TA11

LOGIC TEST 2

MD-11-DZTAB-C

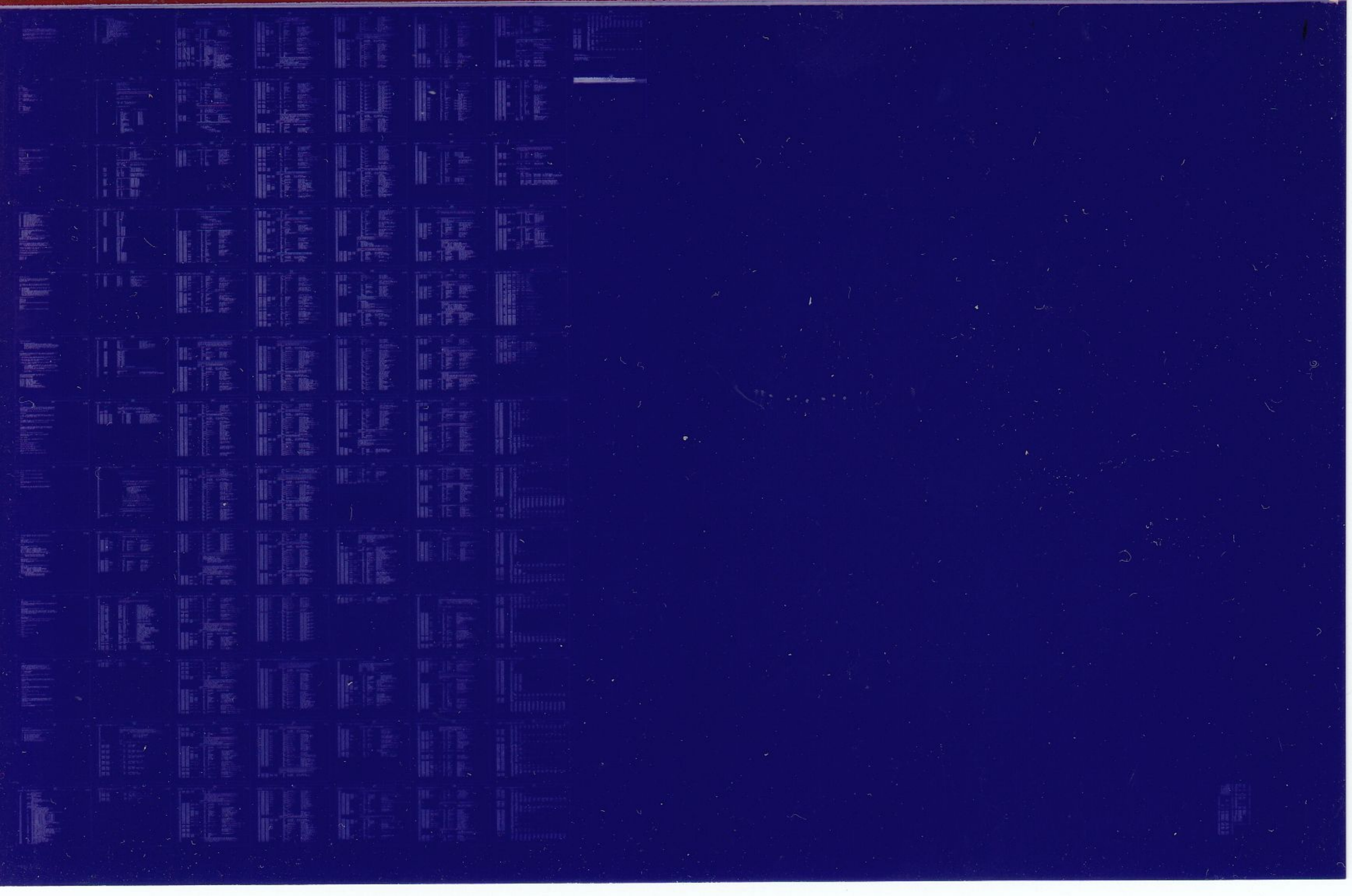
EP-DZTAB-C-DL-A

FICHE 1 OF 1

NOV 1976

digital

MADE IN USA



IDENTIFICATION

PRODUCT CODE: MAINDEC-11-DZTA2-C-D

PRODUCT NAME: TA11 LOGIC TEST (PART 2)

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.

4.2 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
600	LOAD SWITCH REGISTER INTO THE TACS
600	WRITE SWITCH REGISTER ON TAPE FROM BOT TO EOT
700	READ FROM BOT TO EOT

4.3 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.

4.3.1 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.

4.3.1.1 DRIVE SELECTION EXAMPLES

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

SE2 0005
SE3 0005

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 A JSR

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 "TACS","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 RGBLK

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 SFFGSB

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 BSFGSB

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.

9. PROGRAM DESCRIPTION

THIS PROGRAM IS A SEQUENCE OF SMALL INDEPENDENT TESTS THAT CHECK THE TA11 FOR PROPER OPERATION.

THE TESTS CAN BE GROUPED INTO THE FOLLOWING GENERAL GROUPS.

1. TEST THE TIMING ERROR CIRCUITRY
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

```
.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
```

```
                        SW15=   100000
                        SW14=   40000
                        SW13=   20000
                        SW12=   10000
                        SW11=   4000
                        SW10=   2000
                        SW09=   1000
                        SW08=   400
                        SW07=   200
                        SW06=   100
                        SW05=   40
                        SW04=   20
                        SW03=   10
                        SW02=   4
                        SW01=   2
                        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)
                        BIT15=  100000
                        BIT14=  40000
                        BIT13=  20000
                        BIT12=  10000
                        BIT11=  4000
                        BIT10=  2000
                        BIT09=  1000
                        BIT08=  400
                        BIT07=  200
                        BIT06=  100
                        BIT05=  40
                        BIT04=  20
                        BIT03=  10
                        BIT02=  4
                        BIT01=  2
                        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
```

```
                        ERRVEC= 4               ;;TIME OUT AND OTHER ERRORS
                        RESVEC= 10              ;;RESERVED AND ILLEGAL INSTRUCTIONS
                        TBITVEC=14              ;;"T" BIT
                        TRTVEC= 14              ;;TRACE TRAP
                        BPTVEC= 14              ;;BREAKPOINT TRAP (BPT)
                        IOTVEC= 20              ;;INPUT/OUTPUT TRAP (IOT) **SCOPE**
                        PWRVEC= 24              ;;POWER FAIL
                        EMTVEC= 30              ;;EMULATOR TRAP (EMT) **ERROR**
                        TRAPVEC=34              ;;"TRAP" TRAP
                        TKVEC=  60              ;;TTY KEYBOARD VECTOR
                        TPVEC=  64              ;;TTY PRINTER VECTOR
                        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

                                .=0
                        ;*ALL UNUSED LOCATIONS FROM 4 - 776 CONTAIN A ".+2,HALT"
                        ;*SEQUENCE TO CATCH ILLEGAL TRAPS AND INTERRUPTS
                        ;*LOCATION 0 CONTAINS 0 TO CATCH IMPROPERLY LOADED VECTORS
                                .=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 VARIOUS 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                   ;STORAGE 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: 300                     ;TA11 BR LEVEL 6
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

                                        EM201   ;TA11 FAILED TO RESPOND
                                        DH201   ;PC     TACS
                                        DT201   ;$ERRPC TACS
                                        0       ;BOTH NUMBERS ARE TYPED AS OCTAL NUMBERS

                                        EM202   ;NO DRIVES AVAILABLE
                                        DH202   ;PC
                                        DT202   ;$ERRPC
                                        0       ;
```

453	001316		ITEMS2:		;ITEMS 201-202
454					
455	001316	017472		EM201	;TA11 FAILED TO RESPOND
456	001320	017544		DH201	;PC TACS
457	001322	017460		DT201	;$ERRPC TACS
458	001324	000000		0	;BOTH NUMBERS ARE TYPED AS OCTAL NUMBERS
459					
460	001326	017521		EM202	;NO DRIVES AVAILABLE
461	001330	017561		DH202	;PC
462	001332	017466		DT202	;$ERRPC
463	001334	000000		0	;
464					

```
                                        ;////////////////////////////////////////////////////////////////////////////
                                        ;////////////////////////////////////////////////////////////////////////////
                                        ;;**************************************************************

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

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

001336  005005                  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  177344          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$:    MOV     #SWREG,SWR      ;;POINT TO SOFTWARE SWR
001624  012767  000174  177310          MOV     #DISPREG,DISPLAY
001632  012637  000004          66$:    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     #$ENDAD,@#42    ;;ACT-11?
001652  001432                          BEQ     HERE            ;;BRANCH IF YES
001654  104401  001712                  TYPE    ,MSGID          ;;TYPE ASCIZ STRING
                                .SBTTL  GET VALUE FOR SOFTWARE SWITCH REGISTER
001660  005737  000042                  TST     @#42            ;;ARE WE RUNNING UNDER XXDP/ACT?
001664  001006                          BNE     67$             ;;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  000403                          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                          BEQ     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$:     ERROR   202                     ;NO DRIVES AVAILABLE
002144  012705  000002                  MOV     #2,R5                   ;DRIVES & ADDRESS
002150  005704                          TST     R4                      ;OPERATOR INPUTS?
002152  001272                          BNE     BEGINX                  ;BR IF YES
002154  013700  000042                  MOV     @#42,R0                 ;GET MONITOR RETURN ADDRESS
002160  001667                          BEQ     BEGINX                  ;NO MONITOR
002162  000137  012232                  JMP     @#$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
```

```
  655  002220  013777  001220  176770  START:  MOV     @#TAVEC+2,@TAVEC        ;SETUP TA11 TRAP VECTOR
  656  002226  005077  176766                  CLR     @TAVEC+2
  657  002232  012737  000340  177776          MOV     #340,@#PS               ;LOCKOUT ALL I/O INT
  658  002240  013704  001206                  MOV     @#TACSL,TACS            ;SETUP TACS
  659  002244  013705  001212                  MOV     @#TADBL,TADB            ;SETUP TADB
  660  002250  005737  001100                  TST     @#$PASS                 ;IF FIRST PASS SETUP FOR EXTRA LONG WAIT LOOPS
  661  002254  001003                          BNE     1$                      ;OTHERWISE USE OLD VALUES
  662  002256  012737  077777  013150          MOV     #^CBIT15,@#MAXCNT
  663  002264  005037  001102          1$:     CLR     @#$TSTNM                ;ZERO THE TEST NUMBER
  664  002270  005003                          CLR     DRIVE                   ;SET DRIVE TO "A"
  665  002272  013701  001230                  MOV     @#DRVPNT,R1             ;GET DRIVE POINTER
  666  002276  121127  000101                  CMPB    (R1),#'A                ;IS IT DRIVE "A"?
  667  002302  001402                          BEQ     TDRV                    ;BR IF YES
  668  002304  012703  000400                  MOV     #UNIT,DRIVE             ;SET DRIVE TO "B"
  669  002310                          TDRV:
  670  002310  104401  002316                  TYPE    ,65$                ;;TYPE ASCIZ STRING
  671  002314  000411                          BR      64$                 ;;GET OVER THE ASCIZ
  672                                  ;;65$:  .ASCIZ  <15><12>*TESTING DRIVE *
  673  002340                          64$:
  674  002340  112167  176670                  MOVB    (R1)+,CURDRV            ;SETUP TO TYPE CURRENT DRIVE
  675  002344  104401  001234                  TYPE    ,CURDRV
  676  002350  104401  001177                  TYPE    ,$CRLF                  ;TYPE A  CR & LF
  677  002354  105711                          TSTB    (R1)                    ;LAST DRIVE BEEN SELECTED
  678  002356  001002                          BNE     1$                      ;BR IF NO
  679  002360  012701  001224                  MOV     #DRVKEY,R1              ;RESET DRIVE POINTER
  680  002364  010137  001230          1$:     MOV     R1,@#DRVPNT             ;SAVE DRIVE POINTER FOR NEXT TIME
  681  002370  005737  001232                  TST     @#ASKKEY                ;GO START TESTING IF NO MANUAL
  682  002374  002007                          BGE     2$                      ;       OPERATIONS REQUESTED
  683  002376  005000                          CLR     R0
  684  002400  000000                          HALT                            ;GIVE CONTROL TO THE OPERATOR
  685  002402  022767  000176  176530          CMP     #SWREG,SWR              ;USING S/W SWITCH REG.?
  686  002410  001001                          BNE     20$                     ;NO- GET OUT
  687  002412  104405                          GTSWR                           ;LET HIM CHANGE IT
  688  002414                          20$:                                    ;CONTINUE
  689                                  ;THIS CODE IS FOR ACT11 & DDP
  690  002414  005737  000042          2$:     TST     @#42                    ;IS THERE A MONITOR?
  691  002420  001406                          BEQ     TST1                    ;GO START TESTING IF NO
  692  002422  010314                          MOV     DRIVE,@TACS             ;IF YES SELECT DRIVE
  693  002424  112714  000017                  MOVB    #REWIND!GO,@TACS        ;SEND TAPE TO BOT
  694  002430  032714  000040          3$:     BIT     #READY,@TACS            ;WAIT ON READY
  695  002434  001775                          BEQ     3$                      ;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
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                        000401                  BR      5$
                        104001          4$:     ERROR   1                       ;"XFER REQ" SHOULDN'T HAVE CLEARED
                        105715          5$:     TSTB    @TADB                   ;CLEAR "XFER REQ"
                        104412                  WAITREADY                       ;WAIT FOR "READY"
                        005714                  TST     @TACS                   ;IS "ERROR" BIT SET?
                        100401                  BMI     6$                      ;BR IF YES
                        104001                  ERROR   1                       ;"ERROR" BIT NOT SET
                        032714  002000  6$:     BIT     #TIMERR,@TACS           ;IS "TIMING ERROR" = 1?
                        001001                  BNE     TST3            ;;BR IF YES
                        104001                  ERROR   1                       ;"TIMING ERROR" NOT SET
                                        ;;*******************************************************
                                        ;*TEST 3         TEST "TIMING ERROR" FOR "READ"
                                        ;;*******************************************************
                        000004          TST3:   SCOPE
                        012767  000012  176300          MOV     #10.,$TIMES     ;;DO 10. ITERATIONS
                        012767  002714  176212          MOV     #7$,$LPADR      ;;SET SCOPE LOOP ADDRESS
                        012767  003062  176266          MOV     #TST4,$ESCAPE   ;;ESCAPE TO TEST 4 ON ERROR
                        000005                  RESET
                        010314                  MOV     DRIVE,@TACS             ;SELECT DRIVE
                        112714  000017                  MOVB    #REWIND!GO,@TACS        ;GO TO "CLEAR LEADER"
                        104412                  WAITREADY                       ;WAIT FOR "READY"
                        112714  000003          7$:     MOVB    #WRITE!GO,@TACS         ;WRITE
                        012700  000006                  MOV     #6,R0                   ;WRITE THIS MANY BYTES ON TAPE
                        104413                  WAITXFER                        ;WAIT FOR "XFER REQ"
                        112715  000377          8$:     MOVB    #377,@TADB              ;WRITE ONE BYTE
                        104413                  WAITXFER                        ;WAIT FOR "XFER REQ"
                        005300                  DEC     R0                      ;LAST BYTE OUT?
                        003373                  BGT     8$                      ;BR IF NO
                        052714  000020                  BIS     #ILBS,@TACS             ;WRITE "CRC"
                        104412                  WAITREADY                       ;WAIT FOR "READY"
                        112714  000017                  MOVB    #REWIND!GO,@TACS        ;BACK OVER THE BLOCK
                        104412                  WAITREADY                       ;WAIT FOR "READY"
                        112714  000005                  MOVB    #READ!GO,@TACS          ;START A "READ"
                        104413                  WAITXFER                        ;WAIT FOR "XFER REQ"
                        105714                  TSTB    @TACS                   ;IS "XFER REQ" SET
                        100401                  BMI     1$                      ;BR IF YES
                        104001                  ERROR   1                       ;"XFER REQ" DIDN'T SET
                        105715          1$:     TSTB    @TADB                   ;KNOCK DOWN "XFER REQ"
                        005000                  CLR     R0                      ;CLEAR COUNTERS
                        005001                  CLR     R1
                        105714          2$:     TSTB    @TACS                   ;FIND OUT HOW LONG IT
                        100405                  BMI     3$                      ;TAKES FOR "XFER REQ"
                        062700  000012                  ADD     #10.,R0         ;TO SET
                        005501                  ADC     R1
                        100372                  BPL     2$
                        104001                  ERROR   1                       ;"XFER REQ" FAILED TO SET
                        105714          3$:     TSTB    @TACS                   ;NOW WASTE MORE THAN THE ABOVE
                        100005                  BPL     4$                      ;AMOUNT OF TIME SO THAT
                        162700  000001                  SUB     #1,R0           ;A "TE" WILL OCCUR
                        005601                  SBC     R1
                        100372                  BPL     3$
                        000401                  BR      5$
                        104001          4$:     ERROR   1                       ;"XFER REQ" CLEARED SOME HOW
                        105715          5$:     TSTB    @TADB                   ;KNOCK DOWN "XFER REQ"
                        052714  000020                  BIS     #ILBS,@TACS             ;STOP THE READ
                        104412                  WAITREADY                       ;WAIT ON "READY"
```

