROM THE DRIVE TABLE
                        ;       B. CONTINUE IN PROGRAM
                        ;
                        ;III.   DESIRED DRIVE(S) CAN BE TESTED
                        ;       A. CONTINUE IN PROGRAM
                        ;
                        ;*****************************************************************
002046  012700  001224  CHKDRV: MOV     #DRVKEY,R0              ;PICKUP ADDRESS OF ASCII DRIVE KEY
002052  004737  015046          JSR     PC,@#EXAM               ;GO EXAMINE FIRST DRIVE
002056  000410                  BR      1$                      ;OK TO TEST---GO CHECK NEXT
002060  116010  000001          MOVB    1(R0),(R0)              ;REPLACE 1ST WITH 2ND
002064  001412                  BEQ     2$                      ;BR IF NO 2ND DRIVE SELECTED
002066  004737  015046          JSR     PC,@#EXAM               ;GO EXAMINE DRIVE
002072  000407                  BR      2$                      ;OK TO TEST
002074  005010                  CLR     (R0)                    ;CLEAR DRIVE CODES
002076  000405                  BR      2$
002100  005200          1$:     INC     R0                      ;POINT TO 2ND
002102  004737  015046          JSR     PC,@#EXAM               ;GO EXAMINE DRIVE
002106  000401                  BR      2$                      ;OK TO TEST
002110  105010                  CLRB    (R0)                    ;CLEAR 2ND
002112  012700  001224  2$:     MOV     #DRVKEY,R0              ;RESET ADDRESS POINTERS
002116  010037  001230          MOV     R0,@#DRVPNT
002122  121060  000001          CMPB    (R0),1(R0)              ;1ST = 2ND?
002126  001002                  BNE     3$                      ;BR IF NO
002130  105060  000001          CLRB    1(R0)                   ;YES---CLEAR 2ND
002134  005710          3$:     TST     (R0)                    ;ANY DRIVES?
002136  001401                  BEQ     5$                      ;BR IF NO
002140  000412                  BR      MANUAL
002142  104202          5$:     ERROR   202                     ;NO DRIVES AVAILABLE
002144  012705  000002          MOV     #2,R5                   ;DRIVES 3 ADDRESS
002150  005704                  TST     R4                      ;OPERATOR INPUTS?
002152  001272                  BNE     BEGINX                  ;BR IF YES
002154  013700  000042          MOV     @#42,R0                 ;GET MONITOR RETURN ADDRESS
002160  001667                  BEQ     BEGINX                  ;NO MONITOR
002162  000137  012232          JMP     @#$ENDAD                ;GO TO END
002166  020427  000003  MANUAL: CMP R4,#3
002172  001002                  BNE     OK
002174  016704  175577          MOV     -1,R4
002200  010437  001232  Ok:     MOV     R4,@#ASKKEY
002204  000405                  BR      START
002206  104401  001712  PWRST:  TYPE    ,MSGID                  ;POWER FAIL RESTART
002212  012737  001224  001230  MOV     #DRVKEY,@#DRVPNT
```

```
                002220  013777  001220  176770  START:  MOV     @#TAVEC+2,@TAVEC        ;SETUP TA11 TRAP VECTOR
                002226  005077  176766          CLR     @TAVEC+2
                002232  012737  000340  177776          MOV     #340,@#PS               ;LOCKOUT ALL I/O INT
                002240  013704  001206          MOV     @#TACSL,TACS            ;SETUP TACS
                002244  013705  001212          MOV     @#TADBL,TADB            ;SETUP TADB
                002250  005737  001100          TST     @#$PASS                 ;IF FIRST PASS SETUP FOR EXTRA LONG WAIT LOOPS
                002254  001003                  BNE     1$                      ;OTHERWISE USE OLD VALUES
                002256  012737  077777  013150          MOV     #^CBIT15,@#MAXCNT
                002264  005037  001102  1$:     CLR     @#STSTNM                ;ZERO THE TEST NUMBER
                002270  005003                  CLR     DRIVE                   ;SET DRIVE TO "A"
                002272  013701  001230          MOV     @#DRVPNT,R1             ;GET DRIVE POINTER
                002276  121127  000101          CMPB    (R1),#'A                ;IS IT DRIVE "A"?
                002302  001402                  BEQ     TDRV                    ;BR IF YES
                002304  012703  000400          MOV     #UNIT,DRIVE             ;SET DRIVE TO "B"
                002310          TDRV:
                002310  104401  002316          TYPE    ,65$                ;;TYPE ASCIZ STRING
                002314  000411                  BR      64$                 ;;GET OVER THE ASCIZ
                                ;;65$:  .ASCIZ  <15><12>*TESTING DRIVE *
                002340          64$:
                002340  112167  176670          MOVB    (R1)+,CURDRV            ;SETUP TO TYPE CURRENT DRIVE
                002344  104401  001234          TYPE    ,CURDRV
                002350  104401  001177          TYPE    ,$CRLF                  ;TYPE A  CR & LF
                002354  105711                  TSTB    (R1)                    ;LAST DRIVE BEEN SELECTED
                002356  001002                  BNE     1$                      ;BR IF NO
                002360  012701  001224          MOV     #DRVKEY,R1              ;RESET DRIVE POINTER
                002364  010137  001230  1$:     MOV     R1,@#DRVPNT             ;SAVE DRIVE POINTER FOR NEXT TIME
                002370  005737  001232          TST     @#ASKKEY                ;GO START TESTING IF NO MANUAL
                002374  002007                  BGE     2$                      ;       OPERATIONS REQUESTED
                002376  005000                  CLR     R0
                002400  000000                  HALT                            ;GIVE CONTROL TO THE OPERATOR
                002402  022767  000176  176530          CMP     #SWREG,SWR              ;USING S/W SWITCH REG.?
                002410  001001                  BNE     20$                     ;NO- GET OUT
                002412  104405                  GTSWR                           ;LET HIM CHANGE IT
                002414          20$:                                            ;CONTINUE
                                ;THIS CODE IS FOR ACT11 & DDP
                002414  005737  000042  2$:     TST     @#42                    ;IS THERE A MONITOR?
                002420  001406                  BEQ     TST1                    ;GO START TESTING IF NO
                002422  010314                  MOV     DRIVE,@TACS             ;IF YES SELECT DRIVE
                002424  112714  000017          MOVB    #REWIND!GO,@TACS        ;SEND TAPE TO BOT
                002430  032714  000040  3$:     BIT     #READY,@TACS            ;WAIT ON READY
                002434  001775                  BEQ     3$                      ;FALL THRU IF READY=1
```

```
                                ;////////////////////////////////////////////////////////////////
                                ;////////////////////////////////////////////////////////////////
                                ;;*****************************************************************
                                ;THIS ISN'T A REAL TEST BUT A SMALL ROUTINE TO DETERMINE THE MAX.
                                ;TIME FOR THE WAIT LOOPS (WAIT FOR "READY" AND "TRANSFER REQUEST")
                                ;;*****************************************************************
                                ;*TEST 1         ROUTINE TO DETERMINE TIME OF WAIT LOOPS
                                ;;*****************************************************************
002436  000004                  TST1:   SCOPE
002440  012767  000001  176520          MOV     #1,$TIMES       ;;DO 1 ITERATION
002446  005737  001100                  TST     @#$PASS                 ;IS THIS THE FIRST PASS
002452  001021                          BNE     TST2            ;;BR IF NO
002454  000005                          RESET
002456  010314                          MOV     DRIVE,@TACS             ;SELECT THE DRIVE
002460  112714  000017                  MOVB    #REWIND!GO,@TACS        ;START A REWIND
002464  104412                          WAITREADY                       ;WAIT FOR READY
002466  112714  000001                  MOVB    #WFG!GO,@TACS           ;WRITE A FILE GAP
002472  104412                          WAITREADY                       ;WAIT ON READY
002474  163737  013124  013150          SUB     @#HGHTIM,@#MAXCNT       ;GET THE TIME IT TOOK
002502  005237  013150                  INC     @#MAXCNT                ;MAKE IT BIGGER
002506  006137  013150                  ROL     @#MAXCNT
002512  006137  013150                  ROL     @#MAXCNT
                                ;////////////////////////////////////////////////////////////////
                                ;////////////////////////////////////////////////////////////////
                                ;THE FOLLOWING TEST WILL CHECK TIMING ERRORS FOR BOTH "WRITE" AND "READ".
                                ;////////////////////////////////////////////////////////////////
                                ;;*****************************************************************
                                ;*TEST 2         TEST "TIMING ERROR" FOR "WRITE"
                                ;;*****************************************************************
002516  000004                  TST2:   SCOPE
002520  012767  000012  176440          MOV     #10.,$TIMES     ;;DO 10. ITERATIONS
002526  012767  002554  176352          MOV     #7$,$LPADR      ;;SET SCOPE LOOP ADDRESS
002534  012767  002656  176426          MOV     #TST3,$ESCAPE   ;;ESCAPE TO TEST 3 ON ERROR
002542  000005                          RESET
002544  010314                          MOV     DRIVE,@TACS             ;SELECT DRIVE
002546  112714  000017                  MOVB    #REWIND!GO,@TACS        ;GO TO "CLEAR LEADER"
002552  104412                          WAITREADY                       ;WAIT ON "READY"
002554  112714  000003          7$:     MOVB    #WRITE!GO,@TACS         ;WRITE FUNCTION
002560  104413                          WAITXFER                        ;WAIT ON "XFER REQ"
002562  105714                          TSTB    @TACS                   ;IS "XFER REQ" = 1
002564  100401                          BMI     1$                      ;BR IF YES
002566  104001                          ERROR   1                       ;NO "XFER REQ" OCCURRED
002570  005015                  1$:     CLR     @TADB                   ;KNOCK DOWN "XFER REQ"
002572  005000                          CLR     R0                      ;CLEAR COUNTER
002574  005001                          CLR     R1
002576  105714                  2$:     TSTB    @TACS                   ;WAIT FOR "XFER REQ"
002600  100405                          BMI     3$
002602  062700  000010                  ADD     #10,R0                  ;KEEP TRACK OF HOW LONG
002606  005501                          ADC     R1                      ;IT TAKES "XFER REQ" TO SET
002610  100372                          BPL     2$
002612  104001                          ERROR   1                       ;"XFER REQ" FAILED TO SET
002614  105714                  3$:     TSTB    @TACS                   ;SAMPLE "XFER REQ"
002616  100005                          BPL     4$                      ;IF "XFER REQ" = 0 SOMETHING IS WRONG
002620  162700  000001                  SUB     #1,R0                   ;DOWN COUNT THE COUNTER
002624  005601                          SBC     R1                      ;SO A "TIMING ERROR WILL
002626  100372                          BPL     3$                      ;OCCUR
```

```
                                        BR      5$                      ;"XFER REQ" SHOULDN'T HAVE CLEARED
                                4$:     ERROR   1
                                5$:     TSTB    @TADB                   ;CLEAR "XFER REQ"
                                        WAITREADY                       ;WAIT FOR "READY"
                                        TST     @TACS                   ;IS "ERROR" BIT SET?
                                        BMI     6$                      ;BR IF YES
                                        ERROR   1                       ;"ERROR" BIT NOT SET
                                6$:     BIT     #TIMERR,@TACS           ;IS "TIMING ERROR" = 1?
                                        BNE     TST3            ;;BR IF YES
                                        ERROR   1                       ;"TIMING ERROR" NOT SET
                                ;;**************************************************
                                ;*TEST 3         TEST "TIMING ERROR" FOR "READ"
                                ;;**************************************************
                                TST3:   SCOPE
                                        MOV     #10.,$TIMES     ;;DO 10. ITERATIONS
                                        MOV     #7$,$LPADR      ;;SET SCOPE LOOP ADDRESS
                                        MOV     #TST4,$ESCAPE   ;;ESCAPE TO TEST 4 ON ERROR
                                        RESET
                                        MOV     DRIVE,@TACS             ;SELECT DRIVE
                                        MOVB    #REWIND!GO,@TACS        ;GO TO "CLEAR LEADER"
                                        WAITREADY                       ;WAIT FOR "READY"
                                7$:     MOVB    #WRITE!GO,@TACS         ;WRITE
                                        MOV     #6,R0                   ;WRITE THIS MANY BYTES ON TAPE
                                        WAITXFER                        ;WAIT FOR "XFER REQ"
                                8$:     MOVB    #377,@TADB              ;WRITE ONE BYTE
                                        WAITXFER                        ;WAIT FOR "XFER REQ"
                                        DEC     R0                      ;LAST BYTE OUT?
                                        BGT     8$                      ;BR IF NO
                                        BIS     #ILBS,@TACS             ;WRITE "CRC"
                                        WAITREADY                       ;WAIT FOR "READY"
                                        MOVB    #REWIND!GO,@TACS        ;BACK OVER THE BLOCK
                                        WAITREADY                       ;WAIT FOR "READY"
                                        MOVB    #READ!GO,@TACS          ;START A "READ"
                                        WAITXFER                        ;WAIT FOR "XFER REQ"
                                        TSTB    @TACS                   ;IS "XFER REQ" SET
                                        BMI     1$                      ;BR IF YES
                                        ERROR   1                       ;"XFER REQ" DIDN'T SET
                                1$:     TSTB    @TADB                   ;KNOCK DOWN "XFER REQ"
                                        CLR     R0                      ;CLEAR COUNTERS
                                        CLR     R1
                                2$:     TSTB    @TACS                   ;FIND OUT HOW LONG IT
                                        BMI     3$                      ;TAKES FOR "XFER REQ"
                                        ADD     #10.,R0                 ;TO SET
                                        ADC     R1
                                        BPL     2$
                                        ERROR   1                       ;"XFER REQ" FAILED TO SET
                                3$:     TSTB    @TACS                   ;NOW WASTE MORE THAN THE ABOVE
                                        BPL     4$                      ;AMOUNT OF TIME SO THAT
                                        SUB     #1,R0                   ;A "TE" WILL OCCUR
                                        SBC     R1
                                        BPL     3$
                                        BR      5$
                                4$:     ERROR   1                       ;"XFER REQ" CLEARED SOME HOW
                                5$:     TSTB    @TADB                   ;KNOCK DOWN "XFER REQ"
                                        BIS     #ILBS,@TACS             ;STOP THE READ
                                        WAITREADY                       ;WAIT ON "READY"
```

```
.ABS.NEW        73          TEST "TIMING ERROR" FOR "READ"

003044  005714                      TST     @TACS                   ;IS "ERROR" SET?
003046  100401                      BMI     6$                      ;BR IF YES
003050  104001                      ERROR   1                       ;"ERROR" NOT = 1
003052  032714  002000      6$:     BIT     #TIMERR,@TACS           ;IS THERE A "TIMING ERROR"
003056  001001                      BNE     TST4            ;;GO TO NEXT TEST IF YES
003060  104001                      ERROR   1                       ;"TIMING ERROR" NOT SET
                            ;;*****************************************************************
                            ;;TEST 4         TEST "ERROR" OUTPUT OF STATUS ROM USING A "TIMING ERROR"
                            ;;*****************************************************************
003062  000004              TST4:   SCOPE
003064  012767  000012  176074      MOV     #10.,$TIMES     ;;DO 10. ITERATIONS
003072  012767  003126  176006      MOV     #1$,$LPADR      ;;SET SCOPE LOOP ADDRESS
003100  012767  003342  176062      MOV     #TST5,$ESCAPE   ;;ESCAPE TO TEST 5 ON ERROR
003106  000005                      RESET
003110  010314                      MOV     DRIVE,@TACS             ;SELECT DRIVE
003112  112714  000017              MOVB    #REWIND!GO,@TACS        ;GO TO BEGINNING OF TAPE
003116  104412                      WAITREADY                       ;WAIT ON "READY" TO SET
003120  112714  000001              MOVB    #WFG!GO,@TACS           ;GET ON THE OXIDE
003124  104412                      WAITREADY                       ;WAIT ON "READY" TO SET
003126  112714  000003      1$:     MOVB    #WRITE!GO,@TACS         ;START A WRITE
003132  104413                      WAITXFER                        ;WAIT FOR "TRANSFER REQ"
003134  112715  000377              MOVB    #377,@TADB              ;WRITE ONE BYTE
003140  005000                      CLR     R0                      ;CLEAR THE DOUBLE LENGTH COUNTER
003142  005001                      CLR     R1
003144  105714              2$:     TSTB    @TACS                   ;CHECK FOR "XFER REQ"
003146  100405                      BMI     3$                      ;BR IF SET
003150  062700  000012              ADD     #10.,R0                 ;COUNT UP UNTIL "XFER REQ"
003154  005501                      ADC     R1                      ;SETS OR OVERFLOW OCCURS
003156  100372                      BPL     2$
003160  104001                      ERROR   1                       ;"XFER REQ" FAILED TO SET
003162  105714              3$:     TSTB    @TACS                   ;CHECK "XFER REQ"
003164  100401                      BMI     4$                      ;BR IF SET
003166  104001                      ERROR   1                       ;"XFER REQ" SHOULDN'T HAVE CLEARED
003170  162700  000001      4$:     SUB     #1,R0                   ;COUNT DOWN TO CAUSE A "TE"
003174  005601                      SBC     R1
003176  100371                      BPL     3$
003200  105715                      TSTB    @TADB                   ;CLEAR "XFER REQ"
003202  104412                      WAITREADY                       ;WAIT FOR READY
003204  005714                      TST     @TACS                   ;MAKE SURE "ERROR" IS SET
003206  100401                      BMI     5$
003210  104001                      ERROR   1                       ;"ERROR" DIDN'T SET
003212  032714  002000      5$:     BIT     #TIMERR,@TACS           ;MAKE SURE "TE" IS SET
003216  001001                      BNE     6$
003220  104001                      ERROR   1                       ;"TE" FAILED TO SET
003222  112714  000000      6$:     MOVB    #WFG,@TACS              ;CHECK "ERROR" WITH "WFG"
003226  005714                      TST     @TACS                   ;SAMPLE THE "ERROR" BIT
003230  100001                      BPL     7$                      ;BR IF "ERROR" = 0
003232  104001                      ERROR   1                       ;"ERROR" NOT = 0
003234  112714  000002      7$:     MOVB    #WRITE,@TACS            ;CHECK "ERROR" WITH "WRITE"
003240  005714                      TST     @TACS                   ;SAMPLE THE "ERROR" BIT
003242  100401                      BMI     8$                      ;BR IF "ERROR" = 1
003244  104001                      ERROR   1                       ;"ERROR" NOT = 1
003246  112714  000004      8$:     MOVB    #READ,@TACS             ;CHECK "ERROR" WITH "READ"
003252  005714                      TST     @TACS                   ;SAMPLE THE "ERROR" BIT
003254  100401                      BMI     9$                      ;BR IF "ERROR" = 1
003256  104001                      ERROR   1                       ;"ERROR" NOT = 1
```

```
003260  112714  000005          9$:     MOVB    #BSFG,@TACS             ;CHECK "ERROR" WITH "BSFG"
003264  005714                          TST     @TACS                   ;SAMPLE THE "ERROR" BIT
003266  100001                          BPL     10$                     ;BR IF "ERROR" = 0
003270  104001                          ERROR   1                       ;"ERROR" NOT = 0
003272  112714  000013          10$:    MOVB    #BSBG,@TACS             ;CHECK "ERROR" WITH "BSBG"
003276  005714                          TST     @TACS                   ;SAMPLE THE "ERROR" BIT
003300  100001                          BPL     11$                     ;BR IF "ERROR" = 0
003302  104001                          ERROR   1                       ;"ERROR" NOT = 0
003304  112714  000012          11$:    MOVB    #SFFG,@TACS             ;CHECK "ERROR" WITH "SFFG"
003310  005714                          TST     @TACS                   ;SAMPLE THE "ERROR" BIT
003312  100001                          BPL     12$                     ;BR IF "ERROR" = 0
003314  104001                          ERROR   1                       ;"ERROR" NOT = 0
003316  112714  000014          12$:    MOVB    #SFBG,@TACS             ;CHECK "ERROR" WITH "SFBG"
003322  005714                          TST     @TACS                   ;SAMPLE THE "ERROR" BIT
003324  100001                          BPL     13$                     ;BR IF "ERROR" = 0
003326  104001                          ERROR   1                       ;"ERROR" NOT = 0
003330  112714  000016          13$:    MOVB    #REWIND,@TACS           ;CHECK "ERROR" WITH "REWIND"
003334  005714                          TST     @TACS                   ;SAMPLE THE "ERROR" BIT
003336  100001                          BPL     TST5            ;;BR IF "ERROR" = 0
003340  104001                          ERROR   1                       ;"ERROR" NOT = 0
                                ;////////////////////////////////////////////////////////////
                                ;////////////////////////////////////////////////////////////
                                ;THE FOLLOWING TESTS CHECK THE INTERRUPT CIRCUITRY FOR:
                                ;
                                ;1)     INTERRUPT OCCURS AT THE PROPER "BR" LEVEL
                                ;2)     "READY" WILL INTERRUPT
                                ;3)     "TRANSFER REQUEST" WILL INTERRUPT
                                ;4)     IMPROPER INTERRUPTS DO NOT OCCUR
                                ;5)     WITH AN ERROR PENDING AND "XFER REQ." SET THE FOLLOWING SEQUENCE OCCURS
                                ;       A)      "XFER REQ" CAUSES AN INTERRUPT
                                ;       B)      CLEARING "XFER REQ" ALLOWS "READY" TO SET
                                ;       C)      "READY" CAUSES AN INTERRUPT
                                ;
                                ;////////////////////////////////////////////////////////////

                                ;;**************************************************************
                                ;THIS TEST WILL SETUP THE TA11'S VECTOR ADDRESS AND AT ADDRESS 0
                                ;A JMP @(PC)+ IS STORED INCASE THE VECTOR IS READ AS 0.
                                ;IT WILL THEN SET THE PRIORITY LEVEL TO 0 AND WASTE ENOUGH TIME
                                ;FOR AN INTERRUPT TO OCCUR.
                                ;AFTER THE TIME IS UP IT WILL RESTORE THE PS TO LEVEL 7
                                ;AND CHECK IF AN INTERRUPT OCCURRED.
                                ;;**************************************************************
                                ;*TEST 5         TEST INTERRUPT WITH READY = "1" AT LEVEL 0
                                ;;**************************************************************
003342  000004                  TST5:   SCOPE
003344  012767  003362  175534          MOV     #1$,$LPADR      ;;SET SCOPE LOOP ADDRESS
003352  012767  003520  175610          MOV     #6$,$ESCAPE     ;;ESCAPE TO 6$ ON ERROR
003360  000005                          RESET
003362  010314                  1$:     MOV     DRIVE,@TACS
003364  012737  000340  177776          MOV     #340,@#PS               ;LOCK OUT ALL INTERRUPTS
003372  012700  000000                  MOV     #0,R0                   ;TEST AT PRIORITY LEVEL 0
003376  005001                          CLR     R1                      ;CLEAR INTERRUPT KEY
003400  012702  000001                  MOV     #1,R2                   ;SETUP TO WASTE A LITTLE TIME
003404  012777  003510  175604          MOV     #4$,@TAVEC              ;INTERRUPT RETURN
003412  012777  000340  175600          MOV     #340,@TAVEC+2           ;LOCK OUT THE WORLD IF INTERRUPT
```

```
                                MOV     #137,@#0                ;SETUP TO CATCH INTERRUPT IF
                                MOV     #5$,@#2                 ;   IT GOES TO LOCATION 0
                                MOVB    #INT.EN,@TACS           ;SET INTERRUPT ENABLE
                                MOV     #0*40,@#PS              ;SET TO PRIORITY LEVEL 0
                        2$:     ASL     R2                      ;KILL SOME TIME
                                BNE     2$
                                MOV     #340,@#PS               ;LOCK OUT THE WORLD
                                TST     R1                      ;DID AN INTERRUPT OCCUR?
                                BNE     3$                      ;BR IF YES
                                CMP     #0*40,@#TAPRIO          ;WAS AN INTERRUPT EXPECTED?
                                BGE     6$                      ;BR IF NO
                                ERROR   6                       ;INTERRUPT FAILED TO OCCUR AT PRIORITY LEVEL 0

                        3$:     CMP     #0*40,@#TAPRIO          ;INTERRUPT OCCURRED--SHOULD IT HAVE?
                                BLT     6$                      ;BR IF YES
                                ERROR   6                       ;INTERRUPT OCCURRED AT PRIORITY LEVEL 0

                        4$:     INC     R1                      ;SET INTERRUPT KEY
                                RTI                             ;RETURN AFTER INTERRUPT
                        5$:     CMP     (SP)+,(SP)+             ;POP THE STACK
                                ERROR   6                       ;INTERRUPT WENT TO LOCATION 0

                        6$:     CLR     @TACS                   ;CLEAR INTERRUPT ENABLE
                                MOV     @#TAVEC+2,@TAVEC        ;SET TRAP CATCHER
                                CLR     @TAVEC+2
                                CLR     @#0
                                CLR     @#2
                        ;;**************************************************************
                        ;THIS TEST WILL SETUP THE TA11'S VECTOR ADDRESS AND AT ADDRESS 0
                        ;A JMP @(PC)+ IS STORED INCASE THE VECTOR IS READ AS 0.
                        ;IT WILL THEN SET THE PRIORITY LEVEL TO 1 AND WASTE ENOUGH TIME
                        ;FOR AN INTERRUPT TO OCCUR.
                        ;AFTER THE TIME IS UP IT WILL RESTORE THE PS TO LEVEL 7
                        ;AND CHECK IF AN INTERRUPT OCCURRED.
                        ;;**************************************************************
                        ;*TEST 6         TEST INTERRUPT WITH READY = "1" AT LEVEL 1
                        ;;**************************************************************
                        ;ST6:   SCOPE
                                MOV     #1$,SLPADR      ;;SET SCOPE LOOP ADDRESS
                                MOV     #6$,$ESCAPE     ;;ESCAPE TO 6$ ON ERROR
                                RESET
                        1$:     MOV     DRIVE,@TACS
                                MOV     #340,@#PS               ;LOCK OUT ALL INTERRUPTS
                                MOV     #1,R0                   ;TEST AT PRIORITY LEVEL 1
                                CLR     R1                      ;CLEAR INTERRUPT KEY
                                MOV     #1,R2                   ;SETUP TO WASTE A LITTLE TIME
                                MOV     #4$,@TAVEC              ;INTERRUPT RETURN
                                MOV     #340,@TAVEC+2           ;LOCK OUT THE WORLD IF INTERRUPT
                                MOV     #137,@#0                ;SETUP TO CATCH INTERRUPT IF
                                MOV     #5$,@#2                 ;   IT GOES TO LOCATION 0
                                MOVB    #INT.EN,@TACS           ;SET INTERRUPT ENABLE
                                MOV     #1*40,@#PS              ;SET TO PRIORITY LEVEL 1
                        2$:     ASL     R2                      ;KILL SOME TIME
                                BNE     2$
                                MOV     #340,@#PS               ;LOCK OUT THE WORLD
                                TST     R1                      ;DID AN INTERRUPT OCCUR?
```

```
003664  001005                  BNE     3$                      ;BR IF YES
003666  022737  000340  001222  CMP     #1*40,@#TAPRIO          ;WAS AN INTERRUPT EXPECTED?
003674  002012                  BGE     6$                      ;BR IF NO
003676  104006                  ERROR   6                       ;INTERRUPT FAILED TO OCCUR AT PRIORITY LEVEL 1

003700  022737  000340  001222  3$:     CMP     #1*40,@#TAPRIO          ;INTERRUPT OCCURRED--SHOULD IT HAVE?
003706  002405                  BLT     6$                      ;BR IF YES
003710  104006                  ERROR   6                       ;INTERRUPT OCCURRED AT PRIORITY LEVEL 1

003712  005201                  4$:     INC     R1                      ;SET INTERRUPT KEY
003714  000002                  RTI                             ;RETURN AFTER INTERRUPT
003716  022626                  5$:     CMP     (SP)+,(SP)+             ;POP THE STACK
003720  104006                  ERROR   6                       ;INTERRUPT WENT TO LOCATION 0

003722  005014                  6$:     CLR     @TACS                   ;CLEAR INTERRUPT ENABLE
003724  013777  001220  175264          MOV     @#TAVEC+2,@TAVEC        ;SET TRAP CATCHER
003732  005077  175262                  CLR     @TAVEC+2
003736  005037  000000                  CLR     @#0
003742  005037  000002                  CLR     @#2

                                ;;*****************************************************************
                                ;THIS TEST WILL SETUP THE TA11'S VECTOR ADDRESS AND AT ADDRESS 0
                                ;A JMP @(PC)+ IS STORED INCASE THE VECTOR IS READ AS 0.
                                ;IT WILL THEN SET THE PRIORITY LEVEL TO 2 AND WASTE ENOUGH TIME
                                ;FOR AN INTERRUPT TO OCCUR.
                                ;AFTER THE TIME IS UP IT WILL RESTORE THE PS TO LEVEL 7
                                ;AND CHECK IF AN INTERRUPT OCCURRED.
                                ;;*****************************************************************
                                ;*TEST 7         TEST INTERRUPT WITH READY = "1" AT LEVEL 2
                                ;;*****************************************************************

003746  000004                  T$T7:   SCOPE
003750  012767  002766  175130          MOV     #1$,$LPADR      ;;SET SCOPE LOOP ADDRESS
003756  012767  004124  175204          MOV     #6$,$ESCAPE     ;;ESCAPE TO 6$ ON ERROR
003764  000005                  RESET
003766  010314                  1$:     MOV     DRIVE,@TACS
003770  012737  000340  177776          MOV     #340,@#PS               ;LOCK OUT ALL INTERRUPTS
003776  012700  000002                  MOV     #2,R0                   ;TEST AT PRIORITY LEVEL 2
004002  005001                  CLR     R1                      ;CLEAR INTERRUPT KEY
004004  012702  000001                  MOV     #1,R2                   ;SETUP TO WASTE A LITTLE TIME
004010  012777  004114  175200          MOV     #4$,@TAVEC              ;INTERRUPT RETURN
004016  012777  000340  175174          MOV     #340,@TAVEC+2           ;LOCK OUT THE WORLD IF INTERRUPT
004024  012737  000137  000000          MOV     #137,@#0                ;SETUP TO CATCH INTERRUPT IF
004032  012737  004120  000002          MOV     #5$,@#2                 ;   IT GOES TO LOCATION 0
004040  112714  000100                  MOVB    #INT.EN,@TACS           ;SET INTERRUPT ENABLE
004044  012737  000100  177776          MOV     #2*40,@#PS              ;SET TO PRIORITY LEVEL 2
004052  006302                  2$:     ASL     R2                      ;KILL SOME TIME
004054  001376                  BNE     2$
004056  012737  000340  177776          MOV     #340,@#PS               ;LOCK OUT THE WORLD
004064  005701                  TST     R1                      ;DID AN INTERRUPT OCCUR?
004066  001005                  BNE     3$                      ;BR IF YES
004070  022737  000100  001222          CMP     #2*40,@#TAPRIO          ;WAS AN INTERRUPT EXPECTED?
004076  002012                  BGE     6$                      ;BR IF NO
004100  104006                  ERROR   6                       ;INTERRUPT FAILED TO OCCUR AT PRIORITY LEVEL 2

