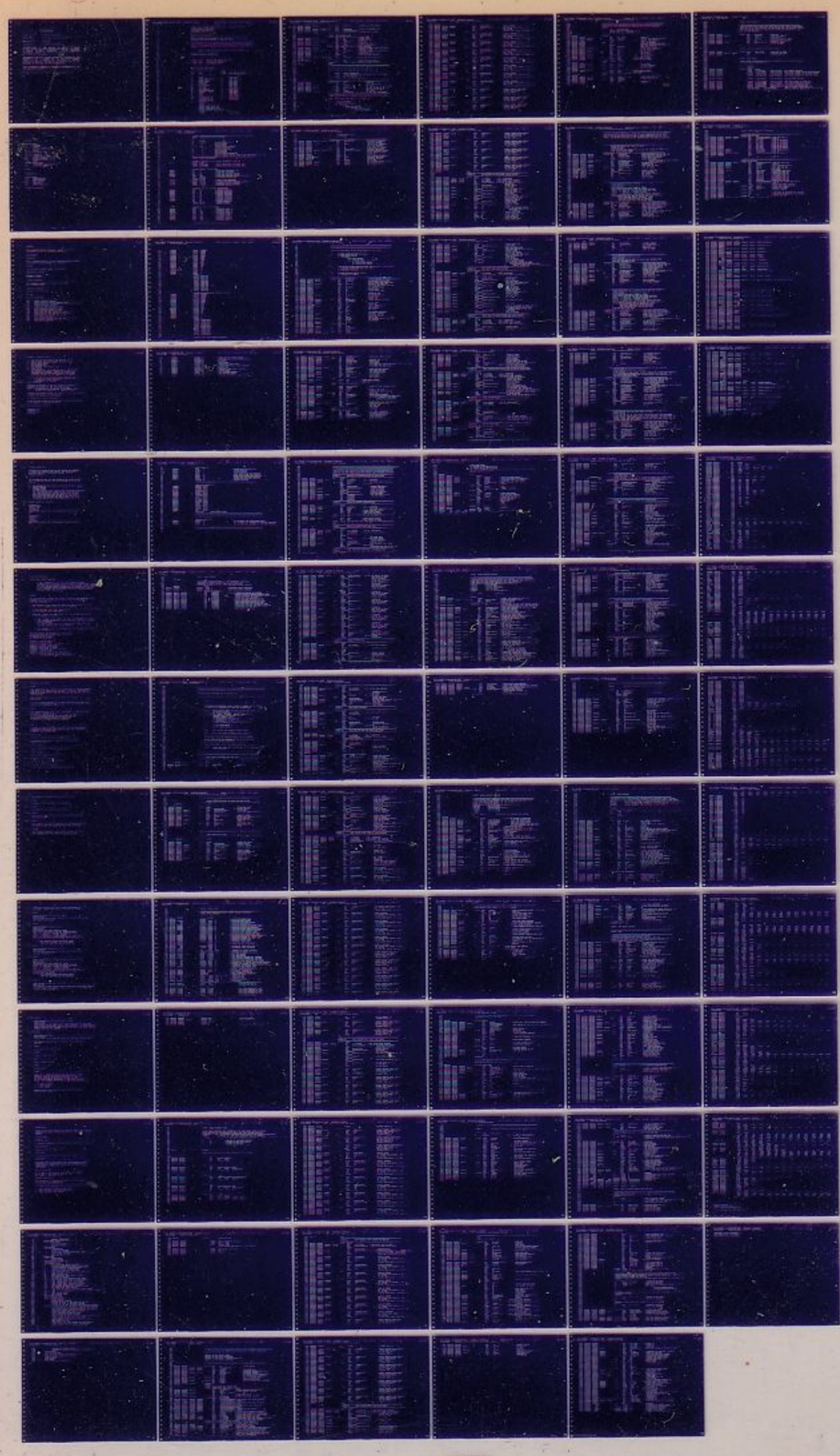
TA11

MANUAL INTERVENTION TEST
MD-11-DZTAC-C

EP DZTAC C DL

FICHE 1 OF 1

JAN 1978
digital
MADE IN USA



IDENTIFICATION

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

PRODUCT NAME: TA11 MANUAL INTERVENTION TEST

PRODUCT DATE: JULY,1976

MAINTAINER: DIAGNOSTIC ENGINEERING

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
MAINDEC-11-DZTAB

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
500	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 TYPE INSTRUCTIONS ON THE TTY FOR THE OPERATOR TO FOLLOW. AFTER THE OPERATOR HAS PERFORMED THE REQUIRED OPERATION HE WILL PRESS "CARRIAGE RETURN" AND THE PROGRAM WILL CONTINUE.

*** NOTE: IF USING THE SOFTWARE SWITCH REGISTER THE PROGRAM WILL TYPE "SWR=XXXXXX NEW=" AFTER TYPING THE NAME OF THE PROGRAM.

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
```

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
*** IF THE PROCESSOR HALTS (BIT 15=1), OPERATOR CAN RESET S/W SWITCH REGISTER BY HITTING A "CONTROL G" <^G> BEFORE HITTING CONTINUE.

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

5.2.5 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 ASKADR

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

5.2.5.5 ASKQUES

THIS ROUTINE WILL TYPE DIRECTIONS ON THE TTY AND WAITS
FOR A RESPONSE OF A "Y","N" OR "CARRIAGE RETURN.

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 ECT
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

IS OPERATOR DEPENDENT BUT SHOULD TAKE NO MORE THAN 2 MINUTES.

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 THROUGH OUT THE PROGRAM FOR "DRIVE", "TACS" AND "TADB"

9. PROGRAM DESCRIPTION

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

THE TESTS CAN BE GROUPED INTO THE FOLLOWING GENERAL GROUPS.

1. TEST "OFFLINE" WITH TU60 POWER OFF
2. TEST "OFFLINE" WITH CASSETTE REMOVED
3. TEST "WRITE LOCK" CIRCUITRY

DZTACC.NEW TABLE OF CONTENTS

```
                        .TITLE  TA11 MANUAL INTERVENTION TEST   MAINDEC-11-DZTAC-C
                        ;*COPYRIGHT (C) 1973,1976
                        ;*DIGITAL EQUIPMENT CORP.
                        ;*MAYNARD, MASS. 01754
                        ;*
                        ;*PROGRAM BY JIM 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)
100000                          BIT15=  100000
040000                          BIT14=  40000
020000                          BIT13=  20000
010000                          BIT12=  10000
004000                          BIT11=  4000
002000                          BIT10=  2000
001000                          BIT09=  1000
000400                          BIT08=  400
000200                          BIT07=  200
000100                          BIT06=  100
000040                          BIT05=  40
000020                          BIT04=  20
000010                          BIT03=  10
000004                          BIT02=  4
000002                          BIT01=  2
000001                          BIT00=  1
                                .EQUIV  BIT09,BIT9
                                .EQUIV  BIT08,BIT8
                                .EQUIV  BIT07,BIT7
                                .EQUIV  BIT06,BIT6
                                .EQUIV  BIT05,BIT5
                                .EQUIV  BIT04,BIT4
                                .EQUIV  BIT03,BIT3
                                .EQUIV  BIT02,BIT2
                                .EQUIV  BIT01,BIT1
                                .EQUIV  BIT00,BIT0