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                                        TST     @TACS                   ;IS "ERROR" SET?
                                        BMI     6$                      ;BR IF YES
                                        ERROR   !                       ;"ERROR" NOT = 1
002000                          6$:     BIT     #TIMERR,@TACS           ;IS THERE A "TIMING ERROR"
                                        BNE     TST4            ;;GO TO NEXT TEST IF YES
                                        ERROR   1                       ;"TIMING ERROR" NOT SET
                                ;;**************************************************************
                                ;*TEST 4         TEST "ERROR" OUTPUT OF STATUS ROM USING A "TIMING ERROR"
                                ;;**************************************************************
000004                          TST4:   SCOPE
000012  176074                          MOV     #10.,$TIMES     ;;DO 10. ITERATIONS
003126  176006                          MOV     #1$,$LPADR      ;;SET SCOPE LOOP ADDRESS
003342  176062                          MOV     #TST5,$ESCAPE   ;;ESCAPE TO TEST 5 ON ERROR
000005                                  RESET
010314                                  MOV     DRIVE,@TACS             ;SELECT DRIVE
000017                                  MOVB    #REWIND!GO,@TACS        ;GO TO BEGINNING OF TAPE
                                        WAITREADY                       ;WAIT ON "READY" TO SET
000001                                  MOVB    #WFG!GO,@TACS           ;GET ON THE OXIDE
                                        WAITREADY                       ;WAIT ON "READY" TO SET
000003                          1$:     MOVB    #WRITE!GO,@TACS         ;START A WRITE
                                        WAITXFER                        ;WAIT FOR "TRANSFER REQ"
000377                                  MOVB    #377,@TADB              ;WRITE ONE BYTE
005000                                  CLR     R0                      ;CLEAR THE DOUBLE LENGTH COUNTER
005001                                  CLR     R1
105714                          2$:     TSTB    @TACS                   ;CHECK FOR "XFER REQ"
100405                                  BMI     3$                      ;BR IF SET
000012                                  ADD     #10.,R0                 ;COUNT UP UNTIL "XFER REQ"
005501                                  ADC     R1                      ;SETS OR OVERFLOW OCCURS
100372                                  BPL     2$
104001                                  ERROR   1                       ;"XFER REQ" FAILED TO SET
105714                          3$:     TSTB    @TACS                   ;CHECK "XFER REQ"
100401                                  BMI     4$                      ;BR IF SET
104001                                  ERROR   1                       ;"XFER REQ" SHOULDN'T HAVE CLEARED
000001                          4$:     SUB     #1,R0                   ;COUNT DOWN TO CAUSE A "TE"
005601                                  SBC     R1
100371                                  BPL     3$
105715                                  TSTB    @TADB                   ;CLEAR "XFER REQ"
104412                                  WAITREADY                       ;WAIT FOR READY
005714                                  TST     @TACS                   ;MAKE SURE "ERROR" IS SET
100401                                  BMI     5$
104001                                  ERROR   1                       ;"ERROR" DIDN'T SET
002000                          5$:     BIT     #TIMERR,@TACS           ;MAKE SURE "TE" IS SET
001001                                  BNE     6$
104001                                  ERROR   1                       ;"TE" FAILED TO SET
000000                          6$:     MOVB    #WFG,@TACS              ;CHECK "ERROR" WITH "WFG"
005714                                  TST     @TACS                   ;SAMPLE THE "ERROR" BIT
100001                                  BPL     7$                      ;BR IF "ERROR" = 0
104001                                  ERROR   1                       ;"ERROR" NOT = 0
000002                          7$:     MOVB    #WRITE,@TACS            ;CHECK "ERROR" WITH "WRITE"
005714                                  TST     @TACS                   ;SAMPLE THE "ERROR" BIT
100401                                  BMI     8$                      ;BR IF "ERROR" = 1
104001                                  ERROR   1                       ;"ERROR" NOT = 1
000004                          8$:     MOVB    #READ,@TACS             ;CHECK "ERROR" WITH "READ"
005714                                  TST     @TACS                   ;SAMPLE THE "ERROR" BIT
100401                                  BMI     9$                      ;BR IF "ERROR" = 1
104001                                  ERROR   1                       ;"ERROR" NOT = 1
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```
 864  003260  112714  000005          9$:     MOVB    #BSFG,@TACS             ;CHECK "ERROR" WITH "BSFG"
 865  003264  005714                          TST     @TACS                   ;SAMPLE THE "ERROR" BIT
 866  003266  100001                          BPL     10$                     ;BR IF "ERROR" = 0
 867  003270  104001                          ERROR   1                       ;"ERROR" NOT = 0
 868  003272  112714  000010          10$:    MOVB    #BSBG,@TACS             ;CHECK "ERROR" WITH "BSBG"
 869  003276  005714                          TST     @TACS                   ;SAMPLE THE "ERROR" BIT
 870  003300  100001                          BPL     11$                     ;BR IF "ERROR" = 0
 871  003302  104001                          ERROR   1                       ;"ERROR" NOT = 0
 872  003304  112714  000012          11$:    MOVB    #SFFG,@TACS             ;CHECK "ERROR" WITH "SFFG"
 873  003310  005714                          TST     @TACS                   ;SAMPLE THE "ERROR" BIT
 874  003312  100001                          BPL     12$                     ;BR IF "ERROR" = 0
 875  003314  104001                          ERROR   1                       ;"ERROR" NOT = 0
 876  003316  112714  000014          12$:    MOVB    #SFBG,@TACS             ;CHECK "ERROR" WITH "SFBG"
 877  003322  005714                          TST     @TACS                   ;SAMPLE THE "ERROR" BIT
 878  003324  100001                          BPL     13$                     ;BR IF "ERROR" = 0
 879  003326  104001                          ERROR   1                       ;"ERROR" NOT = 0
 880  003330  112714  000016          13$:    MOVB    #REWIND,@TACS           ;CHECK "ERROR" WITH "REWIND"
 881  003334  005714                          TST     @TACS                   ;SAMPLE THE "ERROR" BIT
 882  003336  100001                          BPL     TST5            ;;BR IF "ERROR" = 0
 883  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
                                  ;;*****************************************************************
 909  003342  000004                  TST5:   SCOPE
 910  003344  012767  003362  175534          MOV     #1$,$LPADR      ;;SET SCOPE LOOP ADDRESS
 911  003352  012767  003520  175610          MOV     #6$,$ESCAPE     ;;ESCAPE TO 6$ ON ERROR
 912  003360  000005                          RESET
 913  003362  010314                  1$:     MOV     DRIVE,@TACS
 914  003364  012737  000340  177776          MOV     #340,@#PS               ;LOCK OUT ALL INTERRUPTS
 915  003372  012700  000000                  MOV     #0,R0                   ;TEST AT PRIORITY LEVEL 0
 916  003376  005001                          CLR     R1                      ;CLEAR INTERRUPT KEY
 917  003400  012702  000001                  MOV     #1,R2                   ;SETUP TO WASTE A LITTLE TIME
 918  003404  012777  003510  175604          MOV     #4$,@TAVEC              ;INTERRUPT RETURN
 919  003412  012777  000340  175600          MOV     #340,@TAVEC+2           ;LOCK OUT THE WORLD IF INTERRUPT
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 920  003420  012737  000137  000000          MOV     #137,@#0                ;SETUP TO CATCH INTERRUPT IF
 921  003426  012737  003514  000002          MOV     #5$,@#2                 ;    IT GOES TO LOCATION 0
 922  003434  112714  000100                  MOVB    #INT.EN,@TACS           ;SET INTERRUPT ENABLE
 923  003440  012737  000000  177776          MOV     #0*40,@#PS              ;SET TO PRIORITY LEVEL 0
 924  003446  006302                  2$:     ASL     R2                      ;KILL SOME TIME
 925  003450  001376                          BNE     2$
 926  003452  012737  000340  177776          MOV     #340,@#PS               ;LOCK OUT THE WORLD
 927  003460  005701                          TST     R1                      ;DID AN INTERRUPT OCCUR?
 928  003462  001005                          BNE     3$                      ;BR IF YES
 929  003464  022737  000000  001222          CMP     #0*40,@#TAPRIO          ;WAS AN INTERRUPT EXPECTED?
 930  003472  002012                          BGE     6$                      ;BR IF NO
 931  003474  104006                          ERROR   6                       ;INTERRUPT FAILED TO OCCUR AT PRIORITY LEVEL 0
 932
 933  003476  022737  000000  001222  3$:     CMP     #0*40,@#TAPRIO          ;INTERRUPT OCCURRED--SHOULD IT HAVE?
 934  003504  002405                          BLT     6$                      ;BR IF YES
 935  003506  104006                          ERROR   6                       ;INTERRUPT OCCURRED AT PRIORITY LEVEL 0
 936
 937  003510  005201                  4$:     INC     R1                      ;SET INTERRUPT KEY
 938  003512  000002                          RTI                             ;RETURN AFTER INTERRUPT
 939  003514  022626                  5$:     CMP     (SP)+,(SP)+             ;POP THE STACK
 940  003516  104006                          ERROR   6                       ;INTERRUPT WENT TO LOCATION 0
 941
 942  003520  005014                  6$:     CLR     @TACS                   ;CLEAR INTERRUPT ENABLE
 943  003522  013777  001220  175466          MOV     @#TAVEC+2,@TAVEC        ;SET TRAP CATCHER
 944  003530  005077  175464                  CLR     @TAVEC+2
 945  003534  005037  000000                  CLR     @#0
 946  003540  005037  000002                  CLR     @#2
 947                          ;;*****************************************************************
 948                          ;THIS TEST WILL SETUP THE TA11'S VECTOR ADDRESS AND AT ADDRESS 0
 949                          ;A JMP @(PC)+ IS STORED INCASE THE VECTOR IS READ AS 0.
 950                          ;IT WILL THEN SET THE PRIORITY LEVEL TO 1 AND WASTE ENOUGH TIME
 951                          ;FOR AN INTERRUPT TO OCCUR.
 952                          ;AFTER THE TIME IS UP IT WILL RESTORE THE PS TO LEVEL 7
 953                          ;AND CHECK IF AN INTERRUPT OCCURRED.
 954                          ;;*****************************************************************
 955                          ;*TEST 6         TEST INTERRUPT WITH READY = "1" AT LEVEL 1
 956                          ;;*****************************************************************
 957  003544  000004          TST6:   SCOPE
 958  003546  012767  003564  175332          MOV     #1$,$LPADR      ;;SET SCOPE LOOP ADDRESS
 959  003554  012767  003722  175406          MOV     #6$,$ESCAPE     ;;ESCAPE TO 6$ ON ERROR
 960  003562  000005                          RESET
 961  003564  010314                  1$:     MOV     DRIVE,@TACS
 962  003566  012737  000340  177776          MOV     #340,@#PS               ;LOCK OUT ALL INTERRUPTS
 963  003574  012700  000001                  MOV     #1,R0                   ;TEST AT PRIORITY LEVEL 1
 964  003600  005001                          CLR     R1                      ;CLEAR INTERRUPT KEY
 965  003602  012702  000001                  MOV     #1,R2                   ;SETUP TO WASTE A LITTLE TIME
 966  003606  012777  003712  175402          MOV     #4$,@TAVEC              ;INTERRUPT RETURN
 967  003614  012777  000340  175376          MOV     #340,@TAVEC+2           ;LOCK OUT THE WORLD IF INTERRUPT
 968  003622  012737  000137  000000          MOV     #137,@#0                ;SETUP TO CATCH INTERRUPT IF
 969  003630  012737  003716  000002          MOV     #5$,@#2                 ;    IT GOES TO LOCATION 0
 970  003636  112714  000100                  MOVB    #INT.EN,@TACS           ;SET INTERRUPT ENABLE
 971  003642  012737  000040  177776          MOV     #1*40,@#PS              ;SET TO PRIORITY LEVEL 1
 972  003650  006302                  2$:     ASL     R2                      ;KILL SOME TIME
 973  003652  001376                          BNE     2$
 974  003654  012737  000340  177776          MOV     #340,@#PS               ;LOCK OUT THE WORLD
 975  003662  005701                          TST     R1                      ;DID AN INTERRUPT OCCUR?
```