004102  022737  000100  001222  3$:     CMP     #2*40,@#TAPRIO          ;INTERRUPT OCCURRED--SHOULD IT HAVE?
004110  002405                  BLT     6$                      ;BR IF YES
004112  104006                  ERROR   6                       ;INTERRUPT OCCURRED AT PRIORITY LEVEL 2
```

```
1032
1033  004114  005201                  4$:     INC     R1                      ;SET INTERRUPT KEY
1034  004116  000002                          RTI                             ;RETURN AFTER INTERRUPT
1035  004120  022626                  5$:     CMP     (SP)+,(SP)+             ;POP THE STACK
1036  004122  104006                          ERROR   6                       ;INTERRUPT WENT TO LOCATION 0
1037
1038  004124  005014                  6$:     CLR     @TACS                   ;CLEAR INTERRUPT ENABLE
1039  004126  013777  001220  175062          MOV     @#TAVEC+2,@TAVEC        ;SET TRAP CATCHER
1040  004134  005077  175060                  CLR     @TAVEC+2
1041  004140  005037  000000                  CLR     @#0
1042  004144  005037  000002                  CLR     @#2
1043                                  ;;**************************************************************
1044                                  ;THIS TEST WILL SETUP THE TA11'S VECTOR ADDRESS AND AT ADDRESS 0
1045                                  ;A JMP @(PC)+ IS STORED INCASE THE VECTOR IS READ AS 0.
1046                                  ;IT WILL THEN SET THE PRIORITY LEVEL TO 3 AND WASTE ENOUGH TIME
1047                                  ;FOR AN INTERRUPT TO OCCUR.
1048                                  ;AFTER THE TIME IS UP IT WILL RESTORE THE PS TO LEVEL 7
1049                                  ;AND CHECK IF AN INTERRUPT OCCURRED.
1050                                  ;;**************************************************************
1051                                  ;*TEST 10        TEST INTERRUPT WITH READY = "1" AT LEVEL 3
1052                                  ;;**************************************************************
1053  004150  000004                  TST10:  SCOPE
1054  004152  012767  004170  174726          MOV     #1$,$LPADR      ;;SET SCOPE LOOP ADDRESS
1055  004160  012767  004326  175002          MOV     #6$,$ESCAPE     ;;ESCAPE TO 6$ ON ERROR
1056  004166  000005                          RESET
1057  004170  010314                  1$:     MOV     DRIVE,@TACS
1058  004172  012737  000340  177776          MOV     #340,@#PS               ;LOCK OUT ALL INTERRUPTS
1059  004200  012700  000003                  MOV     #3,R0                   ;TEST AT PRIORITY LEVEL 3
1060  004204  005001                          CLR     R1                      ;CLEAR INTERRUPT KEY
1061  004206  012702  000001                  MOV     #1,R2                   ;SETUP TO WASTE A LITTLE TIME
1062  004212  012777  004316  174776          MOV     #4$,@TAVEC              ;INTERRUPT RETURN
1063  004220  012777  000340  174772          MOV     #340,@TAVEC+2           ;LOCK OUT THE WORLD IF INTERRUPT
1064  004226  012737  000137  000000          MOV     #137,@#0                ;SETUP TO CATCH INTERRUPT IF
1065  004234  012737  004322  000002          MOV     #5$,@#2                 ;   IT GOES TO LOCATION 0
1066  004242  112714  000100                  MOVB    #INT.EN,@TACS           ;SET INTERRUPT ENABLE
1067  004246  012737  000140  177776          MOV     #3*40,@#PS              ;SET TO PRIORITY LEVEL 3
1068  004254  006302                  2$:     ASL     R2                      ;KILL SOME TIME
1069  004256  001376                          BNE     2$
1070  004260  012737  000340  177776          MOV     #340,@#PS               ;LOCK OUT THE WORLD
1071  004266  005701                          TST     R1                      ;DID AN INTERRUPT OCCUR?
1072  004270  001005                          BNE     3$                      ;BR IF YES
1073  004272  022737  000140  001222          CMP     #3*40,@#TAPRIO          ;WAS AN INTERRUPT EXPECTED?
1074  004300  002012                          BGE     6$                      ;BR IF NO
1075  004302  104006                          ERROR   6                       ;INTERRUPT FAILED TO OCCUR AT PRIORITY LEVEL 3
1076
1077  004304  022737  000140  001222  3$:     CMP     #3*40,@#TAPRIO          ;INTERRUPT OCCURRED--SHOULD IT HAVE?
1078  004312  002405                          BLT     6$                      ;BR IF YES
1079  004314  104006                          ERROR   6                       ;INTERRUPT OCCURRED AT PRIORITY LEVEL 3
1080
1081  004316  005201                  4$:     INC     R1                      ;SET INTERRUPT KEY
1082  004320  000002                          RTI                             ;RETURN AFTER INTERRUPT
1083  004322  022626                  5$:     CMP     (SP)+,(SP)+             ;POP THE STACK
1084  004324  104006                          ERROR   6                       ;INTERRUPT WENT TO LOCATION 0
1085
1086  004326  005014                  6$:     CLR     @TACS                   ;CLEAR INTERRUPT ENABLE
1087  004330  013777  001220  174660          MOV     @#TAVEC+2,@TAVEC        ;SET TRAP CATCHER
```

```
 1088  004336  005077  174656                CLR     @TAVEC+2
 1089  004342  005037  000000                CLR     @#0
 1090  004346  005037  000002                CLR     @#2
 1091                                ;;*****************************************************************
 1092                                ;THIS TEST WILL SETUP THE TA11'S VECTOR ADDRESS AND AT ADDRESS 0
 1093                                ;A JMP @(PC)+ IS STORED INCASE THE VECTOR IS READ AS 0.
 1094                                ;IT WILL THEN SET THE PRIORITY LEVEL TO 4 AND WASTE ENOUGH TIME
 1095                                ;FOR AN INTERRUPT TO OCCUR.
 1096                                ;AFTER THE TIME IS UP IT WILL RESTORE THE PS TO LEVEL 7
 1097                                ;AND CHECK IF AN INTERRUPT OCCURRED.
 1098                                ;;*****************************************************************
 1099                                ;*TEST 11        TEST INTERRUPT WITH READY = "1" AT LEVEL 4
 1100                                ;;*****************************************************************
 1101  004352  000004                TST11:  SCOPE
 1102  004354  012767  004372  174524        MOV     #1$,$LPADR      ;;SET SCOPE LOOP ADDRESS
 1103  004362  012767  004530  174600        MOV     #6$,$ESCAPE     ;;ESCAPE TO 6$ ON ERROR
 1104  004370  000005                        RESET
 1105  004372  010314                1$:     MOV     DRIVE,@TACS
 1106  004374  012737  000340  177776        MOV     #340,@#PS               ;LOCK OUT ALL INTERRUPTS
 1107  004402  012700  000004                MOV     #4,R0                   ;TEST AT PRIORITY LEVEL 4
 1108  004406  005001                        CLR     R1                      ;CLEAR INTERRUPT KEY
 1109  004410  012702  000001                MOV     #1,R2                   ;SETUP TO WASTE A LITTLE TIME
 1110  004414  012777  004520  174574        MOV     #4$,@TAVEC              ;INTERRUPT RETURN
 1111  004422  012777  000340  174570        MOV     #340,@TAVEC+2           ;LOCK OUT THE WORLD IF INTERRUPT
 1112  004430  012737  000137  000000        MOV     #137,@#0                ;SETUP TO CATCH INTERRUPT IF
 1113  004436  012737  004524  000002        MOV     #5$,@#2                 ;   IT GOES TO LOCATION 0
 1114  004444  112714  000100                MOVB    #INT.EN,@TACS           ;SET INTERRUPT ENABLE
 1115  004450  012737  000200  177776        MOV     #4*40,@#PS              ;SET TO PRIORITY LEVEL 4
 1116  004456  006302                2$:     ASL     R2                      ;KILL SOME TIME
 1117  004460  001376                        BNE     2$
 1118  004462  012737  000340  177776        MOV     #340,@#PS               ;LOCK OUT THE WORLD
 1119  004470  005701                        TST     R1                      ;DID AN INTERRUPT OCCUR?
 1120  004472  001005                        BNE     3$                      ;BR IF YES
 1121  004474  022737  000200  001222        CMP     #4*40,@#TAPRIO          ;WAS AN INTERRUPT EXPECTED?
 1122  004502  002012                        BGE     6$                      ;BR IF NO
 1123  004504  104006                        ERROR   6                       ;INTERRUPT FAILED TO OCCUR AT PRIORITY LEVEL 4
 1124
 1125  004506  022737  000200  001222  3$:     CMP     #4*40,@#TAPRIO          ;INTERRUPT OCCURRED--SHOULD IT HAVE?
 1126  004514  002405                        BLT     6$                      ;BR IF YES
 1127  004516  104006                        ERROR   6                       ;INTERRUPT OCCURRED AT PRIORITY LEVEL 4
 1128
 1129  004520  005201                4$:     INC     R1                      ;SET INTERRUPT KEY
 1130  004522  000002                        RTI                             ;RETURN AFTER INTERRUPT
 1131  004524  022626                5$:     CMP     (SP)+,(SP)+             ;POP THE STACK
 1132  004526  104006                        ERROR   6                       ;INTERRUPT WENT TO LOCATION 0
 1133
 1134  004530  005014                6$:     CLR     @TACS                   ;CLEAR INTERRUPT ENABLE
 1135  004532  013777  001220  174456        MOV     @#TAVEC+2,@TAVEC        ;SET TRAP CATCHER
 1136  004540  005077  174454                CLR     @TAVEC+2
 1137  004544  005037  000000                CLR     @#0
 1138  004550  005037  000002                CLR     @#2
 1139                                ;;*****************************************************************
 1140                                ;THIS TEST WILL SETUP THE TA11'S VECTOR ADDRESS AND AT ADDRESS 0
 1141                                ;A JMP @(PC)+ IS STORED INCASE THE VECTOR IS READ AS 0.
 1142                                ;IT WILL THEN SET THE PRIORITY LEVEL TO 5 AND WASTE ENOUGH TIME
 1143                                ;FOR AN INTERRUPT TO OCCUR.
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                                        ;AFTER THE TIME IS UP IT WILL RESTORE THE PS TO LEVEL 7
                                        ;AND CHECK IF AN INTERRUPT OCCURRED.
                                ;;**************************************************************
                                ;*TEST 12       TEST INTERRUPT WITH READY = "1" AT LEVEL 5
                                ;;**************************************************************
004554  000004                  TST12:  SCOPE
004556  012767  004574  174322          MOV     #1$,$LPADR      ;;SET SCOPE LOOP ADDRESS
004564  012767  004732  174376          MOV     #6$,$ESCAPE     ;;ESCAPE TO 6$ ON ERROR
004572  000005                          RESET
004574  013314                  1$:     MOV     DRIVE,@TACS
004576  012737  000340  177776          MOV     #340,@#PS               ;LOCK OUT ALL INTERRUPTS
004604  012700  000005                  MOV     #5,R0                   ;TEST AT PRIORITY LEVEL 5
004610  005001                          CLR     R1                      ;CLEAR INTERRUPT KEY
004612  012702  000001                  MOV     #1,R2                   ;SETUP TO WASTE A LITTLE TIME
004616  012777  004722  174372          MOV     #4$,@TAVEC              ;INTERRUPT RETURN
004624  012777  000340  174366          MOV     #340,@TAVEC+2           ;LOCK OUT THE WORLD IF INTERRUPT
004632  012737  000137  000000          MOV     #137,@#0                ;SETUP TO CATCH INTERRUPT IF
004640  012737  004726  000002          MOV     #5$,@#2                 ;   IT GOES TO LOCATION 0
004646  112714  000100                  MOVB    #INT.EN,@TACS           ;SET INTERRUPT ENABLE
004652  012737  000240  177776          MOV     #5*40,@#PS              ;SET TO PRIORITY LEVEL 5
004660  006302                  2$:     ASL     R2                      ;KILL SOME TIME
004662  001376                          BNE     2$
004664  012737  000340  177776          MOV     #340,@#PS               ;LOCK OUT THE WORLD
004672  005701                          TST     R1                      ;DID AN INTERRUPT OCCUR?
004674  001005                          BNE     3$                      ;BR IF YES
004676  022737  000240  001222          CMP     #5*40,@#TAPRIO          ;WAS AN INTERRUPT EXPECTED?
004704  002012                          BGE     6$                      ;BR IF NO
004706  104006                          ERROP   6                       ;INTERRUPT FAILED TO OCCUR AT PRIORITY LEVEL 5

004710  022737  000240  001222  3$:     CMP     #5*40,@#TAPRIO          ;INTERRUPT OCCURRED--SHOULD IT HAVE?
004716  002405                          BLT     6$                      ;BR IF YES
004720  104006                          ERROR   6                       ;INTERRUPT OCCURRED AT PRIORITY LEVEL 5

004722  005201                  4$:     INC     R1                      ;SET INTERRUPT KEY
004724  000002                          RTI                             ;RETURN AFTER INTERRUPT
004726  022626                  5$:     CMP     (SP)+,(SP)+             ;POP THE STACK
004730  104006                          ERROR   6                       ;INTERRUPT WENT TO LOCATION 0

004732  005014                  6$:     CLR     @TACS                   ;CLEAR INTERRUPT ENABLE
004734  013777  001220  174254          MOV     @#TAVEC+2,@TAVEC        ;SET TRAP CATCHER
004742  005077  174232                  CLR     @TAVEC+2
004746  005037  000000                  CLR     @#0
004752  005037  000002                  CLR     @#2
                                ;;**************************************************************
                                        ;THIS TEST WILL SETUP THE TA11'S VECTOR ADDRESS AND AT ADDRESS 0
                                        ;A JMP @(PC)+ IS STORED INCASE THE VECTOR IS READ AS 0.
                                        ;IT WILL THEN SET THE PRIORITY LEVEL TO 6 AND WASTE ENOUGH TIME
                                        ;FOR AN INTERRUPT TO OCCUR.
                                        ;AFTER THE TIME IS UP IT WILL RESTORE THE PS TO LEVEL 7
                                        ;AND CHECK IF AN INTERRUPT OCCURRED.
                                ;;**************************************************************
                                ;*TEST 13       TEST INTERRUPT WITH READY = "1" AT LEVEL 6
                                ;;**************************************************************
004756  000004                  TST13:  SCOPE
004760  012767  004776  174120          MOV     #1$,$LPADR      ;;SET SCOPE LOOP ADDRESS
004766  012767  005134  174174          MOV     #6$,$ESCAPE     ;;ESCAPE TO 6$ ON ERROR
```

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12230  005774  000005                    RESET
12231  005776  010314          1$:       MOV     DRIVE,@TACS
12232  006000  012737  000340  177776    MOV     #340,@#PS               ;LOCK OUT ALL INTERRUPTS
12233  006006  012700  000006            MOV     #6,R0                   ;TEST AT PRIORITY LEVEL 6
12234  006012  005001                    CLR     R1                      ;CLEAR INTERRUPT KEY
12235  006014  012702  000001            MOV     #1,R2                   ;SETUP TO WASTE A LITTLE TIME
12236  006020  012777  005124  174170    MOV     #4$,@TAVEC              ;INTERRUPT RETURN
12237  006026  012777  000340  174164    MOV     #340,@TAVEC+2           ;LOCK OUT THE WORLD IF INTERRUPT
12238  006034  012737  000137  000000    MOV     #137,@#0                ;SETUP TO CATCH INTERRUPT IF
12239  006042  012737  005130  000002    MOV     #5$,@#2                 ;    IT GOES TO LOCATION 0
12240  006050  112714  000100            MOVB    #INT.EN,@TACS           ;SET INTERRUPT ENABLE
12241  006054  012737  000300  177776    MOV     #6*40,@#PS              ;SET TO PRIORITY LEVEL 6
12242  006062  006302          2$:       ASL     R2                      ;KILL SOME TIME
12243  006064  001376                    BNE     2$
12244  006066  012737  000340  177776    MOV     #340,@#PS               ;LOCK OUT THE WORLD
12245  006074  005701                    TST     R1                      ;DID AN INTERRUPT OCCUR?
12246  006076  001005                    BNE     3$                      ;BR IF YES
12247  006100  022737  000300  001222    CMP     #6*40,@#TAPRIC          ;WAS AN INTERRUPT EXPECTED?
12248  006106  002012                    BGE     6$                      ;BR IF NO
12249  006110  104006                    ERROR   6                       ;INTERRUPT FAILED TO OCCUR AT PRIORITY LEVEL 6
12250
12251  006112  022737  000300  001222  3$:       CMP     #6*40,@#TAPRIC          ;INTERRUPT OCCURRED--SHOULD IT HAVE?
12252  006120  002405                    BLT     6$                      ;BR IF YES
12253  006122  104006                    ERROR   6                       ;INTERRUPT OCCURRED AT PRIORITY LEVEL 6
12254
12255  006124  005201          4$:       INC     R1                      ;SET INTERRUPT KEY
12256  006126  000002                    RTI                             ;RETURN AFTER INTERRUPT
12257  006130  022626          5$:       CMP     (SP)+,(SP)+             ;POP THE STACK
12258  006132  104006                    ERROR   6                       ;INTERRUPT WENT TO LOCATION 0
12259
12260  006134  005014          6$:       CLR     @TACS                   ;CLEAR INTERRUPT ENABLE
12261  006136  013777  001220  174052    MOV     @#TAVEC+2,@TAVEC        ;SET TRAP CATCHER
12262  006144  005077  174050            CLR     @TAVEC+2
12263  006150  005037  000000            CLR     @#0
12264  006154  005037  000002            CLR     @#2
12265                                  ;;*****************************************************************
12266                                  ;THIS TEST WILL SETUP THE TA11'S VECTOR ADDRESS AND AT ADDRESS 0
12267                                  ;A JMP @(PC)+ IS STORED INCASE THE VECTOR IS READ AS 0.
12268                                  ;IT WILL THEN SET THE PRIORITY LEVEL TO 7 AND WASTE ENOUGH TIME
12269                                  ;FOR AN INTERRUPT TO OCCUR.
12270                                  ;AFTER THE TIME IS UP IT WILL RESTORE THE PS TO LEVEL 7
12271                                  ;AND CHECK IF AN INTERRUPT OCCURRED.
12272                                  ;;*****************************************************************
12273                                  ;*TEST 14        TEST INTERRUPT WITH READY = "1" AT LEVEL 7
12274                                  ;;*****************************************************************
12275  006160  000004          TST14:  SCOPE
12276  006162  012767  005200  173716          MOV     #1$,$LPADR      ;;SET SCOPE LOOP ADDRESS
12277  006170  012767  005336  173772          MOV     #6$,$ESCAPE     ;;ESCAPE TO 6$ ON ERROR
12278  006176  000005                  RESET
12279  006200  010314          1$:       MOV     DRIVE,@TACS
12280  006202  012737  000340  177776    MOV     #340,@#PS               ;LOCK OUT ALL INTERRUPTS
12281  006210  012700  000007            MOV     #7,R0                   ;TEST AT PRIORITY LEVEL 7
12282  006214  005001                    CLR     R1                      ;CLEAR INTERRUPT KEY
12283  006216  012702  000001            MOV     #1,R2                   ;SETUP TO WASTE A LITTLE TIME
12284  006222  012777  005326  173766    MOV     #4$,@TAVEC              ;INTERRUPT RETURN
12285  006230  012777  000340  173762    MOV     #340,@TAVEC+2           ;LOCK OUT THE WORLD IF INTERRUPT
```

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1256  005236  012737  000137  000000          MOV     #137,@#0                ;SETUP TO CATCH INTERRUPT IF
1257  005244  012737  005332  000002          MOV     #5$,@#2                 ;   IT GOES TO LOCATION 0
1258  005252  112714  000100                  MOVB    #INT.EN,@TACS           ;SET INTERRUPT ENABLE
1259  005256  012737  000340  177776          MOV     #7*40,@#PS              ;SET TO PRIORITY LEVEL 7
1260  005264  006302                  2$:     ASL     R2                      ;KILL SOME TIME
1261  005266  001376                          BNE     2$
1262  005270  012737  000340  177776          MOV     #340,@#PS               ;LOCK OUT THE WORLD
1263  005276  005701                          TST     R1                      ;DID AN INTERRUPT OCCUR?
1264  005300  001005                          BNE     3$                      ;BR IF YES
1265  005302  022737  000340  001222          CMP     #7*40,@#TAPRIO          ;WAS AN INTERRUPT EXPECTED?
1266  005310  002012                          BGE     6$                      ;BR IF NO
1267  005312  104006                          ERROR   6                       ;INTERRUPT FAILED TO OCCUR AT PRIORITY LEVEL 7
1268
1269  005314  022737  000340  001222  3$:     CMP     #7*40,@#TAPRIO          ;INTERRUPT OCCURRED--SHOULD IT HAVE?
1270  005322  002405                          BLT     6$                      ;BR IF YES
1271  005324  104006                          ERROR   6                       ;INTERRUPT OCCURRED AT PRIORITY LEVEL 7
1272
1273  005326  005201                  4$:     INC     R1                      ;SET INTERRUPT KEY
1274  005330  000002                          RTI                             ;RETURN AFTER INTERRUPT
1275  005332  022626                  5$:     CMP     (SP)+,(SP)+             ;POP THE STACK
1276  005334  104006                          ERROR   6                       ;INTERRUPT WENT TO LOCATION 0
1277
1278  005336  005014                  6$:     CLR     @TACS                   ;CLEAR INTERRUPT ENABLE
1279  005340  013777  001220  173650          MOV     @#TAVEC+2,@TAVEC        ;SET TRAP CATCHER
1280  005346  005077  173646                  CLR     @TAVEC+2
1281  005352  005037  000000                  CLR     @#0
1282  005356  005037  000002                  CLR     @#2
1283                                  ;;**************************************************************
1284                                  ;*TEST 15       TEST INTERRUPT WITH "TRANSFER REQUEST" = 1
1285                                  ;;**************************************************************
1286  005362  000004                  T15:    SCOPE
1287  005364  012767  000010  173574          MOV     #10,$TIMES      ;;DO 10 ITERATIONS
1288  005372  012767  005420  173506          MOV     #4$,$LPADR      ;;SET SCOPE LOOP ADDRESS
1289  005400  012767  005530  173562          MOV     #3$,$ESCAPE     ;;ESCAPE TO 3$ ON ERROR
1290  005406  000005                          RESET
1291  005410  010314                          MOV     DRIVE,@TACS             ;SELECT DRIVE
1292  005412  112714  000017                  MOVB    #REWIND+GO,@TACS        ;POSITION THE TAPE
1293  005416  104412                          WAITREADY                       ;GO WAIT FOR "READY" TO SET
1294  005420  010314                  4$:     MOV     DRIVE,@TACS             ;SELECT DRIVE
1295  005422  112714  000001                  MOVB    #WFG+GO,@TACS           ;START A "WRITE FILE GAP"
1296  005426  104412                          WAITREADY                       ;GO WAIT FOR "READY" TO SET
1297  005430  012737  000340  177776          MOV     #340,@#PS               ;LOCK OUT ALL INTERRUPTS
1298  005436  012701  000001                  MOV     #1,R1                   ;SETUP TO WASTE SOME TIME
1299  005442  012777  005526  173546          MOV     #2$,@TAVEC              ;SETUP INTERRUPT RETURN
1300  005450  012777  000340  173542          MOV     #340,@TAVEC+2           ;PRIORITY "7" ON INTERRUPT
1301  005456  012737  000137  000000          MOV     #137,@#0                ;CATCH INTERRUPT IF IT GOES
1302  005464  012737  005522  000002          MOV     #5$,@#2                 ;   TO LOCATION 0
1303  005472  112714  000103                  MOVB    #WRITE!INT.EN!GO,@TACS  ;START A "WRITE" WITH "INT. EN."
1304  005476  104413                          WAITXFER                        ;GO WAIT ON "TRANSFER REQUEST" TO SET
1305  005500  005037  177776                  CLR     @#PS                    ;LEVEL 0
1306  005504  005000                          CLR     R0
1307  005506  006301                  1$:     ASL     R1                      ;KILL A LITTLE TIME
1308  005510  001376                          BNE     1$
1309  005512  012737  000340  177776          MOV     #340,@#PS               ;LOCK OUT ALL INTERRUPTS
1310  005520  104006                          ERROR   6                       ;INTERRUPT FOR XFER REQ. FAILED
1311  005522  022626                  5$:     CMP     (SP)+,(SP)+             ;POP THE STACK
```

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                                        ERROR   6                       ;INTERRUPT WENT TO LOCATION 0
                                2$:     CMP     (SP)+,(SP)+             ;POP STACK
                                3$:     RESET                           ;CLEAR ALL
005532  013777  001220  173456          MOV     @#TAVEC+2,@TAVEC        ;SET TRAP CATCHER
005540  005077  173454                  CLR     @TAVEC+2
005544  005037  000000                  CLR     @#0
005550  005037  000002                  CLR     @#2
                                ;;*****************************************************************
                                ;*TEST 16       TEST INTERRUPT WITH "READY" = 0 AND "XFER REQ" = 0
                                ;;*****************************************************************
005554  000004                  TST16:  SCOPE
005556  012767  000001  173402          MOV     #1,$TIMES       ;;DO 1 ITERATION
005564  012767  005724  173376          MOV     #5$,$ESCAPE     ;;ESCAPE TO 5$ ON ERROR
005572  012767  005724  000064          MOV     #5$,3$
005600  012701  000001                  MOV     #1,R1
005604  012737  000340  177776          MOV     #340,@#PS               ;LOCK OUT THE WORLD
005612  000005                          RESET                           ;CLEAR THE WORLD
005614  010314                          MOV     DRIVE,@TACS             ;SELECT DRIVE
005616  104412                          WAITREADY                       ;GO WAIT FOR "READY" TO SET
005620  012777  005714  173370          MOV     #4$,@TAVEC              ;RETURN IF INTERRUPT OCCURS
005626  012777  000340  173364          MOV     #340,@TAVEC+2           ;LEVEL "7" IF INTERRUPT
005634  012737  000137  000000          MOV     #137,@#0                ;CATCH INTERRUPT IF IT GOES TO
005642  012737  005720  000002          MOV     #7$,@#2                 ;  LOCATION 0
005650  112714  000117                  MOVB    #REWIND!INT.EN!GO,@TACS
005654  032714  000240          1$:     BIT     #TR.REQ!READY,@TACS     ;GIVE READY TIME TO CLEAR
005660  001404                          BEQ     2$
005662  005327                          DEC     (PC)+
005664  000000                  3$:     0
005666  001372                          BNE     1$
005670  104001                          ERROR   1                       ;READY OR XFER REQ = "1"
005672  005037  177776          2$:     CLR     @#PS                    ;ALLOW INTERRUPT
005676  005000                          CLR     R0                      ;AT LEVEL 0
005700  006301                  6$:     ASL     R1                      ;GIVE INTERRUPT TIME TO COME IN
005702  001376                          BNE     6$
005704  012737  000340  177776          MOV     #340,@#PS               ;LOCK OUT INTERRUPT
005712  000404                          BR      5$                      ;EXIT WITH NO ERRORS
005714  022626                  4$:     CMP     (SP)+,(SP)+             ;POP STACK
005716  104006                          ERROR   6                       ;INTERRUPT OCCURRED
005720  022626                  7$:     CMP     (SP)+,(SP)+             ;POP THE STACK
005722  104006                          ERROR   6                       ;INTERRUPTTED TO LOCATION 0
005724  000005                  5$:     RESET                           ;CLEAR THE WORLD
005726  013777  001220  173262          MOV     @#TAVEC+2,@TAVEC        ;SET TRAP CATCHER
005734  005077  173260                  CLR     @TAVEC+2
005740  005037  000000                  CLR     @#0
005744  005037  000002                  CLR     @#2
                                ;;***************************************************** **********
                                ;*TEST 17       TEST INTERRUPT WITH "XFER REQ" = 1 & "TIMING ERROR" = 1
                                ;;*****************************************************************
005750  000004                  TST17:  SCOPE
005752  012767  000012  173206          MOV     #10.,$TIMES     ;;DO 10. ITERATIONS
005760  012767  006014  173120          MOV     #1$,$LPADR      ;;SET SCOPE LOOP ADDRESS
005766  012767  006222  173174          MOV     #11$,$ESCAPE    ;;ESCAPE TO 11$ ON ERROR
005774  000005                          RESET                           ;CLEAR ALL
005776  010314                          MOV     DRIVE,@TACS             ;SELECT DRIVE
006000  112714  000017                  MOVB    #REWIND!GO,@TACS        ;GO TO "BOT"
006004  104412                          WAITREADY                       ;WAIT ON READY
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1368  006006  112714  000001          MOVB    #WFG!GO,@TACS           ;SET ON OXIDE
1369  006012  104412                  WAITREADY
1370  006014  010314                  1$:     MOV     DRIVE,@TACS     ;SELECT DRIVE
1371  006016  112714  000003          MOVB    #WRITE!GO,@TACS         ;START A WRITE
1372  006022  104413                  WAITXFER                        ;WAIT ON "TRANSFER REQUEST"
1373  006024  112715  000377          MOVB    #377,@TADB              ;WRITE A BYTE
1374  006030  005000                  CLR     R0                      ;ZERO THE COUNTER
1375  006032  005001                  CLR     R1
1376  006034  105714                  2$:     TSTB    @TACS           ;CHECK "XFER REQ"
1377  006036  100405                  BMI     3$                      ;BR IF SET
1378  006040  062700  000010          ADD     #10,R0                  ;FIND OUT HOW LONG IT TAKES
1379  006044  005501                  ADC     R1                      ;FOR "XFER REQ" TO SET
1380  006046  100372                  BPL     2$
1381  006050  104001                  ERROR   1                       ;"XFER REQ" DIDN'T SET
1382  006052  105714                  3$:     TSTB    @TACS           ;CHECK "XFER REQ" IF IT IS = 0
1383  006054  100005                  BPL     4$                      ;SOMETHING IS WRONG
1384  006056  162700  000001          SUB     #1,R0                   ;DOWN COUNT THE COUNTER
1385  006062  005601                  SBC     R1                      ;SO A "TIMING ERROR" WILL OCCUR
1386  006064  100372                  BPL     3$
1387  006066  000401                  BR      5$
1388
1389  006070  104001                  4$:     ERROR   1               ;"XFER REQ" CLEARED
1390
1391  006072  012777  006160  173116  5$:     MOV     #8$,@TAVEC      ;SETUP  INTERRRUPT RETURN
1392  006100  012777  000340  173112          MOV     #340,@TAVEC+2   ;PRIORITY "7" ON INTERRUPT
1393  006106  012737  000137  000000          MOV     #137,@#0        ;CATCH INTERRUPT IF IT GOES
1394  006114  012737  006154  000002          MOV     #7$,@#2         ;       TO LOCATION 0
1395  006122  012701  000001                  MOV     #1,R1           ;SETUP TO WASTE SOME TIME
1396  006126  005037  177776                  CLR     @#PS            ;ALLOW INTERRUPTS
1397  006132  005000                  CLR     R0                      ;AT LEVEL "0"
1398  006134  052714  000100          BIS     #INT.EN,@TACS           ;TURN ON "INTERRUPT ENABLE"
1399  006140  006301                  6$:     ASL     R1              ;GIVE INTERRUPT TIME TO OCCUR
1400  006142  001376                  BNE     6$
1401  006144  012737  000340  177776          MOV     #340,@#PS       ;LOCK OUT INTERRUPTS
1402  006152  104006                  ERROR   6                       ;FAILED TO INTERRUPT WITH "XFER REQ" = 1
1403
1404  006154  022626                  7$:     CMP     (SP)+,(SP)+     ;POP THE STACK
1405  006156  104006                  ERROR   6                       ;INTERRUPT WENT TO LOCATION 0
1406
1407  006160  022626                  8$:     CMP     (SP)+,(SP)+     ;POP THE STACK
1408  006162  105715                  TSTB    @TADB                   ;KNOCK DOWN "XFER REQ"
1409  006164  104412                  WAITREADY                       ;WAIT ON "READY" CAUSED BY "TIMING ERROR"
1410  006166  012777  006220  173022          MOV     #10$,@TAVEC     ;SETUP INTERRUPT RETURN
1411  006174  012701  000001                  MOV     #1,R1           ;SETUP TO WASTE TIME
1412  006200  005037  177776                  CLR     @#PS            ;ALLOW INTERRUPTS
1413  006204  006301                  9$:     ASL     R1              ;GIVE INTERRUPTS TIME TO OCCUR
1414  006206  001376                  BNE     9$
1415  006210  012737  000340  177776          MOV     #340,@#PS       ;LOCK OUT INTERRUPTS
1416  006216  104006                  ERROR   6                       ;"INTERRUPT FAILED TO OCCUR FOR READY
1417
1418  006220  022626                  10$:    CMP     (SP)+,(SP)+     ;POP THE STACK
1419  006222  000005                  11$:    RESET                   ;CLEAR ALL
1420  006224  012777  001220  172764          MOV     #TAVEC+2,@TAVEC ;RESTORE THE TRAP CATCHER
1421  006232  005077  172762                  CLR     @TAVEC+2
1422  006236  005037  000000                  CLR     @#0
1423  006242  005037  000002                  CLR     @#2
```

```
                                        ;//////////////////////////////////////////////////////////////////
                                        ;//////////////////////////////////////////////////////////////////
                                        ;THE FOLLOWING TEST ARE USED TO CHECK THE BASIC OPERATION OF THE SPACING FUNCTIONS
                                        ;//////////////////////////////////////////////////////////////////
                                        ;;**************************************************************
                                        ;*TEST 20       TEST "BACK SPACE FILE GAP"
                                        ;;**************************************************************
006246  000004                  TST20:  SCOPE
006250  012767  000012  172710          MOV     #10.,$TIMES     ;;DO 10. ITERATIONS
006256  012767  006274  172622          MOV     #3$,$LPADR      ;;SET SCOPE LOOP ADDRESS
006264  012767  006370  172676          MOV     #TST21,$ESCAPE  ;;ESCAPE TO TEST 21 ON ERROR
006272  000005                          RESET
006274  010314                  3$:     MOV     DRIVE,@TACS             ;SELECT DRIVE
006276  112714  000017                  MOVB    #REWIND!GO,@TACS        ;POSITION TAPE ON CLEAR LEADER
006302  104412                          WAITREADY                       ;GO WAIT FOR "READY" TO SET
006304  112714  000001                  MOVB    #WFG!GO,@TACS           ;WRITE A FILE GAP OFF OF CLEAR LEADER
006310  104412                          WAITREADY                       ;GO WAIT FOR "READY" TO SET
006312  112714  000003                  MOVB    #WRITE!GO,@TACS         ;PUT A DATA BLOCK ON THE TAPE
006316  104413                          WAITXFER                        ;GO WAIT ON "TRANSFER REQUEST" TO SET
006320  112715  000377                  MOVB    #377,@TADB              ;KNOCK DOWN XFER REQ
006324  104413                          WAITXFER                        ;GO WAIT ON "TRANSFER REQUEST" TO SET
006326  052714  000020                  BIS     #ILBS,@TACS             ;WRITE "CRC"
006332  104412                          WAITREADY                       ;GO WAIT FOR "READY" TO SET
006334  112714  000007                  MOVB    #BSFG!GO,@TACS          ;BACK UP OVER THE DATA
006340  104412                          WAITREADY                       ;GO WAIT FOR "READY" TO SET
006342  032714  004000                  BIT     #FGAP,@TACS             ;CHECK FOR FILE GAP
006346  001001                          BNE     1$                      ;BR IF "FILE GAP" =1
006350  104001                          ERROR   1                       ;ERROR--NO FILE GAP INDICATION
006352  005714                  1$:     TST     @TACS                   ;IS "ERROR" =1?
006354  100001                          BPL     2$                      ;BR IF NO
006356  104001                          ERROR   1                       ;"ERROR" =1
006360  032714  020000          2$:     BIT     #LEADER,@TACS           ;IS "CLEAR LEADER" =1?
006364  001401                          BEQ     TST21           ;;BR IF NO
006366  104001                          ERROR   1                       ;"WFG" OR "BSFG" FAILED
                                        ;;**************************************************************
                                        ;*TEST 21       TEST "SPACE FORWARD FILE GAP" FUNCTION
                                        ;;**************************************************************
006370  000004                  TST21:  SCOPE
006372  012767  000005  172566          MOV     #5,$TIMES       ;;DO 5 ITERATIONS
006400  012767  006464  172500          MOV     #1$,$LPADR      ;;SET SCOPE LOOP ADDRESS
006406  012767  006510  172554          MOV     #TST22,$ESCAPE  ;;ESCAPE TO TEST 22 ON ERROR
006414  000005                          RESET
006416  010314                          MOV     DRIVE,@TACS             ;SELECT A DRIVE
006420  112714  000017                  MOVB    #REWIND!GO,@TACS        ;POSITION THE TAPE
006424  104412                          WAITREADY                       ;GO WAIT FOR "READY" TO SET
006426  112714  000001                  MOVB    #WFG!GO,@TACS           ;WRITE FILE GAP OFF OF CLEAR LEADER
006432  104412                          WAITREADY                       ;GO WAIT FOR "READY" TO SET
006434  112714  000003                  MOVB    #WRITE!GO,@TACS         ;PUT SOME DATA ON THE TAPE
006440  104413                          WAITXFER                        ;GO WAIT ON "TRANSFER REQUEST" TO SET
006442  112715  000377                  MOVB    #377,@TADB              ;KNOCK DOWN XFER REQ
006446  104413                          WAITXFER                        ;GO WAIT ON "TRANSFER REQUEST" TO SET
006450  052714  000020                  BIS     #ILBS,@TACS             ;WRITE CRC AND SHUT DOWN
006454  104412                          WAITREADY                       ;GO WAIT FOR "READY" TO SET
006456  112714  000001                  MOVB    #WFG!GO,@TACS           ;WRITE FILE GAP AFTER THE RECORD
006462  104412                          WAITREADY                       ;GO WAIT FOR "READY" TO SET
006464  112714  000017          1$:     MOVB    #REWIND!GO,@TACS        ;REPOSITION THE TAPE
```