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

C2

```
169          000004                ERRVEC= 4          ;;TIME OUT AND OTHER ERRORS
170          000010                RESVEC= 10         ;;RESERVED AND ILLEGAL INSTRUCTIONS
171          000014                TBITVEC=14         ;;"T" BIT
172          000014                TRTVEC= 14         ;;TRACE TRAP
173          000014                BPTVEC= 14         ;;BREAKPOINT TRAP (BPT)
174          000020                IOTVEC= 20         ;;INPUT/OUTPUT TRAP (IOT) **SCOPE**
175          000024                PWRVEC= 24         ;;POWER FAIL
176          000030                EMTVEC= 30         ;;EMULATOR TRAP (EMT) **ERROR**
177          000034                TRAPVEC=34         ;;"TRAP" TRAP
178          000060                TKVEC=  60         ;;TTY KEYBOARD VECTOR
179          000064                TPVEC=  64         ;;TTY PRINTER VECTOR
180          000240                PIRQVEC=240        ;;PROGRAM INTERRUPT REQUEST VECTOR
```

```
                                ;TA11 FUNCTIONS
000000                          WFG=    0                       ;WRITE FILE GAP FUNCTION
000002                          WRITE=  2                       ;WRITE FUNCTION
000004                          READ=   4                       ;READ FUNCTION
000006                          BSFG=   6                       ;BACK SPACE FILE GAP FUNCTION
000010                          BSBG=   10                      ;BACK SPACE BLOCK GAP FUNCTION
000012                          SFFG=   12                      ;SPACE FWD FILE GAP FUNCTION
000014                          SFBG=   14                      ;SPACE FWD BLOCK GAP FUNCTION
000016                          REWIND= 16                      ;REWIND FUNCTION
                                ;;**************************************************************************
                                ;TA11 BIT ASSIGNMENT
100000                          ERROR=  BIT15
040000                          CRCERR= BIT14
020000                          LEADER= BIT13
010000                          WRTLOCK=BIT12
004000                          FGAP=   BIT11
002000                          TIMERR= BIT10
001000                          OFFLINE=BIT09
000400                          UNIT=   BIT08
000200                          TR.REQ= BIT07
000100                          INT.EN= BIT06
000040                          READY=  BIT05
000020                          ILBS=   BIT04
000010                          FUNC2=  BIT03
000004                          FUNC1=  BIT02
000002                          FUNC0=  BIT01
000001                          GO=     BIT00
000016                          FUNCTION=       FUNC2+FUNC1+FUNC0
                                ;//////////////////////////////////////////////////////////////////////////
                                ;//////////////////////////////////////////////////////////////////////////
                                ;//////////////////////////////////////////////////////////////////////////

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

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

```
                                .SBTTL  TRAP CATCHER

                                        .=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  001326                  JMP     @#BEGIN1        ;;JUMP TO STARTING ADDRESS OF PROGRAM
000204  000137  001360                  JMP     @#BEGIN2                ;SELECT DRIVE(S) BEFORE STARTING TEST
000210  000137  001366                  JMP     @#BEGIN3                ;SELECT DRIVE(S) AND ADDRESSES BEFORE TESTING
000214  000137  001730                  JMP     @#BEGINX                ;SETUP FOR MANUAL LOOPING
000220  000137  007604                  JMP     @#WFGSUB                ;WRITE FILE GAP FROM BOT TO EOT
000224  000137  007670                  JMP     @#WRTSUB                ;WRITE CONTINUOUS BLOCKS OF DATA
000230  000137  007756                  JMP     @#RDSUB                 ;READ CONTINUOUS BLOCKS OF DATA
000234  000137  010036                  JMP     @#WGPBLK                ;WRITE FILE GAP AND A BLOCK OF DATA
000240  000137  010140                  JMP     @#RGPBLK                ;READ BLOCK OF DATA AND INTO A FILE GAP
000244  000137  010234                  JMP     @#SFFGSB                ;SPACE FWD FILE GAP FROM BOT TO EOT
000250  000137  010320                  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 THE
                                        LOCATION SWR (=1140) MUST CONTAIN
                                        ADDRESS "SWREG" (=176).
                                        *** PLACE VALUE INTO 176 ***
                                        ** REGISTERS 3, 4, AND 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
                        ;;**************************************************************************