```
  976  003664  001005                    BNE     3$                      ;BR IF YES
  977  003666  022737  000040  001222    CMP     #1*40,@#TAPRIO          ;WAS AN INTERRUPT EXPECTED?
  978  003674  002012                    BGE     6$                      ;BR IF NO
  979  003676  104006                    ERROR   6                       ;INTERRUPT FAILED TO OCCUR AT PRIORITY LEVEL 1
  980
  981  003700  022737  000040  001222  3$:   CMP     #1*40,@#TAPRIO          ;INTERRUPT OCCURRED--SHOULD IT HAVE?
  982  003706  002405                    BLT     6$                      ;BR IF YES
  983  003710  104006                    ERROR   6                       ;INTERRUPT OCCURRED AT PRIORITY LEVEL 1
  984
  985  003712  005201                  4$:   INC     R1                      ;SET INTERRUPT KEY
  986  003714  000002                    RTI                             ;RETURN AFTER INTERRUPT
  987  003716  022626                  5$:   CMP     (SP)+,(SP)+             ;POP THE STACK
  988  003720  104006                    ERROR   6                       ;INTERRUPT WENT TO LOCATION 0
  989
  990  003722  005014                  6$:   CLR     @TACS                   ;CLEAR INTERRUPT ENABLE
  991  003724  013777  001220  175264        MOV     @#TAVEC+2,@TAVEC        ;SET TRAP CATCHER
  992  003732  005077  175262                CLR     @TAVEC+2
  993  003736  005037  000000                CLR     @#0
  994  003742  005037  000002                CLR     @#2
  995                              ;;**********************************************************************
  996                              ;THIS TEST WILL SETUP THE TA11'S VECTOR ADDRESS AND AT ADDRESS 0
  997                              ;A JMP @(PC)+ IS STORED INCASE THE VECTOR IS READ AS 0.
  998                              ;IT WILL THEN SET THE PRIORITY LEVEL TO 2 AND WASTE ENOUGH TIME
  999                              ;FOR AN INTERRUPT TO OCCUR.
 1000                              ;AFTER THE TIME IS UP IT WILL RESTORE THE PS TO LEVEL 7
 1001                              ;AND CHECK IF AN INTERRUPT OCCURRED.
 1002                              ;;**********************************************************************
 1003                              ;*TEST 7         TEST INTERRUPT WITH READY = "1" AT LEVEL 2
 1004                              ;;**********************************************************************
 1005  003746  000004              TST7:   SCOPE
 1006  003750  012767  003766  175130        MOV     #1$,$LPADR      ;;SET SCOPE LOOP ADDRESS
 1007  003756  012767  004124  175204        MOV     #6$,$ESCAPE     ;;ESCAPE TO 6$ ON ERROR
 1008  003764  000005                        RESET
 1009  003766  010314              1$:       MOV     DRIVE,@TACS
 1010  003770  012737  000340  177776        MOV     #340,@#PS               ;LOCK OUT ALL INTERRUPTS
 1011  003776  012700  000002                MOV     #2,R0                   ;TEST AT PRIORITY LEVEL 2
 1012  004002  005001                        CLR     R1                      ;CLEAR INTERRUPT KEY
 1013  004004  012702  000001                MOV     #1,R2                   ;SETUP TO WASTE A LITTLE TIME
 1014  004010  012777  004114  175200        MOV     #4$,@TAVEC              ;INTERRUPT RETURN
 1015  004016  012777  000340  175174        MOV     #340,@TAVEC+2           ;LOCK OUT THE WORLD IF INTERRUPT
 1016  004024  012737  000137  000000        MOV     #137,@#0                ;SETUP TO CATCH INTERRUPT IF
 1017  004032  012737  004120  000002        MOV     #5$,@#2                 ;   IT GOES TO LOCATION 0
 1018  004040  112714  000100                MOVB    #INT.EN,@TACS           ;SET INTERRUPT ENABLE
 1019  004044  012737  000100  177776        MOV     #2*40,@#PS              ;SET TO PRIORITY LEVEL 2
 1020  004052  006302              2$:       ASL     R2                      ;KILL SOME TIME
 1021  004054  001376                        BNE     2$
 1022  004056  012737  000340  177776        MOV     #340,@#PS               ;LOCK OUT THE WORLD
 1023  004064  005701                        TST     R1                      ;DID AN INTERRUPT OCCUR?
 1024  004066  001005                        BNE     3$                      ;BR IF YES
 1025  004070  022737  000100  001222        CMP     #2*40,@#TAPRIO          ;WAS AN INTERRUPT EXPECTED?
 1026  004076  002012                        BGE     6$                      ;BR IF NO
 1027  004100  104006                        ERROR   6                       ;INTERRUPT FAILED TO OCCUR AT PRIORITY LEVEL 2
 1028
 1029  004102  022737  000100  001222  3$:   CMP     #2*40,@#TAPRIO          ;INTERRUPT OCCURRED--SHOULD IT HAVE?
 1030  004110  002405                        BLT     6$                      ;BR IF YES
 1031  004112  104006                        ERROR   6                       ;INTERRUPT OCCURRED AT PRIORITY LEVEL 2
```

```
004114  005201                    4$:     INC     R1                      ;SET INTERRUPT KEY
004116  000002                            RTI                             ;RETURN AFTER INTERRUPT
004120  022626                    5$:     CMP     (SP)+,(SP)+             ;POP THE STACK
004122  104006                            ERROR   6                       ;INTERRUPT WENT TO LOCATION 0

004124  005014                    6$:     CLR     @TACS                   ;CLEAR INTERRUPT ENABLE
004126  013777  001220  175062            MOV     @#TAVEC+2,@TAVEC        ;SET TRAP CATCHER
004134  005077  175060                    CLR     @TAVEC+2
004140  005037  000000                    CLR     @#0
004144  005037  000002                    CLR     @#2
                                  ;;*********************************************************
                                          ;THIS TEST WILL SETUP THE TA11'S VECTOR ADDRESS AND AT ADDRESS 0
                                          ;A JMP @(PC)+ IS STORED INCASE THE VECTOR IS READ AS 0.
                                          ;IT WILL THEN SET THE PRIORITY LEVEL TO 3 AND WASTE ENOUGH TIME
                                          ;FOR AN INTERRUPT TO OCCUR.
                                          ;AFTER THE TIME IS UP IT WILL RESTORE THE PS TO LEVEL 7
                                          ;AND CHECK IF AN INTERRUPT OCCURRED.
                                  ;;*********************************************************
                                  ;*TEST 10        TEST INTERRUPT WITH READY = "1" AT LEVEL 3
                                  ;;*********************************************************
004150  000004                    TST10:  SCOPE
004152  012767  004170  174726            MOV     #1$,$LPADR      ;;SET SCOPE LOOP ADDRESS
004160  012767  004326  175002            MOV     #6$,$ESCAPE     ;;ESCAPE TO 6$ ON ERROR
004166  000005                            RESET
004170  010314                    1$:     MOV     DRIVE,@TACS
004172  012737  000340  177776            MOV     #340,@#PS               ;LOCK OUT ALL INTERRUPTS
004200  012700  000003                    MOV     #3,R0                   ;TEST AT PRIORITY LEVEL 3
004204  005001                            CLR     R1                      ;CLEAR INTERRUPT KEY
004206  012702  000001                    MOV     #1,R2                   ;SETUP TO WASTE A LITTLE TIME
004212  012777  004316  174776            MOV     #4$,@TAVEC              ;INTERRUPT RETURN
004220  012777  000340  174772            MOV     #340,@TAVEC+2           ;LOCK OUT THE WORLD IF INTERRUPT
004226  012737  000137  000000            MOV     #137,@#0                ;SETUP TO CATCH INTERRUPT IF
004234  012737  004322  000002            MOV     #5$,@#2                 ;   IT GOES TO LOCATION 0
004242  112714  000100                    MOVB    #INT.EN,@TACS           ;SET INTERRUPT ENABLE
004246  012737  000140  177776            MOV     #3*40,@#PS              ;SET TO PRIORITY LEVEL 3
004254  006302                    2$:     ASL     R2                      ;KILL SOME TIME
004256  001376                            BNE     2$
004260  012737  000340  177776            MOV     #340,@#PS               ;LOCK OUT THE WORLD
004266  005701                            TST     R1                      ;DID AN INTERRUPT OCCUR?
004270  001005                            BNE     3$                      ;BR IF YES
004272  022737  000140  001222            CMP     #3*40,@#TAPRIO          ;WAS AN INTERRUPT EXPECTED?
004300  002012                            BGE     6$                      ;BR IF NO
004302  104006                            ERROR   6                       ;INTERRUPT FAILED TO OCCUR AT PRIORITY LEVEL 3

004304  022737  000140  001222    3$:     CMP     #3*40,@#TAPRIO          ;INTERRUPT OCCURRED--SHOULD IT HAVE?
004312  002405                            BLT     6$                      ;BR IF YES
004314  104006                            ERROR   6                       ;INTERRUPT OCCURRED AT PRIORITY LEVEL 3

004316  005201                    4$:     INC     R1                      ;SET INTERRUPT KEY
004320  000002                            RTI                             ;RETURN AFTER INTERRUPT
004322  022626                    5$:     CMP     (SP)+,(SP)+             ;POP THE STACK
004324  104006                            ERROR   6                       ;INTERRUPT WENT TO LOCATION 0