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1480  006470  104412                        WAITREADY                       ;GO WAIT FOR "READY" TO SET
1481  006472  112714  000013                MOVB    #SFFG!GO,@TACS          ;SPACE OVER THE RECORD
1482  006476  104412                        WAITREADY                       ;GO WAIT FOR "READY" TO SET
1483  006500  032714  004000                BIT     #FGAP,@TACS             ;SETTING IN A FILE GAP?
1484  006504  001001                        BNE     TST22           ;;BR IF YES
1485  006506  104001                        ERROR   1                       ;NO FILE GAP INDICATION
1486                                ;;*******************************************************************
1487                                ;*TEST 22        TEST "BACK SPACE BLOCK GAP"
1488                                ;;*******************************************************************
1489  006510  000004                TST22:  SCOPE
1490  006512  012767  000005  172446        MOV     #5,$TIMES       ;;DO 5 ITERATIONS
1491  006520  012767  006536  172360        MOV     #1$,$LPADR      ;;SET SCOPE LOOP ADDRESS
1492  006526  012767  006622  172434        MOV     #TST23,$ESCAPE  ;;ESCAPE TO TEST 23 ON ERROR
1493  006534  000005                        RESET
1494  006536  010314                1$:     MOV     DRIVE,@TACS             ;SELECT DRIVE
1495  006540  112714  000017                MOVB    #REWIND!GO,@TACS        ;GO TO CLEAR LEADER
1496  006544  104412                        WAITREADY                       ;GO WAIT FOR "READY" TO SET
1497  006546  112714  000001                MOVB    #WFG!GO,@TACS           ;WRITE A FILE GAP
1498  006552  104412                        WAITREADY                       ;GO WAIT FOR "READY" TO SET
1499  006554  112714  000003                MOVB    #WRITE!GO,@TACS         ;WRITE A BLOCK OF DATA
1500  006560  104413                        WAITXFER                        ;GO WAIT ON "TRANSFER REQUEST" TO SET
1501  006562  112715  000377                MOVB    #377,@TADB              ;WRITE ONE BYTE
1502  006566  104413                        WAITXFER                        ;GO WAIT ON "TRANSFER REQUEST" TO SET
1503  006570  052714  000020                BIS     #ILBS,@TACS             ;WRITE "CRC"
1504  006574  104412                        WAITREADY                       ;GO WAIT FOR "READY" TO SET
1505  006576  112714  000011                MOVB    #BSBG!GO,@TACS          ;BACK OVER THE DATA
1506  006602  104412                        WAITREADY                       ;GO WAIT FOR "READY" TO SET
1507  006604  005714                        TST     @TACS                   ;CHECK FOR ERRORS
1508  006606  100001                        BPL     2$                      ;BR IF NONE
1509  006610  104001                        ERROR   1                       ;ERROR OCCURRED
1510  006612  032714  020000        2$:     BIT     #LEADER,@TACS           ;IS CLEAR LEADER=1?
1511  006616  001401                        BEQ     TST23           ;;BR IF NO
1512  006620  104001                        ERROR   1                       ;ON CLEAR LEADER
1513                                ;;*******************************************************************
1514                                ;*TEST 23        TEST "SPACE FWD BLOCK GAP"
1515                                ;;*******************************************************************
1516  006622  000004                TST23:  SCOPE
1517  006624  012767  000005  172334        MOV     #5,$TIMES       ;;DO 5 ITERATIONS
1518  006632  012767  006716  172246        MOV     #1$,$LPADR      ;;SET SCOPE LOOP ADDRESS
1519  006640  012767  006742  172322        MOV     #TST24,$ESCAPE  ;;ESCAPE TO TEST 24 ON ERROR
1520  006646  000005                        RESET
1521  006650  010314                        MOV     DRIVE,@TACS
1522  006652  112714  000017                MOVB    #REWIND!GO,@TACS        ;GO TO CLEAR LEADER
1523  006656  104412                        WAITREADY                       ;GO WAIT FOR "READY" TO SET
1524  006660  112714  000001                MOVB    #WFG!GO,@TACS           ;PUT FILE GAP ON TAPE
1525  006664  104412                        WAITREADY                       ;GO WAIT FOR "READY" TO SET
1526  006666  112714  000003                MOVB    #WRITE!GO,@TACS         ;WRITE ONE BYTE BLOCK
1527  006672  104413                        WAITXFER                        ;GO WAIT ON "TRANSFER REQUEST" TO SET
1528  006674  112715  000377                MOVB    #377,@TADB
1529  006700  104413                        WAITXFER                        ;GO WAIT ON "TRANSFER REQUEST" TO SET
1530  006702  052714  000020                BIS     #ILBS,@TACS             ;WRITE "CRC"
1531  006706  104412                        WAITREADY                       ;GO WAIT FOR "READY" TO SET
1532  006710  112714  000001                MOVB    #WFG!GO,@TACS           ;WRITE A FILE GAP AFTER THE DATA
1533  006714  104412                        WAITREADY                       ;GO WAIT FOR "READY" TO SET
1534  006716  112714  000017        1$:     MOVB    #REWIND!GO,@TACS        ;GO TO "CLEAR LEADER"
1535  006722  104412                        WAITREADY                       ;GO WAIT FOR "READY" TO SET
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                        MOVB    #SFBG!GO,@TACS          ;SEE IF SFBG WILL SPACE OVER THE BLOCK OF DATA
                        WAITREADY                       ;GO WAIT FOR "READY" TO SET
                        BIT     #ERROR!LEADER!FGAP,@TACS        ;"ERROR" SHOULD BE CLEAR
                        BEQ     TST24           ;;SO SHOULD "CLEAR LEADER" AND "FILE GAP"
                        ERROR   1                       ;TAPE IS IN THE WRONG PLACE AFTER A SFBG
                ;////////////////////////////////////////////////////////////////
                ;////////////////////////////////////////////////////////////////
                ;THE FOLLOWING TESTS ARE USED TO CHECK THE "FILE GAP" CIRCUITS
                ;////////////////////////////////////////////////////////////////
                ;;*****************************************************************
                ;*TEST 24        TEST AUTOMATIC "WFG" WHEN WRITING OFF OF "CLEAR LEADER"
                ;;*****************************************************************
                TST24:  SCOPE
                        MOV     #10.,$TIMES     ;;DO 10. ITERATIONS
                        MOV     #1$,$LPADR      ;;SET SCOPE LOOP ADDRESS
                        MOV     #TST25,$ESCAPE  ;;ESCAPE TO TEST 25 ON ERROR
                        RESET
                1$:     MOV     DRIVE,@TACS             ;SELECT DRIVE
                        MOVB    #REWIND!GO,@TACS        ;GO TO CLEAR LEADER
                        WAITREADY                       ;GO WAIT FOR "READY" TO SET
                        MOVB    #WRITE!GO,@TACS         ;WRITE "AUTO. FILE GAP"
                        WAITXFER                        ;GO WAIT ON "TRANSFER REQUEST" TO SET
                        MOV     #377,@TADB              ;WRITE "DATA"
                        WAITXFER                        ;GO WAIT ON "TRANSFER REQUEST" TO SET
                        BIS     #ILBS,@TACS             ;WRITE "CRC"
                        WAITREADY                       ;GO WAIT FOR "READY" TO SET
                        MOVB    #BSFG!GO,@TACS          ;BACK OVER THE DATA BLOCK
                        WAITREADY                       ;GO WAIT FOR "READY" TO SET
                        BIT     #FGAP,@TACS             ;IN FILE GAP?
                        BNE     2$                      ;BR IF YES
                        ERROR   1                       ;NO FILE GAP INDICATION
                2$:     BIT     #ERROR!LEADER,@TACS     ;ERROR SHOULD BE CLEAR
                        BEQ     TST25           ;;SO SHOULD "CLEAR LEADER"
                        ERROR   1                       ;ERROR OR CLEAR LEADER ON A
                ;;*****************************************************************
                ;*TEST 25        TEST "READ" INTO FILE GAP CAUSES AN ERROR
                ;;*****************************************************************
                TST25:  SCOPE
                        MOV     #10.,$TIMES     ;;DO 10. ITERATIONS
                        MOV     #1$,$LPADR      ;;SET SCOPE LOOP ADDRESS
                        MOV     #TST26,$ESCAPE  ;;ESCAPE TO TEST 26 ON ERROR
                        RESET
                        MOV     DRIVE,@TACS             ;SELECT DRIVE
                        MOVB    #REWIND!GO,@TACS        ;GO TO BEGINNING OF TAPE
                        WAITREADY                       ;WAIT ON "READY"
                1$:     MOVB    #WRITE!GO,@TACS         ;START A WRITE
                        WAITXFER                        ;WAIT ON "XFER REQ"
                        MOVB    #377,@TADB              ;WRITE ONE BYTE
                        WAITXFER                        ;WAIT ON "XFER REQ"
                        BIS     #ILBS,@TACS             ;WRITE "CRC"
                        WAITREADY                       ;WAIT ON "READY"
                        MOVB    #WFG!GO,@TACS           ;WRITE A "FILE GAP"
                        WAITREADY                       ;WAIT ON "READY"
                        MOVB    #BSBG!GO,@TACS          ;BACK OVER THE DATA
                        WAITREADY                       ;WAIT ON "READY"
                        MOVB    #SFBG!GO,@TACS          ;SPACE OVER THE DATA BLOCK
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1592  007150  104412                  WAITREADY                       ;WAIT ON "READY"
1593  007152  112714  000005          MOVB    #READ!GO,@TACS          ;START A "READ"
1594  007156  104412                  WAITREADY                       ;WAIT ON "READY"
1595  007160  005714                  TST     @TACS                   ;DID AN "ERROR" OCCUR?
1596  007162  100401                  BMI     2$                      ;BR IF YES
1597  007164  104001                  ERROR   1                       ;ERROR FAILED TO SET
1598  007166  032714  004000  2$:     BIT     #FGAP,@TACS             ;IS FILE GAP=1?
1599  007172  001001                  BNE     TST26           ;;BR IF YES
1600  007174  104001                  ERROR   1                       ;FILE GAP NOT=1
1601                                  ;;*****************************************************************
1602                                  ;*TEST 26       TEST "SFBG" INTO FILE GAP CAUSES AN ERROR
1603                                  ;;*****************************************************************
1604  007176  000004          TST26:  SCOPE
1605  007200  012767  000012  171760  MOV     #10.,$TIMES     ;;DO 10. ITERATIONS
1606  007206  012767  007234  171672  MOV     #1$,$LPADR      ;;SET SCOPE LOOP ADDRESS
1607  007214  012767  007324  171746  MOV     #TST27,$ESCAPE  ;;ESCAPE TO TEST 27 ON ERROR
1608  007222  000005                  RESET
1609  007224  010314                  MOV     DRIVE,@TACS             ;SELECT DRIVE
1610  007226  112714  000017          MOVB    #REWIND!GO,@TACS        ;GO TO BEGINNING OF TAPE
1611  007232  104412                  WAITREADY                       ;WAIT ON "READY"
1612  007234  112714  000003  1$:     MOVB    #WRITE!GO,@TACS         ;START A WRITE
1613  007240  104413                  WAITXFER                        ;WAIT ON "XFER REQ"
1614  007242  112715  000377          MOVB    #377,@TACDB             ;WRITE ONE BYTE
1615  007246  104413                  WAITXFER                        ;WAIT ON "XFER REQ"
1616  007250  052714  000020          BIS     #ILBS,@TACS             ;WRITE"CRC"
1617  007254  104412                  WAITREADY                       ;WAIT ON "READY"
1618  007256  112714  000001          MOVB    #WFG!GO,@TACS           ;WRITE A "FILE GAP"
1619  007262  104412                  WAITREADY                       ;WAIT ON "READY"
1620  007264  112714  000011          MOVB    #BSBG!GO,@TACS          ;BACK OVER THE DATA
1621  007270  104412                  WAITREADY                       ;WAIT ON "READY"
1622  007272  112714  000015          MOVB    #SFBG!GO,@TACS          ;SPACE OVER THE DATA BLOCK
1623  007276  104412                  WAITREADY                       ;WAIT ON "READY"
1624  007300  112714  000015          MOVB    #SFBG!GO,@TACS          ;START A "SFBG"
1625  007304  104412                  WAITREADY                       ;WAIT ON "READY"
1626  007306  005714                  TST     @TACS                   ;DID AN "ERROR" OCCUR?
1627  007310  100401                  BMI     2$                      ;BR IF YES
1628  007312  104001                  ERROR   1                       ;ERROR FAILED TO SET
1629  007314  032714  004000  2$:     BIT     #FGAP,@TACS             ;IS FILE GAP=1?
1630  007320  001001                  BNE     TST27           ;;BR IF YES
1631  007322  104001                  ERROR   1                       ;FILE GAP NOT=1
1632                                  ;;*****************************************************************
1633                                  ;*TEST 27       TEST "ERROR" OUTPUT OF THE STATUS ROM WITH "FILE GAP=1"
1634                                  ;;*****************************************************************
1635  007324  000004          TST27:  SCOPE
1636  007326  012767  000012  171632  MOV     #10.,$TIMES     ;;DO 10. ITERATIONS
1637  007334  012767  007430  171544  MOV     #1$,$LPADR      ;;SET SCOPE LOOP ADDRESS
1638  007342  012767  007574  171620  MOV     #TST30,$ESCAPE  ;;ESCAPE TO TEST 30 ON ERROR
1639  007350  000005                  RESET
1640  007352  010314                  MOV     DRIVE,@TACS             ;SELECT DRIVE
1641  007354  104412                  WAITREADY                       ;MAKE SURE READY IS SET
1642  007356  112714  000017          MOVB    #REWIND!GO,@TACS        ;GO TO BEGINNING OF TAPE
1643  007362  104412                  WAITREADY                       ;WAIT ON "READY"
1644  007364  112714  000001          MOVB    #WFG!GO,@TACS           ;GET OFF OF CLEAR LEADER
1645  007370  104412                  WAITREADY                       ;WAIT FOR READY
1646  007372  112714  000003          MOVB    #WRITE!GO,@TACS         ;START A WRITE
1647  007376  104413                  WAITXFER                        ;WAIT ON "XFER REQ"
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1648  007400  112715  000377          MOVB    #377,@TADB              ;WRITE ONE BYTE
1649  007404  104413                  WAITXFER                        ;WAIT ON "XFER REQ"
1650  007406  112715  000377          MOVB    #377,@TADB              ;WRITE
1651  007412  104413                  WAITXFER                        ;WAIT ON "XFER REQ"
1652  007414  052714  000020          BIS     #ILBS,@TACS             ;WRITE "CRC"
1653  007420  104412                  WAITREADY                       ;WAIT ON "READY"
1654  007422  112714  000001          MOVB    #WFG!GO,@TACS           ;WRITE A "FILE GAP"
1655  007426  104412                  WAITREADY                       ;WAIT ON "READY"
1656  007430  112714  000017  1$:     MOVB    #REWIND!GO,@TACS        ;BACK OVER THE DATA
1657  007434  104412                  WAITREADY                       ;WAIT ON "READY"
1658  007436  112714  000013          MOVB    #SFFG!GO,@TACS          ;DO A SPACE FWD FILE GAP
1659  007442  104412                  WAITREADY
1660  007444  032714  004000          BIT     #FGAP,@TACS             ;IS FILE GAP=1?
1661  007450  001001                  BNE     2$                      ;BR IF YES
1662  007452  104001                  ERROR   1                       ;FILE GAP NOT=1
1663                          ;NOW CHECK "ERROR" BIT FOR ALL FUNCTIONS
1664  007454  112714  000000  2$:     MOVB    #WFG,@TACS              ;CHECK "ERROR" WITH "WFG"
1665  007460  005714                  TST     @TACS                   ;SAMPLE THE "ERROR" BIT
1666  007462  100001                  BPL     3$                      ;BR IF "ERROR" = 0
1667  007464  104001                  ERROR                           ;"ERROR" NOT = 0
1668  007466  112714  000002  3$:     MOVB    #WRITE,@TACS            ;CHECK "ERROR" WITH "WRITE"
1669  007472  005714                  TST     @TACS                   ;SAMPLE THE "ERROR" BIT
1670  007474  100001                  BPL     4$                      ;BR IF "ERROR" = 0
1671  007476  104001                  ERROR   1                       ;"ERROR" NOT = 0
1672  007500  112714  000004  4$:     MOVB    #READ,@TACS             ;CHECK "ERROR" WITH "READ"
1673  007504  005714                  TST     @TACS                   ;SAMPLE THE "ERROR" BIT
1674  007506  100401                  BMI     5$                      ;BR IF "ERROR" = 1
1675  007510  104001                  ERROR   1                       ;"ERROR" NOT = 1
1676  007512  112714  000006  5$:     MOVB    #BSFG,@TACS             ;CHECK "ERROR" WITH "BSFG"
1677  007516  005714                  TST     @TACS                   ;SAMPLE THE "ERROR" BIT
1678  007520  100001                  BPL     6$                      ;BR IF "ERROR" = 0
1679  007522  104001                  ERROR   1                       ;"ERROR" NOT = 0
1680  007524  112714  000010  6$:     MOVB    #BSBG,@TACS             ;CHECK "ERROR" WITH "BSBG"
1681  007530  005714                  TST     @TACS                   ;SAMPLE THE "ERROR" BIT
1682  007532  100001                  BPL     7$                      ;BR IF "ERROR" = 0
1683  007534  104001                  ERROR   1                       ;"ERROR" NOT = 0
1684  007536  112714  000012  7$:     MOVB    #SFFG,@TACS             ;CHECK "ERROR" WITH "SFFG"
1685  007542  005714                  TST     @TACS                   ;SAMPLE THE "ERROR" BIT
1686  007544  100001                  BPL     8$                      ;BR IF "ERROR" = 0
1687  007546  104001                  ERROR   1                       ;"ERROR" NOT = 0
1688  007550  112714  000014  8$:     MOVB    #SFBG,@TACS             ;CHECK "ERROR" WITH "SFBG"
1689  007554  005714                  TST     @TACS                   ;SAMPLE THE "ERROR" BIT
1690  007556  100401                  BMI     9$                      ;BR IF "ERROR" = 1
1691  007560  104001                  ERROR   1                       ;"ERROR" NOT = 1
1692  007562  112714  000016  9$:     MOVB    #REWIND,@TACS           ;CHECK "ERROR" WITH "REWIND"
1693  007566  005714                  TST     @TACS                   ;SAMPLE THE "ERROR" BIT
1694  007570  100001                  BPL     TST30           ::BR IF "ERROR" = 0
1695  007572  104001                  ERROR   1                       ;"ERROR" NOT = 0
```

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                                        ;////////////////////////////////////////////////////////////////
                                        ;////////////////////////////////////////////////////////////////
                                        ;THE FOLLOWING TESTS INSURE THAT BACKING INTO "CLEAR LEADER" CAUSES AN ERROR
                                        ;////////////////////////////////////////////////////////////////
                                        ;;****************************************************************
                                        ;*TEST 30       TEST BACK-SPACE-FILE-GAP INTO CLEAR LEADER
                                        ;;****************************************************************
007574  000004                TST30:  SCOPE
007576  012767  000012  171362          MOV     #10.,$TIMES     ;;DO 10. ITERATIONS
007604  012767  007700  171274          MOV     #1$,$LPADR      ;;SET SCOPE LOOP ADDRESS
007612  012767  010000  171350          MOV     #TST31,$ESCAPE  ;;ESCAPE TO TEST 31 ON ERROR
007620  000005                        RESET
007622  010314                        MOV     DRIVE,@TACS             ;SELECT DRIVE
007624  104412                        WAITREADY                       ;MAKE SURE READY IS SET
007626  112714  000017                MOVB    #REWIND!GO,@TACS        ;GO TO BEGINNING OF TAPE
007632  104412                        WAITREADY                       ;WAIT ON "READY"
007634  112714  000001                MOVB    #WFG!GO,@TACS           ;GET OFF OF CLEAR LEADER
007640  104412                        WAITREADY                       ;WAIT FOR READY
007642  112714  000003                MOVB    #WRITE!GO,@TACS         ;START A WRITE
007646  104413                        WAITXFER                        ;WAIT ON "XFER REQ"
007650  112715  000377                MOVB    #377,@TADB              ;WRITE ONE BYTE
007654  104413                        WAITXFER                        ;WAIT ON "XFER REQ"
007656  112715  000377                MOVB    #377,@TADB              ;WRITE
007662  104413                        WAITXFER                        ;WAIT ON "XFER REQ"
007664  052714  000020                BIS     #ILBS,@TACS             ;WRITE "CRC"
007670  104412                        WAITREADY                       ;WAIT ON "READY"
007672  112714  000001                MOVB    #WFG!GO,@TACS           ;WRITE A "FILE GAP"
007676  104412                        WAITREADY                       ;WAIT ON "READY"
007700  112714  000017        1$:     MOVB    #REWIND!GO,@TACS        ;BACK OVER THE DATA
007704  104412                        WAITREADY                       ;WAIT ON "READY"
007706  112714  000013                MOVB    #SFFG!GO,@TACS          ;DO A SPACE FWD FILE GAP
007712  104412                        WAITREADY
007714  032714  004000                BIT     #FGAP,@TACS             ;IS FILE GAP=1?
007720  001001                        BNE     2$                      ;BR IF YES
007722  104001                        ERROR   1                       ;FILE GAP NOT=1
007724  112714  000007        2$:     MOVB    #BSFG!GO,@TACS          ;GO TO FIRST FILE GAP ON TAPE
007730  104412                        WAITREADY                       ;GO WAIT FOR "READY" TO SET
007732  032714  004000                BIT     #FGAP,@TACS             ;IN A FILE GAP?
007736  001001                        BNE     3$                      ;BR IF YES
007740  104001                        ERROR   1                       ;DIDN'T STOP IN A GAP
007742  032714  100000        3$:     BIT     #ERROR,@TACS            ;DID WE GET AN ERROR?
007746  001401                        BEQ     4$                      ;BR IF NO
007750  104001                        ERROR   1                       ;AN ERROR OCCURRED
007752  112714  000007        4$:     MOVB    #BSFG!GO,@TACS          ;BACK ONTO THE CLEAR LEADER
007756  104412                        WAITREADY                       ;GO WAIT FOR "READY" TO SET
007760  032714  100000                BIT     #ERROR,@TACS            ;CHECK FOR AN ERROR
007764  001001                        BNE     5$                      ;BR IF "ERROR" BIT IS SET
007766  104001                        ERROR   1                       ;"ERROR" BIT FAILED TO SET
007770  032714  020000        5$:     BIT     #LEADER,@TACS           ;CHECK FOR CLEAR LEADER
007774  001001                        BNE     TST31           ;;BR IF "CLEAR LEADER" = 1
007776  104001                        ERROR   1                       ;"ERROR" WASN'T DUE TO "CLEAR LEADER"
```

```
1747                                    ;;**********************************************************************
1748                                    ;*TEST 31        TEST BACK-SPACE-BLOCK-GAP INTO CLEAR LEADER
1749                                    ;;**********************************************************************
1750  010000  000004               TST31:  SCOPE
1751  010002  012767  000012  171156        MOV     #10.,$TIMES     ;;DO 10. ITERATIONS
1752  010010  012767  010104  171070        MOV     #1$,$LPADR      ;;SET SCOPE LOOP ADDRESS
1753  010016  012767  010172  171144        MOV     #TST32,$ESCAPE  ;;ESCAPE TO TEST 32 ON ERROR
1754  010024  000005                        RESET
1755  010026  010314                        MOV     DRIVE,@TACS             ;SELECT DRIVE
1756  010030  104412                        WAITREADY                       ;MAKE SURE READY IS SET
1757  010032  112714  000017               MOVB    #REWIND!GO,@TACS        ;GO TO BEGINNING OF TAPE
1758  010036  104412                        WAITREADY                       ;WAIT ON "READY"
1759  010040  112714  000001               MOVB    #WFG!GO,@TACS           ;GET OFF OF CLEAR LEADER
1760  010044  104412                        WAITREADY                       ;WAIT FOR READY
1761  010046  112714  000003               MOVB    #WRITE!GO,@TACS         ;START A WRITE
1762  010052  104413                        WAITXFER                        ;WAIT ON "XFER REQ"
1763  010054  112715  000377               MOVB    #377,@TADB              ;WRITE ONE BYTE
1764  010060  104413                        WAITXFER                        ;WAIT ON "XFER REQ"
1765  010062  112715  000377               MOVB    #377,@TADB              ;WRITE
1766  010066  104413                        WAITXFER                        ;WAIT ON "XFER REQ"
1767  010070  052714  000020               BIS     #ILBS,@TACS             ;WRITE "CRC"
1768  010074  104412                        WAITREADY                       ;WAIT ON "READY"
1769  010076  112714  000001               MOVB    #WFG!GO,@TACS           ;WRITE A "FILE GAP"
1770  010102  104412                        WAITREADY                       ;WAIT ON "READY"
1771  010104  112714  000017        1$:    MOVB    #REWIND!GO,@TACS        ;BACK OVER THE DATA
1772  010110  104412                        WAITREADY                       ;WAIT ON "READY"
1773  010112  112714  000013               MOVB    #SFFG!GO,@TACS          ;DO A SPACE FWD FILE GAP
1774  010116  104412                        WAITREADY
1775  010120  032714  004000               BIT     #FGAP,@TACS             ;IS FILE GAP=1?
1776  010124  001001                        BNE     2$                      ;BR IF YES
1777  010126  104001                        ERROR   1                       ;FILE GAP NOT=1
1778  010130  112714  000011        2$:    MOVB    #BSBG!GO,@TACS          ;GO TO FIRST FILE GAP ON TAPE
1779  010134  104412                        WAITREADY                       ;GO WAIT FOR "READY" TO SET
1780  010136  032714  124000               BIT     #ERROR!FGAP!LEADER,@TACS        ;DID WE GET ANY ERROR?
1781  010142  001401                        BEQ     3$                      ;BR IF NO
1782  010144  104001                        ERROR   1                       ;AN ERROR OCCURRED
1783  010146  112714  000011        3$:    MOVB    #BSBG!GO,@TACS          ;BSBG WHILE IN A FILE GAP
1784  010152  104412                        WAITREADY                       ;GO WAIT FOR "READY" TO SET
1785  010154  005714                        TST     @TACS                   ;"ERROR" BIT SHOULD BE SET
1786  010156  100401                        BMI     4$                      ;BR IF IT IS
1787  010160  104001                        ERROR   1                       ;"ERROR" BIT WASN'T SET
1788  010162  032714  020000        4$:    BIT     #LEADER,@TACS           ;"CLEAR LEADER" SHOULD BE SET
1789  010166  001001                        BNE     TST32           ;;BR IF "CLEAR LEADER" = 1
1790  010170  104001                        ERROR   1                       ;"CLEAR LEADER" NOT SET
1791                                    ;////////////////////////////////////////////////////////////////////////
1792                                    ;////////////////////////////////////////////////////////////////////////
1793                                    ;THE FOLLOWING TESTS INSURE THAT DATA CAN BE WRITING ONTO AND READ FROM THE TAPE
1794                                    ;////////////////////////////////////////////////////////////////////////
1795                                    ;;**********************************************************************
1796                                    ;*TEST 32        TEST "WRITE" 377 & 0 "READ" 377 & 0
1797                                    ;;**********************************************************************
1798  010172  000004               TST32:  SCOPE
1799  010174  012767  000012  170764        MOV     #10.,$TIMES     ;;DO 10. ITERATIONS
1800  010202  012767  010230  170676        MOV     #3$,$LPADR      ;;SET SCOPE LOOP ADDRESS
1801  010210  012767  010330  170752        MOV     #TST33,$ESCAPE  ;;ESCAPE TO TEST 33 ON ERROR
1802  010216  000005                        RESET
```

```
 1803  010220  010314                        MOV     DRIVE,@TACS             ;SELECT DRIVE
 1804  010222  112714  000017                MOVB    #REWIND!GO,@TACS        ;GO TO "CLEAR LEADER"
 1805  010226  104412                        WAITREADY                       ;WAIT ON "READY"
 1806  010230  112714  000003        3$:     MOVB    #WRITE!GO,@TACS         ;WRITE DATA
 1807  010234  104413                        WAITXFER                        ;WAIT ON "XFER REQ"
 1808  010236  112715  000377                MOVB    #377,@TADB              ;1ST BYTE
 1809  010242  104413                        WAITXFER                        ;WAIT ON "XFER REQ"
 1810  010244  112715  000000                MOVB    #0,@TADB                ;2ND BYTE
 1811  010250  104413                        WAITXFER                        ;WAIT ON "XFER REQ"
 1812  010252  052714  000020                BIS     #ILBS,@TACS             ;WRITE "CRC"
 1813  010256  104412                        WAITREADY                       ;WAIT ON "READY"
 1814  010260  112714  000011                MOVB    #BSBG!GO,@TACS          ;BACK OVER THE DATA
 1815  010264  104412                        WAITREADY                       ;WAIT ON "READY"
 1816  010266  112714  000005                MOVB    #READ!GO,@TACS          ;START A "READ"
 1817  010272  104413                        WAITXFER                        ;WAIT ON "XFER REQ"
 1818  010274  011501                        MOV     @TADB,R1                ;PUT THIS BYTE IN R1
 1819  010276  012700  000377                MOV     #377,R0                 ;PUT WHAT IT SHOULD BE IN R0
 1820  010302  020100                        CMP     R1,R0                   ;DID DATA READ GOOD?
 1821  010304  001401                        BEQ     1$                      ;BR IF YES
 1822  010306  104005                        ERROR   5                       ;DATA WASN'T = 377
 1823  010310  104413          1$:           WAITXFER                        ;WAIT ON "XFER"
 1824  010312  005000                        CLR     R0
 1825  010314  011501                        MOV     @TADB,R1                ;READ
 1826  010316  001401                        BEQ     2$                      ;BR IF DATA = 000
 1827  010320  104005                        ERROR   5                       ;DATA WASN'T = 000
 1828  010322  052714  000020        2$:     BIS     #ILBS,@TACS             ;SHUT DOWN
 1829  010326  104412                        WAITREADY                       ;WAIT ON "READY"
 1830                          ;;*************************************************
 1831                          ;*TEST 33       TEST "WRITE & READ" A COUNT PATTERN
 1832                          ;;*************************************************
 1833  010330  000004          TST33:  SCOPE
 1834  010332  012767  000012  170626        MOV     #10.,$TIMES     ;;DO 10. ITERATIONS
 1835  010340  012767  010442  170540        MOV     #3$,$LPADR      ;;SET SCOPE LOOP ADDRESS
 1836  010346  012767  010516  170614        MOV     #TST34,$ESCAPE  ;;ESCAPE TO TEST 34 ON ERROR
 1837  010354  000005                        RESET                           ;CLEAR ALL
 1838  010356  010314                        MOV     DRIVE,@TACS             ;SELECT DRIVE
 1839  010360  112714  000017                MOVB    #REWIND!GO,@TACS        ;GO TO "BOT"
 1840  010364  104412                        WAITREADY                       ;WAIT ON "READY" TO SET
 1841  010366  112714  000031                MOVB    #WFG!GO,@TACS           ;GET ON OXIDE
 1842  010372  104412                        WAITREADY                       ;WAIT ON "READY" TO SET
 1843  010374  012700  000377                MOV     #377,R0                 ;FIRST DATA PATTERN AND COUNTER
 1844  010400  112714  000003                MOVB    #WRITE!GO,@TACS         ;START A WRITE
 1845  010404  104413                        WAITXFER                        ;WAIT ON "XFER REQ" TO SET
 1846  010406  010015          1$:           MOV     R0,@TADB                ;WRITE A BYTE ON TAPE
 1847  010410  104413                        WAITXFER                        ;WAIT ON "XFER REQ" TO SET
 1848  010412  011501                        MOV     @TADB,R1                ;GET BACK THE LAST BYTE WRITTEN
 1849  010414  020005                        CMP     R0,R1                   ;       AND CHECK IT
 1850  010416  001401                        BEQ     2$                      ;BR IF IT LOOKS GOOD
 1851  010420  104005                        ERROR   5                       ;THE DATA IN TADB WAS BAD
 1852  010422  005300          2$:           DEC     R0                      ;NEXT PATTERN
 1853  010424  002370                        BGE     1$                      ;BR IF MORE TO DO
 1854  010426  052714  000020                BIS     #ILBS,@TACS             ;WRITE THE "CRC"
 1855  010432  104412                        WAITREADY                       ;WAIT ON "READY" TO SET
 1856  010434  005714                        TST     @TACS                   ;ANY ERRORS OCCUR?
 1857  010436  100001                        BPL     3$                      ;BR IF NO
 1858  010440  104001                        ERROR   1                       ;ERROR OCCURRED DURING WRITE
```

```
 010442  112714  000011          3$:     MOVB    #BSBG!GO,@TACS          ;GO TO BEGINNING OF BLOCK
 010446  104412                          WAITREADY                       ;WAIT ON "READY" TO SET
 010450  112714  000005                  MOVB    #READ!GO,@TACS          ;START A "READ"
 010454  012700  000377                  MOV     #377,R0                 ;FIRST DATA PATTERN AND COUNTER
 010460  104413                  4$:     WAITXFER                        ;WAIT ON "XFER REQ" TO SET
 010462  011501                          MOV     @TADB,R1                ;READ A BYTE FROM TAPE
 010464  020001                          CMP     R0,R1                   ;IS IT VALID?
 010466  001401                          BEQ     5$                      ;BR IF YES
 010470  104005                          ERROR   5                       ;BAD DATA READ FROM TAPE
 010472  005300                  5$:     DEC     R0                      ;NEXT PATTERN
 010474  002371                          BGE     4$                      ;BR IF MORE TO READ
 010476  104413                          WAITXFER                        ;WAIT ON "XFER REQ" TO SET
 010500  052714  000020                  BIS     #ILBS,@TACS             ;SHUT DOWN THE "READ" OPERATION
 010504  104412                          WAITREADY                       ;WAIT ON "READY" TO SET
 010506  032714  140000                  BIT     #ERROR!CRCERR,@TACS     ;ERROR AND CRCERR SHOULD BE = 0
 010512  001401                          BEQ     TST34           ;;BR IF THEY ARE
 010514  104001                          ERROR   1                       ;(ERROR ! CRCERR) = 1
                         ;////////////////////////////////////////////////////////////////
                         ;////////////////////////////////////////////////////////////////
                         ;THE FOLLOWING TESTS ARE USED TO INSURE THAT THE "CRC" CIRCUITRY FUNCTIONS PROPERLY
                         ;////////////////////////////////////////////////////////////////
                         ;;**************************************************************
                         ;*TEST 34        TEST "ERROR" WITH "CRCERR" = 1
                         ;;**************************************************************
 010516  000004          TST34:  SCOPE
 010520  012767  000012  170440          MOV     #10.,$TIMES     ;;DO 10. ITERATIONS
 010526  012767  010562  170352          MOV     #20$,$LPADR     ;;SET SCOPE LOOP ADDRESS
 010534  012767  010776  170426          MOV     #TST35,$ESCAPE  ;;ESCAPE TO TEST 35 ON ERROR
 010542  000005                          RESET
 010544  010314                          MOV     DRIVE,@TACS             ;SELECT DRIVE
 010546  112714  000017                  MOVB    #REWIND!GO,@TACS        ;GO TO CLEAR LEADER
 010552  104412                          WAITREADY                       ;WAIT ON "READY"
 010554  112714  000001                  MOVB    #WFG!GO,@TACS           ;GET OFF OF CLEAR LEADER
 010560  104412                          WAITREADY                       ;WAIT FOR READY
 010562  112714  000003          20$:    MOVB    #WRITE!GO,@TACS         ;START A WRITE
 010566  012700  000006                  MOV     #6,R0                   ;SETUP FOR 6 BYTES
 010572  104413                  1$:     WAITXFER                        ;WAIT ON "XFER REQ"
 010574  005300                          DEC     R0                      ;DOWN COUNT
 010576  002403                          BLT     2$                      ;DONE?
 010600  112715  000377                  MOVB    #377,@TADB              ;NO--WRITE ON TAPE
 010604  000772                          BR      1$                      ;LOOP
 010606  052714  000020          2$:     BIS     #ILBS,@TACS             ;WRITE "CRC"
 010612  104412                          WAITREADY                       ;WAIT ON "READY"
 010614  112714  000011                  MOVB    #BSBG!GO,@TACS          ;BACK OVER THE DATA BLOCK
 010620  104412                          WAITREADY                       ;WAIT ON "READY"
 010622  112714  000005                  MOVB    #READ!GO,@TACS          ;START A "READ"
 010626  012700  000003                  MOV     #3,R0                   ;DO 3 BYTES
 010632  104413                  3$:     WAITXFER                        ;WAIT FOR "XFER REQ"
 010634  005300                          DEC     R0                      ;COUNT # OF BYTES
 010636  002402                          BLT     4$
 010640  105715                          TSTB    @TADB                   ;CLEAR "XFER REQ"
 010642  000773                          BR      3$
 010644  052714  000020          4$:     BIS     #ILBS,@TACS             ;DO "ILBS"
 010650  104412                          WAITREADY                       ;WAIT ON "READY"
 010652  005714                          TST     @TACS                   ;CHECK FOR "ERROR"
 010654  100401                          BMI     5$                      ;BR IF "ERROR"
```

```
 1915  010656  104001                          ERROR   1                       ;"ERROR" BIT NOT SET
 1916  010660  032714  040000          5$:     BIT     #CRCERR,@TACS           ;CHECK FOR "CRC" ERROR
 1917  010664  001001                          BNE     6$                      ;BR IF "CRC" ERROR
 1918  010666  104001                          ERROR   1                       ;NO "CRC" ERROR
 1919                                  ;THE FOLLOWING CODE IS USED TO CHECK THE ROM
 1920  010670  112714  000000          6$:     MOVB    #WFG,@TACS              ;CHECK "ERROR" WITH "WFG"
 1921  010674  005714                          TST     @TACS                   ;SAMPLE THE "ERROR" BIT
 1922  010676  100001                          BPL     7$                      ;BR IF "ERROR" = 0
 1923  010700  104001                          ERROR   1                       ;"ERROR" NOT = 0
 1924  010702  112714  000002          7$:     MOVB    #WRITE,@TACS            ;CHECK "ERROR" WITH "WRITE"
 1925  010706  005714                          TST     @TACS                   ;SAMPLE THE "ERROR" BIT
 1926  010710  100401                          BMI     8$                      ;BR IF "ERROR" = 1
 1927  010712  104001                          ERROR   1                       ;"ERROR" NOT = 1
 1928  010714  112714  000006          8$:     MOVB    #BSFG,@TACS             ;CHECK "ERROR" WITH "BSFG"
 1929  010720  005714                          TST     @TACS                   ;SAMPLE THE "ERROR" BIT
 1930  010722  100001                          BPL     9$                      ;BR IF "ERROR" = 0
 1931  010724  104001                          ERROR   1                       ;"ERROR" NOT = 0
 1932  010726  112714  000010          9$:     MOVB    #BSBG,@TACS             ;CHECK "ERROR" WITH "BSBG"
 1933  010732  005714                          TST     @TACS                   ;SAMPLE THE "ERROR" BIT
 1934  010734  100001                          BPL     10$                     ;BR IF "ERROR" = 0
 1935  010736  104001                          ERROR   1                       ;"ERROR" NOT = 0
 1936  010740  112714  000012          10$:    MOVB    #SFFG,@TACS             ;CHECK "ERROR" WITH "SFFG"
 1937  010744  005714                          TST     @TACS                   ;SAMPLE THE "ERROR" BIT
 1938  010746  100001                          BPL     11$                     ;BR IF "ERROR" = 0
 1939  010750  104001                          ERROR   1                       ;"ERROR" NOT = 0
 1940  010752  112714  000014          11$:    MOVB    #SFBG,@TACS             ;CHECK "ERROR" WITH "SFBG"
 1941  010756  005714                          TST     @TACS                   ;SAMPLE THE "ERROR" BIT
 1942  010760  100001                          BPL     12$                     ;BR IF "ERROR" = 0
 1943  010762  104001                          ERROR   1                       ;"ERROR" NOT = 0
 1944  010764  112714  000016          12$:    MOVB    #REWIND,@TACS           ;CHECK "ERROR" WITH "REWIND"
 1945  010770  005714                          TST     @TACS                   ;SAMPLE THE "ERROR" BIT
 1946  010772  100001                          BPL     TST35           ;;BR IF "ERROR" = 0
 1947  010774  104001                          ERROR   1                       ;"ERROR" NOT = 0
 1948                                  ;;*****************************************************************
 1949                                  ;*TEST 35       TEST "DATA OF 0 GIVES CRC OF 0"
 1950                                  ;;*****************************************************************
 1951  010776  000004                  TST35:  SCOPE
 1952  011000  012767  000005  170160          MOV     #5,$TIMES       ;;DO 5 ITERATIONS
 1953  011006  012767  011034  170072          MOV     #6$,$LPADR      ;;SET SCOPE LOOP ADDRESS
 1954  011014  012767  011160  170146          MOV     #TST36,$ESCAPE  ;;ESCAPE TO TEST 36 ON ERROR
 1955  011022  000005                          RESET
 1956  011024  010314                          MOV     DRIVE,@TACS             ;SELECT DRIVE
 1957  011026  112714  000017                  MOVB    #REWIND!GO,@TACS        ;GO TO "CLEAR LEADER"
 1958  011032  104412                          WAITREADY                       ;WAIT ON "READY"
 1959  011034  112714  000003          6$:     MOVB    #WRITE!GO,@TACS         ;WRITE THE DATA
 1960  011040  104413                          WAITXFER                        ;WAIT ON "XFER REQ"
 1961  011042  105015                          CLRB    @TADB                   ;1ST BYTE = 0
 1962  011044  104413                          WAITXFER                        ;WAIT ON "XFER REQ"
 1963  011046  105015                          CLRB    @TADB                   ;2ND BYTE = 0
 1964  011050  104413                          WAITXFER                        ;WAIT ON "XFER REQ"
 1965  011052  052714  000020                  BIS     #ILBS,@TACS             ;WRITE "CRC"
 1966  011056  104412                          WAITREADY                       ;WAIT ON "READY"
 1967  011060  112714  000011                  MOVB    #BSBG!GO,@TACS          ;BACK OVER THE DATA
 1968  011064  104412                          WAITREADY                       ;WAIT ON "READY"
 1969  011066  112714  000005                  MOVB    #READ!GO,@TACS          ;START A "READ"
 1970  011072  104413                          WAITXFER                        ;WAIT ON "XFER REQ" FIRST
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        011074  005000                            CLR     R0                          ;SET R0 TO WHAT THE DATA SHOULD BE
        011076  011501                            MOV     @TADB,R1                    ;READ DATA BYTE
        011100  001401                            BEQ     1$                          ;BR IF DATA = 0
        011102  104005                            ERROR   5                           ;1ST BYTE NOT = 0
        011104  104413                    1$:     WAITXFER                            ;WAIT ON "XFER REQ"
        011106  011501                            MOV     @TADB,R1                    ;READ SECOND DATA BYTE
        011110  001401                            BEQ     2$                          ;BR IF 2ND BYTE = 0
        011112  104005                            ERROR   5                           ;DATA WASN'T = 0
        011114  104413                    2$:     WAITXFER                            ;WAIT ON "XFER REQ"
        011116  011501                            MOV     @TADB,R1                    ;READ FIRST CRC BYTE
        011120  001401                            BEQ     3$                          ;BR IF 1ST CRC BYTE = 0
        011122  104005                            ERROR   5                           ;1ST BYTE OF CRC BAD
        011124  104413                    3$:     WAITXFER                            ;WAIT ON "XFER REQ"
        011126  011501                            MOV     @TADB,R1                    ;READ SECOND CRC BYTE
        011130  001401                            BEQ     4$                          ;BR IF 2ND CRC BYTE = 0
        011132  104005                            ERROR   5                           ;2ND BYTE OF CRC BAD
        011134  052714  000020            4$:     BIS     #ILBS,@TACS
        011140  104412                            WAITREADY                           ;WAIT FOR "READY"
        011142  005714                            TST     @TACS                       ;"ERROR" SHOULD BE = 1
        011144  100401                            BMI     5$                          ;BR IF "ERROR" IS  = 1
        011146  104001                            ERROR   1
        011150  032714  040000            5$:     BIT     #CRCERR,@TACS               ;IS  THE ERROR  A "CRC" ERROR?
        011154  001001                            BNE     TST36           ;;GO TO NEXT TEST IF YES
        011156  104001                            ERROR   1                           ;THE ERROR WASN'T A "CRC" ERROR
                                          ;;*************************************************************
                                          ;;*TEST 36        TEST "CRC" CIRCUIT USING A COUNT PATTERN
                                          ;;*************************************************************
        011160  000004                    TST36:  SCOPE
        011162  012767  000012  167776            MOV     #10.,$TIMES     ;;DO 10. ITERATIONS
        011170  012767  011272  167710            MOV     #3$,$LPADR      ;;SET SCOPE LOOP ADDRESS
        011176  012767  011412  167764            MOV     #TST37,$ESCAPE  ;;ESCAPE TO TEST 37 ON ERROR
        011204  000005                            RESET                               ;CLEAR ALL
        011206  010314                            MOV     DRIVE,@TACS                 ;SELECT DRIVE
        011210  112714  000017                    MOVB    #REWIND!GO,@TACS            ;GO TO "BOT"
        011214  104412                            WAITREADY                           ;WAIT ON "READY" TO SET
        011216  112714  000001                    MOVB    #WFG!GO,@TACS               ;GET ON OXIDE
        011222  104412                            WAITREADY                           ;WAIT ON "READY" TO SET
        011224  012700  000377                    MOV     #377,R0                     ;FIRST DATA PATTERN AND COUNTER
        011230  112714  000003                    MOVB    #WRITE!GO,@TACS             ;START A WRITE
        011234  104413                            WAITXFER                            ;WAIT ON "XFER REQ" TO SET
        011236  010015                    1$:     MOV     R0,@TADB                    ;WRITE A BYTE ON TAPE
        011240  104413                            WAITXFER                            ;WAIT ON "XFER REQ" TO SET
        011242  011501                            MOV     @TADB,R1                    ;GET BACK THE LAST BYTE WRITTEN
        011244  020001                            CMP     R0,R1                       ;       AND CHECK IT
        011246  001401                            BEQ     2$                          ;BR IF IT LOOKS GOOD
        011250  104005                            ERROR   5                           ;THE DATA IN TADB WAS BAD
        011252  005300                    2$:     DEC     R0                          ;NEXT PATTERN
        011254  002370                            BGE     1$                          ;BR I  MORE TO DO
        011256  052714  000020                    BIS     #ILBS,@TACS                 ;WRIT  THE "CRC"
        011262  104412                            WAITREADY                           ;WAIT ON "READY" TO SET
        011264  005714                            TST     @TACS                       ;ANY ERRORS OCCUR?
        011266  100001                            BPL     3$                          ;BR IF NO
        011270  104001                            ERROR   1                           ;ERROR OCCURRED DURING WRITE
        011272  112714  000011            3$:     MOVB    #BSBG!GO,@TACS              ;BACK OVER THE DATA BLOCK
        011276  104412                            WAITREADY                           ;WAIT ON "READY" TO SET
        011300  112714  000005                    MOVB    #READ!GO,@TACS              ;START A "READ"
```