                000500                  .=500

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

```
                                ;;*****************************************************************
                                ;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          $REGAD: .WORD   0               ;;CONTAINS THE ADDRESS FROM
                                                        ;;WHICH  ($REG0) WAS OBTAINED
001162  000000          $REG0:  .WORD   0               ;;CONTAINS (($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
```

```
   392  001222  000300                 TAPRIO: 300                    ;TA11 BR LEVEL 6
   393  001224  000000  000000         DRVKEY: 0,0                    ;DRIVE SELECT KEY:
   394  001230  001224                 DRVPNT: DRVKEY
   395  001232  000000                 ASKKEY: 0
   396  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
013061                                  EM1     ;STATUS PROBLEM
013227                                  DH1     ;PC     TACS
013340                                  DT1     ;$ERRPC $REG0
000000                                  0

                                ;ITEM   2
013100                                  EM2     ;READY FAILED TO SET
013244                                  DH2     ;PC     TACS    WAIT ADDRESS
013346                                  DT2     ;$ERRPC $REG0   SAVPC
000000                                  0

                                ;ITEM   3
013126                                  EM3     ;TRANSFER REQUEST FAILED TO SET
013244                                  DH2     ;PC     TACS    WAIT ADDRESS
013346                                  DT2     ;$ERRPC $REG0   SAVPC
000000                                  0

                                ;ITEM   4
013167                                  EM4     ;THE WRONG FLAG SET
013244                                  DH2     ;PC     TACS    WAIT ADDRESS
013346                                  DT2     ;$ERRPC $REG0   SAVPC
000000                                  0

                                ;ITEM   5
013212                                  EM5     ;DATA PROBLEM
013301                                  DH5     ;PC     TACS    EXPECT  RCV'D
013356                                  DT5     ;$ERRPC $REG0   $GDDAT  $BDDAT
000000                                  0
```

```
   446  001306                          ITEMS2:         ;ITEMS 201-202
   447
   448  001306  013402                          EM201   ;TA11 FAILED TO RESPOND
   449  001310  013454                          DH201   ;PC      TACS
   450  001312  013370                          DT201   ;$ERRPC TACS
   451  001314  000000                          0       ;BOTH NUMBERS ARE TYPED AS OCTAL NUMBERS
   452
   453  001316  013431                          EM202   ;NO DRIVES AVAILABLE
   454  001320  013471                          DH202   ;PC
   455  001322  013376                          DT202   ;$ERRPC
   456  001324  000000                          0       ;
   457
```

```
                                ;////////////////////////////////////////////////////////////////////////////////
                                ;////////////////////////////////////////////////////////////////////////////////
                                ;;**************************************************************************
                                
                                ;BEGIN1 IS FOR NORMAL START
                                ;BEGIN2 IS FOR DRIVE SELECTION
                                ;BEGIN3 IS FOR DRIVE & ADDRESS SELECTION
                                ;BEGIN4 IS FOR MANUAL OPERATION
                                
                                ;;**************************************************************************
                                
001326  005005                  BEGIN1: CLR     R5                      ;NORMAL START
001330  012737  041101  001224          MOV     #"AB,@#DRVKEY
001336  122737  000005  000041          CMPB    #5,@#41                 ;CASSETTE DDP?
001344  001015                         BNE     BGNCMN                  ;GO BEGIN COMMON CODE IF NO
001346  022737  000260  001216          CMP     #260,@#TAVEC            ;STANDARD VECTOR?
001354  001011                         BNE     BGNCMN                  ;GO BEGIN COMMON CODE IF NO
001356  000403                         BR      BEGIN3                  ;GET DRIVES AND ADDRESSES
001360  012705  000001          BEGIN2: MOV     #1,R5                   ;ASK FOR DRIVES FLAG
001364  000405                         BR      BGNCMN                  ;BEGIN COMMON CODE
001366  012705  000002          BEGIN3: MOV     #2,R5                   ;ASK FOR DRIVES AND ADDRESSES
001372  000402                         BR      BGNCMN
001374  012705  000003          BEGIN4: MOV     #3,R5
001400                          BGNCMN:
                                 .SBTTL  INITIALIZE THE COMMON TAGS
                                ;;CLEAR THE COMMON TAGS (@CMTAG) AREA
001400  012706  001100                  MOV     #@CMTAG,R6      ;;FIRST LOCATION TO BE CLEARED
001404  005026                         CLR     (R6)+           ;;CLEAR MEMORY LOCATION
001406  022706  001140                  CMP     #@WR,R6 ;;DONE?
001412  001374                         BNE     .-6             ;;LOOP BACK IF NO
001414  012706  001100                  MOV     #STACK,SP       ;;SETUP THE STACK POINTER
                                ;;INITIALIZE A FEW VECTORS
001420  012737  006046  000020          MOV     #@SCOPE,@#IOTVEC ;;IOT VECTOR FOR SCOPE ROUTINE
001426  012737  000340  000022          MOV     #340,@#IOTVEC+2 ;;LEVEL 7
001434  012737  006320  000030          MOV     #@ERROR,@#EMTVEC ;;EMT VECTOR FOR ERROR ROUTINE
001442  012737  000340  000032          MOV     #340,@#EMTVEC+2 ;;LEVEL 7
001450  012737  012304  000034          MOV     #@TRAP,@#TRAPVEC ;;TRAP VECTOR FOR TRAP CALLS
001456  012737  000340  000036          MOV     #340,@#TRAPVEC+2;LEVEL 7
001464  012737  012370  000024          MOV     #@PWRDN,@#PWRVEC ;;POWER FAILURE VECTOR
001472  012737  000340  000026          MOV     #340,@#PWRVEC+2 ;;LEVEL 7
001500  016767  004270  004260          MOV     #ENDCT,@EOPCT   ;;SETUP END-OF-PROGRAM COUNTER
001506  005067  177454                  CLR     @TIMES          ;;INITIALIZE NUMBER OF ITERATIONS
001512  005067  177452                  CLR     @ESCAPE         ;;CLEAR THE ESCAPE ON ERROR ADDRESS
001516  112767  000001  177371          MOVB    #1,@ERMAX       ;;ALLOW ONE ERROR PER TEST
001524  012767  001524  177354          MOV     #.,@LPADR       ;;INITIALIZE THE LOOP ADDRESS FOR SCOPE
001532  012767  001532  177350          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.
001540  013746  000004                  MOV     @#ERRVEC,-(SP)  ;;SAVE ERROR VECTOR
001544  012737  001600  000004          MOV     #648,@#ERRVEC   ;;SET UP ERROR VECTOR
001552  012767  177570  177360          MOV     #DSWR,SWR       ;;SETUP FOR A HARDWARE SWICH REGISTER
001560  012767  177570  177354          MOV     #DDISP,DISPLAY  ;;AND A HARDWARE DISPLAY REGISTER
001566  022777  177777  177344          CMP     #-1,@SWR        ;;TRY TO REFERENCE HARDWARE SWR
001574  001012                         BNE     668             ;;BRANCH IF NO TIMEOUT TRAP OCCURRED
                                                                ;;AND  THE HARDWARE SWR IS NOT = -1
001576  000403                         BR      658             ;;BRANCH IF NO TIMEOUT
```

```
   514  001600  012716  001606          648:    MOV     #659,(SP)       ;;SET UP FOR TRAP RETURN
   515  001604  000002                          RTI
   516  001606  012767  000176  177324  658:    MOV     #SWREG,SWR      ;;POINT TO SOFTWARE SWR
   517  001614  012767  000174  177320          MOV     #DISPREG,DISPLAY
   518  001622  012637  000004          668:    MOV     (SP)+,@#ERRVEC  ;;RESTORE ERROR VECTOR
   519
   520                                  .SBTTL  TYPE PROGRAM NAME
   521                                  ;;TYPE THE NAME OF THE PROGRAM IF FIRST PASS
   522  001626  005227  177777                  INC     #-1             ;;FIRST TIME?
   523  001632  001036                          BNE     HERE            ;;BRANCH IF NO
   524  001634  022737  006014  000042          CMP     #$ENDAD,@#42    ;;ACT-11?
   525  001642  001432                          BEQ     HERE            ;;BRANCH IF YES
   526  001644  104401  001702                  TYPE    ,MSGID          ;;TYPE ASCIZ STRING
   527                                  .SBTTL  GET VALUE FOR SOFTWARE SWITCH REGISTER
   528  001650  005737  000042                  TST     @#42            ;;ARE WE RUNNING UNDER XXDP/ACT?
   529  001654  001006                          BNE     67$             ;;BRANCH IF YES
   530  001656  026727  177256  000176          CMP     SWR,#SWREG      ;;SOFTWARE SWITCH REG SELECTED?
   531  001664  001005                          BNE     68$             ;;BRANCH IF NO
   532  001666  104405                          GTSWR                   ;;GET SOFT-SWR SETTINGS
   533  001670  000403                          BR      68$
   534  001672  112767  000001  177234  67$:    MOVB    #1,$AUTOB       ;;SET AUTO-MODE INDICATOR
   535  001700                          68$:
   536  001700  000413                          BR      HERE            ;;GET OVER THE ASCIZ
   537                                  ;;MSGID:        .ASCIZ  <CRLF>/MAINDEC-11-DZTAC-C/<CRLF>
   538  001730                          HERE:
   539                                  ;;*****************************************************************
   540                                  ;;*****************************************************************
   541
   542                                  ;THE CONTENTS OF R5 DETERMINES WHAT WILL BE DONE
   543                                  ;
   544                                  ;       R5=3    MANUAL OPERATIONS
   545                                  ;       R5=2    ASK FOR DRIVE(S) AND ADDRESSES (TACS AND VECTOR)
   546                                  ;       R5=1    ASK FOR DRIVE(S)
   547                                  ;       R5=0    DON'T ASK FOR ANYTHING
   548                                  ;
   549                                  ;;*****************************************************************
   550  001730  010504          BEGINX: MOV     R5,R4                   ;COPY R5
   551  001732  005305                  DEC     R5                      ;ASK FOR DRIVES?
   552  001734  002406                  BLT     CHKADR                  ;BR IF NO
   553  001736  004737  007036          JSR     PC,@#ASKDRV             ;GO GET DRIVES TO BE TESTED
   554  001742  005305                  DEC     R5                      ;ASK FOR ADDRESSES?
   555  001744  002402                  BLT     CHKADR                  ;BR IF NO
   556  001746  004737  007146          JSR     PC,@#ASKADR             ;GO GET TA11 ADDRESSES
   557                                  ;;*****************************************************************
   558                                  ;;*****************************************************************
   559
   560                                  ;CHECK THAT "TACS" WILL RESPOND TO ADDRESSING
   561                                  ;
   562                                  ;I.     TIMEOUT OCCURRED
   563                                  ;       A. TYPE ERROR MESSAGE
   564                                  ;       B. EXAMINE R4
   565                                  ;               1. R4>0 GOTO BEGINX
   566                                  ;               2. R4=0 EXAMINE (42)
   567                                  ;                       A. (42)=0 GOTO BEGINX
   568                                  ;                       B. (42)>0 GOTO $ENDAD
   569                                  ;
```

```
                                        ;II.    TIMEOUT DIDN'T OCCUR
                                        ;       A. CONTINUE
                                        ;
                                        ;;*****************************************************************************
001752  012737  001770  000004  CHKADR: MOV     #1$,@#ERRVEC            ;IN CASE OF TIMEOUTS
001760  005000                          CLR     R0                      ;USE AS A SWITCH
001762  005777  177220                  TST     @TACSL                  ;SEE IF TA11 RESPONDS
001766  000402                          BR      2$                      ;BR IF NO TIMEOUT
001770  005200                  1$:     INC     R0                      ;COME HERE ON TIMEOUT
001772  022626                          CMP     (SP)+,(SP)+             ;CLEANUP THE STACK
001774  012737  000006  000004  2$:     MOV     #ERRVEC+2,@#ERRVEC      ;RESTORE TIMEOUT VECTOR
002002  005700                          TST     R0                      ;DID A TIMEOUT OCCUR?
002004  001412                          BEQ     3$                      ;BR IF NO
002006  104201                          ERROR   201                     ;TA11 FAILED TO RESPOND
002010  012705  000002                  MOV     #2,R5                   ;DRIVES & ADDRESSES
002014  005704                          TST     R4                      ;OPERATOR INPUTS?
002016  001344                          BNE     BEGINX                  ;BR IF YES
002020  013700  000042                  MOV     @#42,R0                 ;GET MONITOR RETURN ADDRESS
002024  001741                          BEQ     BEGINX                  ;BR IF NO MONITOR
002026  000137  006014                  JMP     @#ENDAD                 ;GO TO END
002032                          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 SENDAD
                        ;
                        ;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
                        ;
                        ;;*****************************************************************
002032  012700  001224  CHKDRV: MOV     #DRVKEY,R0              ;PICKUP ADDRESS OF ASCII DRIVE KEY
002036  004737  010654          JSR     PC,@#EXAM               ;GO EXAMINE FIRST DRIVE
002042  000410                  BR      1$                      ;OK TO TEST---GO CHECK NEXT
002044  116010  000001          MOVB    1(R0),(R0)              ;REPLACE 1ST WITH 2ND
002050  001412                  BEQ     2$                      ;BR IF NO 2ND DRIVE SELECTED
002052  004737  010654          JSR     PC,@#EXAM               ;GO EXAMINE DRIVE
002056  000407                  BR      2$                      ;OK TO TEST
002060  005010                  CLR     (R0)                    ;CLEAR DRIVE CODES
002062  000405                  BR      2$
002064  005200          1$:     INC     R0                      ;POINT TO 2ND
002066  004737  010654          JSR     PC,@#EXAM               ;GO EXAMINE DRIVE
002072  000401                  BR      2$                      ;OK TO TEST
002074  105010                  CLRB    (R0)                    ;CLEAR 2ND
002076  012700  001224  2$:     MOV     #DRVKEY,R0              ;RESET ADDRESS POINTERS
002102  010037  001230          MOV     R0,@#DRVPNT
002106  121060  000001          CMPB    (R0),1(R0)              ;1ST = 2ND?
002112  001002                  BNE     3$                      ;BR IF NO
002114  105060  000001          CLRB    1(R0)                   ;YES---CLEAR 2ND
002120  005710          3$:     TST     (R0)                    ;ANY DRIVES?
002122  001401                  BEQ     5$                      ;BR IF NO
002124  000412                  BR      MANUAL
002126  104202          5$:     ERROR   202                     ;NO DRIVES AVAILABLE
002130  012705  000002          MOV     #2,R5                   ;DRIVES & ADDRESS
002134  005704                  TST     R4                      ;OPERATOR INPUTS?
002136  001274                  BNE     BEGINX                  ;BR IF YES
002140  013700  000042          MOV     @#42,R0                 ;GET MONITOR RETURN ADDRESS
002144  001671                  BEQ     BEGINX                  ;NO MONITOR
002146  000137  006014          JMP     @#@#ENDAD               ;GO TO END
002152  020427  000003  MANUAL: CMP     R4,#3
002156  001002                  BNE     OK
002160  016704  175613          MOV     -1,R4
002164  010437  001232  OK:     MOV     R4,@#ASKKEY
002170  000405                  BR      START
002172  104401  001702  PWRST:  TYPE    ,MSGID                  ;POWER FAIL RESTART
002176  012737  001224  001230          MOV     #DRVKEY,@#DRVPNT
```

```
   647  002204  013777  001220  177004  START:  MOV     @#TAVEC+2,@#TAVEC       ;SETUP TA11 TRAP VECTOR
   648  002212  005077  177002                  CLR     @#TAVEC+2
   649  002216  012737  000340  177776          MOV     #340,@#PS               ;LOCKOUT ALL I/O INT
   650  002224  013704  001206                  MOV     @#TACSL,TACS            ;SETUP TACS
   651  002230  013705  001212                  MOV     @#TADBL,TADB            ;SETUP TADB
   652  002234  005737  001100                  TST     @#PASS                  ;IF FIRST PASS SETUP FOR EXTRA LONG WAIT LOOPS
   653  002240  001003                          BNE     1$                      ;OTHERWISE USE OLD VALUES
   654  002242  012737  077777  006732          MOV     #^CBIT15,@#MAXCNT
   655  002250  005037  001102          1$:     CLR     @#TSTNM                 ;ZERO THE TEST NUMBER
   656  002254  005003                          CLR     DRIVE                   ;SET DRIVE TO "A"
   657  002256  013701  001230                  MOV     @#DRVPNT,R1             ;GET DRIVE POINTER
   658  002262  121127  000101                  CMPB    (R1),#'A                ;IS IT DRIVE "A"?
   659  002266  001402                          BEQ     TDRV                    ;BR IF YES
   660  002270  012703  000400                  MOV     #UNIT,DRIVE             ;SET DRIVE TO "B"
   661  002274                          TDRV:
   662  002274  104401  002302                  TYPE    ,65$                ;;TYPE ASCIZ STRING
   663  002300  000411                          BR      64$                 ;;GET OVER THE ASCIZ
   664                                  ;;65$:  .ASCIZ  <15><12>"TESTING DRIVE "
   665  002324                          64$:
   666  002324  112167  176704                  MOVB    (R1)+,CURDRV            ;SETUP TO TYPE CURRENT DRIVE
   667  002330  104401  001234                  TYPE    ,CURDRV
   668  002334  104401  001177                  TYPE    ,#CRLF                  ;TYPE A  CR & LF
   669  002340  105711                          TSTB    (R1)                    ;LAST DRIVE BEEN SELECTED
   670  002342  001002                          BNE     1$                      ;BR IF NO
   671  002344  012701  001224                  MOV     #DRVKEY,R1              ;RESET DRIVE POINTER
   672  002350  010137  001230          1$:     MOV     R1,@#DRVPNT             ;SAVE DRIVE POINTER FOR NEXT TIME
   673  002354  005737  001232                  TST     @#ASKKEY                ;GO START TESTING IF NO MANUAL
   674  002360  002007                          BGE     2$                      ;       OPERATIONS REQUESTED