004326  005014                    6$:     CLR     @TACS                   ;CLEAR INTERRUPT ENABLE
004330  013777  001220  174660            MOV     @#TAVEC+2,@TAVEC        ;SET TRAP CATCHER
```

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 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 STOFED 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  010314                  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                          ERROR   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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 1200  004774  000005                          RESET
 1201  004776  010314              1$:         MOV     DRIVE,@TACS
 1202  005000  012737  000340  177776          MOV     #340,@#PS               ;LOCK OUT ALL INTERRUPTS
 1203  005006  012700  000006                  MOV     #6,R0                   ;TEST AT PRIORITY LEVEL 6
 1204  005012  005001                          CLR     R1                      ;CLEAR INTERRUPT KEY
 1205  005014  012702  000001                  MOV     #1,R2                   ;SETUP TO WASTE A LITTLE TIME
 1206  005020  012777  005124  174170          MOV     #4$,@TAVEC              ;INTERRUPT RETURN
 1207  005026  012777  000340  174164          MOV     #340,@TAVEC+2           ;LOCK OUT THE WORLD IF INTERRUPT
 1208  005034  012737  000137  000000          MOV     #137,@#0                ;SETUP TO CATCH INTERRUPT IF
 1209  005042  012737  005130  000002          MOV     #5$,@#2                 ;    IT GOES TO LOCATION 0
 1210  005050  112714  000100                  MOVB    #INT.EN,@TACS           ;SET INTERRUPT ENABLE
 1211  005054  012737  000300  177776          MOV     #6*40,@#PS              ;SET TO PRIORITY LEVEL 6
 1212  005062  006302              2$:         ASL     R2                      ;KILL SOME TIME
 1213  005064  001376                          BNE     2$
 1214  005066  012737  000340  177776          MOV     #340,@#PS               ;LOCK OUT THE WORLD
 1215  005074  005701                          TST     R1                      ;DID AN INTERRUPT OCCUR?
 1216  005076  001005                          BNE     3$                      ;BR IF YES
 1217  005100  022737  000300  001222          CMP     #6*40,@#TAPRIO          ;WAS AN INTERRUPT EXPECTED?
 1218  005106  002012                          BGE     6$                      ;BR IF NO
 1219  005110  104006                          ERROR   6                       ;INTERRUPT FAILED TO OCCUR AT PRIORITY LEVEL 6
 1220
 1221  005112  022737  000300  001222  3$:     CMP     #6*40,@#TAPRIO          ;INTERRUPT OCCURRED--SHOULD IT HAVE?
 1222  005120  002405                          BLT     6$                      ;BR IF YES
 1223  005122  104006                          ERROR   6                       ;INTERRUPT OCCURRED AT PRIORITY LEVEL 6
 1224
 1225  005124  005201              4$:         INC     R1                      ;SET INTERRUPT KEY
 1226  005126  000002                          RTI                             ;RETURN AFTER INTERRUPT
 1227  005130  022626              5$:         CMP     (SP)+,(SP)+             ;POP THE STACK
 1228  005132  104006                          ERROR   6                       ;INTERRUPT WENT TO LOCATION 0
 1229
 1230  005134  005014              6$:         CLR     @TACS                   ;CLEAR INTERRUPT ENABLE
 1231  005136  013777  001220  174052          MOV     @#TAVEC+2,@TAVEC        ;SET TRAP CATCHER
 1232  005144  005077  174050                  CLR     @TAVEC+2
 1233  005150  005037  000000                  CLR     @#0
 1234  005154  005037  000002                  CLR     @#2
 1235                                  ;;*****************************************************************
 1236                                  ;THIS TEST WILL SETUP THE TA11'S VECTOR ADDRESS AND AT ADDRESS 0
 1237                                  ;A JMP @(PC)+ IS STORED INCASE THE VECTOR IS READ AS 0.
 1238                                  ;IT WILL THEN SET THE PRIORITY LEVEL TO 7 AND WASTE ENOUGH TIME
 1239                                  ;FOR AN INTERRUPT TO OCCUR.
 1240                                  ;AFTER THE TIME IS UP IT WILL RESTORE THE PS TO LEVEL 7
 1241                                  ;AND CHECK IF AN INTERRUPT OCCURRED.
 1242                                  ;;*****************************************************************
 1243                                  ;*TEST 14        TEST INTERRUPT WITH READY = "1" AT LEVEL 7
 1244                                  ;;*****************************************************************
 1245  005160  000004              TST14:  SCOPE
 1246  005162  012767  005200  173716          MOV     #1$,$LPADR      ;;SET SCOPE LOOP ADDRESS
 1247  005170  012767  005336  173772          MOV     #6$,$ESCAPE     ;;ESCAPE TO 6$ ON ERROR
 1248  005176  000005                          RESET
 1249  005200  010314              1$:         MOV     DRIVE,@TACS
 1250  005202  012737  000340  177776          MOV     #340,@#PS               ;LOCK OUT ALL INTERRUPTS
 1251  005210  012700  000007                  MOV     #7,R0                   ;TEST AT PRIORITY LEVEL 7
 1252  005214  005001                          CLR     R1                      ;CLEAR INTERRUPT KEY
 1253  005216  012702  000001                  MOV     #1,R2                   ;SETUP TO WASTE A LITTLE TIME
 1254  005222  012777  005326  173766          MOV     #4$,@TAVEC              ;INTERRUPT RETURN
 1255  005230  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$:     CLR     @TACS                   ;CLEAR INTERRUPT ENABLE
1279  005340  013777  001220  173650          MOV     @#TAVEC+2,@TAVEC        ;SET TRAP CATCHER
1280  005346  005077  173646                  CLR     @TAVEC+2
1281  005352  005037  000000                  CLR     @#0
1282  005356  005037  000002                  CLR     @#2
1283                          ;;**************************************************************
1284                          ;*TEST 15        TEST INTERRUPT WITH "TRANSFER REQUEST" = 1
1285                          ;;**************************************************************
1286  005362  000004          T$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$:     RESET                           ;CLEAR ALL
005532  013777  001220  173456          MOV     @#TAVEC+2,@TAVEC        ;SET TRAP CATCHER
005540  005077  173454                  CLR     @TAVEC+2
005544  005037  000000                  CLR     @#0
005550  005037  000002                  CLR     @#2
                                ;;*****************************************************************
                                ;*TEST 16        TEST INTERRUPT WITH "READY" = 0 AND "XFER REQ" = 0
                                ;;*****************************************************************
005554  000004                  T5T16:  SCOPE
005556  012767  000001  173402          MOV     #1,$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  03c714  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$:     RESET                           ;CLEAR THE WORLD
005726  013777  001220  173262          MOV     @#TAVEC+2,@TAVEC        ;SET TRAP CATCHER
005734  005077  173260                  CLR     @TAVEC+2
005740  005037  000000                  CLR     @#0
005744  005037  000002                  CLR     @#2
                                ;;*****************************************************************
                                ;*TEST 17        TEST INTERRUPT WITH "XFER REQ" = 1 & "TIMING ERROR" = 1
                                ;;*****************************************************************
005750  000004                  T5T17:  SCOPE
005752  012767  000012  173206          MOV     #10.,$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           ;GET 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$:     BIT     #ERROR!LEADER,@TACS     ;ERROR SHOULD BE CLEAR
                        BEQ     TST25           ;;SO SHOULD "CLEAR LEADER"
                        ERROR   1                       ;ERROR OR CLEAR LEADER ON A (1)
                ;;**********************************************************
                ;*TEST 25        TEST "READ" INTO FILE GAP CAUSES AN ERROR
                ;;**********************************************************
                TST25:  SCOPE
                        MOV     #10.,$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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                                        WAITREADY                       ;WAIT ON "READY"
                                        MOVB    #READ!GO,@TACS          ;START A "READ"
                                        WAITREADY                       ;WAIT ON "READY"
                                        TST     @TACS                   ;DID AN "ERROR" OCCUR?
                                        BMI     2$                      ;BR IF YES
                                        ERROR   1                       ;ERROR FAILED TO SET
                                2$:     BIT     #FGAP,@TACS             ;IS FILE GAP=1?
                                        BNE     TST26           ;;BR IF YES
                                        ERROR   1                       ;FILE GAP NOT=1
                                ;;**************************************************************
                                ;*TEST 26       TEST "SFBG" INTO FILE GAP CAUSES AN ERROR
                                ;;**************************************************************
                                TST26:  SCOPE
                                        MOV     #10.,$TIMES     ;;DO 10. ITERATIONS
                                        MOV     #1$,$LPADR      ;;SET SCOPE LOOP ADDRESS
                                        MOV     #TST27,$ESCAPE  ;;ESCAPE TO TEST 27 ON ERROR
                                        RESET
                                        MOV     DRIVE,@TACS             ;SELECT DRIVE
                                        MOVB    #REWIND!GO,@TACS        ;GO TO BEGINNING OF TAPE
                                        WAITREADY                       ;WAIT ON "READY"
                                1$:     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
                                        WAITREADY                       ;WAIT ON "READY"
                                        MOVB    #SFBG!GO,@TACS          ;START A "SFBG"
                                        WAITREADY                       ;WAIT ON "READY"
                                        TST     @TACS                   ;DID AN "ERROR" OCCUR?
                                        BMI     2$                      ;BR IF YES
                                        ERROR   1                       ;ERROR FAILED TO SET
                                2$:     BIT     #FGAP,@TACS             ;IS FILE GAP=1?
                                        BNE     TST27           ;;BR IF YES
                                        ERROR   1                       ;FILE GAP NOT=1
                                ;;**************************************************************
                                ;*TEST 27       TEST "ERROR" OUTPUT OF THE STATUS ROM WITH "FILE GAP=1"
                                ;;**************************************************************
                                TST27:  SCOPE
                                        MOV     #10.,$TIMES     ;;DO 10. ITERATIONS
                                        MOV     #1$,$LPADR      ;;SET SCOPE LOOP ADDRESS
                                        MOV     #TST30,$ESCAPE  ;;ESCAPE TO TEST 30 ON ERROR
                                        RESET
                                        MOV     DRIVE,@TACS             ;SELECT DRIVE
                                        WAITREADY                       ;MAKE SURE READY IS SET
                                        MOVB    #REWIND!GO,@TACS        ;GO TO BEGINNING OF TAPE
                                        WAITREADY                       ;WAIT ON "READY"
                                        MOVB    #WFG!GO,@TACS           ;GET OFF OF CLEAR LEADER
                                        WAITREADY                       ;WAIT FOR READY
                                        MOVB    #WRITE!GO,@TACS         ;START A WRITE
                                        WAITXFER                        ;WAIT ON "XFER REQ"
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 1648  007400  112715  000377                MOVB    #377,@TADB              ;WRITE ONE BYTE
 1649  007404  104413                        WAITXFER                        ;WAIT ON "XFER REQ"
 1650  007406  112715  000377                MOVB    #377,@TADB              ;WRITE
 1651  007412  104413                        WAITXFER                        ;WAIT ON "XFER REQ"
 1652  007414  052714  000020                BIS     #ILBS,@TACS             ;WRITE "CRC"
 1653  007420  104412                        WAITREADY                       ;WAIT ON "READY"
 1654  007422  112714  000001                MOVB    #WFG!GO,@TACS           ;WRITE A "FILE GAP"
 1655  007426  104412                        WAITREADY                       ;WAIT ON "READY"
 1656  007430  112714  000017        1$:     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   1                       ;"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"
```

```
                                ;;**********************************************************
                                ;*TEST 31        TEST BACK-SPACE-BLOCK-GAP INTO CLEAR LEADER
                                ;;**********************************************************
                        TST31:  SCOPE
010000  000004                 MOV     #10.,$TIMES     ;;DO 10. ITERATIONS
010002  012767  000012  171156  MOV     #1$,$LPADR      ;;SET SCOPE LOOP ADDRESS
010010  012767  010104  171070  MOV     #TST32,$ESCAPE  ;;ESCAPE TO TEST 32 ON ERROR
010016  012767  010172  171144  RESET
010024  000005                 MOV     DRIVE,@TACS             ;SELECT DRIVE
010026  010314                 WAITREADY                       ;MAKE SURE READY IS SET
010030  104412                 MOVB    #REWIND!GO,@TACS        ;GO TO BEGINNING OF TAPE
010032  112714  000017          WAITREADY                       ;WAIT ON "READY"
010036  104412                 MOVB    #WFG!GO,@TACS           ;GET OFF OF CLEAR LEADER
010040  112714  000001          WAITREADY                       ;WAIT FOR READY
010044  104412                 MOVB    #WRITE!GO,@TACS         ;START A WRITE
010046  112714  000003          WAITXFER                        ;WAIT ON "XFER REQ"
010052  104413                 MOVB    #377,@TADB              ;WRITE ONE BYTE
010054  112715  000377          WAITXFER                        ;WAIT ON "XFER REQ"
010060  104413                 MOVB    #377,@TADB              ;WRITE
010062  112715  000377          WAITXFER                        ;WAIT ON "XFER REQ"
010066  104413                 BIS     #ILBS,@TACS             ;WRITE "CRC"
010070  052714  000020          WAITREADY                       ;WAIT ON "READY"
010074  104412                 MOVB    #WFG!GO,@TACS           ;WRITE A "FILE GAP"
010076  112714  000001          WAITREADY                       ;WAIT ON "READY"
010102  104412                 MOVB    #REWIND!GO,@TACS        ;BACK OVER THE DATA
010104  112714  000017  1$:     WAITREADY                       ;WAIT ON "READY"
010110  104412                 MOVB    #SFFG!GO,@TACS          ;DO A SPACE FWD FILE GAP
010112  112714  000013          WAITREADY
010116  104412                 BIT     #FGAP,@TACS             ;IS FILE GAP=1?
010120  032714  004000          BNE     2$                      ;BR IF YES
010124  001001                 ERROR   1                       ;FILE GAP NOT=1
010126  104001                 MOVB    #BSBG!GO,@TACS          ;GO TO FIRST FILE GAP ON TAPE
010130  112714  000011  2$:     WAITREADY                       ;GO WAIT FOR "READY" TO SET
010134  104412                 BIT     #ERROR!FGAP!LEADER,@TACS        ;DID WE GET ANY ERROR?
010136  032714  124000          BEQ     3$                      ;BR IF NO
010142  001401                 ERROR   1                       ;AN ERROR OCCURRED
010144  104001                 MOVB    #BSBG!GO,@TACS          ;BSBG WHILE IN A FILE GAP
010146  112714  000011  3$:     WAITREADY                       ;GO WAIT FOR "READY" TO SET
010152  104412                 TST     @TACS                   ;"ERROR" BIT SHOULD BE SET
010154  005714                 BMI     4$                      ;BR IF IT IS
010156  100401                 ERROR   1                       ;"ERROR" BIT WASN'T SET
010160  104001                 BIT     #LEADER,@TACS           ;"CLEAR LEADER" SHOULD BE SET
010162  032714  020000  4$:     BNE     TST32           ;;BR IF "CLEAR LEADER" = 1
010166  001001                 ERROR   1                       ;"CLEAR LEADER" NOT SET
010170  104001
                                ;////////////////////////////////////////////////////////////
                                ;////////////////////////////////////////////////////////////
                                ;THE FOLLOWING TESTS INSURE THAT DATA CAN BE WRITING ONTO AND READ FROM THE TAPE
                                ;////////////////////////////////////////////////////////////
                                ;;**********************************************************
                                ;*TEST 32        TEST "WRITE" 377 & 0 "READ" 377 & 0
                                ;;**********************************************************
                        TST32:  SCOPE
010172  000004                 MOV     #10.,$TIMES     ;;DO 10. ITERATIONS
010174  012767  000012  170764  MOV     #3$,$LPADR      ;;SET SCOPE LOOP ADDRESS
010202  012767  010230  170676  MOV     #TST33,$ESCAPE  ;;ESCAPE TO TEST 33 ON ERROR
010210  012767  010330  170752  RESET
010216  000005
```

```
 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,$ESCAPE  ;;ESCAPE TO TEST 34 ON ERROR
 1837  010354  000005                        RESET                           ;CLEAR ALL
 1838  010356  010314                        MOV     DRIVE,@TACS             ;SELECT DRIVE
 1839  010360  112714  000017                MOVB    #REWIND!GO,@TACS        ;GO TO "BOT"
 1840  010364  104412                        WAITREADY                       ;WAIT ON "READY" TO SET
 1841  010366  112714  000001                MOVB    #WFG!GO,@TACS           ;GET ON OXIDE
 1842  010372  104412                        WAITREADY                       ;WAIT ON "READY" TO SET
 1843  010374  012700  000377                MOV     #377,R0                 ;FIRST DATA PATTERN AND COUNTER
 1844  010400  112714  000003                MOVB    #WRITE!GO,@TACS         ;START A WRITE
 1845  010404  104413                        WAITXFER                        ;WAIT ON "XFER REQ" TO SET
 1846  010406  010015          1$:           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  020001                        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
```

```
 1859  010442  112714  000011          3$:     MOVB    #BSBG!GO,@TACS          ;GO TO BEGINNING OF BLOCK
 1860  010446  104412                          WAITREADY                       ;WAIT ON "READY" TO SET
 1861  010450  112714  000005                  MOVB    #READ!GO,@TACS          ;START A "READ"
 1862  010454  012700  000377                  MOV     #377,R0                 ;FIRST DATA PATTERN AND COUNTER
 1863  010460  104413                  4$:     WAITXFER                        ;WAIT ON "XFER REQ" TO SET
 1864  010462  011501                          MOV     @TADB,R1                ;READ A BYTE FROM TAPE
 1865  010464  020001                          CMP     R0,R1                   ;IS IT VALID?
 1866  010466  001401                          BEQ     5$                      ;BR IF YES
 1867  010470  104005                          ERROR   5                       ;BAD DATA READ FROM TAPE
 1868  010472  005300                  5$:     DEC     R0                      ;NEXT PATTERN
 1869  010474  002371                          BGE     4$                      ;BR IF MORE TO READ
 1870  010476  104413                          WAITXFER                        ;WAIT ON "XFER REQ" TO SET
 1871  010500  052714  000020                  BIS     #ILBS,@TACS             ;SHUT DOWN THE "READ" OPERATION
 1872  010504  104412                          WAITREADY                       ;WAIT ON "READY" TO SET
 1873  010506  032714  140000                  BIT     #ERROR!CRCERR,@TACS     ;ERROR AND CRCERR SHOULD BE = 0
 1874  010512  001401                          BEQ     TST34           ;;BR IF THEY ARE
 1875  010514  104001                          ERROR   1                       ;(ERROR ! CRCERR) = 1
 1876                          ;////////////////////////////////////////////////////////////////
 1877                          ;////////////////////////////////////////////////////////////////
 1878                          ;THE FOLLOWING TESTS ARE USED TO INSURE THAT THE "CRC" CIRCUITRY FUNCTIONS PROPERLY
 1879                          ;////////////////////////////////////////////////////////////////
 1880                          ;;**************************************************************
 1881                          ;*TEST 34        TEST "ERROR" WITH "CRCERR" = 1
 1882                          ;;**************************************************************
 1883  010516  000004          TST34:  SCOPE
 1884  010520  012767  000012  170440          MOV     #10.,$TIMES     ;;DO 10. ITERATIONS
 1885  010526  012767  010562  170352          MOV     #20$,$LPADR     ;;SET SCOPE LOOP ADDRESS
 1886  010534  012767  010776  170426          MOV     #TST35,$ESCAPE  ;;ESCAPE TO TEST 35 ON ERROR
 1887  010542  000005                          RESET
 1888  010544  010314                          MOV     DRIVE,@TACS             ;SELECT DRIVE
 1889  010546  112714  000017                  MOVB    #REWIND!GO,@TACS        ;GO TO CLEAR LEADER
 1890  010552  104412                          WAITREADY                       ;WAIT ON "READY"
 1891  010554  112714  000001                  MOVB    #WFG!GO,@TACS           ;GET OFF OF CLEAR LEADER
 1892  010560  104412                          WAITREADY                       ;WAIT FOR READY
 1893  010562  112714  000003          20$:    MOVB    #WRITE!GO,@TACS         ;START A WRITE
 1894  010566  012700  000006                  MOV     #6,R0                   ;SETUP FOR 6 BYTES
 1895  010572  104413                  1$:     WAITXFER                        ;WAIT ON "XFER REQ"
 1896  010574  005300                          DEC     R0                      ;DOWN COUNT
 1897  010576  002403                          BLT     2$                      ;DONE?
 1898  010600  112715  000377                  MOVB    #377,@TADB              ;NO--WRITE ON TAPE
 1899  010604  000772                          BR      1$                      ;LOOP
 1900  010606  052714  000020          2$:     BIS     #ILBS,@TACS             ;WRITE "CRC"
 1901  010612  104412                          WAITREADY                       ;WAIT ON "READY"
 1902  010614  112714  000011                  MOVB    #BSBG!GO,@TACS          ;BACK OVER THE DATA BLOCK
 1903  010620  104412                          WAITREADY                       ;WAIT ON "READY"
 1904  010622  112714  000005                  MOVB    #READ!GO,@TACS          ;START A "READ"
 1905  010626  012700  000003                  MOV     #3,R0                   ;DO 3 BYTES
 1906  010632  104413                  3$:     WAITXFER                        ;WAIT FOR "XFER REQ"
 1907  010634  005300                          DEC     R0                      ;COUNT # OF BYTES
 1908  010636  002402                          BLT     4$
 1909  010640  105715                          TSTB    @TADB                   ;CLEAR "XFER REQ"
 1910  010642  000773                          BR      3$
 1911  010644  052714  000020          4$:     BIS     #ILBS,@TACS             ;DO "ILBS"
 1912  010650  104412                          WAITREADY                       ;WAIT ON "READY"
 1913  010652  005714                          TST     @TACS                   ;CHECK FOR "ERROR"
 1914  010654  100401                          BMI     5$                      ;BR IF "ERROR"
```

```
                                        ERROR   1                       ;"ERROR" BIT NOT SET
                                5$:     BIT     #CRCERR,@TACS           ;CHECK FOR "CRC" ERROR
                                        BNE     6$                      ;BR IF "CRC" ERROR
                                        ERROR   1                       ;NO "CRC" ERROR
                                ;THE FOLLOWING CODE IS USED TO CHECK THE ROM
                                6$:     MOVB    #WFG,@TACS              ;CHECK "ERROR" WITH "WFG"
                                        TST     @TACS                   ;SAMPLE THE "ERROR" BIT
                                        BPL     7$                      ;BR IF "ERROR" = 0
                                        ERROR   1                       ;"ERROR" NOT = 0
                                7$:     MOVB    #WRITE,@TACS            ;CHECK "ERROR" WITH "WRITE"
                                        TST     @TACS                   ;SAMPLE THE "ERROR" BIT
                                        BMI     8$                      ;BR IF "ERROR" = 1
                                        ERROR   1                       ;"ERROR" NOT = 1
                                8$:     MOVB    #BSFG,@TACS             ;CHECK "ERROR" WITH "BSFG"
                                        TST     @TACS                   ;SAMPLE THE "ERROR" BIT
                                        BPL     9$                      ;BR IF "ERROR" = 0
                                        ERROR   1                       ;"ERROR" NOT = 0
                                9$:     MOVB    #BSBG,@TACS             ;CHECK "ERROR" WITH "BSBG"
                                        TST     @TACS                   ;SAMPLE THE "ERROR" BIT
                                        BPL     10$                     ;BR IF "ERROR" = 0
                                        ERROR   1                       ;"ERROR" NOT = 0
                                10$:    MOVB    #SFFG,@TACS             ;CHECK "ERROR" WITH "SFFG"
                                        TST     @TACS                   ;SAMPLE THE "ERROR" BIT
                                        BPL     11$                     ;BR IF "ERROR" = 0
                                        ERROR   1                       ;"ERROR" NOT = 0
                                11$:    MOVB    #SFBG,@TACS             ;CHECK "ERROR" WITH "SFBG"
                                        TST     @TACS                   ;SAMPLE THE "ERROR" BIT
                                        BPL     12$                     ;BR IF "ERROR" = 0
                                        ERROR   1                       ;"ERROR" NOT = 0
                                12$:    MOVB    #REWIND,@TACS           ;CHECK "ERROR" WITH "REWIND"
                                        TST     @TACS                   ;SAMPLE THE "ERROR" BIT
                                        BPL     TST35           ;;BR IF "ERROR" = 0
                                        ERROR   1                       ;"ERROR" NOT = 0
                                ;;**************************************************************
                                ;*TEST 35       TEST "DATA OF 0 GIVES CRC OF 0"
                                ;;**************************************************************
                                TST35:  SCOPE
                                        MOV     #5,$TIMES       ;;DO 5 ITERATIONS
                                        MOV     #6$,$LPADR      ;;SET SCOPE LOOP ADDRESS
                                        MOV     #TST36,$ESCAPE  ;;ESCAPE TO TEST 36 ON ERROR
                                        RESET
                                        MOV     DRIVE,@TACS             ;SELECT DRIVE
                                        MOVB    #REWIND!GO,@TACS        ;GO TO "CLEAR LEADER"
                                        WAITREADY                       ;WAIT ON "READY"
                                6$:     MOVB    #WRITE!GO,@TACS         ;WRITE THE DATA
                                        WAITXFER                        ;WAIT ON "XFER REQ"
                                        CLRB    @TADB                   ;1ST BYTE = 0
                                        WAITXFER                        ;WAIT ON "XFER REQ"
                                        CLRB    @TADB                   ;2ND BYTE = 0
                                        WAITXFER                        ;WAIT ON "XFER REQ"
                                        BIS     #ILBS,@TACS             ;WRITE "CRC"
                                        WAITREADY                       ;WAIT ON "READY"
                                        MOVB    #BSBG!GO,@TACS          ;BACK OVER THE DATA
                                        WAITREADY                       ;WAIT ON "READY"
                                        MOVB    #READ!GO,@TACS          ;START A "READ"
                                        WAITXFER                        ;WAIT ON "XFER REQ" FIRST
```

```
 1971  011074  005000                         CLR     R0                      ;SET R0 TO WHAT THE DATA SHOULD BE
 1972  011076  011501                         MOV     @TADB,R1                ;READ DATA BYTE
 1973  011100  001401                         BEQ     1$                      ;BR IF DATA = 0
 1974  011102  104005                         ERROR   5                       ;1ST BYTE NOT = 0
 1975  011104  104413                 1$:     WAITXFER                        ;WAIT ON "XFER REQ"
 1976  011106  011501                         MOV     @TADB,R1                ;READ SECOND DATA BYTE
 1977  011110  001401                         BEQ     2$                      ;BR IF 2ND BYTE = 0
 1978  011112  104005                         ERROR   5                       ;DATA WASN'T = 0
 1979  011114  104413                 2$:     WAITXFER                        ;WAIT ON "XFER REQ"
 1980  011116  011501                         MOV     @TADB,R1                ;READ FIRST CRC BYTE
 1981  011120  001401                         BEQ     3$                      ;BR IF 1ST CRC BYTE = 0
 1982  011122  104005                         ERROR   5                       ;1ST BYTE OF CRC BAD
 1983  011124  104413                 3$:     WAITXFER                        ;WAIT ON "XFER REQ"
 1984  011126  011501                         MOV     @TADB,R1                ;READ SECOND CRC BYTE
 1985  011130  001401                         BEQ     4$                      ;BR IF 2ND CRC BYTE = 0
 1986  011132  104005                         ERROR   5                       ;2ND BYTE OF CRC BAD
 1987  011134  052714  000020         4$:     BIS     #ILBS,@TACS             ;WAIT FOR "READY"
 1988  011140  104412                         WAITREADY                       ;"ERROR" SHOULD BE = 1
 1989  011142  005714                         TST     @TACS                   ;BR IF "ERROR" IS  = 1
 1990  011144  100401                         BMI     5$                      ;IS  THE ERROR  A "CRC" ERROR?
 1991  011146  104001                         ERROR   1                       ;GO TO NEXT TEST IF YES
 1992  011150  032714  040000         5$:     BIT     #CRCERR,@TACS           ;THE ERROR WASN'T A "CRC" ERROR
 1993  011154  001001                         BNE     TST36           ;;GO TO NEXT TEST IF YES
 1994  011156  104001                         ERROR   1                       ;THE ERROR WASN'T A "CRC" ERROR
 1995                                 ;;*****************************************************************
 1996                                 ;*TEST 36       TEST "CRC" CIRCUIT USING A COUNT PATTERN
 1997                                 ;;*****************************************************************
 1998  011160  000004                 TST36:  SCOPE
 1999  011162  012767  000012  167776         MOV     #10.,$TIMES     ;;DO 10. ITERATIONS
 2000  011170  012767  011272  167710         MOV     #3$,$LPADR      ;;SET SCOPE LOOP ADDRESS
 2001  011176  012767  011412  167764         MOV     #TST37,$ESCAPE  ;;ESCAPE TO TEST 37 ON ERROR
 2002  011204  000005                         RESET                           ;CLEAR ALL
 2003  011206  010314                         MOV     DRIVE,@TACS             ;SELECT DRIVE
 2004  011210  112714  000017                 MOVB    #REWIND!GO,@TACS        ;GO TO "BOT"
 2005  011214  104412                         WAITREADY                       ;WAIT ON "READY" TO SET
 2006  011216  112714  000001                 MOVB    #WFG!GO,@TACS           ;GET ON OXIDE
 2007  011222  104412                         WAITREADY                       ;WAIT ON "READY" TO SET
 2008  011224  012700  000377                 MOV     #377,R0                 ;FIRST DATA PATTERN AND COUNTER
 2009  011230  112714  000003                 MOVB    #WRITE!GO,@TACS         ;START A WRITE
 2010  011234  104413                         WAITXFER                        ;WAIT ON "XFER REQ" TO SET
 2011  011236  010015                 1$:     MOV     R0,@TADB                ;WRITE A BYTE ON TAPE
 2012  011240  104413                         WAITXFER                        ;WAIT ON "XFER REQ" TO SET
 2013  011242  011501                         MOV     @TADB,R1                ;GET BACK THE LAST BYTE WRITTEN
 2014  011244  020001                         CMP     R0,R1                   ;       AND CHECK IT
 2015  011246  001401                         BEQ     2$                      ;BR IF IT LOOKS GOOD
 2016  011250  104005                         ERROR   5                       ;THE DATA IN TADB WAS BAD
 2017  011252  005300                 2$:     DEC     R0                      ;NEXT PATTERN
 2018  011254  002370                         BGE     1$                      ;BR IF MORE TO DO
 2019  011256  052714  000020                 BIS     #ILBS,@TACS             ;WRITE THE "CRC"
 2020  011262  104412                         WAITREADY                       ;WAIT ON "READY" TO SET
 2021  011264  005714                         TST     @TACS                   ;ANY ERRORS OCCUR?
 2022  011266  100001                         BPL     3$                      ;BR IF NO
 2023  011270  104001                         ERROR   1                       ;ERROR OCCURRED DURING WRITE
 2024  011272  112714  000011         3$:     MOVB    #BSBG!GO,@TACS          ;BACK OVER THE DATA BLOCK
 2025  011276  104412                         WAITREADY                       ;WAIT ON "READY" TO SET
 2026  011300  112714  000005                 MOVB    #READ!GO,@TACS          ;START A "READ"
```