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002037  011304  012700  000377          MOV     #377,R0                 ;FIRST DATA PATTERN AND COUNTER
002038  011310  005037  013774          CLR     @#CRC.WD                ;INITIALIZES THE "CRC WORD"
002039  011314  004737  013654    4$:   JSR     PC,@#DO.CRC             ;COMBINE THIS BYTE [R0] WITH THE "CRC WORD"
002040  011320  104413                  WAITXFER                        ;WAIT ON "XFER REG" TO SET
002041  011322  011501                  MOV     @TADB,R1                ;READ A BYTE FROM TAPE
002042  011324  020001                  CMP     R0,R1                   ;IS IT VALID?
002043  011326  001401                  BEQ     5$                      ;BR IF YES
002044  011330  104005                  ERROR   5                       ;BAD DATA READ FROM TAPE
002045  011332  005300            5$:   DEC     R0                      ;NEXT PATTERN
002046  011334  002367                  BGE     4$                      ;BR IF MORE TO READ
002047  011336  005000                  CLR     R0                      ;GET LOW BYTE OF "CRC WORD"
002048  011340  153700  013774          BISB    @#CRC.WD,R0
002049  011344  104413                  WAITXFER                        ;WAIT ON "XFER REG" TO SET
002050  011346  052714  000020          BIS     #ILBS,@TACS             ;SHUT DOWN THE "READ" OPERATION
002051  011352  011501                  MOV     @TADB,R1                ;PICK FIRST BYTE OF TU60 "CRC"
002052  011354  020001                  CMP     R0,R1                   ;IS IT GOOD?
002053  011356  001401                  BEQ     6$                      ;BR IF YES
002054  011360  104005                  ERROR   5                       ;FIRST BYTE OF TU60 "CRC" IS BAD
002055  011362  005000            6$:   CLR     R0                      ;GET HIGH BYTE OF "CRC WORD"
002056  011364  153700  013775          BISB    @#CRC.WD+1,R0
002057  011370  104412                  WAITREADY                       ;WAIT ON "READY" TO SET
002058  011372  011501                  MOV     @TADB,R1                ;READ THE 2ND BYTE OF TU60 "CRC"
002059  011374  020001                  CMP     R0,R1                   ;IS IT GOOD?
002060  011376  001401                  BEQ     7$                      ;BR IF YES
002061  011400  104005                  ERROR   5                       ;HIGH BYTE OF "CRC" IS BAD
002062  011402  032714  140000    7$:   BIT     #ERROR!CRCERR,@TACS     ;ERROR AND CRCERR SHOULD BE = 1
002063  011406  001401                  BEQ     TST37           ;BR IF THEY ARE
002064  011410  104001                  ERROR   1                       ;(ERROR ! CRCERR) = 1
002065                          ;;*****************************************************************
002066                          ;THIS TEST REQUIRES BOTH DRIVES .
002067                          ;FOR THE FOLLOWING DESCRIPTION DRIVE "1" IS THE DRIVE UNDER TEST
002068                          ;AND DRIVE "2" IS THE OTHER DRIVE
002069                          ;
002070                          ;TEST DESCRIPTION
002071                          ;1)     REWIND DRIVE 1
002072                          ;2)     WAIT FOR READY TO SET
002073                          ;3)     START DRIVE 2 REWINDING
002074                          ;4)     WAIT FOR READY TO CLEAR
002075                          ;5)     SELECT DRIVE 1  AND CHECK THAT READY IS STILL SET
002076                          ;6)     SELECT DRIVE 2 AND CHECK THAT READY IS STILL CLEAR
002077                          ;
002078                          ;;*****************************************************************
002079                          ;TEST 37        TRY TO HANG "READY" ON "REWIND"
002080                          ;;*****************************************************************
002081  011412  000004          TST37:  SCOPE
002082  011414  012767  000005  167544          MOV     #5,$TIMES       ;;DO 5 ITERATIONS
002083  011422  012767  011436  167456          MOV     #1$,$LPADR      ;;SET SCOPE LOOP ADDRESS
002084  011430  012767  011552  167532          MOV     #TST40,$ESCAPE  ;;ESCAPE TO TEST 40 ON ERROR
002085  011436  105737  001225          1$:     TSTB    @#DRVKEY+1              ;TESTING TWO DRIVES?
002086  011442  001443                  BEQ     TST40           ;;BR IF NO
002087  011444  012701  000001          MOV     #1,R1                   ;SET TIMER
002088  011450  010302                  MOV     DRIVE,R2                ;SET R2 TO THE OTHER DRIVE
002089  011452  062702  000400          ADD     #UNIT,R2
002090  011456  042702  177377          BIC     #^CUNIT,R2
002091  011462  000005                  RESET                           ;CLEAR ALL
002092  011464  010314                  MOV     DRIVE,@TACS             ;SELECT 1ST DRIVE
```

```
002083  011466  104412                    WAITREADY                       ;WAIT ON "READY"
002084  011470  010214                    MOV     R2,@TACS                ;SELECT 2ND DRIVE
002085  011472  104412                    WAITREADY                       ;WAIT ON "READY"
002086  011474  112714  000017            MOVB    #REWIND!GO,@TACS        ;SEND 2ND DRIVE TO BOT
002087  011500  006301              2$:   ASL     R1                      ;GIVE "READY" TIME TO CLEAR
002088  011502  001001                    BNE     3$
002089  011504  104001                    ERROR   1                       ;"READY" FAILED TO CLEAR
002090                                                                    ;NOTE:  THIS ERROR OCCURRED ON THE
002091                                                                    ;2ND DRIVE. I.E. IF TESTING DRIVE A
002092                                                                    ;THEN DRIVE B FAILED
002093  011506  032714  000040        3$:   BIT     #READY,@TACS            ;WAIT FOR "READY" TO CLEAR
002094  011512  001372                    BNE     2$
002095  011514  010314                    MOV     DRIVE,@TACS             ;SELECT 1ST DRIVE
002096  011516  112714  000016            MOVB    #REWIND,@TACS           ;LOAD A "REWIND"
002097  011522  032714  000040            BIT     #READY,@TACS            ;CHECK "READY"
002098  011526  001001                    BNE     4$                      ;BR IF STILL SET
002099  011530  104001                    ERROR   1                       ;"READY" WAS CLEAR
002100  011532  010214              4$:   MOV     R2,@TACS                ;SELECT 2ND DRIVE
002101  011534  112714  000016            MOVB    #REWIND,@TACS           ;LOAD A REWIND
002102  011540  032714  000040            BIT     #READY,@TACS            ;CHECK "READY"
002103  011544  001401                    BEQ     5$                      ;BR IF STILL CLEAR
002104  011546  104001                    ERROR   1                       ;"READY" WAS SET
002105  011550  104412              5$:   WAITREADY                       ;WAIT ON "READY"
002106                                ;;**********************************************************************
002107                                ;THIS TEST REQUIRES BOTH DRIVES .
002108                                ;FOR THE FOLLOWING DESCRIPTION DRIVE "1" IS THE DRIVE UNDER TEST
002109                                ;AND DRIVE "2" IS THE OTHER DRIVE
002110                                ;
002111                                ;TEST DESCRIPTION
002112                                ;1)     REWIND DRIVE 1
002113                                ;2)     WFG ON DRIVE 1
002114                                ;3)     START A REWIND ON DRIVE 2
002115                                ;4)     WHILE DRIVE 2 IS REWINDING WRITE DATA ON DRIVE 1
002116                                ;5)     CHECK FOR ERRORS
002117                                ;6)     START A REWIND ON DRIVE 2
002118                                ;7)     WHILE DRIVE 2 IS REWINDING READ DATA FROM DRIVE 1
002119                                ;8)     CHECK FOR ERRORS
002120                                ;
002121                                ;;**********************************************************************
002122                                ;*TEST 40       TRY TO GLITCH THE "POWER SUPPLY"
002123                                ;;**********************************************************************
002124  011552  000004                TST40:  SCOPE
002125  011554  012767  000005  167404        MOV     #5,$TIMES       ;;DO 5 ITERATIONS
002126  011562  012767  011576  167316        MOV     #1$,$LPADR      ;;SET SCOPE LOOP ADDRESS
002127  011570  012767  012134  167372        MOV     #TST41,$ESCAPE  ;;ESCAPE TO TEST 41 ON ERROR
002128  011576  105737  001225        1$:   TSTB    @#DRVKEY+1                ;TESTING TWO DRIVES?
002129  011602  001554                    BEQ     TST41           ;;BR IF NO
002130  011604  012701  000001            MOV     #1,R1                     ;SET TIMER
002131  011610  010302                    MOV     DRIVE,R2                  ;SET R2 TO THE OTHER DRIVE
002132  011612  062702  000400            ADD     #UNIT,R2
002133  011616  042702  177377            BIC     #^CUNIT,R2
002134  011622  000005                    RESET                             ;CLEAR ALL
002135  011624  010314                    MOV     DRIVE,@TACS               ;SELECT 1ST DRIVE
002136  011626  112714  000017            MOVB    #REWIND!GO,@TACS          ;REWIND TO BOT
002137  011632  104412                    WAITREADY                         ;WAIT ON "READY"
002138  011634  112714  000001            MOVB    #WFG!GO,@TACS             ;GET ON OXIDE
```