   675  002362  005000                          CLR     R0
   676  002364  000000                          HALT                            ;GIVE CONTROL TO THE OPERATOR
   677  002366  022767  000176  176544          CMP     #SWREG,SWR              ;USING S/W SWITCH REG?
   678  002374  001001                          BNE     20$                     ;NO- GET OUT
   679  002376  104405                          GTSWR                           ;GET VALUE
   680  002400                          20$:                                    ;CONTINUE
   681                                  ;THIS CODE IS FOR ACT11 & DDP
   682  002400  005737  000042          2$:     TST     @#42                    ;IS THERE A MONITOR?
   683  002404  001406                          BEQ     TST1                    ;GO START TESTING IF NO
   684  002406  013714                          MOV     DRIVE,@TACS             ;IF YES SELECT DRIVE
   685  002410  112714  000017                  MOVB    #REWIND!GO,@TACS        ;SEND TAPE TO BOT
   686  002414  032714  000040          3$:     BIT     #READY,@TACS            ;WAIT ON READY
   687  002420  001775                          BEQ     3$                      ;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
                                ;;******************************************************************
002422  000004                  TST1:   SCOPE
002424  012767  000001  176534          MOV     #1,@TIMES       ;;DO 1 ITERATION
002432  005737  001100                  TST     @#PASS                  ;IS THIS THE FIRST PASS?
002436  001021                  BNE     TST2            ;;BR IF NO
002440  000005                  RESET
002442  010314                  MOV     DRIVE,@TACS             ;SELECT THE DRIVE
002444  112714  000017          MOVB    #REWIND!GO,@TACS        ;START A REWIND
002450  104412                  WAITREADY                       ;WAIT FOR READY
002452  112714  000001          MOVB    #WFG!GO,@TACS           ;WRITE A FILE GAP
002456  104412                  WAITREADY                       ;WAIT ON READY
002460  163737  006706  006732  SUB     @#HGHTIM,@#MAXCNT       ;GET THE TIME IT TOOK
002466  005237  006732          INC     @#MAXCNT                ;MAKE IT BIGGER
002472  006137  006732          ROL     @#MAXCNT
002476  006137  006732          ROL     @#MAXCNT
                                ;;******************************************************************
                                ;*TEST 2         SETUP FOR MANUAL INTERVENTION
                                ;;******************************************************************
002502  000004                  TST2:   SCOPE
002504  012767  000001  176454          MOV     #1,@TIMES       ;;DO 1 ITERATION
002512  005767  176362          TST     @PASS                   ;IS THIS THE FIRST PASS?
002516  001053                  BNE     TST3            ;;SKIP TYPE OUT IF YES
002520  104401  002526          TYPE    ,65$            ;;TYPE ASCIZ STRING
002524  000423                  BR      64$             ;;GET OVER THE ASCIZ
                                ;;65$:  .ASCIZ  <!5><12>"DIRECTIONS WILL BE TYPED ON THE TTY"
002574                          64$:
002574  104401  002602          TYPE    ,67$            ;;TYPE ASCIZ STRING
002600  000422                  BR      66$             ;;GET OVER THE ASCIZ
                                ;;67$:  .ASCIZ  <15><12>"HIT 'CR' WHEN READY TO CONTINUE"<15><12>
002646                          66$:
                                ;;******************************************************************
                                ;*TEST 3         SETUP FOR POWER DOWN TU60 TEST
                                ;;******************************************************************
002646  000004                  TST3:   SCOPE
002650  012767  000012  176310          MOV     #10.,@TIMES     ;;DO 10. ITERATIONS
002656  012767  002700  176222          MOV     #1$,@LPADR      ;;SET SCOPE LOOP ADDRESS
002664  004767  007436                  JSR     R0,@#ASKQUES
002670  012574                          MTUPWR
002672  000402                  BR      1$                      ;DO THIS TEST
002674  000137  003120          JMP     @#TST6          ;SKIP POWER FAIL TESTS
002700  000005                  1$:     RESET                   ;CLEAR INTERFACE
002702  010314                  MOV     DRIVE,@TACS             ;SELECT DRIVE
002704  032714  001000          BIT     #OFFLINE,@TACS          ;IS "OFFLINE" ON A ONE?
002710  001001                  BNE     TST4            ;;BR IF YES
002712  104001                  ERROR   1                       ;"OFFLINE" BIT ISN'T ON A ONE
                                ;;******************************************************************
                                ;*TEST 4         TEST "OFFLINE" WHEN TU60 IS POWERED DOWN
                                ;;******************************************************************
002714  000004                  TST4:   SCOPE
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                                        MOV     #TST5,$ESCAPE   ;;ESCAPE TO TEST 5 ON ERROR
                                        MOVB    #WFG!GO,@TACS           ;TRY TO DO A "WFG"
                                        WAITREADY                       ;WAIT IN "READY"
                                        TST     @TACS                   ;CHECK FOR AN "ERROR"
                                        BMI     1$                      ;BR IF "ERROR"=1
                                        ERROR   1                       ;"ERROR"=0
                                1$:     MOVB    #WRITE!GO,@TACS         ;TRY TO DO A "WRITE"
                                        WAITREADY                       ;WAIT ON "READY"
                                        TST     @TACS                   ;CHECK ERROR FLAG
                                        BMI     2$
                                        ERROR   1                       ;"ERROR"=0
                                2$:     MOVB    #READ!GO,@TACS          ;TRY TO DO A "READ"
                                        WAITREADY                       ;WAIT ON "READY"
                                        TST     @TACS                   ;CHECK ERROR FLAG
                                        BMI     3$
                                        ERROR   1                       ;"ERROR"=0
                                3$:     MOVB    #BSFG!GO,@TACS          ;TRY TO DO A "BSFG"
                                        WAITREADY                       ;WAIT ON "READY"
                                        TST     @TACS                   ;CHECK ERROR FLAG
                                        BMI     4$
                                        ERROR   1                       ;"ERROR=0
                                4$:     MOVB    #BSBG!GO,@TACS          ;TRY TO DO A "BSBG"
                                        WAITREADY                       ;WAIT ON "READY"
                                        TST     @TACS                   ;CHECK ERROR FLAG
                                        BMI     5$
                                        ERROR   1                       ;"ERROR"=0
                                5$:     MOVB    #SFFG!GO,@TACS          ;TRY TO DO A "SFFG"
                                        WAITREADY                       ;WAIT ON "READY"
                                        TST     @TACS                   ;CHECK ERROR FLAG
                                        BMI     6$
                                        ERROR   1                       ;"ERROR"=0
                                6$:     MOVB    #SFBG!GO,@TACS          ;TRY TO DO A "SFBG"
                                        WAITREADY                       ;WAIT ON "READY"
                                        TST     @TACS                   ;CHECK ERROR FLAG
                                        BMI     7$
                                        ERROR   1                       ;"ERROR"=0
                                7$:     MOVB    #REWIND!GO,@TACS        ;TRY TO DO A REWIND
                                        TST     @TACS                   ;CHECK ERROR FLAG
                                        BMI     TST5            ;;BR IF ERROR=1
                                        ERROR   1                       ;"ERROR"=0
                                ;;**************************************************************
                                ;*TEST 5        POWER UP THE TU60
                                ;;**************************************************************
                                TST5:   SCOPE
                                        MOV     #2$,$LPADR      ;;SET SCOPE LOOP ADDRESS
                                        JSR     R0,@#ASKQUES
                                        MPWRUP                          ;MESSAGE POINTER
                                        NOP
                                1$:     RESET
                                2$:     MOV     DRIVE,@TACS             ;SELECT DRIVE
                                        WAITREADY                       ;WAIT ON READY
                                        BIT     #OFFLINE,@TACS          ;DID OFFLINE CLEAR?
                                        BEQ     TST6            ;;BR IF YES
                                        ERROR   1                       ;OFFLINE = 1
                                ;;**************************************************************
                                ;*TEST 6        TEST "OFFLINE" WHEN DRIVE IS EMPTY
```