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 2027  011304  012700  000377            MOV     #377,R0                 ;FIRST DATA PATTERN AND COUNTER
 2028  011310  005037  013774            CLR     @#CRC.WD                ;INITIALIZES THE "CRC WORD"
 2029  011314  004737  013654      4$:   JSR     PC,@#D0.CRC             ;COMBINE THIS BYTE [R0] WITH THE "CRC WORD"
 2030  011320  104413                    WAITXFER                        ;WAIT ON "XFER REQ" TO SET
 2031  011322  011501                    MOV     @TADB,R1                ;READ A BYTE FROM TAPE
 2032  011324  020001                    CMP     R0,R1                   ;IS IT VALID?
 2033  011326  001401                    BEQ     5$                      ;BR IF YES
 2034  011330  104005                    ERROR   5                       ;BAD DATA READ FROM TAPE
 2035  011332  005300            5$:     DEC     R0                      ;NEXT PATTERN
 2036  011334  002367                    BGE     4$                      ;BR IF MORE TO READ
 2037  011336  005000                    CLR     R0                      ;GET LOW BYTE OF "CRC WORD"
 2038  011340  153700  013774            BISB    @#CRC.WD,R0
 2039  011344  104413                    WAITXFER                        ;WAIT ON "XFER REQ" TO SET
 2040  011346  052714  000020            BIS     #ILBS,@TACS             ;SHUT DOWN THE "READ" OPERATION
 2041  011352  011501                    MOV     @TADB,R1                ;PICK FIRST BYTE OF TU60 "CRC"
 2042  011354  020001                    CMP     R0,R1                   ;IS IT GOOD?
 2043  011356  001401                    BEQ     6$                      ;BR IF YES
 2044  011360  104005                    ERROR   5                       ;FIRST BYTE OF TU60 "CRC" IS BAD
 2045  011362  005000            6$:     CLR     R0                      ;GET HIGH BYTE OF "CRC WORD"
 2046  011364  153700  013775            BISB    @#CRC.WD+1,R0
 2047  011370  104412                    WAITREADY                       ;WAIT ON "READY" TO SET
 2048  011372  011501                    MOV     @TADB,R1                ;READ THE 2ND BYTE OF TU60 "CRC"
 2049  011374  020001                    CMP     R0,R1                   ;IS IT GOOD?
 2050  011376  001401                    BEQ     7$                      ;BR IF YES
 2051  011400  104005                    ERROR   5                       ;HIGH BYTE OF "CRC" IS BAD
 2052  011402  032714  140000      7$:   BIT     #ERROR!CRCERR,@TACS     ;ERROR AND CRCERR SHOULD BE = 0
 2053  011406  001401                    BEQ     TST37           ;;BR IF THEY ARE
 2054  011410  104001                    ERROR   1                       ;(ERROR ! CRCERR) = 1
 2055                          ;;*****************************************************************
 2056                          ;THIS TEST REQUIRES BOTH DRIVES .
 2057                          ;FOR THE FOLLOWING DESCRIPTION DRIVE "1" IS THE DRIVE UNDER TEST
 2058                          ;AND DRIVE "2" IS THE OTHER DRIVE
 2059                          ;
 2060                          ;TEST DESCRIPTION
 2061                          ;1)     REWIND DRIVE 1
 2062                          ;2)     WAIT FOR READY TO SET
 2063                          ;3)     START DRIVE 2 REWINDING
 2064                          ;4)     WAIT FOR READY TO CLEAR
 2065                          ;5)     SELECT DRIVE 1  AND CHECK THAT READY IS STILL SET
 2066                          ;6)     SELECT DRIVE 2 AND CHECK THAT READY IS STILL CLEAR
 2067                          ;
 2068                          ;;*****************************************************************
 2069                          ;*TEST 37        TRY TO HANG "READY" ON "REWIND"
 2070                          ;;*****************************************************************
 2071  011412  000004          TST37:  SCOPE
 2072  011414  012767  000005  167544          MOV     #5,$TIMES       ;;DO 5 ITERATIONS
 2073  011422  012767  011436  167456          MOV     #1$,$LPADR      ;;SET SCOPE LOOP ADDRESS
 2074  011430  012767  011552  167532          MOV     #TST40,$ESCAPE  ;;ESCAPE TO TEST 40 ON ERROR
 2075  011436  105737  001225          1$:     TSTB    @#DRVKEY+1              ;TESTING TWO DRIVES?
 2076  011442  001443                          BEQ     TST40           ;;BR IF NO
 2077  011444  012701  000001                  MOV     #1,R1                   ;SET TIMER
 2078  011450  010302                          MOV     DRIVE,R2                ;SET R2 TO THE OTHER DRIVE
 2079  011452  062702  000400                  ADD     #UNIT,R2
 2080  011456  042702  177377                  BIC     #^CUNIT,R2
 2081  011462  000005                          RESET                           ;CLEAR ALL
 2082  011464  010314                          MOV     DRIVE,@TACS             ;SELECT 1ST DRIVE
```