```
                                                WHITREADY                       ;WAIT ON "READY"
011640  104413                                  MOV     R2,@TACS                ;SELECT 2ND DRIVE
011642  010214                                  WAITREADY                       ;WAIT ON "READY"
011644  104412                                  MOVB    #REWIND!GO,@TACS        ;START A "REWIND"
011646  112714  000017                          ASL     R1                      ;GIVE "READY" TIME TO CLEAR
011652  006301                          2$:     BNE     3$
011654  001001                                  ERROR   1                       ;"READY" FAILED TO CLEAR
011656  104001                                                                  ;NOTE:  THIS ERROR OCCURRED ON THE
                                                                                ;2ND DRIVE. I.E. IF TESTING DRIVE A
                                                                                ;THEN DRIVE B FAILED
011660  032714  000040                  3$:     BIT     #READY,@TACS            ;WAIT FOR "READY" TO CLEAR
011664  001372                                  BNE     2$
011666  010314                                  MOV     DRIVE,@TACS             ;SELECT 1ST DRIVE
011670  112714  000003                          MOVB    #WRITE!GO,@TACS         ;WRITE WHILE THE OTHER DRIVE IS "REWINDING"
011674  104413                                  WAITXFER                        ;WAIT ON "XFER REQ"
011676  112715  000377                          MOVB    #377,@TADB              ;WRITE 1ST BYTE
011702  104413                                  WAITXFER                        ;WAIT ON "XFER REQ"
011704  105015                                  CLRB    @TADB                   ;WRITE 2ND BYTE
011706  104413                                  WAITXFER                        ;WAIT ON "XFER REQ"
011710  052714  000020                          BIS     #ILBS,@TACS             ;WRITE "CRC" & SHUT DOWN
011714  104412                                  WAITREADY                       ;WAIT ON "READY"
011716  005714                                  TST     @TACS                   ;ANY ERROR?
011720  100001                                  BPL     4$                      ;BR IF NO
011722  104001                                  ERROR   1                       ;ERROR OCCURRED DURING "WRITE"
011724  112714  000011                  4$:     MOVB    #BSBG!GO,@TACS          ;POSITION TAPE FOR "READ"
011730  104412                                  WAITREADY                       ;WAIT ON "READY"
011732  005714                                  TST     @TACS                   ;ANY ERROR?
011734  100001                                  BPL     5$                      ;BR IF NO
011736  104001                                  ERROR   1                       ;ERROR OCCURRED DURING "BSBG"
011740  112714  000005                  5$:     MOVB    #READ!GO,@TACS          ;START A "READ"
011744  104413                                  WAITXFER                        ;WAIT ON "XFER REQ"
011746  012700  000377                          MOV     #377,R0                 ;FIRST DATA PATTERN
011752  011501                                  MOV     @TADB,R1                ;PICKUP FIST BYTE
011754  020001                                  CMP     R0,R1                   ;IS IT GOOD?
011756  001401                                  BEQ     6$                      ;BR IF NO
011760  104005                                  ERROR   5                       ;1ST DATA BYTE IS BAD
011762  104413                          6$:     WAITXFER                        ;WAIT ON "XFER REQ"
011764  005000                                  CLR     R0                      ;2ND DATA PATTERN
011766  011501                                  MOV     @TADB,R1                ;PICKUP 2ND BYTE
011770  001401                                  BEQ     7$                      ;BR IF IT IS GOOD
011772  104005                                  ERROR   5                       ;2ND BYTE IS BAD
011774  104413                          7$:     WAITXFER                        ;WAIT ON "XFER REQ"
011776  052714  000020                          BIS     #ILBS,@TACS             ;SHUT DOWN
012002  104412                                  WAITREADY                       ;WAIT ON "READY"
012004  005714                                  TST     @TACS                   ;ERROR?
012006  100001                                  BPL     8$                      ;BR IF NO
012010  104001                                  ERROR   1                       ;ERROR OCCURRED
012012  112714  000011                  8$:     MOVB    #BSBG!GO,@TACS          ;POSITION FOR NEXT "READ"
012016  104412                                  WAITREADY                       ;WAIT ON "READY"
012020  005714                                  TST     @TACS                   ;ERROR?
012022  100001                                  BPL     9$                      ;BR IF NO
012024  104001                                  ERROR   1                       ;ERROR OCCURRED DURING "BSBG
012026  010214                          9$:     MOV     R2,@TACS                ;SELECT 2ND DRIVE
012030  104412                                  WAITREADY                       ;WAIT ON "READY"
012032  112714  000017                          MOVB    #REWIND!GO,@TACS        ;START A "REWIND"
012036  012701  000001                          MOV     #1,R1                   ;SET THE TIMER
```

```
002196  012042  005201                 1C$:    INC     R1                      ;GIVE "READY" TIME TO CLEAR
002196  012044  001001                         BNE     11$
002197  012046  104001                         ERROR   1                       ;"READY" FAILED TO CLEAR
002198                                                                          ;NOTE:  THIS ERROR OCCURRED ON THE
002199                                                                          ;2ND DRIVE. I.E. IF TESTING DRIVE A
002200                                                                          ;THEN DRIVE B FAILED
002201  012050  032714  000040          11$:    BIT     #READY,@TACS            ;WAIT FOR "READY" TO CLEAR
002202  012054  001372                         BNE     10$
002203  012056  010314                         MOV     DRIVE,@TACS             ;SELECT 1ST DRIVE
002204  012060  104412                         WAITREADY                       ;WAIT ON "READY"
002205  012062  112714  000005                 MOVB    #READ!GO,@TACS          ;"READ" WHILE OTHER DRIVE IS "REWINDING"
002206  012066  104413                         WAITXFER                        ;WAIT ON "XFER REQ"
002207  012070  012700  000377                 MOV     #377,R0                 ;1ST DATA PATTERN
002208  012074  011501                         MOV     @TADB,R1                ;READ 1ST BYTE
002209  012076  020001                         CMP     R0,R1                   ;IS IT GOOD?
002210  012100  001401                         BEQ     12$                     ;BR IF NO
002211  012102  104005                         ERROR   5                       ;1ST BYTE FAILED
002212  012104  104413                 12$:    WAITXFER                        ;WAIT ON "XFER REQ"
002213  012106  005000                         CLR     R0                      ;2ND DATA PATTERN
002214  012110  011501                         MOV     @TADB,R1                ;READ 2ND BYTE
002215  012112  001401                         BEQ     13$                     ;BR IF IT IS GOOD
002216  012114  104005                         ERROR   5                       ;2ND BYTE FAILED
002217  012116  104413                 13$:    WAITXFER                        ;WAIT ON "XFER REQ"
002218  012120  052714  000020                 BIS     #ILBS,@TACS             ;SHUT DOWN
002219  012124  104412                         WAITREADY                       ;WAIT ON "READY"
002220  012126  005714                         TST     @TACS                   ;ERROR?
002221  012130  100001                         BPL     TST41           ;;BR IF NO
002222  012132  104001                         ERROR   1                       ;ERROR OCCURRED
002223                                 ;;*****************************************************************
002224                                 ;*TEST 41        END OF TEST CODE
002225                                 ;;*****************************************************************
002226  012134  000004                 TST41:  SCOPE
002227  012136  012767  000001  167022         MOV     #1,$TIMES       ;;DO 1 ITERATION
002228  012144  000005                         RESET
002229  012146  010314                         MOV     DRIVE,@TACS             ;SELECT DRIVE
002230  012150  112714  000017                 MOVB    #REWIND!GO,@TACS
002231  012154  104412                         WAITREADY
002232                                 .SBTTL  END OF PASS ROUTINE
002233
002234                                 ;;*****************************************************************
002235                                 ;*INCREMENT THE PASS NUMBER ($PASS)
002236                                 ;*TYPE "END PASS"
002237                                 ;*IF THERES A MONITOR GO TO IT
002238                                 ;*IF THERE ISN'T JUMP TO START
002239                                 ;*IF IT IS DESIRED TO HAVE A BELL INDICATE THE "END OF PASS" LOCATION
002240                                 ;*$ENDMG CAN BE CHANGED TO 7.
002241
002242  012156                         $EOP:
002243  012156  000004                         SCOPE
002244  012160  005067  166716                 CLR     $TSTNM          ;;ZERO THE TEST NUMBER
002245  012164  005067  166776                 CLR     $TIMES          ;;ZERO THE NUMBER OF ITERATIONS
002246  012170  005267  166704                 INC     $PASS           ;;INCREMENT THE PASS NUMBER
002247  012174  042767  100000  166676         BIC     #100000,$PASS   ;;DON'T ALLOW A NEG. NUMBER
002248  012202  005327                         DEC     (PC)+           ;;LOOP?
002249  012204  000001                 $EOPCT: .WORD   1
002250  012206  003015                         BGT     $DOAG           ;;YES
```

```
012210  012737                      MOV     (PC)+,@(PC)+      ;;RESTORE COUNTER
012212  000001             $ENDCT:  .WORD   1
012214  012204                      $EOPCT
012216  104401  012251              TYPE    ,$ENDMG           ;;TYPE "END PASS"
012222  013700  000042     $GET42:  MOV     @#42,R0           ;;GET MONITOR ADDRESS
012226  001405                      BEQ     $DOAGN            ;;BRANCH IF NO MONITOR
012230  000005                      RESET                     ;;CLEAR THE WORLD
012232  004710             $ENDAD:  JSR     PC,(R0)           ;;GO TO MONITOR
012234  000240                      NOP                       ;;SAVE ROOM
012236  000240                      NOP                       ;;FOR
012240  000240                      NOP                       ;;ACT11
012242                     $DOAGN:
012242  000137                      JMP     @(PC)+            ;;RETURN
012244  002220             $RTNAD:  .WORD   START
012246     377     377     000  $ENULL:  .BYTE   -1,-1,0           ;;NULL CHARACTER STRING
012251     015  042412  042116  $ENDMG:  .ASCIZ  <15><12>/END PASS/
012256  050040  051501  000123
```

```
                                .SBTTL  SCOPE HANDLER ROUTINE

                                ;;**************************************************************
                                ;*THIS ROUTINE CONTROLS THE LOOPING OF SUBTESTS. IT WILL INCREMENT
                                ;*AND LOAD THE TEST NUMBER($TSTNM) INTO THE DISPLAY REG.(DISPLAY<7:0>)
                                ;*AND LOAD THE ERROR FLAG ($ERFLG) INTO DISPLAY<15:08>
                                ;*THE SWITCH OPTIONS PROVIDED BY THIS ROUTINE ARE:
                                ;*SW14=1         LOOP ON TEST
                                ;*SW11=1         INHIBIT ITERATIONS
                                ;*SW09=1         LOOP ON ERROR
                                ;*SW08=1         LOOP ON TEST IN SWR<7:0>
                                ;*CALL
                                ;*      SCOPE           ;;SCOPE=IOT

012264                          $SCOPE:
012264  104406                          CKSWR                   ;;TEST  FOR CHANGE IN SOFT-SWR
012266  032777  040000  166644  1$:     BIT     #BIT14,@SWR     ;;LOOP ON PRESENT TEST?
012274  001111                          BNE     $OVER           ;;YES IF SW14=1
                                ;*****START OF CODE FOR THE XOR TESTER*****
012276  000416                  $XTSTR: BR      6$              ;;IF RUNNING ON THE "XOR" TESTER CHANGE
                                                                ;;THIS INSTRUCTION TO A "NOP" (NOP=240)
012300  013746  000004                  MOV     @#ERRVEC,-(SP)  ;;SAVE THE CONTENTS OF THE ERROR VECTOR
012304  012737  012324  000004          MOV     #5$,@#ERRVEC    ;;SET FOR TIMEOUT
012312  005737  177060                  TST     @#177060        ;;TIME OUT ON XOR'
012316  012637  000004                  MOV     (SP)+,@#ERRVEC  ;;RESTORE THE ERROR VECTOR
012322  000463                          BR      $SVLAD          ;;GO TO THE NEXT TEST
012324  022626                  5$:     CMP     (SP)+,(SP)+     ;;CLEAR THE STACK AFTER A TIME OUT
012326  012637  000004                  MOV     (SP)+,@#ERRVEC  ;;RESTORE THE ERROR VECTOR
012332  000423                          BR      7$              ;;LOOP ON THE PRESENT TEST
012334                          6$:;*****END OF CODE FOR THE XOR TESTER*****
012334  032777  000400  165576          BIT     #BIT08,@SWR     ;;LOOP ON SPEC. TEST?
012342  001404                          BEQ     2$              ;;BR IF NO
012344  127767  166570  166530          CMPB    @SWR,$TSTNM     ;;ON THE RIGHT TEST?    SWR<7:0>
012352  001462                          BEQ     $OVER           ;;BR IF YES
012354  105767  166523          2$:     TSTB    $ERFLG          ;;HAS AN ERROR OCCURRED?
012360  001421                          BEQ     3$              ;;BR IF NO
012362  126767  166527  166513          CMPB    $ERMAX,$ERFLG   ;;MAX. ERRORS FOR THIS TEST OCCURRED?
012370  101015                          BHI     3$              ;;BR IF NO
012372  032777  001000  166540          BIT     #BIT09,@SWR     ;;LOOP ON ERROR?
012400  001404                          BEQ     4$              ;;BR IF NO
012402  016767  166502  166476  7$:     MOV     $LPERR,$LPADR   ;;SET LOOP ADDRESS TO LAST SCOPE
012410  000443                          BR      $OVER
012412  105067  166465          4$:     CLRB    $ERFLG          ;;ZERO THE ERROR FLAG
012416  005067  166544                  CLR     $TIMES          ;;CLEAR THE NUMBER OF ITERATIONS TO MAKE
012422  000415                          BR      1$              ;;ESCAPE TO THE NEXT TEST
012424  032777  004000  166506  3$:     BIT     #BIT11,@SWR     ;;INHIBIT ITERATIONS?
012432  001011                          BNE     1$              ;;BR IF YES
012434  005767  166440                  TST     $PASS           ;;IF FIRST PASS OF PROGRAM
012440  001406                          BEQ     1$              ;;      INHIBIT ITERATIONS
012442  005267  166436                  INC     $ICNT           ;;INCREMENT ITERATION COUNT
012446  026767  166514  166430          CMP     $TIMES,$ICNT    ;;CHECK THE NUMBER OF ITERATIONS MADE
012454  002021                          BGE     $OVER           ;;BR IF MORE ITERATION REQUIRED
012456  012767  000001  166420  1$:     MOV     #1,$ICNT        ;;REINITIALIZE THE ITERATION COUNTER
012464  016767  000044  166474          MOV     $MXCNT,$TIMES   ;;SET NUMBER OF ITERATIONS TO DO
012472  105267  166404          $SVLAD: INCB    $TSTNM          ;;COUNT TEST NUMBERS
012476  011667  166404                  MOV     (SP),$LPADR     ;;SAVE SCOPE LOOP ADDRESS
```

```
 2324  012502  011667  166402                  MOV     (SP),$LPERR     ;;SAVE ERROR LOOP ADDRESS
 2325  012506  005067  166456                  CLR     $ESCAPE         ;;CLEAR THE ESCAPE FROM ERROR ADDRESS
 2326  012512  112767  000001  166375          MOVB    #1,$ERMAX       ;;ONLY ALLOW ONE(1) ERROR ON NEXT TEST
 2327  012520  016777  166356  166414  $OVER:  MOV     $TSTNM,@DISPLAY ;;DISPLAY TEST NUMBER
 2328  012526  016716  166354                  MOV     $LPADR,(SP)     ;;FUDGE RETURN ADDRESS
 2329  012532  000002                          RTI                     ;;FIXES PS
 2330  012534  003720                  $MXCNT: 2000.                   ;;MAX. NUMBER OF ITERATIONS
```

```
                                        .SBTTL  ERROR HANDLER ROUTINE

                                        ;;**************************************************************
                                        ;*THIS ROUTINE WILL INCREMENT THE ERROR FLAG AND THE ERROR COUNT,
                                        ;*SAVE THE ERROR ITEM NUMBER AND THE ADDRESS OF THE ERROR CALL
                                        ;*AND GO TO TYPERR ON ERROR
                                        ;*THE SWITCH OPTIONS PROVIDED BY THIS ROUTINE ARE:
                                        ;*SW15=1         HALT ON ERROR
                                        ;*SW13=1         INHIBIT ERROR TYPEOUTS
                                        ;*SW10=1         BELL ON ERROR
                                        ;*SW09=1         LOOP ON ERROR
                                        ;*CALL
                                        ;*      ERROR   N       ;;ERROR=EMT AND N=ERROR ITEM NUMBER

012536                                  $ERROR:
012536  104406                                 CKSWR                   ;;TEST FOR CHANGE IN SOFT-SWR
012540  011437  001162                         MOV     @TACS,@#$REG0           ;SAVE THE STATUS REG.
012544  011537  001164                         MOV     @TADB,@#$REG1           ;SAVE THE DATA BUFFER
012550  010037  001124                         MOV     R0,@#$GDDAT             ;R0 WILL CONTAIN THE GOOD DATA
012554  010137  001126                         MOV     R1,@#$BDDAT             ;R1 WILL CONTAIN THE BAD DATA
012560  105267  166317                 7$:     INCB    $ERFLG          ;;SET THE ERROR FLAG
012564  001775                               BEQ     7$              ;;DON'T LET THE FLAG GO TO ZERO
012566  016777  166310  166346               MOV     $TSTNM,@DISPLAY ;;DISPLAY TEST NUMBER AND ERROR FLAG
012574  032777  002000  166336               BIT     #BIT10,@SWR     ;;BELL ON ERROR?
012602  001402                               BEQ     1$              ;;NO - SKIP
012604  104401  001172                       TYPE    ,$BELL          ;;RING BELL
012610  005267  166276                 1$:     INC     $ERTTL          ;;COUNT THE NUMBER OF ERRORS
012614  011667  166276                       MOV     (SP),$ERRPC     ;;GET ADDRESS OF ERROR INSTRUCTION
012620  162767  000002  166270               SUB     #2,$ERRPC
012626  117767  166264  166260               MOVB    @$ERRPC,$ITEMB  ;;STRIP AND SAVE THE ERROR ITEM CODE
012634  032777  020000  166276               BIT     #BIT13,@SWR     ;;SKIP TYPEOUT IF SET
012642  001004                               BNE     20$             ;;SKIP TYPEOUTS
012644  004767  000060                       JSR     PC,TYPERR       ;;GO TO USER ERROR ROUTINE
012650  104401  001177                       TYPE    ,$CRLF
012654                                  20$:
012654  005777  166260                 2$:     TST     @SWR            ;;HALT ON ERROR
012660  100002                               BPL     3$              ;;SKIP IF CONTINUE
012662  000000                               HALT                    ;;HALT ON ERROR!
012664  104406                               CKSWR                   ;;TEST FOR CHANGE IN SOFT-SWR
012666  032777  001000  166244         3$:     BIT     #BIT09,@SWR     ;;LOOP ON ERROR SWITCH SET?
012674  001402                               BEQ     4$              ;;BR IF NO
012676  016716  166206                       MOV     $LPERR,(SP)     ;;FUDGE RETURN FOR LOOPING
012702  005767  166262                 4$:     TST     $ESCAPE         ;;CHECK FOR AN ESCAPE ADDRESS
012706  001402                               BEQ     5$              ;;BR IF NONE
012710  016716  166254                       MOV     $ESCAPE,(SP)    ;;FUDGE RETURN ADDRESS FOR ESCAPE
012714                                  5$:
012714  022737  012232  000042               CMP     #$ENDAD,@#42    ;;ACT-11 AUTO-ACCEPT?
012722  001001                               BNE     6$              ;;BRANCH IF NO
012724  000000                               HALT                    ;;YES
012726                                  6$:
012726  000002                               RTI                     ;;RETURN
```

```
                                ;;*****************************************************************
                                ;THIS ROUTINE WILL TYPEOUT THE ERROR MESSAGES

012730  104401  001177  TYPERR: TYPE    ,$CRLF                  ;TYPE A CARRIAGE RETURN & LINE FEED
012734  010046                   MOV     R0,-(SP)                ;SAVE R0
012736  113700  001114           MOVB    @#$ITEMB,R0             ;PICKUP THE ITEM INDEX
012742  005300                   DEC     R0                      ;ADJUST THE INDEX
012744  006300                   ASL     R0                      ;SO IT WILL WORK FOR
012746  006300                   ASL     R0                      ;THE ERROR TABLE
012750  006300                   ASL     R0
012752  062700  001236           ADD     #$ERRTB,R0              ;FORM THE TABLE POINTER
012756  012067  000002           MOV     (R0)+,1$                ;PICKUP "ERROR MESSAGE" POINTER
012762  104401                   TYPE                            ;TYPE "ERROR MESSAGE"
012764  000000           1$:     0                               ;"ERROR MESSAGE POINTER" GOES HERE
012766  104401  001177           TYPE    ,$CRLF
012772  012067  000004           MOV     (R0)+,2$                ;PICKUP "DATA HEADER" POINTER
012776  001404                   BEQ     3$                      ;IF "0" DON'T TYPE
013000  104401                   TYPE                            ;TYPE "DATA HEADER
013002  000000           2$:     0                               ;"DATA HEADER" POINTER GOES HERE
013004  104401  001177           TYPE    ,$CRLF
013010  012000           3$:     MOV     (R0)+,R0                ;PICKUP "DATA POINTER"
013012  001004                   BNE     5$                      ;IF THERE IS DATA TO TYPE GO DO IT
013014  012600           4$:     MOV     (SP)+,R0                ;RESTORE R0
013016  104401  001177           TYPE    ,$CRLF                  ;TYPE A CARRAGE RETURN&LINE FEED
013022  000207                   RTS     PC                      ;RETURN
013024                   5$:
013024  013046                   MOV     @(R0)+,-(SP)    ;;SAVE @(R0)+ FOR TYPEOUT
                                                         ;;TYPE DATA
013026  104402                   TYPOC                   ;;GO TYPE--OCTAL ASCII(ALL DIGITS)
013030  005710                   TST     (R0)                    ;TERMINATOR?
013032  001770                   BEQ     4$                      ;BR IF YES
013034  104401  013042           TYPE    ,6$                     ;TYPE 2 SPACES
013040  000771                   BR      5$                      ;LOOP
013042  020040      000  6$:     .ASCIZ  /  /                    ;ASCII STRING OF 2 SPACES
013046                           .EVEN
```

```
                                        ;;*************************************************************
                                        ;ROUTINE TO WAIT ON THE READY BIT
                                        
013046                                  WAIT.ON.READY:
013046  005067  000044                          CLR     WAIT2                   ;SETUP MAX. TIME TO WAIT ON "READY"
013052  016767  000072  000044                  MOV     MAXCNT,HGHTIM
013060  012637  001202                          MOV     (SP)+,@#SAVPC           ;GET THE PC OF THE WAITREADY INSTRUCTION
013064  162737  000002  001202                  SUB     #2,@#SAVPC
013072  012637  001204                          MOV     (SP)+,@#SAVPS           ;SAVE THE PS
013076  032714  000040                  WAIT1:  BIT     #READY,@TACS            ;READY=1?
013102  001013                                  BNE     WAIT3                   ;GO ON IF YES
013104  105714                                  TSTB    @TACS                   ;CHECK TRANSFER REQUEST
013106  100002                                  BPL     WAIT4
013110  104004                                  ERROR   4                       ;"TRANSFER REQUEST" SET WHILE WAITING ON "READY"
013112  000407                                  BR      WAIT3
013114  005227                          WAIT4:  INC     (PC)+                   ;COUNT FAST COUNTER
013116  000000                          WAIT2:  0
013120  001366                                  BNE     WAIT1                   ;GO CHECK "READY" AGAIN
013122  005327                                  DEC     (PC)+                   ;COUNT LOOP COUNTER
013124  000000                          HGHTIM: 0
013126  003363                                  BGT     WAIT1                   ;GO LOOP AGAIN
013130  104002                                  ERROR   2                       ;"READY" FAILED TO SET
013132  013746  001204                  WAIT3:  MOV     @#SAVPS,-(SP)           ;GET THE STATUS BACK
013136  013746  001202                          MOV     @#SAVPC,-(SP)           ;GET THE PC
013142  062716  000002                          ADD     #2,(SP)
013146  000002                                  RTI
013150  000000                          MAXCNT: 0
                                        
                                        ;;*************************************************************
                                        ;ROUTINE TO WAIT ON TRANSFER REQUEST
                                        
013152                                  WAIT.FOR.XFER.REQ:
013152  005067  000044                          CLR     2$                      ;SETUP WASTE TIME LOOP
013156  013767  013150  000044                  MOV     @#MAXCNT,3$
013164  012637  001202                          MOV     (SP)+,@#SAVPC           ;GET THE PC OF THE WAITXFER INSTRUCTION
013170  162737  000002  001202                  SUB     #2,@#SAVPC
013176  012637  001204                          MOV     (SP)+,@#SAVPS           ;SAVE THE PS
013202  105714                          1$:     TSTB    @TACS                   ;CHECK XFER REQ
013204  100414                                  BMI     4$                      ;EXIT IF SET
013206  032714  000040                          BIT     #READY,@TACS            ;LOOK AT READY
013212  001402                                  BEQ     5$                      ;BR IF "READY" ISN'T SET
013214  104004                                  ERROR   4                       ;"READY" SET WHILE WAITING FOR "XFER REQ"
013216  000407                                  BR      4$
013220  005227                          5$:     INC     (PC)+                   ;COUNT
013222  000000                          2$:     0
013224  001366                                  BNE     1$                      ;BR IF MORE TO DO
013226  005327                                  DEC     (PC)+
013230  000000                          3$:     0
013232  003363                                  BGT     1$
013234  104003                                  ERROR   3                       ;"TRANSFER REQUEST" FAILED TO SET
013236  013746  001204                  4$:     MOV     @#SAVPS,-(SP)           ;GET THE STATUS BACK
013242  013746  001202                          MOV     @#SAVPC,-(SP)           ;GET THE PC
013246  062716  000002                          ADD     #2,(SP)
013252  000002                                  RTI                             ;GO BACK
```

```
                        ;;*****************************************************************
                        .SBTTL          ROUTINE TO ASK THE OPERATOR WHAT DRIVE(S) TO TEST

                        ;CALL
                        ;       JSR     PC,@#ASKDRV
                        ;       RETURN                  ;NOTE: R0 AND R1 ARE DESTROYED

013254  104401  016744  ASKDRV: TYPE    ,MSGDRV                 ;<CRLF>"DRIVE(S)? "
013260  005067  165740          CLR     DRVKEY
013264  104410                  RDLIN                           ;GO GET A DRIVE
013266  012600                  MOV     (SP)+,R0                ;SETUP TO CHECK FOR VALID DRIVE(S)
013270  105710                  TSTB    @R0                     ;WAS A DRIVE SELECTED?
013272  001425                  BEQ     NOTLGL                  ;BR IF NO
013274  012701  001224          MOV     #DRVKEY,R1
013300  122710  000101  LOOP:   CMPB    #'A,@R0                 ;WAS DRIVE "A" SELECTED?
013304  001002                  BNE     NOTA                    ;BR IF NO
013306  112021                  MOVB    (R0)+,(R1)+             ;SET KEY FOR DRIVE "A"
013310  000411                  BR      NEXT
013312  122710  000102  NOTA:   CMPB    #'B,@R0                 ;WAS DRIVE "B" SELECTED?
013316  001002                  BNE     NOTB                    ;BR IF NO
013320  112021                  MOVB    (R0)+,(R1)+             ;SET KEY FOR DRIVE "B"
013322  000404                  BR      NEXT
013324  122710  000054  NOTB:   CMPB    #54,@R0                 ;WAS A COMMA TYPED?
013330  001006                  BNE     NOTLGL                  ;BR IF NO
013332  105720                  TSTB    (R0)+                   ;DUMP THE COMMA
013334  105710  NEXT:   TSTB    @R0                     ;TERMINATOR?
013336  001406                  BEQ     EXIT                    ;BR IF YES
013340  022701  001226          CMP     #DRVKEY+2,R1            ;TWO DRIVES SELECTED?
013344  101355                  BHI     LOOP                    ;BR IF NO
013346  104401  001176  NOTLGL: TYPE    ,$QUES                  ;ILLEGAL INPUT DETECTED
013352  000740                  BR      ASKDRV                  ;GO TRY AGAIN
013354  005767  165644  EXIT:   TST     DRVKEY                  ;ANY DRIVE SELECTED?
013360  001772                  BEQ     NOTLGL                  ;BR IF NO
013362  000207                  RTS     PC

                        ;;*****************************************************************
                        ;
                        ;CALL
                        ;JSR     PC,@#ASKADR