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                                ;;*****************************************************************
003120  000004                TST6:   SCOPE
003122  012767  003146  175756        MOV     #2$,$LPADR      ;;SET SCOPE LOOP ADDRESS
003130  004037  007436              1$: JSR     R0,@#ASKQUES
003134  012732                        MOFFLN                  ;MESSAGE POINTER
003136  000402                        BR      1$              ;DO TEST
003140  000137  003224              2$: JMP     @#TST10         ;SKIP THIS TEST
003144  000005                TST7:   RESET                   ;CLEAR THE WORLD
003146  010314                        MOV     DRIVE,@TACS     ;SELECT DRIVE
003150  042714  001000                BIC     #OFFLINE,@TACS  ;TRY TO CLEAR OFFLINE INDICATION
003154  032714  001000                BIT     #OFFLINE,@TACS  ;TEST FOR "OFFLINE"
003160  001001                        BNE     TST7            ;;BR IF "OFFLINE"=1
003162  104001                        ERROR   1               ;"OFFLINE"=0
                                ;;*****************************************************************
                                ;*TEST 7         PUT DRIVE "ONLINE"
                                ;;*****************************************************************
003164  000004                TST7:   SCOPE
003166  012767  003212  175712        MOV     #2$,$LPADR      ;;SET SCOPE LOOP ADDRESS
003174  004037  007436              1$: JSR     R0,@#ASKQUES
003200  013000                        MTAPE
003202  000402                        BR      1$              ;DO TEST
003204  000137  003224              2$: JMP     @#TST10         ;SKIP THIS TEST
003210  000005                TST8:   RESET
003212  010314                        MOV     DRIVE,@TACS     ;SELECT DRIVE
003214  032714  001000                BIT     #OFFLINE,@TACS  ;IS DRIVE OFFLINE?
003220  001401                        BEQ     TST10           ;;BR IF NO
003222  104001                        ERROR   1               ;DRIVE IS OFFLINE
                                ;;*****************************************************************
                                ;*TEST 10        PUT DATA ON TAPE FOR WRITE LOCK TEST
                                ;;*****************************************************************
003224  000004                TST10:  SCOPE
003226  012767  000001  175732        MOV     #1,$TIMES       ;;DO 1 ITERATION
003234  012767  003242  175726        MOV     #1$,$ESCAPE     ;;ESCAPE TO 1$ ON ERROR
                                        ;##################
                                        ;HANG IN THIS TEST UNTIL DATA IS ON TAPE WITH NO ERRORS
003242  000005                1$:     RESET
003244  010314                        MOV     DRIVE,@TACS
003246  112714  000017                MOVB    #REWIND!GO,@TACS
003252  104412                        WAITREADY                       ;WAIT ON READY
003254  005714                        TST     @TACS                   ;CHECK FOR ERROR
003256  100001                        BPL     2$
003260  104001                        ERROR   1                       ;"ERROR" = 1
003262                          2$:
                                        ;WRITE A BLOCK OF 6 BYTES
003262  012767  000006  000014        MOV     #6,65$                  ;SETUP FOR 6 BYTES
003270  112714  000003                MOVB    #WRITE!GO,@TACS         ;START A WRITE
003274  104413                  64$:  WAITXFER                        ;WAIT ON TRANSFER REQUEST
003276  112715  000377                MOVB    #377,@TADB              ;LOAD DATA BUFFER
003302  005327                        DEC     (PC)+                   ;MORE TO DO?
003304  000000                  65$:  0                               ;NUMBER OF BYTES TO WRITE GOES HERE
003306  003372                        BGT     64$                     ;BR IF YES
003310  104413                        WAITXFER                        ;WAIT ON TRANSER REQUEST
003312  052714  000020                BIS     #ILBS,@TACS             ;WRITE CRC
003316  104412                        WAITREADY                       ;WAIT ON READY
                                        ;WRITE A BLOCK OF 6 BYTES
003320  012767  000006  000014        MOV     #6,67$                  ;SETUP FOR 6 BYTES
```

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                                        MOVB    #WRITE!GO,@TACS         ;START A WRITE
                                668:    WAITXFER                        ;WAIT ON TRANSFER REQUEST
                                        MOVB    #377,@TADB              ;LOAD DATA BUFFER
                                        DEC     (PC)+                   ;MORE TO DO?
                                678:    0                               ;NUMBER OF BYTES TO WRITE GOES HERE
                                        BGT     668                     ;BR IF YES
                                        WAITXFER                        ;WAIT ON TRANSER REQUEST
                                        BIS     #ILBS,@TACS             ;WRITE CRC
                                        WAITREADY                       ;WAIT ON READY
                                        MOVB    #WFG!GO,@TACS           ;WRITE A FILE GAP
                                        WAITREADY                       ;WAIT ON "READY"
                                        ;WRITE A BLOCK OF 6 BYTES
                                        MOV     #6,698                  ;SETUP FOR 6 BYTES
                                        MOVB    #WRITE!GO,@TACS         ;START A WRITE
                                688:    WAITXFER                        ;WAIT ON TRANSFER REQUEST
                                        MOVB    #377,@TADB              ;LOAD DATA BUFFER
                                        DEC     (PC)+                   ;MORE TO DO?
                                698:    0                               ;NUMBER OF BYTES TO WRITE GOES HERE
                                        BGT     688                     ;BR IF YES
                                        WAITXFER                        ;WAIT ON TRANSER REQUEST
                                        BIS     #ILBS,@TACS             ;WRITE CRC
                                        WAITREADY                       ;WAIT ON READY
                                ;;**********************************************************************
                                ;*TEST 11        TEST "WRITE LOCK" WHEN AT CLEAR LEADER
                                ;;**********************************************************************
                                TST11:  SCOPE
                                        MOV     #1,$TIMES       ;;DO 1 ITERATION
                                        MOV     #1$,$LPADR      ;;SET SCOPE LOOP ADDRESS
                                        MOV     @TST12,$ESCAPE  ;;ESCAPE TO TEST 12 ON ERROR
                                        JSR     R0,@#ASKQUES            ;HAVE OPERATOR SET "WRITE LOCK"
                                        MWRTLK
                                        BR      1$                      ;DO TEST
                                        JMP     @#TST22         ;SKIP WRITE LOCK TESTS
                                1$:
                                        RESET                           ;CLEAR ALL
                                        MOV     DRIVE,@TACS             ;SELECT DRIVE
                                        MOVB    #REWIND!GO,@TACS        ;GO TO "BOT"
                                        WAITREADY
                                        TST     @TACS                   ;IS "ERROR"=1
                                        BPL     2$                      ;BR IF NO
                                        ERROR   1                       ;"ERROR"=1
                                2$:     BIT     #LEADER,@TACS           ;CHECK FOR CLEAR LEADER
                                        BNE     3$                      ;BR IF ON CLEAR LEADER
                                        ERROR   1                       ;REWIND DIDN'T GO TO BOT
                                3$:
                                        MOVB    #WFG,@TACS              ;LOAD A "WFG"
                                        BIT     #WRTLOCK,@TACS          ;IS "WRITE LOCK ERROR" = "1"
                                        BNE     64$                     ;BR IF YES
                                        ERROR   1                       ;"WRITE LOCK ERROR" NOT EQUAL "1"
                                64$:
                                        MOVB    #WRITE,@TACS            ;LOAD A "WRITE"
                                        BIT     #WRTLOCK,@TACS          ;IS "WRITE LOCK ERROR" = "1"
                                        BNE     65$                     ;BR IF YES
                                        ERROR   1                       ;"WRITE LOCK ERROR" NOT EQUAL "1"
                                65$:
                                        MOVB    #READ,@TACS             ;LOAD A "READ"
```