```
 2083  011466  104412                          WAITREADY                       ;WAIT ON "READY"
 2084  011470  010214                          MOV     R2,@TACS                ;SELECT 2ND DRIVE
 2085  011472  104412                          WAITREADY                       ;WAIT ON "READY"
 2086  011474  112714  000017                  MOVB    #REWIND!GO,@TACS        ;SEND 2ND DRIVE TO BOT
 2087  011500  006301                  2$:     ASL     R1                      ;GIVE "READY" TIME TO CLEAR
 2088  011502  001001                          BNE     3$
 2089  011504  104001                          ERROR   1                       ;"READY" FAILED TO CLEAR
 2090                                                                          ;NOTE:  THIS ERROR OCCURRED ON THE
 2091                                                                          ;2ND DRIVE. I.E. IF TESTING DRIVE A
 2092                                                                          ;THEN DRIVE B FAILED
 2093  011506  032714  000040          3$:     BIT     #READY,@TACS            ;WAIT FOR "READY" TO CLEAR
 2094  011512  001372                          BNE     2$
 2095  011514  010314                          MOV     DRIVE,@TACS             ;SELECT 1ST DRIVE
 2096  011516  112714  000016                  MOVB    #REWIND,@TACS           ;LOAD A "REWIND"
 2097  011522  032714  000040                  BIT     #READY,@TACS            ;CHECK "READY"
 2098  011526  001001                          BNE     4$                      ;BR IF STILL SET
 2099  011530  104001                          ERROR   1                       ;"READY" WAS CLEAR
 2100  011532  010214                  4$:     MOV     R2,@TACS                ;SELECT 2ND DRIVE
 2101  011534  112714  000016                  MOVB    #REWIND,@TACS           ;LOAD A REWIND
 2102  011540  032714  000040                  BIT     #READY,@TACS            ;CHECK "READY"
 2103  011544  001401                          BEQ     5$                      ;BR IF STILL CLEAR
 2104  011546  104001                          ERROR   1                       ;"READY" WAS SET
 2105  011550  104412                  5$:     WAITREADY                       ;WAIT ON "READY"
 2106                                  ;;*****************************************************************
 2107                                  ;THIS TEST REQUIRES BOTH DRIVES.
 2108                                  ;FOR THE FOLLOWING DESCRIPTION DRIVE "1" IS THE DRIVE UNDER TEST
 2109                                  ;AND DRIVE "2" IS THE OTHER DRIVE
 2110                                  ;
 2111                                  ;TEST DESCRIPTION
 2112                                  ;1)     REWIND DRIVE 1
 2113                                  ;2)     WFG ON DRIVE 1
 2114                                  ;3)     START A REWIND ON DRIVE 2
 2115                                  ;4)     WHILE DRIVE 2 IS REWINDING WRITE DATA ON DRIVE 1
 2116                                  ;5)     CHECK FOR ERRORS
 2117                                  ;6)     START A REWIND ON DRIVE 2
 2118                                  ;7)     WHILE DRIVE 2 IS REWINDING READ DATA FROM DRIVE 1
 2119                                  ;8)     CHECK FOR ERRORS
 2120                                  ;
 2121                                  ;;*****************************************************************
 2122                                  ;*TEST 40        TRY TO GLITCH THE "POWER SUPPLY"
 2123                                  ;;*****************************************************************
 2124  011552  000004                  TST40:  SCOPE
 2125  011554  012767  000005  167404          MOV     #5,$TIMES       ;;DO 5 ITERATIONS
 2126  011562  012767  011576  167316          MOV     #1$,$LPADR      ;;SET SCOPE LOOP ADDRESS
 2127  011570  012767  012134  167372          MOV     #TST41,$ESCAPE  ;;ESCAPE TO TEST 41 ON ERROR
 2128  011576  105737  001225          1$:     TSTB    @#DRVKEY+1              ;TESTING TWO DRIVES?
 2129  011602  001554                          BEQ     TST41           ;;BR IF NO
 2130  011604  012701  000001                  MOV     #1,R1                   ;SET TIMER
 2131  011610  010302                          MOV     DRIVE,R2                ;SET R2 TO THE OTHER DRIVE
 2132  011612  062702  000400                  ADD     #UNIT,R2
 2133  011616  042702  177377                  BIC     #^CUNIT,R2
 2134  011622  000005                          RESET                           ;CLEAR ALL
 2135  011624  010314                          MOV     DRIVE,@TACS             ;SELECT 1ST DRIVE
 2136  011626  112714  000017                  MOVB    #REWIND!GO,@TACS        ;REWIND TO BOT
 2137  011632  104412                          WAITREADY                       ;WAIT ON "READY"
 2138  011634  112714  000001                  MOVB    #WFG!GO,@TACS           ;GET ON OXIDE
```

```
02139  011640  104412                        WAITREADY                       ;WAIT ON "READY"
02140  011642  010214                        MOV     R2,@TACS                ;SELECT 2ND DRIVE
02141  011644  104412                        WAITREADY                       ;WAIT ON "READY"
02142  011646  112714  000017                MOVB    #REWIND!GO,@TACS        ;START A "REWIND"
02143  011652  006301              2$:       ASL     R1                      ;GIVE "READY" TIME TO CLEAR
02144  011654  001001                        BNE     3$
02145  011656  104001                        ERROR   1                       ;"READY" FAILED TO CLEAR
02146                                                                        ;NOTE:  THIS ERROR OCCURRED ON THE
02147                                                                        ;2ND DRIVE. I.E. IF TESTING DRIVE A
02148                                                                        ;THEN DRIVE B FAILED
02149  011660  032714  000040              3$:       BIT     #READY,@TACS    ;WAIT FOR "READY" TO CLEAR
02150  011664  001372                        BNE     2$
02151  011666  010314                        MOV     DRIVE,@TACS             ;SELECT 1ST DRIVE
02152  011670  112714  000003                MOVB    #WRITE!GO,@TACS         ;WRITE WHILE THE OTHER DRIVE IS "REWINDING"
02153  011674  104413                        WAITXFER                        ;WAIT ON "XFER REQ"
02154  011676  112715  000377                MOVB    #377,@TADB              ;WRITE 1ST BYTE
02155  011702  104413                        WAITXFER                        ;WAIT ON "XFER REQ"
02156  011704  105015                        CLRB    @TADB                   ;WRITE 2ND BYTE
02157  011706  104413                        WAITXFER                        ;WAIT ON "XFER REQ"
02158  011710  052714  000020                BIS     #ILBS,@TACS             ;WRITE "CRC" & SHUT DOWN
02159  011714  104412                        WAITREADY                       ;WAIT ON "READY"
02160  011716  005714                        TST     @TACS                   ;ANY ERROR?
02161  011720  100001                        BPL     4$                      ;BR IF NO
02162  011722  104001                        ERROR   1                       ;ERROR OCCURRED DURING "WRITE"
02163  011724  112714  000011              4$:       MOVB    #BSBG!GO,@TACS  ;POSITION TAPE FOR "READ"
02164  011730  104412                        WAITREADY                       ;WAIT ON "READY"
02165  011732  005714                        TST     @TACS                   ;ANY ERROR?
02166  011734  100001                        BPL     5$                      ;BR IF NO
02167  011736  104001                        ERROR   1                       ;ERROR OCCURRED DURING "BSBG"
02168  011740  112714  000005              5$:       MOVB    #READ!GO,@TACS  ;START A "READ"
02169  011744  104413                        WAITXFER                        ;WAIT ON "XFER REQ"
02170  011746  012700  000377                MOV     #377,R0                 ;FIRST DATA PATTERN
02171  011752  011501                        MOV     @TADB,R1                ;PICKUP FIST BYTE
02172  011754  020001                        CMP     R0,R1                   ;IS IT GOOD?
02173  011756  001401                        BEQ     6$                      ;BR IF NO
02174  011760  104005                        ERROR   5                       ;1ST DATA BYTE IS BAD
02175  011762  104413              6$:       WAITXFER                        ;WAIT ON "XFER REQ"
02176  011764  005000                        CLR     R0                      ;2ND DATA PATTERN
02177  011766  011501                        MOV     @TADB,R1                ;PICKUP 2ND BYTE
02178  011770  001401                        BEQ     7$                      ;BR IF IT IS GOOD
02179  011772  104005                        ERROR   5                       ;2ND BYTE IS BAD
02180  011774  104413              7$:       WAITXFER                        ;WAIT ON "XFER REQ"
02181  011776  052714  000020                BIS     #ILBS,@TACS             ;SHUT DOWN
02182  012002  104412                        WAITREADY                       ;WAIT ON "READY"
02183  012004  005714                        TST     @TACS                   ;ERROR?
02184  012006  100001                        BPL     8$                      ;BR IF NO
02185  012010  104001                        ERROR   1                       ;ERROR OCCURRED
02186  012012  112714  000011              8$:       MOVB    #BSBG!GO,@TACS  ;POSITION FOR NEXT "READ"
02187  012016  104412                        WAITREADY                       ;WAIT ON "READY"
02188  012020  005714                        TST     @TACS                   ;ERROR?
02189  012022  100001                        BPL     9$                      ;BR IF NO
02190  012024  104001                        ERROR   1                       ;ERROR OCCURRED DURING "BSBG
02191  012026  010214              9$:       MOV     R2,@TACS                ;SELECT 2ND DRIVE
02192  012030  104412                        WAITREADY                       ;WAIT ON "READY"
02193  012032  112714  000017                MOVB    #REWIND!GO,@TACS        ;START A "REWIND"
02194  012036  012701  000001                MOV     #1,R1                   ;SET THE TIMER
```