013364  010046  ASKADR: MOV     R0,-(SP)                ;SAVE R0
013366  104401  016760  1$:     TYPE    ,?$GASK                 ;"TACS?"
013372  104411                  RDOCT                           ;GET VALUE
013374  012600                  MOV     (SP)+,R0                ;PICK UP THE OCTAL NUMBER
013376  001423                  BEQ     3$                      ;IF "0" USE OLD VALUES
013400  020027  160000          CMP     R0,#160000              ;MAKE SURE IT IS A BUS ADDRESS
013404  103770                  BLO     1$
013406  010037  001206          MOV     R0,@#TACSL              ;SAVE TCE TACS
013412  062700  000002          ADD     #2,R0                   ;STEP TO TADB ADDRESS
013416  010037  001212          MOV     R0,@#TADBL              ;AND SAVE IT
013422  013737  001206  001210  MOV     @#TACSL,@#TACSH ;SETUP TACS UPPER
013430  005237  001210          INC     @#TACSH                 ;BYTE POINTER

013434  013737  001212  001214  MOV     @#TADBL,@#TADBH         ;SETUP TADB UPPER
013442  005237  001214          INC     @#TADBH                 ;BYTE POINTER
013446  104401  016770  3$:     TYPE    ,MSGVEC                 ;"VECTOR?"
```

```
013452  104411                  RDOCT
013454  012600                  MOV     (SP)+,R0
013456  001411                  BEQ     5$
013460  020027  001000          CMP     R0,#1000                ;MAKE SURE ADDRESS IS IN VECTOR AREA
013464  103370                  BHIS    3$
013466  010037  001216          MOV     R0,@#TAVEC              ;SAVE AS VECTOR ADDRESS
013472  062700  000002          ADD     #2,R0
013476  010037  001220          MOV     R0,@#TAVEC+2
013502  104401  017000  5$:     TYPE    ,MSGPRI                 ;ASK FOR PRIORITY
013506  104411                  RDOCT
013510  012600                  MOV     (SP)+,R0
013512  001413                  BEQ     6$                      ;IF "0" USE OLD VALUE
013514  020027  000007          CMP     R0,#7                   ;MAKE SURE ITS VALID
013520  101270                  BHI     5$
013522  000300                  SWAB    R0                      ;PUT INTO HIGH BYTE
013524  006200                  ASR     R0                      ;AND SHIFT
013526  006200                  ASR     R0                      ;INTO PROPER
013530  006200                  ASR     R0                      ;POSITION
013532  042700  177437          BIC     #^C<340>,R0             ;SAVE ONLY PRIORITY BITS
013536  010037  001222          MOV     R0,@#TMPRIO             ;STORE IT AWAY
013542  104401  017012  6$:     TYPE    ,MTACS                  ;TACS="
013546  016746  165434          MOV     TACSL,-(SP)     ;;SAVE TACSL FOR TYPEOUT
013552  104402                  TYPOC                   ;;GO TYPE--OCTAL ASCII(ALL DIGITS)
013554  104401  017020          TYPE    ,MTADB                  ;"TADB="
013560  016746  165426          MOV     TADBL,-(SP)     ;;SAVE TADBL FOR TYPEOUT
013564  104402                  TYPOC                   ;;GO TYPE--OCTAL ASCII(ALL DIGITS)
013566  104401  017027          TYPE    ,MTAVEC                 ;"VECTOR="
013572  016746  165420          MOV     TAVEC,-(SP)     ;;SAVE TAVEC FOR TYPEOUT
013576  104402                  TYPOC                   ;;GO TYPE--OCTAL ASCII(ALL DIGITS)
013600  104401  017040          TYPE    ,MTAPRI                 ;"PRIORITY="
013604  016746  165412          MOV     TAPRIO,-(SP)    ;;SAVE TAPRIO FOR TYPEOUT
013610  104402                  TYPOC                   ;;GO TYPE--OCTAL ASCII(ALL DIGITS)
013612  104401  017053          TYPE    ,MSGOK                  ;"OK?"
013616  104407                  RDCHR                   ;GO READ ONE CHARACTER
013620  012600                  MOV     (SP)+,R0        ;GET IT
013622  022700  000015          CMP     #15,R0          ;IS IT "CR"?
013626  001406                  BEQ     7$              ;BRANCH IF YES
013630  022700  000131          CMP     #'Y,R0          ;IS IT "Y"?
013634  001403                  BEQ     7$              ;IT WAS
013636  104401  001176          TYPE    ,$QUES          ;TYPE "?"
013642  000651                  BR      1$              ;AND LET HIM CORRECT THEM
013644  104401  017061  7$:     TYPE    ,MYES           ;TYPE OUT "YES"
013650  012600                  MOV     (SP)+,R0        ;RESTORE R0
013652  000207                  RTS     PC              ;AND RETURN
```

```
                        ;;*****************************************************************
                        ;THIS ROUTINE WILL CALCULATE THE CRC
                        ;CALL:
                        ;       JSR     PC,DO.CRC               ;R0=1 BYTE OF DATA

013654                  DO.CRC:
013654  010046                  MOV     R0,-(SP)        ;;PUSH R0 ON STACK
013656  010146                  MOV     R1,-(SP)        ;;PUSH R1 ON STACK
013660  010246                  MOV     R2,-(SP)        ;;PUSH R2 ON STACK
013662  010346                  MOV     R3,-(SP)        ;;PUSH R3 ON STACK
013664  010446                  MOV     R4,-(SP)        ;;PUSH R4 ON STACK
013666  012767  000010  000354        MOV     #8.,3$                  ;MAKE EIGHT ITERATIONS
013674  016703  000074                MOV     CRC.WD,R3               ;PICKUP THE CRC WORD
013700  005001                  1$:     CLR     R1
013702  010302                  MOV     R3,R2                   ;GET THE PARTIAL CRC WORD
013704  042702  177776                BIC     #^CBIT00,R2             ;STRIP AWAY EVERYTHING BUT BIT00
013710  006000                  ROR     R0                      ;PULL OFF THIS BIT
013712  006101                  ROL     R1                      ;AND SETUP TO XOR IT
013714  010104                  MOV     R1,R4                   ;FORM THE XOR OF "R1" AND "R2"
013716  040204                  BIC     R2,R4
013720  040102                  BIC     R1,R2
013722  050402                  BIS     R4,R2                   ;RESULTS TO "R2"
013724  006002                  ROR     R2
013726  103006                  BCC     2$
013730  012701  040002                MOV     #BIT14!BIT01,R1
013734  010104                  MOV     R1,R4                   ;FORM THE XOR OF "R1" AND "R3"
013736  040304                  BIC     R3,R4
013740  040103                  BIC     R1,R3
013742  050403                  BIS     R4,R3                   ;RESULTS TO "R3"
013744  006003                  2$:     ROR     R3
013746  005327                  DEC     (PC)+
013750  000000                  3$:     0
013752  003352                  BGT     1$                      ;BR IF MORE BITS TO DO
013754  010367  000014                MOV     R3,CRC.WD
013760  012604                  MOV     (SP)+,R4        ;;POP STACK INTO R4
013762  012603                  MOV     (SP)+,R3        ;;POP STACK INTO R3
013764  012602                  MOV     (SP)+,R2        ;;POP STACK INTO R2
013766  012601                  MOV     (SP)+,R1        ;;POP STACK INTO R1
013770  012600                  MOV     (SP)+,R0        ;;POP STACK INTO R0
013772  000207                  RTS     PC
013774  000000          CRC.WD: 0                               ;CRC WORD
                        ;;*****************************************************************
```

```
                                        ;////////////////////////////////////////////////////////////////////
                                        ;////////////////////////////////////////////////////////////////////
                                        ;THE FOLLOWING ROUTINES CAN BE USED TO MAKE ADJUSTMENTS TO THE TU60
                                        ;NOTE:  *** BEFORE USING ANY OF THE ROUTINES LOAD AND START AT 214 ***
                                        ;////////////////////////////////////////////////////////////////////



                                        ;;***************************************************************
                                        ;       WRITE FILE GAPS FROM "BOT" TO "EOT"
                                                ;START AT 220
                                                ;THIS ROUTINE CAN BE USED TO ADJUST THE "WRITE GAP MONO" AND
                                                ;THE "WRITE DELAY MONO".
                                        ;;***************************************************************
013776  012706  001100                  WFGSUB: MOV     #STACK,SP               ;KEEP THE STACK OUT OF THE WAY
014002  013704  001206                          MOV     @#TACSL,TACS            ;SETUP THE TA11 STATUS AND
014006  013705  001212                          MOV     @#TADBL,TADB            ;DATA BUFFER REGISTERS
014012  000005                                  RESET                           ;RESET THE WORLD
014014  012737  013776  001110                  MOV     #WFGSUB,@#$LPERR                ;SETUP THE LOOP ON ERROR ADDRESS
014022  004737  015002                          JSR     PC,@#NXTDRV             ;GO SETUP FOR NEXT DRIVE
014026  010314                                  MOV     DRIVE,@TACS             ;SELECT DRIVE
014030  112714  000017                          MOVB    #REWIND!GO,@TACS        ;SEND TAPE TO "BOT"
014034  032714  000040                  100$:   BIT     #READY,@TACS            ;WAIT ON READY
014040  001775                                  BEQ     100$
014042  112714  000001                  1$:     MOVB    #WFG!GO,@TACS           ;WRITE A FILE GAP
014046  104412                                  WAITREADY                       ;WAIT ON READY
014050  032714  020000                          BIT     #LEADER,@TACS           ;AT "CLEAR LEADER"?
014054  001772                                  BEQ     1$                      ;BR IF NO
014056  000000                                  HALT                            ;STOP IF YES
014060  000746                                  BR      WFGSUB                  ;LOOP ON CONT.


                                        ;;***************************************************************
                                        ;       WRITE CONTINUOUS BLOCKS OF DATA
                                                ;START AT 224
                                                ;THE PROGRAM WILL HALT THREE(3) TIMES
                                                ;AFTER EACH HALT SET THE SWR AND PRESS CONTINUE
                                                ;HALT 1 --- SWR<7:0> = NUMBER OF BYTES PER BLOCK
                                                ;HALT 2 --- SWR<7:0> = PATTERN DESIRED
                                                ;HALT 3 --- SWR<15:0> = OPERATIONAL SWITCH SETTINGS
                                                ;THIS ROUTINE CAN BE USED TO ADJUST THE "GAP TIME MONO"
                                                ;** IF USING SOFTWARE SWITCH REGISTER, AFTER
                                                ;       EACH HALT OPERATOR WILL BE PROMPTED
                                                ;       FOR THE VALUE WITH "SWR=XXXXXX NEW="
                                        ;;***************************************************************
014062  004737  014544                  WRTSUB: JSR     PC,@#SETBUF             ;GET BLOCK SIZE AND PATTERN
014066  012706  001100                  WLOOP:  MOV     #STACK,SP               ;KEEP THE STACK OUT OF THE WAY
014072  013704  001206                          MOV     @#TACSL,TACS            ;SETUP THE TA11 STATUS AND
014076  013705  001212                          MOV     @#TADBL,TADB            ;DATA BUFFER REGISTERS
014102  000005                                  RESET                           ;RESET THE WORLD
014104  012737  014066  001110                  MOV     #WLOOP,@#$LPERR         ;SETUP THE LOOP ON ERROR ADDRESS
014112  004737  015002                          JSR     PC,@#NXTDRV             ;GO SETUP FOR NEXT DRIVE
014116  010314                                  MOV     DRIVE,@TACS             ;SELECT DRIVE
014120  112714  000017                          MOVB    #REWIND!GO,@TACS        ;SEND TAPE TO "BOT"
014124  032714  000040                  100$:   BIT     #READY,@TACS            ;WAIT ON READY
014130  001775                                  BEQ     100$
```

```
 2671  014132  004737  014660          1$:     JSR     PC,@#WRTBLK             ;WRITE A BLOCK
 2672  014136  032714  020000                  BIT     #LEADER,@TACS           ;AT "CLEAR LEADER"?
 2673  014142  001773                          BEQ     1$                      ;BR IF NO
 2674  014144  000000                          HALT                            ;STOP IF "EOT"
 2675  014146  000747                          BR      WLOOP                   ;LOOP IF CONT.
 2676
 2677
 2678                                  ;;**********************************************************************
 2679                                  ;       READ CONTINUOUS BLOCKS OF DATA
 2680                                          ;START AT 230
 2681                                          ;THIS ROUTINE CAN BE USED TO ADJUST THE "SIGNAL MONO"
 2682                                          ;AND THE "THRESHOLD POT".
 2683                                  ;;**********************************************************************
 2684  014150  012706  001100          RDSUB:  MOV     #STACK,SP               ;KEEP THE STACK OUT OF THE WAY
 2685  014154  013704  001206                  MOV     @#TACSL,TACS            ;SETUP THE TA11 STATUS AND
 2686  014160  013705  001212                  MOV     @#TADBL,TADB            ;DATA BUFFER REGISTERS
 2687  014164  000005                          RESET                           ;RESET THE WORLD
 2688  014166  012737  014150  001110          MOV     #RDSUB,@#$LPERR         ;SETUP THE LOOP ON ERROR ADDRESS
 2689  014174  004737  015002                  JSR     PC,@#NXTDRV             ;GO SETUP FOR NEXT DRIVE
 2690  014200  010314                          MOV     DRIVE,@TACS             ;SELECT DRIVE
 2691  014202  112714  000017                  MOVB    #REWIND!GO,@TACS        ;SEND TAPE TO "BOT"
 2692  014206  032714  000040          100$:   BIT     #READY,@TACS            ;WAIT ON READY
 2693  014212  001775                          BEQ     100$
 2694  014214  004737  014722          1$:     JSR     PC,@#RDBLK              ;READ A BLOCK
 2695  014220  032714  020000                  BIT     #LEADER,@TACS           ;AT "CLEAR LEADER"?
 2696  014224  001351                          BNE     RDSUB                   ;BR IF YES---LOOP
 2697  014226  000772                          BR      1$
 2698
 2699
 2700                                  ;;**********************************************************************
 2701                                  ;       WRITE A FILE GAP AND A BLOCK OF DATA FROM BOT TO EOT
 2702                                          ;START AT 234
 2703                                          ;THE PROGRAM WILL HALT THREE(3) TIMES
 2704                                          ;AFTER EACH HALT SET THE SWR AND PRESS CONTINUE
 2705                                          ;HALT 1 --- SWR<7:0> = NUMBER OF BYTES PER BLOCK
 2706                                          ;HALT 2 --- SWR<7:0> = PATTERN DESIRED
 2707                                          ;HALT 3 --- SWR<15:0> = OPERATIONAL SWITCH SETTINGS
 2708                                          ;** IF USING SOFTWARE SWITCH REGISTER, AFTER
 2709                                          ;       EACH HALT OPERATOR WILL BE PROMPTED
 2710                                          ;       FOR THE VALUE WITH "SWR=XXXXXX NEW="
 2711                                          ;AND THE "GAP TIME MONO".
 2712                                          ;THIS ROUTINE SUPPORTS THE S/W SWITCH REG FUNCTIONS
 2713                                  ;;**********************************************************************
 2714  014230  004737  014544          WGPBLK: JSR     PC,@#SETBUF             ;GET BLOCK SIZE AND PATTERN
 2715  014234  012706  001100          WGBLOP: MOV     #STACK,SP               ;KEEP THE STACK OUT OF THE WAY
 2716  014240  013704  001206                  MOV     @#TACSL,TACS            ;SETUP THE TA11 STATUS AND
 2717  014244  013705  001212                  MOV     @#TADBL,TADB            ;DATA BUFFER REGISTERS
 2718  014250  000005                          RESET                           ;RESET THE WORLD
 2719  014252  012737  014234  001110          MOV     #WGBLOP,@#$LPERR                ;SETUP THE LOOP ON ERROR ADDRESS
 2720  014260  004737  015002                  JSR     PC,@#NXTDRV             ;GO SETUP FOR NEXT DRIVE
 2721  014264  010314                          MOV     DRIVE,@TACS             ;SELECT DRIVE
 2722  014266  112714  000017                  MOVB    #REWIND!GO,@TACS        ;SEND TAPE TO "BOT"
 2723  014272  032714  000040          100$:   BIT     #READY,@TACS            ;WAIT ON READY
 2724  014276  001775                          BEQ     100$
 2725  014300  112714  000001          1$:     MOVB    #WFG!GO,@TACS           ;WRITE A FILE GAP
 2726  014304  104412                          WAITREADY                       ;WAIT ON READY
```

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                014306  032714  020000          BIT     #LEADER,@TACS           ;AT "CLEAR LEADER"?
                014312  001005                  BNE     2$                      ;BR IF YES
                014314  004737  014560          JSR     PC,@#WRTBLK             ;WRITE A BLOCK
                014320  032714  020000          BIT     #LEADER,@TACS           ;AT "CLEAR LEADER"?
                014324  001765                  BEQ     1$                      ;BR IF NO
                014326  000000          2$:     HALT                            ;STOP AT "EOT"
                014330  000741                  BR      WGBLOP                  ;START OVER ON CONT.


                                        ;;**************************************************************
                                        ;       READ A BLOCK OF DATA AND A FILE GAP
                                                ;START AT 240
                                                ;THIS ROUTINE IS USED AFTER "WRITE A BLOCK AND A FILE GAP" ROUTINE
                                                ;IT CAN BE USED TO ADJUST THE "SIGNAL MONO", THE THRESHOLD POT"
                                                ;AND THE "TAPE BLANK MONO".
                                        ;;**************************************************************
                014332  012706  001100  RGPB_K: MOV     #STACK,SP               ;KEEP THE STACK OUT OF THE WAY
                014336  013704  001206          MOV     @#TACSL,TACS            ;SETUP THE TA11 STATUS AND
                014342  013705  001212          MOV     @#TADBL,TADB            ;DATA BUFFER REGISTERS
                014346  000005                  RESET                           ;RESET THE WORLD
                014350  012737  014332  001110  MOV     #RGPBLK,@#$LPERR                ;SETUP THE LOOP ON ERROR ADDRESS
                014356  004737  015002          JSR     PC,@#NXTDRV             ;GO SETUP FOR NEXT DRIVE
                014362  010314                  MOV     DRIVE,@TACS             ;SELECT DRIVE
                014364  112714  000017          MOVB    #REWIND!GO,@TACS        ;SEND TAPE TO "BOT"
                014370  032714  000040  100$:   BIT     #READY,@TACS            ;WAIT ON READY
                014374  001775                  BEQ     100$
                014376  004737  014722  1$:     JSR     PC,@#RDBLK              ;READ A BLOCK OF DATA
                014402  032714  020000          BIT     #LEADER,@TACS           ;AT "CLEAR LEADER"?
                014406  001351                  BNE     RGPBLK                  ;BR IF YES
                014410  112714  000015          MOVB    #SFBG!GO,@TACS          ;GET INTO A FILE GAP
                014414  104412                  WAITREADY
                014416  032714  020000          BIT     #LEADER,@TACS           ;AT "CLEAR LEADER"?
                014422  001343                  BNE     RGPBLK                  ;BR IF YES
                014424  000764                  BR      1$                      ;LOOP


                                        ;;**************************************************************
                                        ;       SPACE FORWARD FILE GAP FROM "BOT" TO "EOT"
                                                ;START AT 244
                                                ;THIS ROUTINE CAN BE USED AFTER "WRITE FILE GAP" FOR LOW SPEED
                                                ;SPACE FOWARD (TAPE BLANK MONO CAN BE ADJUSTED), OR AFTER READ OR
                                                ;WRITE A FILE GAP AND A BLOCK OF DATA FOR HIGH SPEED SPACE FORWARD
                                                ;(SIGNAL MONO CAN BE CHECKED).
                                        ;;**************************************************************
                014426  012706  001100  SFFGSB: MOV     #STACK,SP               ;KEEP THE STACK OUT OF THE WAY
                014432  013704  001206          MOV     @#TACSL,TACS            ;SETUP THE TA11 STATUS AND
                014436  013705  001212          MOV     @#TADBL,TADB            ;DATA BUFFER REGISTERS
                014442  000005                  RESET                           ;RESET THE WORLD
                014444  012737  014426  001110  MOV     #SFFGSB,@#$LPERR                ;SETUP THE LOOP ON ERROR ADDRESS
                014452  004737  015002          JSR     PC,@#NXTDRV             ;GO SETUP FOR NEXT DRIVE
                014456  010314                  MOV     DRIVE,@TACS             ;SELECT DRIVE
                014460  112714  000017          MOVB    #REWIND!GO,@TACS        ;SEND TAPE TO "BOT"
                014464  032714  000040  100$:   BIT     #READY,@TACS            ;WAIT ON READY
                014470  001775                  BEQ     100$
                014472  112714  000013  1$:     MOVB    #SFFG!GO,@TACS          ;SPACE INTO A FILE GAP
                014476  104412                  WAITREADY                       ;WAIT ON READY
```

```
                014500  032714  020000          B.T     #LEADER,@TACS           ;AT "CLEAR LEADER"?
                014504  001772                  BEQ     1$                      ;BR IF NO
                014506  000000                  HALT                            ;STOP AT "EOT"
                014510  000746                  BR      SFFGSB                  ;LOOP ON CONT.


                                        ;;**************************************************************
                                        ;       BACK SPACE FILE GAP
                                        ;       ;START AT 250
                                        ;       ;THIS ROUTINE CAN BE USED TO ADJUST OR CHECK THE "SIGNAL MONO".
                                        ;;**************************************************************
                014512  000005          BSFGSB: RESET                           ;RESET THE WORLD
                014514  012737  014512  000110          MOV     #BSFGSB,@#$LPERR        ;LOOP ON ERROR ADDRESS
                014522  010314                  MOV     DRIVE,@TACS             ;SELECT DRIVE
                014524  112714  000007  1$:     MOVB    #BSFG!GO,@TACS          ;BACK SPACE A FILE GAP
                014530  104412                  WAITREADY                       ;WAIT ON READY
                014532  032714  020000          BIT     #LEADER,@TACS           ;AT "CLEAR LEADER"?
                014536  001772                  BEQ     1$                      ;BR IF NO
                014540  000000                  HALT                            ;STOP AT BOT
                014542  000763                  BR      BSFGSB                  ;START OVER ON CONT.


                                        ;;**************************************************************
                                        ;       SETUP BLOCK SIZE AND PATTERN FOR SUBROUTINES
                                        ;;**************************************************************
                014544  005000          SETBUF: CLR     R0
                014546  000000                  HALT                            ;OPERATOR PUTS BYTE COUNT IN SWR<7:0>
                014550  022767  000176  164362          CMP     #SWREG,SWR              ;USING S/W SWITCH REG.?
                014556  001001                  BNE     20$                     ;NO- GET OUT
                014560  104405                  GTSWR                           ;LET HIM CHANGE IT
                014562                  20$:                                    ;CONTINUE
                014562  157700  164352                  BISB    @SWR,R0         ;PICKUP THE BYTE COUNT
                014566  001006                  BNE     2$                      ;BR IF NON-ZERO
                014570  105777  164345                  TSTB    @SWR+1          ;CHECK IF GREATER THAN 377
                014574  001402                  BEQ     1$                      ;BR IF NO
                014576  012700  000376                  MOV     #376,R0         ;SET FOR MAX ALLOWED
                014602  005200          1$:     INC     R0                      ;MAKE IT 377 OR 1
                014604  010037  014654  2$:     MOV     R0,@#BLKLIM             ;SETUP THE BLOCK LIMIT
                014610  005037  014656                  CLR     @#PATTRN
                014614  000000                  HALT                            ;OPERATOR PUTS PATTERN IN SWR<7:0>
                014616  022767  000176  164314          CMP     #SWREG,SWR              ;USING S/W SWITCH REG.?
                014624  001001                  BNE     21$                     ;NO- GET OUT
                014626  104405                  GTSWR                           ;LET HIM CHANGE IT
                014630                  21$:                                    ;CONTINUE
                014630  117737  164304  014656          MOVB    @SWR,@#PATTRN           ;PICK UP THE PATTERN
                014636  000000                  HALT                            ;SET OPERATIONAL SWITCHES
                014640  022767  000176  164272          CMP     #SWREG,SWR              ;USING S/W SWITCH REG.?
                014646  001001                  BNE     22$                     ;NO- GET OUT
                014650  104405                  GTSWR                           ;LET HIM CHANGE IT
                014652                  22$:                                    ;CONTINUE
                014652  000207                  RTS     PC                      ;RETURN
                014654  000000          BLKLIM: 0                               ;READ AND WRITE BLOCK SIZE
                014656  000000          PATTRN: 0                               ;PATTERN TO GO ON THE TAPE


                                        ;;**************************************************************
```

```
                        ;       WRITE ROUTINE FOR THE MANUAL OPERATIONS
                        ;;**************************************************************
014660  013701  014654  WRTBLK: MOV     @#BLKLIM,R1             ;PICKUP THE BLOCK SIZE
014664  112714  000003          MOVB    #WRITE!GO,@TACS         ;START A WRITE
014670  104413          1$:     WAITXFER                        ;WAIT ON TRANSFER REQUEST
014672  032714  000040          BIT     #READY,@TACS            ;DID READY SET?
014676  001010                  BNE     3$                      ;BR IF YES
014700  005301                  DEC     R1                      ;COUNT THIS REQUEST
014702  002403                  BLT     2$                      ;BR IF TIME FOR ILBS
014704  113715  014656          MOVB    @#PATTRN,@TADB          ;PUT DATA ON TAPE
014710  000767                  BR      1$                      ;LOOP
014712  052714  000020  2$:     BIS     #ILBS,@TACS             ;WRITE CRC AND SHUT DOWN
014716  104412                  WAITREADY                       ;WAIT ON THE READY FLAG
014720  000207          3$:     RTS     PC


                        ;;**************************************************************
                        ;       READ ROUTINE FOR THE MANUAL OPERATIONS
                        ;;**************************************************************
014722  013702  014654  RDBLK:  MOV     @#BLKLIM,R2             ;PICKUP THE BLOCK SIZE
014726  013700  014656          MOV     @#PATTRN,R0             ;USE THIS DATA PATTERN TO COMPARE TO
014732  112714  000005          MOVB    #READ!GO,@TACS          ;START A READ
014736  104413          1$:     WAITXFER                        ;WAIT ON TRANSFER REQUEST
014740  032714  000040          BIT     #READY,@TACS            ;IS READY SET?
014744  001012                  BNE     3$                      ;BR IF YES
014746  005302                  DEC     R2                      ;COUNT THIS REQUEST
014750  002405                  BLT     2$                      ;BR IF TIME FOR ILBS
014752  011501                  MOV     @TADB,R1                ;READ THE DATA BUFFER
014754  120001                  CMPB    R0,R1                   ;CHECK THE DATA
014756  001767                  BEQ     1$                      ;BR IF OK
014760  104005                  ERROR   5                       ;BAD DATA
014762  000406                  BR      4$                      ;GET OUT
014764  052714  000020  2$:     BIS     #ILBS,@TACS             ;READ ILBS
014770  104412                  WAITREADY                       ;WAIT ON READY
014772  005714          3$:     TST     @TACS                   ;CHECK FOR ERROR
014774  100001                  BPL     4$                      ;BR IF NONE
014776  104001                  ERROR   1                       ;ERROR OCCURRED
015000  000207          4$:     RTS     PC                      ;RETURN


                        ;;**************************************************************
                        ;       ROUTINE TO CHANGE DRIVES
                        ;
015002  105777  164132  NXTDRV: TSTB    @SWR                    ;IS SW07 ON A (1)?
015006  100416                  BMI     3$                      ;BR IF YES
015010  005003                  CLR     DRIVE                   ;SET DRIVE TO "A"
015012  013701  001230          MOV     @#DRVPNT,R1             ;GET DRIVE POINTER
015016  122127  000101          CMPB    (R1)+,#'A               ;IS IT DRIVE "A"?
015022  001402                  BEQ     1$                      ;BR IF YES
015024  012703  000400          MOV     #UNIT,DRIVE             ;SET DRIVE TO "B"
015030  105711          1$:     TSTB    (R1)                    ;LAST DRIVE BEEN SELECTED
015032  001002                  BNE     2$                      ;BR IF NO
015034  012701  001224          MOV     #DRVKEY,R1              ;RESET DRIVE POINTER
015040  010137  001230  2$:     MOV     R1,@#DRVPNT             ;SAVE DRIVE POINTER FOR NEXT TIME
015044  000207          3$:     RTS     PC                      ;GO BACK
```

```
                                        ;;*****************************************************************
                                        ;
                                        .SBTTL          ROUTINE TO EXAMINE DRIVE(S) FOR AVAILABLITY
                                        ;
                                        ;CALL:
                                        ;       MOV     #DRVKEY,R0
                                        ;       JSR     PC,@#EXAM               ;R1 IS DESTROYED
                                        ;       NORMAL RETURN
                                        ;       ERROR RETURN
                                        ;
015046  013701  001206          EXAM:   MOV     @#TACSL,R1              ;PICKUP THE "CONTROL & STATUS" REG. ADR.
015052  005011                          CLR     (R1)                    ;DRIVE="A", FUNCTION="WFG"
015054  122710  000101                  CMPB    #'A,(R0)                ;EXAMINE DRIVE "A"?
015060  001402                          BEQ     1$                      ;BR IF YES
015062  052711  000400                  BIS     #UNIT,(R1)              ;SELECT DRIVE "B"
015066  032711  000040          1$:     BIT     #READY,(R1)             ;WAIT ON READY
015072  001775                          BEQ     1$
015074  005711                          TST     (R1)                    ;ANY ERROR?
015076  100024                          BPL     4$                      ;BR IF NO
015100  032711  001000                  BIT     #OFFLINE,(R1)           ;ERROR DUE TO "OFF LINE"?
015104  001017                          BNE     3$                      ;BR IF YES
015106  032711  010000                  BIT     #WRTLOCK,(R1)           ;ERROR DUE TO "WRITE LOCK"?
015112  001411                          BEQ     2$                      ;BR IF NO
015114  122777  000201  164016          CMPB    #BIT07!BIT00,@SWR       ;"READONLY" SELECTED? (RD1PAS.
015122  001412                          BEQ     4$                      ;BR IF YES
015124  122777  000203  164006          CMPB    #BIT07!BIT01!BIT00,@SWR ;(RD2PAS)?
015132  001406                          BEQ     4$                      ;BR IF YES
015134  000403                          BR      3$                      ;TAKE THE ERROR EXIT
015136  032711  020000          2$:     BIT     #LEADER,(R1)            ;ERROR DUE TO "CLEAR LEADER"?
015142  001002                          BNE     4$                      ;BR IF YES
015144  062716  000002          3$:     ADD     #2,(SP)                 ;TAKE ERROR RETURN
015150  000207                  4$:     RTS     PC                      ;RETURN
```

```
                                        .SBTTL  TYPE ROUTINE

                                        ;;**************************************************************
                                        ;*ROUTINE TO TYPE ASCIZ MESSAGE. MESSAGE MUST TERMINATE WITH A 0 BYTE.
                                        ;*THE ROUTINE WILL INSERT A NUMBER OF NULL CHARACTERS AFTER A LINE FEED.
                                        ;*NOTE1:         $NULL CONTAINS THE CHARACTER TO BE USED AS THE FILLER CHARACTER.
                                        ;*NOTE2:         $FILLS CONTAINS THE NUMBER OF FILLER CHARACTERS REQUIRED.
                                        ;*NOTE3:         $FILLC CONTAINS THE CHARACTER TO FILL AFTER.
                                        ;*
                                        ;*CALL:
                                        ;*1) USING A TRAP INSTRUCTION
                                        ;*       TYPE    ,MESADR         ;;MESADR IS FIRST ADDRESS OF AN ASCIZ STRING
                                        ;*OR
                                        ;*       TYPE
                                        ;*       MESADR
                                        ;*

015152  105767  164031          $TYPE:  TSTB    $TPFLG          ;;IS THERE A TERMINAL?
015156  100002                          BPL     1$              ;;BR IF YES
015160  000000                          HALT                    ;;HALT HERE IF NO TERMINAL
015162  000407                          BR      3$              ;;LEAVE
015164  010046                  1$:     MOV     R0,-(SP)        ;;SAVE R0
015166  017600  000002                  MOV     @2(SP),R0       ;;GET ADDRESS OF ASCIZ STRING
015172  112046                  2$:     MOVB    (R0)+,-(SP)     ;;PUSH CHARACTER TO BE TYPED ONTO STACK
015174  001005                          BNE     4$              ;;BR IF IT ISN'T THE TERMINATOR
015176  005726                          TST     (SP)+           ;;IF TERMINATOR POP IT OFF THE STACK
015200  012600                  60$:    MOV     (SP)+,R0        ;;RESTORE R0
015202  062716  000002          3$:     ADD     #2,(SP)         ;;ADJUST RETURN PC
015206  000002                          RTI                     ;;RETURN
015210  122716  000011          4$:     CMPB    #HT,(SP)        ;;BRANCH IF <HT>
015214  001430                          BEQ     8$
015216  122716  000200                  CMPB    #CRLF,(SP)      ;;BRANCH IF NOT <CRLF>
015222  001006                          BNE     5$
015224  005726                          TST     (SP)+           ;;POP  <CR><LF> EQUIV
015226  104401                          TYPE                    ;;TYPE A CR AND LF
015230  001177                          $CRLF
015232  105067  000130                  CLRB    $CHARCNT        ;;CLEAR CHARACTER COUNT
015236  000755                          BR      2$              ;;GET NEXT CHARACTER
015240  004767  000056          5$:     JSR     PC,$TYPEC       ;;GO TYPE THIS CHARACTER
015244  126726  163706          6$:     CMPB    $FILLC,(SP)+    ;;IS IT TIME FOR FILLER CHARS.?
015250  001350                          BNE     2$              ;;IF NO GO GET NEXT CHAR.
015252  016746  163676                  MOV     $NULL,-(SP)     ;;GET # OF FILLER CHARS. NEEDED
                                                                ;;AND THE NULL CHAR.
015256  105366  000001          7$:     DECB    1(SP)           ;;DOES A NULL NEED TO BE TYPED?
015262  002770                          BLT     6$              ;;BR IF NO--GO POP THE NULL OFF OF STACK
015264  004767  000032                  JSR     PC,$TYPEC       ;;GO TYPE A NULL
015270  105367  000072                  DECB    $CHARCNT        ;;DO NOT COUNT AS A COUNT
015274  000770                          BR      7$              ;;LOOP

                                        ;HORIZONTAL TAB PROCESSOR

015276  112716  000040          8$:     MOVB    #' ,(SP)        ;;REPLACE TAB WITH SPACE
015302  004767  000014          9$:     JSR     PC,$TYPEC       ;;TYPE A SPACE
015306  132767  000007  000052          BITB    #7,$CHARCNT     ;;BRANCH IF NOT AT
015314  001372                          BNE     9$              ;;TAB STOP
015316  005726                          TST     (SP)+           ;;POP SPACE OFF STACK
```

```
 2981  015320  000724                          BR      2$              ;;GET NEXT CHARACTER
 2982  015322  105777  163622          $TYPEC: TSTB    @$TPS           ;;WAIT UNTIL PRINTER IS READY
 2983  015326  100375                          BPL     $TYPEC
 2984  015330  116677  000002  163614          MOVB    2(SP),@$TPB     ;;LOAD CHAR TO BE TYPED INTO DATA REG.
 2985  015336  122766  000015  000002          CMPB    #CR,2(SP)       ;;IS CHARACTER A CARRIAGE RETURN?
 2986  015344  001003                          BNE     1$              ;;BRANCH IF NO
 2987  015346  105067  000014                  CLRB    $CHARCNT        ;;YES--CLEAR CHARACTER COUNT
 2988  015352  000406                          BR      $TYPEX          ;;EXIT
 2989  015354  122766  000012  000002  1$:     CMPB    #LF,2(SP)       ;;IS CHARACTER A LINE FEED?
 2990  015362  001402                          BEQ     $TYPEX          ;;BRANCH IF YES
 2991  015364  105227                          INCB    (PC)+           ;;COUNT THE CHARACTER
 2992  015366  000000          $CHARCNT:.WORD  0               ;;CHARACTER COUNT STORAGE
 2993  015370  000207          $TYPEX: RTS     PC
 2994
 2995                          .SBTTL  READ AN OCTAL NUMBER FROM THE TTY
 2996
 2997                          ;;**************************************************************
 2998                          ;*THIS ROUTINE WILL READ AN OCTAL (ASCII) NUMBER FROM THE TTY AND
 2999                          ;*CHANGE IT TO BINARY.
 3000                          ;*CALL:
 3001                          ;*      RDOCT                   ;;READ AN OCTAL NUMBER
 3002                          ;*      RETURN HERE             ;;LOW ORDER BITS ARE ON TOP OF THE STACK
 3003                          ;*                              ;;HIGH ORDER BITS ARE IN $HIOCT
 3004
 3005  015372  011646          $RDOCT: MOV     (SP),-(SP)      ;;PROVIDE SPACE FOR THE
 3006  015374  016666  000004  000002          MOV     4(SP),2(SP)     ;;INPUT NUMBER
 3007  015402  010046                          MOV     R0,-(SP)        ;;PUSH R0 ON STACK
 3008  015404  010146                          MOV     R1,-(SP)        ;;PUSH R1 ON STACK
 3009  015406  010246                          MOV     R2,-(SP)        ;;PUSH R2 ON STACK
 3010  015410  104410                  1$:     RDLIN                   ;;READ AN ASCIZ LINE
 3011  015412  012600                          MOV     (SP)+,R0        ;;GET ADDRESS OF 1ST CHARACTER
 3012  015414  005001                          CLR     R1              ;;CLEAR DATA WORD
 3013  015416  005002                          CLR     R2
 3014  015420  112046                  2$:     MOVB    (R0)+,-(SP)     ;;PICKUP THIS CHARACTER
 3015  015422  001412                          BEQ     3$              ;;IF ZERO GET OUT
 3016  015424  006301                          ASL     R1              ;;*2
 3017  015426  006102                          ROL     R2
 3018  015430  006301                          ASL     R1              ;;*4
 3019  015432  006102                          ROL     R2
 3020  015434  006301                          ASL     R1              ;;*8
 3021  015436  006102                          ROL     R2
 3022  015440  042716  177770                  BIC     #^C7,(SP)       ;;STRIP THE ASCII JUNK
 3023  015444  062601                          ADD     (SP)+,R1        ;;ADD IN THIS DIGIT
 3024  015446  000764                          BR      2$              ;;LOOP
 3025  015450  005726                  3$:     TST     (SP)+           ;;CLEAN TERMINATOR FROM STACK
 3026  015452  010166  000012                  MOV     R1,12(SP)       ;;SAVE THE RESULT
 3027  015456  010267  000010                  MOV     R2,$HIOCT
 3028  015462  012602                          MOV     (SP)+,R2        ;;POP STACK INTO R2
 3029  015464  012601                          MOV     (SP)+,R1        ;;POP STACK INTO R1
 3030  015466  012600                          MOV     (SP)+,R0        ;;POP STACK INTO R0
 3031  015470  000002                          RTI                     ;;RETURN
 3032  015472  000000          $HIOCT: .WORD   0               ;;HIGH ORDER BITS GO HERE
 3033                          .SBTTL  TTY INPUT ROUTINE
 3034
 3035                          ;;**************************************************************
 3036                          .ENABL  LSB
```

```
3037
3038                                    ;;**********************************************************************
3039                                    ;*SOFTWARE SWITCH REGISTER CHANGE ROUTINE.
3040                                    ;*ROUTINE IS ENTERED FROM THE TRAP HANDLER, AND WILL
3041                                    ;*SERVICE THE TEST FOR CHANGE IN SOFTWARE SWITCH REGISTER TRAP CALL
3042                                    ;*WHEN OPERATING IN TTY FLAG MODE.
3043  015474  022767  000176  163436  $CKSWR: CMP     #SWREG,SWR      ;;IS THE SOFT-SWR SELECTED?
3044  015502  001074                          BNE     15$             ;;BRANCH IF NO
3045  015504  105777  163434                  TSTB    @$TKS           ;;CHAR THERE?
3046  015510  100071                          BPL     15$             ;;IF NO, DON'T WAIT AROUND
3047  015512  117746  163430                  MOVB    @$TKB,-(SP)     ;;SAVE THE CHAR
3048  015516  042716  177600                  BIC     #^C177,(SP)     ;;STRIP-OFF THE ASCII
3049  015522  022726  000007                  CMP     #7,(SP)+        ;;IS IT A CONTROL G?
3050  015526  001062                          BNE     15$             ;;NO, RETURN TO USER
3051  015530  126727  163400  000001          CMPB    $AUTOB,#1       ;;ARE WE RUNNING IN AUTO-MODE?
3052  015536  001456                          BEQ     15$             ;;BRANCH IF YES
3053
3054  015540  104401  016221                  TYPE    ,$CNTLG         ;;ECHO THE CONTROL-G (^G)
3055  015544  104401  016226          $GTSWR: TYPE    ,$MSWR          ;;TYPE CURRENT CONTENTS
3056  015550  016746  162422                  MOV     SWREG,-(SP)     ;;SAVE SWREG FOR TYPEOUT
3057  015554  104402                          TYPOC                   ;;GO TYPE--OCTAL ASCII(ALL DIGITS)
3058  015556  104401  016237                  TYPE    ,$MNEW          ;;PROMPT FOR NEW SWR
3059  015562  005046                  19$:    CLR     -(SP)           ;;CLEAR COUNTER
3060  015564  005046                          CLR     -(SP)           ;;THE NEW SWR
3061  015566  105777  163352          7$:     TSTB    @$TKS           ;;CHAR THERE?
3062  015572  100375                          BPL     7$              ;;IF NOT TRY AGAIN
3063
3064  015574  117746  163346                  MOVB    @$TKB,-(SP)     ;;PICK UP CHAR
3065  015600  042716  177600                  BIC     #^C177,(SP)     ;;MAKE IT 7-BIT ASCII
3066
3067
3068
3069  015604  021627  000025          9$:     CMP     (SP),#25        ;;IS IT A CONTROL-U?
3070  015610  001005                          BNE     10$             ;;BRANCH IF NOT
3071  015612  104401  016214                  TYPE    ,$CNTLU         ;;YES, ECHO CONTROL-U (^U)
3072  015616  062706  000006          20$:    ADD     #6,SP           ;;IGNORE PREVIOUS INPUT
3073  015622  000757                          BR      19$             ;;LET'S TRY IT AGAIN
3074
3075
3076  015624  021627  000015          10$:    CMP     (SP),#15        ;;IS IT A <CR>?
3077  015630  001022                          BNE     16$             ;;BRANCH IF NO
3078  015632  005766  000004                  TST     4(SP)           ;;YES, IS IT THE FIRST CHAR?
3079  015636  001403                          BEQ     11$             ;;BRANCH IF YES
3080  015640  016677  000002  163272          MOV     2(SP),@SWR      ;;SAVE NEW SWR
3081  015646  062706  000006          11$:    ADD     #6,SP           ;;CLEAR UP STACK
3082  015652  104401  001177          14$:    TYPE    ,$CRLF          ;;ECHO <CR> AND <LF>
3083  015656  126727  163253  000001          CMPB    $INTAG,#1       ;;RE-ENABLE TTY KBD INTERRUPTS?
3084  015664  001003                          BNE     15$             ;;BRANCH IF NOT
3085  015666  012777  000100  163250          MOV     #100,@$TKS      ;;RE-ENABLE TTY KBD INTERRUPTS
3086  015674  000002                  15$:    RTI                     ;;RETURN
3087  015676  004767  177420          16$:    JSR     PC,$TYPEC       ;;ECHO CHAR
3088  015702  021627  000060                  CMP     (SP),#60        ;;CHAR < 0?
3089  015706  002420                          BLT     18$             ;;BRANCH IF YES
3090  015710  021627  000067                  CMP     (SP),#67        ;;CHAR > 7?
3091  015714  003015                          BGT     18$             ;;BRANCH IF YES
3092  015716  042726  000060                  BIC     #60,(SP)+       ;;STRIP-OFF ASCII
```

```
 3093  015722  005766  000002                    TST     2(SP)           ;;IS THIS THE FIRST CHAR
 3094  015726  001403                            BEQ     17$             ;;BRANCH IF YES
 3095  015730  006316                            ASL     (SP)            ;;NO, SHIFT PRESENT
 3096  015732  006316                            ASL     (SP)            ;;   CHAR OVER TO MAKE
 3097  015734  006316                            ASL     (SP)            ;;   ROOM FOR NEW ONE.
 3098  015736  005266  000002          17$:      INC     2(SP)           ;;KEEP COUNT OF CHAR
 3099  015742  056616  177776                    BIS     -2(SP),(SP)     ;;SET IN NEW CHAR
 3100  015746  000707                            BR      7$              ;;GET THE NEXT ONE
 3101  015750  104401  001176          18$:      TYPE    ,$QUES          ;;TYPE ?<CR><LF>
 3102  015754  000720                            BR      20$             ;;SIMULATE CONTROL-U
 3103                                  .DSABL    LSB
 3104
 3105
 3106                                  ;;**************************************************************
 3107                                  ;*THIS ROUTINE WILL INPUT A SINGLE CHARACTER FROM THE TTY
 3108                                  ;*CALL:
 3109                                  ;       RDCHR                   ;;INPUT A SINGLE CHARACTER FROM THE TTY
 3110                                  ;*      RETURN HERE             ;;CHARACTER IS ON THE STACK
 3111                                  ;*                              ;;WITH PARITY BIT STRIPPED OFF
 3112                                  ;
 3113
 3114  015756  011646                  $RDCHR: MOV     (SP),-(SP)      ;;PUSH DOWN THE PC
 3115  015760  016666  000004  000002          MOV     4(SP),2(SP)     ;;SAVE THE PS
 3116  015766  105777  163152          1$:     TSTB    @$TKS           ;;WAIT FOR
 3117  015772  100375                          BPL     1$              ;;A CHARACTER
 3118  015774  117766  163146  000004          MOVB    @$TKB,4(SP)     ;;READ THE TTY
 3119  016002  042766  177600  000004          BIC     #^C<177>,4(SP)  ;;GET RID OF JUNK IF ANY
 3120  016010  026627  000004  000023          CMP     4(SP),#23       ;;IS IT A CONTROL-S?
 3121  016016  001013                          BNE     3$              ;;BRANCH IF NO
 3122  016020  105777  163120          2$:     TSTB    @$TKS           ;;WAIT FOR A CHARACTER
 3123  016024  100375                          BPL     2$              ;;LOOP UNTIL ITS THERE
 3124  016026  117746  163114                  MOVB    @$TKB,-(SP)     ;;GET CHARACTER
 3125  016032  042716  177600                  BIC     #^C177,(SP)     ;;MAKE IT 7-BIT ASCII
 3126  016036  022627  000021                  CMP     (SP)+,#21       ;;IS IT A CONTROL-Q?
 3127  016042  001366                          BNE     2$              ;;IF NOT DISCARD IT
 3128  016044  000750                          BR      1$              ;;YES, RESUME
 3129  016046  026627  000004  000140  3$:     CMP     4(SP),#140      ;;IS IT UPPER CASE?
 3130  016054  002407                          BLT     4$              ;;BRANCH IF YES
 3131  016056  026627  000004  000175          CMP     4(SP),#175      ;;IS IT A SPECIAL CHAR?
 3132  016064  003003                          BGT     4$              ;;BRANCH IF YES
 3133  016066  042766  000040  000004          BIC     #40,4(SP)       ;;MAKE IT UPPER CASE
 3134  016074  000002                  4$:     RTI                     ;;GO BACK TO USER
 3135                                  ;;**************************************************************
 3136                                  ;*THIS ROUTINE WILL INPUT A STRING FROM THE TTY
 3137                                  ;*CALL:
 3138                                  ;*      RDLIN                   ;;INPUT A STRING FROM THE TTY
 3139                                  ;*      RETURN HERE             ;;ADDRESS OF FIRST CHARACTER WILL BE ON THE STACK
 3140                                  ;*                              ;;TERMINATOR WILL BE A BYTE OF ALL 0'S
 3141
 3142  016076  010346                  $RDLIN: MOV     R3,-(SP)        ;;SAVE R3
 3143  016100  012703  016204          1$:     MOV     #$TTYIN,R3      ;;GET ADDRESS
 3144  016104  022703  016214          2$:     CMP     #$TTYIN+8.,R3   ;;BUFFER FULL?
 3145  016110  101405                          BLOS    4$              ;;BR IF YES
 3146  016112  104407                          RDCHR                   ;;GO READ ONE CHARACTER FROM THE TTY
 3147  016114  112613                          MOVB    (SP)+,(R3)      ;;GET CHARACTER
 3148  016116  122713  000177          10$:    CMPB    #177,(R3)       ;;IS IT A RUBOUT
```