H3

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  912  003546  032714  010000                BIT     @WRTLOCK,@TACS          ;IS "WRITE LOCK ERROR" = "0"
  913  003552  001401                        BEQ     668                     ;BR IF YES
  914  003554  104001                        ERROR   1                       ;"WRITE LOCK ERROR" NOT EQUAL "0"
  915  003556                        668:
  916  003556  112714  000006                MOVB    @BSFG,@TACS             ;LOAD A "BSFG"
  917  003562  032714  010000                BIT     @WRTLOCK,@TACS          ;IS "WRITE LOCK ERROR" = "0"
  918  003566  001401                        BEQ     678                     ;BR IF YES
  919  003570  104001                        ERROR   1                       ;"WRITE LOCK ERROR" NOT EQUAL "0"
  920  003572                        678:
  921  003572  112714  000010                MOVB    @BSBG,@TACS             ;LOAD A "BSBG"
  922  003576  032714  010000                BIT     @WRTLOCK,@TACS          ;IS "WRITE LOCK ERROR" = "0"
  923  003602  001401                        BEQ     688                     ;BR IF YES
  924  003604  104001                        ERROR   1                       ;"WRITE LOCK ERROR" NOT EQUAL "0"
  925  003606                        688:
  926  003606  112714  000012                MOVB    @SFFG,@TACS             ;LOAD A "SFFG"
  927  003612  032714  010000                BIT     @WRTLOCK,@TACS          ;IS "WRITE LOCK ERROR" = "0"
  928  003616  001401                        BEQ     698                     ;BR IF YES
  929  003620  104001                        ERROR   1                       ;"WRITE LOCK ERROR" NOT EQUAL "0"
  930  003622                        698:
  931  003622  112714  000014                MOVB    @SFBG,@TACS             ;LOAD A "SFBG"
  932  003626  032714  010000                BIT     @WRTLOCK,@TACS          ;IS "WRITE LOCK ERROR" = "0"
  933  003632  001401                        BEQ     708                     ;BR IF YES
  934  003634  104001                        ERROR   1                       ;"WRITE LOCK ERROR" NOT EQUAL "0"
  935  003636                        708:
  936  003636  112714  000016                MOVB    @REWIND,@TACS           ;LOAD A "REWIND"
  937  003642  032714  010000                BIT     @WRTLOCK,@TACS          ;IS "WRITE LOCK ERROR" = "0"
  938  003646  001401                        BEQ     718                     ;BR IF YES
  939  003650  104001                        ERROR   1                       ;"WRITE LOCK ERROR" NOT EQUAL "0"
  940  003652                        718:
  941  003652  112714  000000                MOVB    @WFG,@TACS              ;CHECK "ERROR" WITH "WFG"
  942  003656  005714                        TST     @TACS                   ;SAMPLE THE "ERROR" BIT
  943  003660  100401                        BMI     728                     ;BR IF "ERROR" = 1
  944  003662  104001                        ERROR   1                       ;"ERROR" NOT = 1
  945  003664                        728:
  946  003664  112714  000002                MOVB    @WRITE,@TACS            ;CHECK "ERROR" WITH "WRITE"
  947  003670  005714                        TST     @TACS                   ;SAMPLE THE "ERROR" BIT
  948  003672  100401                        BMI     738                     ;BR IF "ERROR" = 1
  949  003674  104001                        ERROR   1                       ;"ERROR" NOT = 1
  950  003676                        738:
  951  003676  112714  000004                MOVB    @READ,@TACS             ;CHECK "ERROR" WITH "READ"
  952  003702  005714                        TST     @TACS                   ;SAMPLE THE "ERROR" BIT
  953  003704  100401                        BMI     748                     ;BR IF "ERROR" = 1
  954  003706  104001                        ERROR   1                       ;"ERROR" NOT = 1
  955  003710                        748:
  956  003710  112714  000006                MOVB    @BSFG,@TACS             ;CHECK "ERROR" WITH "BSFG"
  957  003714  005714                        TST     @TACS                   ;SAMPLE THE "ERROR" BIT
  958  003716  100401                        BMI     758                     ;BR IF "ERROR" = 1
  959  003720  104001                        ERROR   1                       ;"ERROR" NOT = 1
  960  003722                        758:
  961  003722  112714  000010                MOVB    @BSBG,@TACS             ;CHECK "ERROR" WITH "BSBG"
  962  003726  005714                        TST     @TACS                   ;SAMPLE THE "ERROR" BIT
  963  003730  100401                        BMI     768                     ;BR IF "ERROR" = 1
  964  003732  104001                        ERROR   1                       ;"ERROR" NOT = 1
  965  003734                        768:
  966  003734  112714  000012                MOVB    @SFFG,@TACS             ;CHECK "ERROR" WITH "SFFG"
  967  003740  005714                        TST     @TACS                   ;SAMPLE THE "ERROR" BIT
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```
 968  003742  100401                          BMI     77$                     ;BR IF "ERROR" = 1
 969  003744  104001                          ERROR   1                       ;"ERROR" NOT = 1
 970  003746                          77$:
 971  003746  112714  000014                  MOVB    @SFBG,@TACS             ;CHECK "ERROR" WITH "SFBG"
 972  003752  005714                          TST     @TACS                   ;SAMPLE THE "ERROR" BIT
 973  003754  100401                          BMI     78$                     ;BR IF "ERROR" = 1
 974  003756  104001                          ERROR   1                       ;"ERROR" NOT = 1
 975  003760                          78$:
 976  003760  112714  000016                  MOVB    @REWIND,@TACS           ;CHECK "ERROR" WITH "REWIND"
 977  003764  005714                          TST     @TACS                   ;SAMPLE THE "ERROR" BIT
 978  003766  100001                          BPL     79$                     ;BR IF "ERROR" = 0
 979  003770  104001                          ERROR   1                       ;"ERROR" NOT = 0
 980  003772                          79$:
 981                                          ;;*****************************************************************
 982                                          ;*TEST 12       TEST "WRITE LOCK" WITH "CRC ERROR"
 983                                          ;;*****************************************************************