```
                                10$:    INC     R1                      ;GIVE "READY" TIME TO CLEAR
                                        BNE     11$
                                        ERROR   1                       ;"READY" FAILED TO CLEAR
                                                                        ;NOTE:  THIS ERROR OCCURRED ON THE
                                                                        ;2ND DRIVE. I.E. IF TESTING DRIVE A
                                                                        ;THEN DRIVE B FAILED
                                11$:    BIT     #READY,@TACS            ;WAIT FOR "READY" TO CLEAR
                                        BNE     10$
                                        MOV     DRIVE,@TACS             ;SELECT 1ST DRIVE
                                        WAITREADY                       ;WAIT ON "READY"
                                        MOVB    #READ!GO,@TACS          ;"READ" WHILE OTHER DRIVE IS "REWINDING"
                                        WAITXFER                        ;WAIT ON "XFER REQ"
                                        MOV     #377,R0                 ;1ST DATA PATTERN
                                        MOV     @TADB,R1                ;READ 1ST BYTE
                                        CMP     R0,R1                   ;IS IT GOOD?
                                        BEQ     12$                     ;BR IF NO
                                        ERROR   5                       ;1ST BYTE FAILED
                                12$:    WAITXFER                        ;WAIT ON "XFER REQ"
                                        CLR     R0                      ;2ND DATA PATTERN
                                        MOV     @TADB,R1                ;READ 2ND BYTE
                                        BEQ     13$                     ;BR IF IT IS GOOD
                                        ERROR   5                       ;2ND BYTE FAILED
                                13$:    WAITXFER                        ;WAIT ON "XFER REQ"
                                        BIS     #ILBS,@TACS             ;SHUT DOWN
                                        WAITREADY                       ;WAIT ON "READY"
                                        TST     @TACS                   ;ERROR?
                                        BPL     TST41           ;;BR IF NO
                                        ERROR   1                       ;ERROR OCCURRED
                                ;;**************************************************************
                                ;*TEST 41        END OF TEST CODE
                                ;;**************************************************************
                                TST41:  SCOPE
                                        MOV     #1,$TIMES       ;;DO 1 ITERATION
                                        RESET
                                        MOV     DRIVE,@TACS             ;SELECT DRIVE
                                        MOVB    #REWIND!GO,@TACS
                                        WAITREADY
                                .SBTTL  END OF PASS ROUTINE

                                ;;**************************************************************
                                ;*INCREMENT THE PASS NUMBER ($PASS)
                                ;*TYPE "END PASS"
                                ;*IF THERES A MONITOR GO TO IT
                                ;*IF THERE ISN'T JUMP TO START
                                ;*IF IT IS DESIRED TO HAVE A BELL INDICATE THE "END OF PASS" LOCATION
                                ;*$ENDMG CAN BE CHANGED TO 7.

                                $EOP:
                                        SCOPE
                                        CLR     $TSTNM          ;;ZERO THE TEST NUMBER
                                        CLR     $TIMES          ;;ZERO THE NUMBER OF ITERATIONS
                                        INC     $PASS           ;;INCREMENT THE PASS NUMBER
                                        BIC     #100000,$PASS   ;;DON'T ALLOW A NEG. NUMBER
                                        DEC     (PC)+           ;;LOOP?
                                $EOPCT: .WORD   1
                                        BGT     $DOAGN          ;;YES
```

```
 2251  012210  012737                      MOV     (PC)+,@(PC)+    ;;RESTORE COUNTER
 2252  012212  000001            $ENDCT:   .WORD   1
 2253  012214  012204                      $EOPCT
 2254  012216  104401  012251              TYPE    ,$ENDMG         ;;TYPE "END PASS"
 2255  012222  013700  000042    $GET42:   MOV     @#42,R0         ;;GET MONITOR ADDRESS
 2256  012226  001405                      BEQ     $DOAGN          ;;BRANCH IF NO MONITOR
 2257  012230  000005                      RESET                   ;;CLEAR THE WORLD
 2258  012232  004710            $ENDAD:   JSR     PC,(R0)         ;;GO TO MONITOR
 2259  012234  000240                      NOP                     ;;SAVE ROOM
 2260  012236  000240                      NOP                     ;;FOR
 2261  012240  000240                      NOP                     ;;ACT11
 2262  012242                    $DOAGN:
 2263  012242  000137                      JMP     @(PC)+          ;;RETURN
 2264  012244  002220            $RTNAD:   .WORD   START
 2265  012246     377     377     000    $ENULL:   .BYTE   -1,-1,0         ;;NULL CHARACTER STRING
 2266  012251     015  042412  042116    $ENDMG:   .ASCIZ  <15><12>/END PASS/
 2267  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$:;#####END OF CODE FOR THE XOR TESTER#####
012334  032777  000400  166576          BIT     #BIT08,@SWR     ;;LOOP ON SPEC. TEST?
012342  001404                          BEQ     2$              ;;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$:     TYPE    ,MSGASK                 ;"TACS?"
013372  104411                          RDOCT                           ;GET VALUE
013374  012600                          MOV     (SP)+,R0                ;PICK UP THE OCTAL NUMBER
013376  001423                          BEQ     3$                      ;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?"
```

```
                                RDOCT
                                MOV     (SP)+,R0
                                BEQ     5$
                                CMP     R0,#1000                ;MAKE SURE ADDRESS IS IN VECTOR AREA
                                BHIS    3$
                                MOV     R0,@#TAVEC              ;SAVE AS VECTOR ADDRESS
                                ADD     #2,R0
                                MOV     R0,@#TAVEC+2
5$:                             TYPE    ,MSGPRI                 ;ASK FOR PRIORITY
                                RDOCT
                                MOV     (SP)+,R0
                                BEQ     6$                      ;IF "0" USE OLD VALUE
                                CMP     R0,#7                   ;MAKE SURE ITS VALID
                                BHI     5$
                                SWAB    R0                      ;PUT INTO HIGH BYTE
                                ASR     R0                      ;AND SHIFT
                                ASR     R0                      ;INTO PROPER
                                ASR     R0                      ;POSITION
                                BIC     #^C<340>,R0             ;SAVE ONLY PRIORITY BITS
                                MOV     R0,@#THPRIO             ;STORE IT AWAY
6$:                             TYPE    ,MTACS                  ;TACS="
                                MOV     TACSL,-(SP)     ;;SAVE TACSL FOR TYPEOUT
                                TYPOC                   ;;GO TYPE--OCTAL ASCII(ALL DIGITS)
                                TYPE    ,MTADB                  ;"TADB="
                                MOV     TADBL,-(SP)     ;;SAVE TADBL FOR TYPEOUT
                                TYPOC                   ;;GO TYPE--OCTAL ASCII(ALL DIGITS)
                                TYPE    ,MTAVEC                 ;"VECTOR="
                                MOV     TAVEC,-(SP)     ;;SAVE TAVEC FOR TYPEOUT
                                TYPOC                   ;;GO TYPE--OCTAL ASCII(ALL DIGITS)
                                TYPE    ,MTAPRI                 ;"PRIORITY="
                                MOV     TAPRIO,-(SP)    ;;SAVE TAPRIO FOR TYPEOUT
                                TYPOC                   ;;GO TYPE--OCTAL ASCII(ALL DIGITS)
                                TYPE    ,MSGOK                  ;"OK?"
                                RDCHR                           ;GO READ ONE CHARACTER
                                MOV     (SP)+,R0                ;GET IT
                                CMP     #15,R0                  ;IS IT "CR"?
                                BEQ     7$                      ;BRANCH IF YES
                                CMP     #'Y,R0                  ;IS IT "Y"?
                                BEQ     7$                      ;IT WAS
                                TYPE    ,$QUES                  ;TYPE "?"
                                BR      1$                      ;AND LET HIM CORRECT THEM
7$:                             TYPE    ,MYES                   ;TYPE OUT "YES"
                                MOV     (SP)+,R0                ;RESTORE R0
                                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  000054          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".
                                ;;*****************************************************************
014000  013776  012706  001100          WFGSUB: MOV     #STACK,SP               ;KEEP THE STACK OUT OF THE WAY
014002  014002  013704  001206                  MOV     @#TACSL,TACS            ;SETUP THE TA11 STATUS AND
014006  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
```

```
 2727  014306  032714  020000                BIT     #LEADER,@TACS           ;AT "CLEAR LEADER"?
 2728  014312  001005                        BNE     2$                      ;BR IF YES
 2729  014314  004737  014660                JSR     PC,@#WRTBLK             ;WRITE A BLOCK
 2730  014320  032714  020000                BIT     #LEADER,@TACS           ;AT "CLEAR LEADER"?
 2731  014324  001765                        BEQ     1$                      ;BR IF NO
 2732  014326  000000              2$:       HALT                            ;STOP AT "EOT"
 2733  014330  000741                        BR      WGBLOP                  ;START OVER ON CONT.
 2734
 2735
 2736                                  ;;*****************************************************************
 2737                                  ;       READ A BLOCK OF DATA AND A FILE GAP
 2738                                  ;START AT 240
 2739                                  ;THIS ROUTINE IS USED AFTER "WRITE A BLOCK AND A FILE GAP" ROUTINE
 2740                                  ;IT CAN BE USED TO ADJUST THE "SIGNAL MONO", THE THRESHOLD POT"
 2741                                  ;AND THE "TAPE BLANK MONO".
 2742                                  ;;*****************************************************************
 2743  014332  012706  001100          RGPBLK: MOV     #STACK,SP               ;KEEP THE STACK OUT OF THE WAY
 2744  014336  013704  001206                  MOV     @#TACSL,TACS            ;SETUP THE TA11 STATUS AND
 2745  014342  013705  001212                  MOV     @#TADBL,TADB            ;DATA BUFFER REGISTERS
 2746  014346  000005                          RESET                           ;RESET THE WORLD
 2747  014350  012737  014332  001110          MOV     #RGPBLK,@#$LPERR                ;SETUP THE LOOP ON ERROR ADDRESS
 2748  014356  004737  015002                  JSR     PC,@#NXTDRV             ;GO SETUP FOR NEXT DRIVE
 2749  014362  010314                          MOV     DRIVE,@TACS             ;SELECT DRIVE
 2750  014364  112714  000017                  MOVB    #REWIND!GO,@TACS        ;SEND TAPE TO "BOT"
 2751  014370  032714  000040          100$:   BIT     #READY,@TACS            ;WAIT ON READY
 2752  014374  001775                          BEQ     100$
 2753  014376  004737  014722          1$:     JSR     PC,@#RDBLK              ;READ A BLOCK OF DATA
 2754  014402  032714  020000                  BIT     #LEADER,@TACS           ;AT "CLEAR LEADER"?
 2755  014406  001351                          BNE     RGPBLK                  ;BR IF YES
 2756  014410  112714  000015                  MOVB    #SFBG!GO,@TACS          ;GET INTO A FILE GAP
 2757  014414  104412                          WAITREADY
 2758  014416  032714  020000                  BIT     #LEADER,@TACS           ;AT "CLEAR LEADER"?
 2759  014422  001343                          BNE     RGPBLK                  ;BR IF YES
 2760  014424  000764                          BR      1$                      ;LOOP
 2761
 2762
 2763                                  ;;*****************************************************************
 2764                                  ;       SPACE FORWARD FILE GAP FROM "BOT" TO "EOT"
 2765                                  ;START AT 244
 2766                                  ;THIS ROUTINE CAN BE USED AFTER "WRITE FILE GAP" FOR LOW SPEED
 2767                                  ;SPACE FOWARD (TAPE BLANK MONO CAN BE ADJUSTED), OR AFTER READ OR
 2768                                  ;WRITE A FILE GAP AND A BLOCK OF DATA FOR HIGH SPEED SPACE FORWARD
 2769                                  ;(SIGNAL MONO CAN BE CHECKED).
 2770                                  ;;*****************************************************************
 2771  014426  012706  001100          SFFGSB: MOV     #STACK,SP               ;KEEP THE STACK OUT OF THE WAY
 2772  014432  013704  001206                  MOV     @#TACSL,TACS            ;SETUP THE TA11 STATUS AND
 2773  014436  013705  001212                  MOV     @#TADBL,TADB            ;DATA BUFFER REGISTERS
 2774  014442  000005                          RESET                           ;RESET THE WORLD
 2775  014444  012737  014426  001110          MOV     #SFFGSB,@#$LPERR                ;SETUP THE LOOP ON ERROR ADDRESS
 2776  014452  004737  015002                  JSR     PC,@#NXTDRV             ;GO SETUP FOR NEXT DRIVE
 2777  014456  010314                          MOV     DRIVE,@TACS             ;SELECT DRIVE
 2778  014460  112714  000017                  MOVB    #REWIND!GO,@TACS        ;SEND TAPE TO "BOT"
 2779  014464  032714  000040          100$:   BIT     #READY,@TACS            ;WAIT ON READY
 2780  014470  001775                          BEQ     100$
 2781  014472  112714  000013          1$:     MOVB    #SFFG!GO,@TACS          ;SPACE INTO A FILE GAP
 2782  014476  104412                          WAITREADY                       ;WAIT ON READY
```

```
014500  032714  020000                    BIT     #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  001110            MOV     #BSFGSB,@#$LPERR                ;LOOP ON ERROR ADDRESS
014522  010214                            MOV     DRIVE,@TACS             ;SELECT DRIVE
014524  112714  000007            1$:     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  164001          $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
```