B07


```
016122  001003                           BNE     3$               ;;SKIP IF NOT
016124  104401  001176           4$:     TYPE    ,$QUES           ;;TYPE A "?"
016130  000763                           BR      1$               ;;CLEAR THE BUFFER AND LOOP
016132  111367  000044           3$:     MOVB    (R3),9$          ;;ECHO THE CHARACTER
016136  104401  016202                   TYPE    ,9$
016142  122723  000015                   CMPB    #15,(R3)+        ;;CHECK FOR RETURN
016146  001356                           BNE     2$               ;;LOOP IF NOT RETURN
016150  105063  177777                   CLRB    -1(R3)           ;;CLEAR RETURN (THE 15)
016154  104401  001200                   TYPE    ,$LF             ;;TYPE A LINE FEED
016160  012603                           MOV     (SP)+,R3         ;;RESTORE R3
016162  011646                           MOV     (SP),-(SP)       ;;ADJUST THE STACK AND PUT ADDRESS OF THE
016164  016666  000004  000002           MOV     4(SP),2(SP)      ;;      FIRST ASCII CHARACTER ON IT
016172  012766  016204  000004           MOV     #$TTYIN,4(SP)
016200  000002                           RTI                      ;;RETURN
016202     000                   9$:     .BYTE   0                ;;STORAGE FOR ASCII CHAR. TO TYPE
016203     000                           .BYTE   0                ;;TERMINATOR
016204  000010                   $TTYIN: .BLKB   8.               ;;RESERVE 8 BYTES FOR TTY INPUT
016214  052536  005015     000   $CNTLU: .ASCIZ  /↑U/<15><12>     ;;CONTROL "U"
016221     136  006507  000012   $CNTLG: .ASCIZ  /↑G/<15><12>     ;;CONTROL "G"
016226  005015  053523  020122   $MSWR:  .ASCIZ  <15><12>/SWR = /
016234  020075     000
016237     040  047040  053505   $MNEW:  .ASCIZ  /  NEW = /
016244  036440  000040
                                 .SBTTL  BINARY TO OCTAL (ASCII) AND TYPE

                                 ;;*************************************************************************
                                 ;*THIS ROUTINE IS USED TO CHANGE A 16-BIT BINARY NUMBER TO A 6-DIGIT
                                 ;*OCTAL (ASCII) NUMBER AND TYPE IT.
                                 ;*$TYPOS---ENTER HERE TO SETUP SUPPRESS ZEROS AND NUMBER OF DIGITS TO TYPE
                                 ;*CALL:
                                 ;*       MOV     NUM,-(SP)        ;;NUMBER TO BE TYPED
                                 ;*       TYPOS                    ;;CALL FOR TYPEOUT
                                 ;*       .BYTE   N                ;;N=1 TO 6 FOR NUMBER OF DIGITS TO TYPE
                                 ;*       .BYTE   M                ;;M=1 OR 0
                                 ;*                                          ;;1=TYPE LEADING ZEROS
                                 ;*                                          ;;0=SUPPRESS LEADING ZEROS
                                 ;*
                                 ;*$TYPON----ENTER HERE TO TYPE OUT WITH THE SAME PARAMETERS AS THE LAST
                                 ;*$TYPOS OR $TYPOC
                                 ;*CALL:
                                 ;*       MOV     NUM,-(SP)        ;;NUMBER TO BE TYPED
                                 ;*       TYPON                    ;;CALL FOR TYPEOUT
                                 ;*
                                 ;*$TYPOC---ENTER HERE FOR TYPEOUT OF A 16 BIT NUMBER
                                 ;*CALL:
                                 ;*       MOV     NUM,-(SP)        ;;NUMBER TO BE TYPED
                                 ;*       TYPOC                    ;;CALL FOR TYPEOUT

016250  017646  000000           $TYPOS: MOV     @(SP),-(SP)      ;;PICKUP THE MODE
016254  116667  000001  000211           MOVB    1(SP),$0FILL     ;;LOAD ZERO FILL SWITCH
016262  112667  000207                   MOVB    (SP)+,$OMODE+1   ;;NUMBER OF DIGITS TO TYPE
016266  062716  000002                   ADD     #2,(SP)          ;;ADJUST RETURN ADDRESS
016272  000406                           BR      $TYPON
016274  112767  000001  000171   $TYPOC: MOVB    #1,$0FILL        ;;SET THE ZERO FILL SWITCH
016302  112767  000006  000165           MOVB    #6,$OMODE+1      ;;SET FOR SIX(6) DIGITS
016310  112767  000005  000154   $TYPON: MOVB    #5,$0CNT         ;;SET THE ITERATION COUNT
```

```
016316  010346                             MOV     R3,-(SP)         ;;SAVE R3
016320  010446                             MOV     R4,-(SP)         ;;SAVE R4
016322  010546                             MOV     R5,-(SP)         ;;SAVE R5
016324  116704  000145                     MOVB    $OMODE+1,R4      ;;GET THE NUMBER OF DIGITS TO TYPE
016330  005404                             NEG     R4
016332  062704  000006                     ADD     #6,R4            ;;SUBTRACT IT FOR MAX. ALLOWED
016336  110467  000132                     MOVB    R4,$OMODE        ;;SAVE IT FOR USE
016342  116704  000125                     MOVB    $OFILL,R4        ;;GET THE ZERO FILL SWITCH
016346  016605  000012                     MOV     12(SP),R5        ;;PICKUP THE INPUT NUMBER
016352  005003                             CLR     R3               ;;CLEAR THE OUTPUT WORD
016354  006105                    1$:      ROL     R5               ;;ROTATE MSB INTO "C"
016356  000404                             BR      3$               ;;GO DO MSB
016360  006105                    2$:      ROL     R5               ;;FORM THIS DIGIT
016362  006105                             ROL     R5
016364  006105                             ROL     R5
016366  010503                             MOV     R5,R3
016370  006103                    3$:      ROL     R3               ;;GET LSB OF THIS DIGIT
016372  105367  000076                     DECB    $OMODE           ;;TYPE THIS DIGIT?
016376  100016                             BPL     7$               ;;BR IF NO
016400  042703  177770                     BIC     #177770,R3       ;;GET RID OF JUNK
016404  001002                             BNE     4$               ;;TEST FOR 0
016406  005704                             TST     R4               ;;SUPPRESS THIS 0?
016410  001403                             BEQ     5$               ;;BR IF YES
016412  005204                    4$:      INC     R4               ;;DON'T SUPPRESS ANYMORE 0'S
016414  052703  000060                     BIS     #'0,R3           ;;MAKE THIS DIGIT ASCII
016420  052703  000040            5$:      BIS     #' ,R3           ;;MAKE ASCII IF NOT ALREADY
016424  110367  000040                     MOVB    R3,8$            ;;SAVE FOR TYPING
016430  104401  016470                     TYPE    ,8$              ;;GO TYPE THIS DIGIT
016434  105367  000032            7$:      DECB    $OCNT            ;;COUNT BY 1
016440  003347                             BGT     2$               ;;BR IF MORE TO DO
016442  002402                             BLT     6$               ;;BR IF DONE
016444  005204                             INC     R4               ;;INSURE LAST DIGIT ISN'T A BLANK
016446  000744                             BR      2$               ;;GO DO THE LAST DIGIT
016450  012605                    6$:      MOV     (SP)+,R5         ;;RESTORE R5
016452  012604                             MOV     (SP)+,R4         ;;RESTORE R4
016454  012603                             MOV     (SP)+,R3         ;;RESTORE R3
016456  016666  000002  000004             MOV     2(SP),4(SP)      ;;SET THE STACK FOR RETURNING
016464  012616                             MOV     (SP)+,(SP)
016466  000002                             RTI                      ;;RETURN
016470     000                    8$:      .BYTE   0                ;;STORAGE FOR ASCII DIGIT
016471     000                             .BYTE   0                ;;TERMINATOR FOR TYPE ROUTINE
016472     000                    $OCNT:   .BYTE   0                ;;OCTAL DIGIT COUNTER
016473     000                    $OFILL:  .BYTE   0                ;;ZERO FILL SWITCH
016474  000000                    $OMODE:  .WORD   0                ;;NUMBER OF DIGITS TO TYPE
```

```
                                .SBTTL  TRAP DECODER

                                ;;**************************************************************
                                ;*THIS ROUTINE WILL PICKUP THE LOWER BYTE OF THE "TRAP" INSTRUCTION
                                ;*AND USE IT TO INDEX THROUGH THE TRAP TABLE FOR THE STARTING ADDRESS
                                ;*OF THE DESIRED ROUTINE. THEN USING THE ADDRESS OBTAINED IT WILL
                                ;*GO TO THAT ROUTINE.

016476  010046                  $TRAP:  MOV     R0,-(SP)        ;;SAVE R0
016500  016600  000002                  MOV     2(SP),R0        ;;GET TRAP ADDRESS
016504  005740                          TST     -(R0)           ;;BACKUP BY 2
016506  111000                          MOVB    (R0),R0         ;;GET RIGHT BYTE OF TRAP
016510  006300                          ASL     R0              ;;POSITION FOR INDEXING
016512  016000  016532                  MOV     $TRPAD(R0),R0   ;;INDEX TO TABLE
016516  000200                          RTS     R0              ;;GO TO ROUTINE


                                ;;THIS IS USE TO HANDLE THE "GETPRI" MACRO

016520  011646                  $TRAP2: MOV     (SP),-(SP)      ;;MOVE THE PC DOWN
016522  016666  000004  000002          MOV     4(SP),2(SP)     ;;MOVE THE PSW DOWN
016530  000002                          RTI                     ;;RESTORE THE PSW

                                .SBTTL  TRAP TABLE

                                ;*THIS TABLE CONTAINS THE STARTING ADDRESSES OF THE ROUTINES CALLED
                                ;*BY THE "TRAP" INSTRUCTION.

                                ;       ROUTINE
                                ;       -------
016532  016520                  $TRPAD: .WORD   $TRAP2
016534  015152                          $TYPE   ;;CALL=TYPE     TRAP+1(104401)  TTY TYPEOUT ROUTINE
016536  016274                          $TYPOC  ;;CALL=TYPOC    TRAP+2(104402)  TYPE OCTAL NUMBER (WITH LEADING ZEROS)
016540  016250                          $TYPOS  ;;CALL=TYPOS    TRAP+3(104403)  TYPE OCTAL NUMBER (NO LEADING ZEROS)
016542  016310                          $TYPON  ;;CALL=TYPON    TRAP+4(104404)  TYPE OCTAL NUMBER (AS PER LAST CALL)

016544  015544                          $GTSWR  ;;CALL=GTSWR    TRAP+5(104405)  GET SOFT-SWR SETTING

016546  015474                          $CKSWR  ;;CALL=CKSWR    TRAP+6(104406)  TEST FOR CHANGE IN SOFT-SWR
016550  015756                          $RDCHR  ;;CALL=RDCHR    TRAP+7(104407)  TTY TYPEIN CHARACTER ROUTINE
016552  016076                          $RDLIN  ;;CALL=RDLIN    TRAP+10(104410) TTY TYPEIN STRING ROUTINE
016554  015372                          $RDOCT  ;;CALL=RDOCT    TRAP+11(104411) READ AN OCTAL NUMBER FROM TTY
016556  013046                          WAIT.ON.READY   ;;CALL=WAITREADY        TRAP+12(104412) WAIT ON THE READY BIT TO
016560  013152                          WAIT.FOR.XFER   ;;CALL=WAITXFER TRAP+13(104413) WAIT ON XFER REQ.
```

```
                                .SBTTL  POWER DOWN AND UP ROUTINES

                                ;;**************************************************************
                                ;POWER DOWN ROUTINE
016562  012737  016726  000024  $PWRDN: MOV     #$ILLUP,@#PWRVEC ;;SET FOR FAST UP
016570  012737  000340  000026          MOV     #340,@#PWRVEC+2 ;;PRIO:7
016576  010046                          MOV     R0,-(SP)        ;;PUSH R0 ON STACK
016600  010146                          MOV     R1,-(SP)        ;;PUSH R1 ON STACK
016602  010246                          MOV     R2,-(SP)        ;;PUSH R2 ON STACK
016604  010346                          MOV     R3,-(SP)        ;;PUSH R3 ON STACK
016606  010446                          MOV     R4,-(SP)        ;;PUSH R4 ON STACK
016610  010546                          MOV     R5,-(SP)        ;;PUSH R5 ON STACK
016612  017746  162322                  MOV     @$WR,-(SP)      ;;PUSH @SWR ON STACK
016616  010667  000[illegible]          MOV     SP,$SAVR6       ;;SAVE SP
016622  012737  016634  000024          MOV     #$PWRUP,@#PWRVEC ;;SET UP VECTOR
016630  000000                        HALT
016632  000776                        BR      .-2             ;;HANG UP

                                ;;**************************************************************
                                ;POWER UP ROUTINE
016634  012737  016726  000024  $PWRUP: MOV     #$ILLUP,@#PWRVEC ;;SET FOR FAST DOWN
016642  016706  000064                  MOV     $SAVR6,SP       ;;GET SP
016646  005067  000060                  CLR     $SAVR6          ;;WAIT LOOP FOR THE TTY
016652  005267  000054          1$:     INC     $SAVR6          ;;WAIT FOR THE INC
016656  001375                          BNE     1$              ;;OF  WORD
016660  012677  162254                  MOV     (SP)+,@SWR      ;;POP STACK INTO @SWR
016664  012605                          MOV     (SP)+,R5        ;;POP STACK INTO R5
016666  012604                          MOV     (SP)+,R4        ;;POP STACK INTO R4
016670  012603                          MOV     (SP)+,R3        ;;POP STACK INTO R3
016672  012602                          MOV     (SP)+,R2        ;;POP STACK INTO R2
016674  012601                          MOV     (SP)+,R1        ;;POP STACK INTO R1
016676  012600                          MOV     (SP)+,R0        ;;POP STACK INTO R0
016700  012737  016562  000024          MOV     #$PWRDN,@#PWRVEC ;;SET UP THE POWER DOWN VECTOR
016706  012737  000340  000026          MOV     #340,@#PWRVEC+2 ;;PRIO:7
016714  104401                          TYPE                    ;REPORT THE POWER FAILURE
016716  016734          $PWRMG: .WORD   $POWER          ;;POWER FAIL MESSAGE POINTER
016720  012716                          MOV     (PC)+,(SP)      ;;RESTART AT PWRST
016722  002206          $PWRAD: .WORD   PWRST           ;;RESTART ADDRESS
016724  000002                          RTI
016726  000000          $ILLUP: HALT                    ;;THE POWER UP SEQUENCE WAS STARTED
016730  000776                          BR      .-2             ;; BEFORE THE POWER DOWN WAS COMPLETE
016732  000000          $SAVR6: 0                       ;;PUT THE SP HERE
016734  005015  047520  042527  $POWER: .ASCIZ  <15><12>"POWER"
016742  000122
                                        .EVEN
```

```
 3338  016744  042200  044522  042526  MSGDRV: .ASCIZ  <CRLF>"DRIVE(S)? "
 3339  016752  051450  037451  000040
 3340  016760  005015  040524  051503  MSGASK: .ASCIZ  <15><12>/TACS?/
 3341  016766  000077
 3342  016770  042526  052103  051117  MSGVEC: .ASCIZ  /VECTOR?/
 3343  016776  000077
 3344  017000  051120  047511  044522  MSGPRI: .ASCIZ  /PRIORITY?/
 3345  017006  054524  000077
 3346  017012  040524  051503  000075  MTACS:  .ASCIZ  /TACS=/
 3347  017020  052040  042101  036502  MTADB:  .ASCIZ  / TADB=/
 3348  017026     000
 3349  017027     040  042526  052103  MTAVEC: .ASCIZ  / VECTOR=/
 3350  017034  051117  000075
 3351  017040  050040  044522  051117  MTAPRI: .ASCIZ  / PRIORITY=/
 3352  017046  052111  036531     000
 3353  017053     015  047412  037513  MSGOK:  .ASCIZ  <15><12>/Ok?/
 3354  017060     000
 3355  017061     131  051505  000200  MYES:   .ASCIZ  /YES/<CRLF>
 3356  017066  052123  052101  051525  EM1:    .ASCIZ  /STATUS PROBLEM/
 3357  017074  050040  047522  046102
 3358  017102  046505     000
 3359  017105     042  042522  042101  EM2:    .ASCIZ  /"READY" FAILED TO SET/
 3360  017112  021131  043040  044501
 3361  017120  042514  020104  047524
 3362  017126  051440  052105     000
 3363  017133     042  051124  047101  EM3:    .ASCIZ  /"TRANSFER REQUEST" FAILED TO SET/
 3364  017140  043123  051105  051040
 3365  017146  050505  042525  052123
 3366  017154  020042  040506  046111
 3367  017162  042105  052040  020117
 3368  017170  042523  000124
 3369  017174  044124  020105  051127  EM4:    .ASCIZ  /THE WRONG FLAG SET/
 3370  017202  047117  020107  046106
 3371  017210  043501  051440  052105
 3372  017216     000
 3373  017217     104  052101  020101  EM5:    .ASCIZ  /DATA PROBLEM/
 3374  017224  051120  041117  042514
 3375  017232  000115
 3376  017234  047111  042524  051122  EM6:    .ASCIZ  /INTERRUPT PROBLEM/
 3377  017242  050125  020124  051120
 3378  017250  041117  042514  000115
 3379  017256  041520  020040  020040  DH1:     ASCIZ  /PC      TACS/
 3380  017264  020040  040524  051503
 3381  017272     000
 3382  017273     120  020103  020040  DH2:    .ASCIZ  /PC      TACS    WAIT ADDRESS/
 3383  017300  020040  052040  041501
 3384  017306  020123  020040  053440
 3385  017314  044501  020124  042101
 3386  017322  051104  051505  000123
 3387  017330  041520  020040  020040  DH5:    .ASCIZ  /PC      TACS    EXPECT  RCV'D/
 3388  017336  020040  040524  051503
 3389  017344  020040  020040  054105
 3390  017352  042520  052103  020040
 3391  017360  041522  023526  000104
 3392  017366  041520  020040  020040  DH6:    .ASCIZ  /PC      TACS    BR LEVEL/
 3393  017374  020040  040524  051503
```

```
017402  020040  020040  051102
017410  046040  053105  046105
017416     000
        017420                    .EVEN
017420  001116  001162  000000   DT1:     .WORD   $ERRPC,$REG0,0
017426  001116  001162  001202   DT2:     .WORD   $ERRPC,$REG0,SAVPC,0
017434  000000
017436  001116  001162  001124   DT5:     .WORD   $ERRPC,$REG0,$GDDAT,$BDDAT,0
017444  001126  000000
017450  001116  001162  001124   DT6:     .WORD   $ERRPC,$REG0,$GDDAT,0
017456  000000
017460  001116  001206  000000   DT201:   .WORD   $ERRPC,TACSL,0

017466  001116  000000           DT202:   .WORD   $ERRPC,0

017472  040524  030461  043040   EM201:   .ASCIZ  "TA11 FAILED TO RESPOND"
017500  044501  042514  020104
017506  047524  051040  051505
017514  047520  042116     000
017521     116  020117  051104   EM202:   .ASCIZ  "NO DRIVE AVAILABLE"
017526  053111  020105  053101
017534  044501  040514  046102
017542  000105
017544  041520  020040  020040   DH201:   .ASCIZ  /PC      TACS/
017552  020040  040524  051503
017560     000
017561     120  000103           DH202:   .ASCIZ  /PC/
        000001                            .END
```

H07


```
ASKADR   013364        563     2512#
ASKDRV   013254        560     2490#    2503
ASKKEY   001232        396#     651*     681
BEGINX   001740        557#     593      595      644      646
BEGIN1   001336        231      476#
BEGIN2   001370        232      483#
BEGIN3   001376        233      482      485#
BEGIN4   001404        234      487#
BGNCMN   001410        479      481      484      486      488#
BIT0   = 000001        166#
BIT00  = 000001        156#     165      208     2598     2916     2918
BIT01  = 000002        155#     165      207     2597     2918
BIT02  = 000004        154#     164      206
BIT03  = 000010        153#     163      205
BIT04  = 000020        152#     162      204
BIT05  = 000040        151#     161      203
BIT06  = 000100        150#     160      202
BIT07  = 000200        149#     159      201     2916     2918
BIT08  = 000400        148#     158      200     2298
BIT09  = 001000        147#     157      199     2306     2370
BIT1   = 000002        165#
BIT10  = 002000        146#     198     2354
BIT11  = 004000        145#     197     2313
BIT12  = 010000        144#     196
BIT13  = 020000        143#     195     2361
BIT14  = 040000        142#     194     2284     2597
BIT15  = 100000        141#     193      662
BIT2   = 000004        164#
BIT3   = 000010        163#
BIT4   = 000020        162#
BIT5   = 000040        161#
BIT6   = 000100        160#
BIT7   = 000200        159#
BIT8   = 000400        158#
BIT9   = 001000        157#
BLKLIM   014654       2820*    2834#    2841     2858
BPTVEC = 000014        173#
BSBG   = 000010        186#     868     1505     1589     1620     1680     1778     1783     1814     1859     1902     1932     1967
                      2024     2163     2186
BSFG   = 000006        185#     864     1447     1562     1676     1731     1739     1928     2797
BSFGSB   014512        241     2794#    2795     2802
CHKADR   001762        559      562      581#
CHKDRV   002046        620#
CKSWR  = 104406       2283     2346     2369     3287#
CR     = 000015         81#    2985     2995
CRCERR = 040000        194#    1873     1916     1992     2052
CRC.WD   013774       2028*    2038     2046     2585     2606*    2613#
CRLF   = 000200         82#     545     2956     2995     3338     3355
CURDRV   001234        397#     674*     675
DDISP  = 177570         88#     365      516
DH1      017256        418     3379#
DH2      017273        424      430      436     3382#
DH201    017544        456     3417#
DH202    017561        461     3420#
DH3      017330        442     3387#
DH4      017366        448     3392#
```

```
DISPLA  001142           365#    516*    524*    2327*   2353*
DISPRE  000174           2388#   524
DO.CRC  013654           2569    2578#
DRVKEY  001224           394#    395     477*    630     633     654     679     2075    2128    2481*   2486    2500    2504
                         2890
DRVPNT  001230           395#    634*    654*    665     680*    2884    2891*
ERR     = 177570          87#    364     515
ERR1    017420           419     3388#
ERR2    017426           425     431     437     3399#
ERR201  017460           457     3405#
ERR202  017466           462     3407#
ERR3    017436           443     3401#
ERR4    017450           449     3403#
ERRVEC= 000030           176#    493*    500*
ERRM1   017066           417     3356#
ERRM2   017105           423     3359#
ERRM201 017472           455     3409#
ERRM202 017521           460     3413#
ERRM3   017133           429     3363#
ERRM4   017174           435     3369#
ERRM5   017217           441     3373#
ERRM6   017234           447     3376#
ERROR = 100000           193#    1538    1567    1736    1741    1780    1873    2052
ERRVEC= 000004           169#    513     514*    525*    581*    587*    2289    2290*   2292*   2295*
EXAM    015046           621     625     630     2903#
EXIT    013354           2499    2504#
FGAP  = 004000           197#    1449    1483    1538    1564    1598    1629    1660    1728    1733    1775    1780
FUNCTI= 000016           209#
FUNC0 = 000002           207#    209
FUNC1 = 000004           206#    209
FUNC2 = 000010           205#    209
GNS   = ****** U         227     544     672     3280    3281    3282    3283    3295    3287    3288    3289    3290    3291
                         3292
GO    = 000001           208#    303     306     325     328     693     710     712     731     733     771     773     782
                         784     823     825     827     1292    1295    1303    1335    1366    1368    1371    1437    1439
                         1441    1447    1467    1469    1471    1477    1479    1481    1495    1497    1499    1505    1522
                         1524    1526    1532    1534    1536    1554    1556    1562    1579    1581    1587    1589    1591
                         1593    1610    1612    1618    1620    1622    1624    1642    1644    1646    1654    1656    1658
                         1710    1712    1714    1722    1724    1726    1731    1739    1757    1759    1761    1769    1771
                         1773    1778    1783    1804    1806    1814    1816    1839    1841    1844    1859    1861    1889
                         1891    1893    1902    1904    1957    1959    1967    1969    2004    2006    2009    2024    2026
                         2086    2136    2138    2142    2152    2163    2168    2186    2193    2205    2230    2636    2639
                         2668    2691    2722    2725    2750    2756    2778    2781    2797    2842    2860
GTSWR = 104405           539     687     2812    2825    2831    3285#
HERE    001740           530     532     543     545#
HGHTIM  013124           714     2423*   2437#
HT    = 000011            79#    2954    2995
ILBS  = 000020           204#    780     806     1445    1475    1503    1530    1560    1585    1616    1652    1720    1767
                         1812    1828    1854    1871    1900    1911    1965    1987    2019    2040    2158    2181    2219
                         2850    2871
INT.EN= 000100           202#    922     970     1018    1066    1114    1162    1210    1258    1303    1335    1398
IOTVEC= 000020           174#    497*    498*
ITEMS2  001316           453#
LEADER= 020000           195#    1455    1510    1538    1567    1744    1780    1788    2641    2672    2695    2727    2730
                         2754    2758    2783    2799    2921
LF    = 000012            80#    2989    2995
```

```
LOOP    013300          2487*   2501
LOOP1   000500           291*    298
LOOP2   000600           301*    312
LOOP3   000700           323*    334
MANUAL  002166           640     648*
MAXCNT  013150           662*    714*    715*    716*    717*   2423    2444*   2451
MSGASK  016760          2513    3340*
MSGDRV  016744          2480    3338*
MSGID   001712           533     545*    653
MSGOK   017052          2560    3353*
MSGPRI  017000          2536    3344*
MSGVEC  016770          2527    3342*
MTACS   017012          2548    3346*
MTACSB  017020          2551    3347*
MTAPRI  017040          2557    3351*
MTAVEC  017027          2554    3349*
MYES    017061          2569    3355*
NEXT    013334          2490    2494    2498*
NOTA    013312          2488    2491*
NOTB    013324          2492    2495*
NOTLGL  013346          2485    2496    2502*   2505
NXTDRV  015002          2634    2666    2689    2720    2748    2776    2881*
OFFLIN= 001000           199*   2912
OK      002200           649     651*
PATTRN  014656          2821*   2827*   2835*   2848    2859
PIRQ    = 177772          86*
PIRQVE= 000240           180*
PR0     = 000000           103*
PR1     = 000040           104*
PR2     = 000100           105*
PR3     = 000140           106*
PR4     = 000200           107*
PR5     = 000240           108*
PR6     = 000300           109*
PR7     = 000340           110*
PS      = 177776            83*     84      657*    914*    923*    926*    962*    971*    974*   1010*   1019*   1022*   1058*
                           1067*   1070*   1106*   1115*   1118*   1154*   1163*   1166*   1202*   1211*   1214*   1250*   1259*
                           1262*   1297*   1305*   1309*   1327*   1342*   1346*   1396*   1401*   1412*   1415*
PSW     = 177776            84*
PWRST   002206           653*   3330
PWR.VEC= 000024           175*    503*    504*   3297*   3298*   3307*   3313*   3325*   3326*
RDBLK   014722          2694    2753    2858*
RDCHR   = 104407        2561    3146    3288*
RDLIN   = 104410        2482    3010    3289*
RDOCT   = 104411        2514    2528    2537    3290*
RDSUB   014150           237    2684*   2688    2696
READ    = 000004           184*    328     784     860    1593    1672    1816    1861    1904    1969    2026    2168    2205
                          2860
READY   = 000040           203*    304     311     326     333     694    1336    2093    2097    2102    2149    2201    2427
                          2457    2637    2669    2692    2723    2751    2779    2844    2862    2908
RES.VEC= 000010           170*
REWIND= 000016           189*    303     325     693     710     731     771     782     823     880    1292    1335    1366
                          1437    1467    1479    1495    1522    1534    1554    1579    1610    1642    1656    1692    1710
                          1724    1757    1771    1804    1839    1889    1944    1957    2004    2086    2096    2101    2136
                          2142    2193    2230    2636    2668    2691    2722    2750    2778
RGPB_/  014232           239    2743*   2747    2755    2759
```

```
SAVPC   001202            385*  2424*  2425*  2441   2452*  2453*  2469   3399
SAVPS   001204            386*  2426*  2440   2454*  2468
SETBJF  014544           2660   2714   2808*
SFBG  = 000014            188*   876   1536   1591   1622   1624   1688   1940   2756
SFFG  = 000012            187*   872   1481   1658   1684   1726   1773   1936   2781
SFFGSB  014426            240   2771*  2775   2786
STACK = 001100             74*   495   2629   2661   2684   2715   2743   2771
START   002220            652    655*  2264
STK_MT= 177774             85*
SWR     001140            291    309    364*   493    515*   517    523*   537    685   2284   2298   2300   2306
                         2313   2354   2361   2366   2370   2810   2814   2816   2823   2827   2829   2881   2915
                         2918   3043   3080*  3305   3318*
SWREG   000176            229*   523    537    625   2810   2823   2829   3043   3056
SW0   = 000001            138*
SW00  = 000001            128*   138
SW01  = 000002            127*   137
SW02  = 000004            126*   136
SW03  = 000010            125*   135
SW04  = 000020            124*   134
SW05  = 000040            123*   133
SW06  = 000100            122*   132
SW07  = 000200            121*   131
SW08  = 000400            120*   130
SW09  = 001000            119*   129
SW1   = 000002            137*
SW10  = 002000            118*
SW11  = 004000            117*
SW12  = 010000            116*
SW13  = 020000            115*
SW14  = 040000            114*
SW15  = 100000            113*
SW2   = 000004            136*
SW3   = 000010            135*
SW4   = 000020            134*
SW5   = 000040            133*
SW6   = 000100            132*
SW7   = 000200            131*
SW8   = 000400            130*
SW9   = 001000            129*
TACSH   001210            389*  2522*  2523*
TACSL   001206            388*   583    658   2519*  2522   2549   2630   2662   2685   2716   2744   2772   2903
                         3405
TADBH   001214            391*  2525*  2526*
TADBL   001212            390*   659   2521*  2525   2552   2631   2663   2686   2717   2745   2773
TAPRIO  001222            393*   929    933    977    981   1025   1029   1073   1077   1121   1125   1169   1173
                         1217   1221   1265   1269   2547*  2558
TAVEC   001216            392*   480    597*   655*   656*   918*   919*   943*   944*   956*   967*   991*   992*
                         1014*  1015*  1039*  1040*  1062*  1063*  1087*  1088*  1110*  1111*  1135*  1136*  1158*
                         1159*  1183*  1184*  1206*  1207*  1231*  1232*  1254*  1255*  1279*  1280*  1299*  1300*
                         1315*  1316*  1331*  1332*  1353*  1354*  1391*  1392*  1410*  1420*  1421*  2533*  2535*
                         2555
TBITVE= 000014            171*
TDRV    002310            667    669*
TIMERR= 002000            198*   759    811    849
TKVEC = 000060            178*
TPVEC = 000064            179*
```

```
TRAPVE= 000034            177*    501*    502*
TRTVEC= 000014            172*
TR.REQ= 000200            201*   1336
TST1    002436            691     704*
TST10   004150           1053*
TST11   004352           1101*
TST12   004554           1149*
TST13   004756           1197*
TST14   005160           1245*
TST15   005362           1286*
TST16   005554           1322*
TST17   005750           1360*
TST2    002516            707     725*
TST20   006246           1431*
TST21   006370           1434    1456    1461*
TST22   006510           1464    1484    1489*
TST23   006622           1492    1511    1516*
TST24   006742           1519    1539    1548*
TST25   007050           1551    1568    1573*
TST26   007176           1576    1599    1604*
TST27   007324           1607    1630    1635*
TST3    002656            728     760     765*
TST30   007574           1638    1694    1703*
TST31   010000           1706    1745    1750*
TST32   010172           1753    1789    1798*
TST33   010330           1801    1833*
TST34   010516           1836    1874    1883*
TST35   010776           1886    1946    1951*
TST36   011160           1954    1993    1998*
TST37   011412           2001    2053    2071*
TST4    003062            768     812     817*
TST40   011552           2074    2076    2124*
TST41   012134           2127    2129    2221    2226*
TST5    003342            820     882     909*
TST6    003544            957*
TST7    003746           1005*
TYPE  = 104401            533     653     670     675     676    2254    2356    2364    2386    2395    2397    2400    2402
                         2406    2414    2480    2502    2513    2527    2536    2548    2551    2554    2557    2560    2567
                         2569    2959    3054    3055    3058    3071    3082    3101    3150    3153    3157    3232    3283*
                         3327
TYPERR  012730           2363    2386*
TYPOC = 104402           2411    2550    2553    2556    2559    3057    3281*
TYPON = 104404           3283*
TYPOS = 104403           3282*
UNIT  = 000400            200*    668    2079    2080    2132    2133    2887    2907
WAITRE= 104412            711     713     732     755     772     781     783     807     824     826     845    1293    1296
                         1330    1367    1369    1409    1438    1440    1446    1448    1468    1470    1476    1478    1480
                         1482    1496    1498    1504    1506    1523    1525    1531    1533    1535    1537    1555    1561
                         1563    1580    1586    1588    1590    1592    1594    1611    1617    1619    1621    1623    1625
                         1641    1643    1645    1653    1655    1657    1659    1709    1711    1713    1721    1723    1725
                         1727    1732    1740    1756    1758    1760    1768    1770    1772    1774    1779    1784    1805
                         1613    1815    1829    1840    1842    1855    1860    1872    1890    1892    1901    1903    1912
                         1958    1966    1968    1988    2005    2007    2020    2025    2047    2083    2085    2105    2137
                         2139    2141    2159    2164    2182    2187    2192    2204    2219    2231    2640    2726    2757
                         2782    2798    2851    2872    3291*
WAITXF= 104413            734     775     777     785     828    1304    1372    1442    1444    1472    1474    1500    1502
```

```
                    1527    1529    1557    1559    1582    1584    1613    1615    1647    1649    1651    1715    1717
                    1719    1762    1764    1766    1807    1809    1811    1817    1823    1845    1847    1863    1870
                    1895    1906    1960    1962    1964    1970    1975    1979    1983    2010    2012    2030    2039
                    2153    2155    2157    2169    2175    2180    2206    2212    2217    2843    2861    3292*
WAIT.F  013152      2449*   3292
WAIT.0  013046      2421*   3291
WAIT1   013076      2427*   2435    2438
WAIT2   013110      2422*   2434*
WAIT3   013132      2428    2432    2440*
WAIT4   013114      2430    2433*
WFG   = 000000       182*    712     825     852    1295    1368    1439    1469    1477    1497    1524    1532    1587
                    1618    1644    1654    1664    1712    1722    1759    1769    1841    1891    1920    2006    2138
                    2639    2725
WFGSUB  013776       235    2629*   2633    2644
WGBLOP  014234      2715*   2719    2733
WGPBLK  014230       238    2714*
WLOOP   014066      2661*   2665    2675
WRITE = 000002       183*    306     733     773     827     856    1303    1371    1441    1471    1499    1526    1556
                    1581    1612    1646    1668    1714    1761    1806    1844    1893    1924    1959    2009    2152
                    2842
WRTBLK  014660      2671    2729    2841*
WRTLOC= 010000       196*   2914
WRTSUB  014062       236    2660*
$AUTOB  001134       361*    541*   3051    3172
$BDADR  001122       356*
$BDDAT  001126       358*   2350*   3401
$BELL   001172       380*   2356    2382
$CHARC  015366      2961*   2971*   2978    2987*   2992*
$CKSWR  015474      3043*   3287
$CMTAG  001100       344*    490     491     499     505     506     507
$CM1  = 000002       376*    377*    378*
$CM2  = 000004       376*    377*    378*
$CM3  = 000002       374*    376
$CNTLG  016221      3054    3167*
$CNTLU  016214      3071    3166*
$CRLF   001177       382*    676    2364    2382    2386    2397    2402    2406    2960    2995    3082    3166
$DOAGN  012242      2250    2256    2262*
$ENDAD  012232       531     596     647    2258*   2377
$ENDCT  012212       505    2252*
$ENDMG  012251      2254    2266*
$ENULL  012246      2265*
$EOP    012156      2242*
$EOPCT  012204       505*   2249*   2253
$ERFLG  001103       347*   2273    2302    2304    2310*   2331    2351*   2382
$ERMAX  001115       353*    508*   2304    2326*   2331
$ERROR  012536       499    2345*
$ERRPC  001116       354*   2358*   2359*   2360    2382    3398    3399    3401    3403    3405    3407
$ERRTB  001236       412*   2393
$ERTTL  001112       351*   2357*   2382
$ESCAP  001170       379*    507*    728*    768*    820*    911*    959*   1007*   1055*   1103*   1151*   1199*   1247*
                    1289*   1324*   1363*   1434*   1464*   1492*   1519*   1551*   1576*   1607*   1638*   1706*   1753*
                    1801*   1836*   1886*   1954*   2001*   2074*   2127*   2325*   2373    2375    2382
$FILLC  001156       372*   2964    2995
$FILLS  001155       371*   2995
$GDADR  001120       355*
$GDDAT  001124       357*   2349*   3401    3403
```

```
$GET42  012222          2255*
$GTSWR  015544          3055*   3285
$HD   = 000000            11
$HIOCT  015472          3027*   3032*
$ICNT   001104           348*   2317*   2318    2320*   2330
$ILLUP  016726          3297    3313    3332*
$INTAG  001135           362*   3083    3172
$ITEMB  001114           352*   2360*   2382    2388
$LF     001200           383*   2382    2995    3157    3166
$LPADR  001106           349*    509*    727*    767*    819*    910*    958*   1006*   1054*   1102*   1150*   1198*   1246-
                        1288*   1362*   1433*   1463*   1491*   1518*   1550*   1575*   1606*   1637*   1705*   1752*   1800*
                        1835*   1885*   1953*   2000*   2073*   2126*   2308*   2323*   2328    2330
$LPERR  001110           350*    510*   2308    2324*   2330    2372    2633*   2665*   2688*   2719*   2747*   2775*   2795*
$MAIL = ****** U         527     537    2323    2366    2948
$MNEW   016237          3058    3170*
$MSWR   016226          3055    3168*
$MXCNT  012534          2321    2330*
$NULL   001154           370*   2966    2995
$NWTST= 000001           701*    722*    762*    814*    906*    954*   1002*   1050*   1098*   1146*   1194*   1242*   1283*
                        1319*   1357*   1428*   1458*   1486*   1513*   1545*   1570*   1601*   1632*   1700*   1747*   1795*
                        1830*   1880*   1948*   1995*   2068*   2121*   2223*
$OCNT   016472          3204*   3233*   3246*
$OMODE  016474          3199*   3203*   3208    3211*   3222*   3248*
$OVER   012520          2285    2301    2309    2319    2327*
$PASS   001100           345*    660     706    2246*   2247*   2265    2315    2331
$POWER  016734          3328    3335*
$PWRAD  016722          3330*
$PWRDN  016562           503    3297*   3325
$PWRMG  016716          3328*
$PWRUP  016634          3307    3313*
$QUES   001176           381*   2382    2502    2567    2995    3101    3150    3166
$RDCHR  015756          3114*   3288
$RDDEC= ****** U        3291
$RDLIN  016076          3142*   3289
$RDOCT  015372          3005*   3290
$RDSZ = 000010          3135*
$REGAD  001160           374*
$REGO   001162           376*   2347*   3398    3399    3401    3403
$REGI   001164           377*   2348*
$RTNAD  012244          2264*
$R2A  = ****** U        3291
$SAVRE= ****** U        3291
$SAVR6  016732          3306*   3314    3315*   3316*   3334*
$SCOPE  012264           497    2282*
$SETUP= 000137           476*    486     497     499     501     503     505     506     507     509     531     534    2244
                        2283    2346    2369    2377    3038    3172
$STUP = 177777           476*
$SVLAD  012472          2293    2322*
$SWR  = 167400             1*     11      62      63      64      65      66      67      68     378     379     380     506
                         507     509     510     705     726     766     818     910     958    1006    1054    1102    1150
                        1198    1246    1287    1323    1361    1432    1462    1490    1517    1549    1574    1605    1636
                        1704    1751    1799    1834    1884    1952    1999    2072    2125    2227    2237    2245    2257
                        2263    2265    2274    2275    2276    2277    2278    2284    2296    2298    2299    2302    2303
                        2304    2311    2312    2313    2324    2327    2330    2337    2338    2339    2340    2341    2354
                        2361    2366    2370    2382    3331
$SWRMK= 000000            68      69    2278    2279    2300
```

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TAll BASIC LOGIC TEST (PART 2)  MAINDEC-11-DZTAB-C          MACY11 27(732)  19-AUG-76  11:51  PAGE 80                  SEQ 0092
DZTABC.NEW        CROSS REFERENCE TABLE -- USER SYMBOLS                                                                 SEQ 0092

$TIMES  001166          378#   506*   705*   726*   766*   815*  1287*  1323*  1361*  1432*  1462*  1490*  1517*
                       1549*  1574*  1605*  1636*  1704*  1751*  1799*  1834*  1884*  1952*  1999*  2072*  2125*
                       2227*  2245*  2311*  2318   2321*  2330
$TKB    001146          367#  3036   3047   3064   3118   3124
$TKS    001144          366#  3036   3045   3061   3095*  3116   3122
$TN   = 000042            1#    11    701    705#   707    722    726#   728    750    752    766#   768    812
                        814    818#   820    882    906    910#   954    958#  1002   1006#  1050   1054#  1098
                       1102#  1146   1150#  1194   1198#  1242   1246#  1283   1287#  1319   1323#  1357   1361#
                       1428   1432#  1434   1456   1458   1462#  1464   1484   1486   1490#  1492   1511   1513
                       1517#  1519   1539   1545   1549#  1551   1568   1570   1574#  1576   1599   1601   1605#
                       1607   1630   1632   1636#  1638   1694   1700   1704#  1706   1745   1747   1751#  1753
                       1759   1795   1799#  1801   1830   1834#  1836   1874   1880   1884#  1886   1946   1948
                       1952#  1954   1993   1995   1999#  2001   2053   2068   2072#  2074   2076   2121   2125#
                       2127   2129   2221   2223   2227#
$TPB    001152          369#  2984*  2995
$TPFLG  001157          373#  2942   2995
$TPS    001150          368#  2982   2995
$TRAP   016476          501   3257#
$TRAP2  016520         3268#  3279
$TRP  = 000014         3272#  3281#  3282#  3283#  3284#  3285   3286#  3287   3288#  3289#  3290#  3291#  3292#
                       3293#
$TRPAD  016532         3262   3279#
$TSTNM  001102          346#   663*  2244*  2273   2300   2322*  2327   2331   2353   2382
$TTYIN  016204         3143   3144   3161   3165#
$TYPBN= ****** U       3284
$TYPDS= ****** U       3284
$TYPE   015152         2942#  3272   3280
$TYPEC  015322         2963   2970   2977   2982#  2983   3087
$TYPEX  015370         2988   2990   2993#
$TYPOC  016274         3202#  3281
$TYPON  016310         3201   3204#  3283
$TYPOS  016250         3197#  3282
$XTSTR  012276         2287#
$$GET4= 000000         2257#
$0FILL  016473         3198*  3202*  3212   3247#
$40CAT= ****** U       2284   2363
.     = 017564          223#   227#   289#   299#   321#   343#   384    494    509    510    545#   673#  2265
                       2268   2330   2331   2382   2417#  2995   3036   3165#  3166   3172   3309   3333   3397#


ERRORS DETECTED:  0
DEFAULT GLOBALS GENERATED:  0

*DZTABC,DZTABC/SOL/CRF:SYM=DSKM:SYSMAC.SML[400,1066],DSKZ:DZTABC.NEW[400,1237]
RUN-TIME: 45 58 2 SECONDS
RUN-TIME RATIO: 125/107=1.1
CORE USED:  34K  (68 PAGES)
```

Spooler runtime 14 Seconds, 61 KCS, 398 disk reads, 5 disk writes, 92 pages