```
                                        ;;*****************************************************************
                                        ;*SOFTWARE SWITCH REGISTER CHANGE ROUTINE.
                                        ;*ROUTINE IS ENTERED FROM THE TRAP HANDLER, AND WILL
                                        ;*SERVICE THE TEST FOR CHANGE IN SOFTWARE SWITCH REGISTER TRAP CALL
                                        ;*WHEN OPERATING IN TTY FLAG MODE.
015474  022767  000176  163436  $CKSWR:  CMP     #SWREG,SWR      ;;IS THE SOFT-SWR SELECTED?
015502  001074                          BNE     15$             ;;BRANCH IF NO
015504  105777  163434                  TSTB    @$TKS           ;;CHAR THERE?
015510  100071                          BPL     15$             ;;IF NO, DON'T WAIT AROUND
015512  117746  163430                  MOVB    @$TKB,-(SP)     ;;SAVE THE CHAR
015516  042716  177600                  BIC     #^C177,(SP)     ;;STRIP-OFF THE ASCII
015522  022726  000007                  CMP     #7,(SP)+        ;;IS IT A CONTROL G?
015526  001062                          BNE     15$             ;;NO, RETURN TO USER
015530  126727  163400  000001          CMPB    $AUTOB,#1       ;;ARE WE RUNNING IN AUTO-MODE?
015536  001456                          BEQ     15$             ;;BRANCH IF YES

015540  104401  016221                  TYPE    ,$CNTLG         ;;ECHO THE CONTROL-G (^G)
015544  104401  016226          $GTSWR: TYPE    ,$MSWR          ;;TYPE CURRENT CONTENTS
015550  016746  162422                  MOV     SWREG,-(SP)     ;;SAVE SWREG FOR TYPEOUT
015554  104402                          TYPOC                   ;;GO TYPE--OCTAL ASCII(ALL DIGITS)
015556  104401  016237                  TYPE    ,$MNEW          ;;PROMPT FOR NEW SWR
015562  005046                  19$:    CLR     -(SP)           ;;CLEAR COUNTER
015564  005046                          CLR     -(SP)           ;;THE NEW SWR
015566  105777  163352          7$:     TSTB    @$TKS           ;;CHAR THERE?
015572  100375                          BPL     7$              ;;IF NOT TRY AGAIN

015574  117746  163346                  MOVB    @$TKB,-(SP)     ;;PICK UP CHAR
015600  042716  177600                  BIC     #^C177,(SP)     ;;MAKE IT 7-BIT ASCII


                                9$:     CMP     (SP),#25        ;;IS IT A CONTROL-U?
015604  021627  000025                  BNE     10$             ;;BRANCH IF NOT
015610  001005                          TYPE    ,$CNTLU         ;;YES, ECHO CONTROL-U (^U)
015612  104401  016214          20$:    ADD     #6,SP           ;;IGNORE PREVIOUS INPUT
015616  062706  000006                  BR      19$             ;;LET'S TRY IT AGAIN
015622  000757


015624  021627  000015          10$:    CMP     (SP),#15        ;;IS IT A <CR>?
015630  001022                          BNE     16$             ;;BRANCH IF NO
015632  005766  000004                  TST     4(SP)           ;;YES, IS IT THE FIRST CHAR?
015636  001403                          BEQ     11$             ;;BRANCH IF YES
015640  016677  000002  163272          MOV     2(SP),@SWR      ;;SAVE NEW SWR
015646  062706  000006          11$:    ADD     #6,SP           ;;CLEAR UP STACK
015652  104401  001177          14$:    TYPE    ,$CRLF          ;;ECHO <CR> AND <LF>
015656  126727  163253  000001          CMPB    $INTAG,#1       ;;RE-ENABLE TTY KBD INTERRUPTS?
015664  001003                          BNE     15$             ;;BRANCH IF NOT
015666  012777  000100  163250          MOV     #100,@$TKS      ;;RE-ENABLE TTY KBD INTERRUPTS
015674  000002                  15$:    RTI                     ;;RETURN
015676  004767  177420          16$:    JSR     PC,$TYPEC       ;;ECHO CHAR
015702  021627  000060                  CMP     (SP),#60        ;;CHAR < 0?
015706  002420                          BLT     18$             ;;BRANCH IF YES
015710  021627  000067                  CMP     (SP),#67        ;;CHAR > 7?
015714  003015                          BGT     18$             ;;BRANCH IF YES
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
```

```
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          $TYPOS: MOV     @(SP),-(SP)             ;;PICKUP THE MODE
016254  116667  000001  000211          MOVB    1(SP),$OFILL            ;;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  $TYPOC: MOVB    #1,$OFILL               ;;SET THE ZERO FILL SWITCH
016302  112767  000006  000165          MOVB    #6,$OMODE+1             ;;SET FOR SIX(6) DIGITS
016310  112767  000005  000154  $TYPON: MOVB    #5,$OCNT                ;;SET THE ITERATION COUNT
```

```
 3205  016316  010346                        MOV     R3,-(SP)        ;;SAVE R3
 3206  016320  010446                        MOV     R4,-(SP)        ;;SAVE R4
 3207  016322  010546                        MOV     R5,-(SP)        ;;SAVE R5
 3208  016324  116704  000145                MOVB    $OMODE+1,R4     ;;GET THE NUMBER OF DIGITS TO TYPE
 3209  016330  005404                        NEG     R4
 3210  016332  062704  000006                ADD     #6,R4           ;;SUBTRACT IT FOR MAX. ALLOWED
 3211  016336  110467  000132                MOVB    R4,$OMODE       ;;SAVE IT FOR USE
 3212  016342  116704  000125                MOVB    $OFILL,R4       ;;GET THE ZERO FILL SWITCH
 3213  016346  016605  000012                MOV     12(SP),R5       ;;PICKUP THE INPUT NUMBER
 3214  016352  005003                        CLR     R3              ;;CLEAR THE OUTPUT WORD
 3215  016354  006105                1$:     ROL     R5              ;;ROTATE MSB INTO "C"
 3216  016356  000404                        BR      3$              ;;GO DO MSB
 3217  016360  006105                2$:     ROL     R5              ;;FORM THIS DIGIT
 3218  016362  006105                        ROL     R5
 3219  016364  006105                        ROL     R5
 3220  016366  010503                        MOV     R5,R3
 3221  016370  006103                3$:     ROL     R3              ;;GET LSB OF THIS DIGIT
 3222  016372  105367  000076                DECB    $OMODE          ;;TYPE THIS DIGIT?
 3223  016376  100016                        BPL     7$              ;;BR IF NO
 3224  016400  042703  177770                BIC     #177770,R3      ;;GET RID OF JUNK
 3225  016404  001002                        BNE     4$              ;;TEST FOR 0
 3226  016406  005704                        TST     R4              ;;SUPPRESS THIS 0?
 3227  016410  001403                        BEQ     5$              ;;BR IF YES
 3228  016412  005204                4$:     INC     R4              ;;DON'T SUPPRESS ANYMORE 0'S
 3229  016414  052703  000060                BIS     #'0,R3          ;;MAKE THIS DIGIT ASCII
 3230  016420  052703  000040          5$:   BIS     #' ,R3          ;;MAKE ASCII IF NOT ALREADY
 3231  016424  110367  000040                MOVB    R3,8$           ;;SAVE FOR TYPING
 3232  016430  104401  016470                TYPE    ,8$             ;;GO TYPE THIS DIGIT
 3233  016434  105367  000032          7$:   DECB    $OCNT           ;;COUNT BY 1
 3234  016440  003347                        BGT     2$              ;;BR IF MORE TO DO
 3235  016442  002402                        BLT     6$              ;;BR IF DONE
 3236  016444  005204                        INC     R4              ;;INSURE LAST DIGIT ISN'T A BLANK
 3237  016446  000744                        BR      2$              ;;GO DO THE LAST DIGIT
 3238  016450  012605                6$:     MOV     (SP)+,R5        ;;RESTORE R5
 3239  016452  012604                        MOV     (SP)+,R4        ;;RESTORE R4
 3240  016454  012603                        MOV     (SP)+,R3        ;;RESTORE R3
 3241  016456  016666  000002  000004        MOV     2(SP),4(SP)     ;;SET THE STACK FOR RETURNING
 3242  016464  012616                        MOV     (SP)+,(SP)
 3243  016466  000002                        RTI                     ;;RETURN
 3244  016470     000                8$:     .BYTE   0               ;;STORAGE FOR ASCII DIGIT
 3245  016471     000                        .BYTE   0               ;;TERMINATOR FOR TYPE ROUTINE
 3246  016472     000                $OCNT:   .BYTE   0               ;;OCTAL DIGIT COUNTER
 3247  016473     000                $OFILL:  .BYTE   0               ;;ZERO FILL SWITCH
 3248  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
                                        $TYPE   ;;CALL=TYPE     TRAP+1(104401)  TTY TYPEOUT ROUTINE
                                        $TYPOC  ;;CALL=TYPOC    TRAP+2(104402)  TYPE OCTAL NUMBER (WITH LEADING ZEROS)
                                        $TYPOS  ;;CALL=TYPOS    TRAP+3(104403)  TYPE OCTAL NUMBER (NO LEADING ZEROS)
                                        $TYPON  ;;CALL=TYPON    TRAP+4(104404)  TYPE OCTAL NUMBER (AS PER LAST CALL)

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

                                        $CKSWR  ;;CALL=CKSWR    TRAP+6(104406)  TEST FOR CHANGE IN SOFT-SWR
                                        $RDCHR  ;;CALL=RDCHR    TRAP+7(104407)  TTY TYPEIN CHARACTER ROUTINE
                                        $RDLIN  ;;CALL=RDLIN    TRAP+10(104410) TTY TYPEIN STRING ROUTINE
                                        $RDOCT  ;;CALL=RDOCT    TRAP+11(104411) READ AN OCTAL NUMBER FROM TTY
                                        WAIT.ON.READY   ;;CALL=WAITREADY        TRAP+12(104412) WAIT ON THE READY BIT TO
                                        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     @$WR,-(SP)      ;;PUSH @$WR ON STACK
016616  010667  000110                  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)+,@$WR      ;;POP STACK INTO @$WR
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
```

```
3394   017402  020040  020040  051102
3395   017410  046040  053105  046105
3396   017416     000
3397           017420                          .EVEN
3398   017420  001116  001162  000000  DT1:    .WORD   $ERRPC,$REGO,0
3399   017426  001116  001162  001202  DT2:    .WORD   $ERRPC,$REGO,SAVPC,0
3400   017434  000000
3401   017436  001116  001162  001124  DT5:    .WORD   $ERRPC,$REGO,$GDDAT,$BDDAT,0
3402   017444  001126  000000
3403   017450  001116  001162  001124  DT6:    .WORD   $ERRPC,$REGO,$GDDAT,0
3404   017456  000000
3405   017460  001116  001206  000000  DT201:  .WORD   $ERRPC,TACSL,0
3406
3407   017466  001116  000000          DT202:  .WORD   $ERRPC,0
3408
3409   017472  040524  030461  043040  EM201:  .ASCIZ  "TA11 FAILED TO RESPOND"
3410   017500  044501  042514  020104
3411   017506  047524  051040  051505
3412   017514  047520  042116     000
3413   017521     116  020117  051104  EM202:  .ASCIZ  "NO DRIVE AVAILABLE"
3414   017526  053111  020105  053101
3415   017534  044501  040514  046102
3416   017542  000105
3417   017544  041520  020040  020040  DH201:  .ASCIZ  /PC      TACS/
3418   017552  020040  040524  051503
3419   017560     000
3420   017561     120  000103          DH202:  .ASCIZ  /PC/
3421           000001                          .END
```

```
ASKADR  013364          563    2512#
ASKDRV  013254          560    2480#   2503
ASKKEY  001232          396#    651*    681
BEGINX  001740          567#    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          166#    166     208    2588    2916    2918
BIT01  = 000002          165#    165     207    2597    2918
BIT02  = 000004          164#    164     206
BIT03  = 000010          163#    163     205
BIT04  = 000020          162#    162     204
BIT05  = 000040          161#    161     203
BIT06  = 000100          160#    160     202
BIT07  = 000200          159#    159     201    2916    2918
BIT08  = 000400          158#    158     200    2298
BIT09  = 001000          157#    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#
DH5     017330           442    3387#
DH6     017366           448    3392#
```

```
DISPLA  001142           365#    516*    524*   2327*   2353*
DISPRE  000174           238#    524
DO.CRC  013654          2029    2578#
DRVKEY  001224           394#    395     477*    620     633     654     679    2075    2128    2481*   2486    2500    2504
                        2890
DRVPNT  001230           395#    634*    654*    665     680*   2884    2891*
DSWR    = 177570          87#    364     515
DT1     017420           419    3398#
DT2     017426           425     431     437    3399#
DT201   017460           457    3405#
DT202   017466           462    3407#
DT5     017436           443    3401#
DT6     017450           449    3403#
EMTVEC= 000030           176#    499*    500*
EM1     017066           417    3356#
EM2     017105           423    3359#
EM201   017472           455    3409#
EM202   017521           460    3413#
EM3     017133           429    3363#
EM4     017174           435    3369#
EM5     017217           441    3373#
EM6     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#
FUNCO = 000002           207#    209
FUNC1 = 000004           206#    209
FUNC2 = 000010           205#    209
GNS     = ****** U       227     544     672    3280    3281    3282    3283    3285    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#    292
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   017053          2560    3353#
MSGPRI  017000          2536    3344#
MSGVEC  016770          2527    3342#
MTACS   017012          2548    3346#
MTADB   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
PWRVEC= 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
RESVEC= 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
RGPBLK  014332           239    2743#   2747    2755    2759
```

```
SAVPC   001202            385#   2424*  2425*  2441   2452*  2453*  2469   3399
SAVPS   001204            386#   2426*  2440   2454*  2468
SETBUF  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
STKLMT= 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   2916
                         2918   3043   3080*  3305   3318*
SWREG   000176            229#    523    537    685   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*   966*   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    3280#
                         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
                         1813    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   013116      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#
$REG0   001162           376#   2347*   3398    3399    3401    3403
$REG1   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#    496     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
```

```
$TIMES  001166          378#    506*    705*    726*    766*    818*   1287*   1323*   1361*   1432*   1462*   1490*   1517*
                       1549*   1574*   1605*   1636*   1704*   1751*   1793*   1834*   1884*   1962*   1999*   2072*   2125*
                       2227*   2245*   2311*   2318    2321*   2330
$TKB    001146          367#    3036    3047    3064    3118    3124
$TKS    001144          366#    3036    3045    3061    3085*   3116    3122
$TN     = 000042          1#      11     701     705#    707     722     726#    728     760     762     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
                       1769    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#
$OFILL  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

[redacted]