 984  003772  000004                  TST12:  SCOPE
 985  003774  012767  004052  175104          MOV     #1$,@LPADR      ;;SET SCOPE LOOP ADDRESS
 986  004002  012767  004332  175160          MOV     @TST13,@ESCAPE  ;;ESCAPE TO TEST 13 ON ERROR
 987  004010  000005                          RESET                   ;INIT, THE INTERFACE
 988  004012  010314                          MOV     DRIVE,@TACS     ;SELECT DRIVE
 989  004014  112714  000017                  MOVB    @REWIND!GO,@TACS        ;GO TO BOT
 990  004020  104412                          WAITREADY               ;WAIT ON READY
 991  004022  112714  000005                  MOVB    @READ!GO,@TACS          ;GET OVER FIRST BLOCK OF DATA
 992  004026  104413                          WAITXFER
 993  004030  105715                          TSTB    @TADB           ;KNOCK DOWN "XFER REQ"
 994  004032  104413                          WAITXFER
 995  004034  052714  000020                  BIS     #ILBS,@TACS     ;SHUT DOWN GENERATE CRC ERR
 996  004040  104412                          WAITREADY
 997  004042  032714  040000                  BIT     #CRCERR,@TACS   ;IS CRC ERROR FLAG=1?
 998  004046  001001                          BNE     1$              ;BR IF YES
 999  004050  104001                          ERROR   1               ;NO CRC ERROR
1000  004052                          1$:
1001  004052  112714  000000                  MOVB    @WFG,@TACS      ;CHECK "ERROR" WITH "WFG"
1002  004056  005714                          TST     @TACS           ;SAMPLE THE "ERROR" BIT
1003  004060  100401                          BMI     64$             ;BR IF "ERROR" = 1
1004  004062  104001                          ERROR   1               ;"ERROR" NOT = 1
1005  004064                          64$:
1006  004064  112714  000002                  MOVB    @WRITE,@TACS    ;CHECK "ERROR" WITH "WRITE"
1007  004070  005714                          TST     @TACS           ;SAMPLE THE "ERROR" BIT
1008  004072  100401                          BMI     65$             ;BR IF "ERROR" = 1
1009  004074  104001                          ERROR   1               ;"ERROR" NOT = 1
1010  004076                          65$:
1011  004076  112714  000004                  MOVB    @READ,@TACS     ;CHECK "ERROR" WITH "READ"
1012  004102  005714                          TST     @TACS           ;SAMPLE THE "ERROR" BIT
1013  004104  100401                          BMI     66$             ;BR IF "ERROR" = 1
1014  004106  104001                          ERROR   1               ;"ERROR" NOT = 1
1015  004110                          66$:
1016  004110  112714  000006                  MOVB    @BSFG,@TACS     ;CHECK "ERROR" WITH "BSFG"
1017  004114  005714                          TST     @TACS           ;SAMPLE THE "ERROR" BIT
1018  004116  100001                          BPL     67$             ;BR IF "ERROR" = 0
1019  004120  104001                          ERROR   1               ;"ERROR" NOT = 0
1020  004122                          67$:
1021  004122  112714  000010                  MOVB    @BSBG,@TACS     ;CHECK "ERROR" WITH "BSBG"
1022  004126  005714                          TST     @TACS           ;SAMPLE THE "ERROR" BIT
1023  004130  100001                          BPL     68$             ;BR IF "ERROR" = 0
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1024  004132  104001                    ERROR   1                       ;"ERROR" NOT = 0
1025  004134                        698:
1026  004134  112714  000012            MOVB    #SFFG,@TACS             ;CHECK "ERROR" WITH "SFFG"
1027  004140  005714                    TST     @TACS                   ;SAMPLE THE "ERROR" BIT
1028  004142  100001                    BPL     698                     ;BR IF "ERROR" = 0
1029  004144  104001                    ERROR   1                       ;"ERROR" NOT = 0
1030  004146                        698:
1031  004146  112714  000014            MOVB    #SFBG,@TACS             ;CHECK "ERROR" WITH "SFBG"
1032  004152  005714                    TST     @TACS                   ;SAMPLE THE "ERROR" BIT
1033  004154  100001                    BPL     708                     ;BR IF "ERROR" = 0
1034  004156  104001                    ERROR   1                       ;"ERROR" NOT = 0
1035  004160                        708:
1036  004160  112714  000016            MOVB    #REWIND,@TACS           ;CHECK "ERROR" WITH "REWIND"
1037  004164  005714                    TST     @TACS                   ;SAMPLE THE "ERROR" BIT
1038  004166  100001                    BPL     718                     ;BR IF "ERROR" = 0
1039  004170  104001                    ERROR   1                       ;"ERROR" NOT = 0
1040  004172                        718:
1041  004172  112714  000000            MOVB    #WFG,@TACS              ;LOAD A "WFG"
1042  004176  032714  010000            BIT     #WRTLOCK,@TACS          ;IS "WRITE LOCK ERROR" = "1"
1043  004202  001001                    BNE     728                     ;BR IF YES
1044  004204  104001                    ERROR   1                       ;"WRITE LOCK ERROR" NOT EQUAL "1"
1045  004206                        728:
1046  004206  112714  000002            MOVB    #WRITE,@TACS            ;LOAD A "WRITE"
1047  004212  032714  010000            BIT     #WRTLOCK,@TACS          ;IS "WRITE LOCK ERROR" = "1"
1048  004216  001001                    BNE     738                     ;BR IF YES
1049  004220  104001                    ERROR   1                       ;"WRITE LOCK ERROR" NOT EQUAL "1"
1050  004222                        738:
1051  004222  112714  000004            MOVB    #READ,@TACS             ;LOAD A "READ"
1052  004226  032714  010000            BIT     #WRTLOCK,@TACS          ;IS "WRITE LOCK ERROR" = "0"
1053  004232  001401                    BEQ     748                     ;BR IF YES
1054  004234  104001                    ERROR   1                       ;"WRITE LOCK ERROR" NOT EQUAL "0"
1055  004236                        748:
1056  004236  112714  000006            MOVB    #BSFG,@TACS             ;LOAD A "BSFG"
1057  004242  032714  010000            BIT     #WRTLOCK,@TACS          ;IS "WRITE LOCK ERROR" = "0"
1058  004246  001401                    BEQ     758                     ;BR IF YES
1059  004250  104001                    ERROR   1                       ;"WRITE LOCK ERROR" NOT EQUAL "0"
1060  004252                        758:
1061  004252  112714  000010            MOVB    #BSBG,@TACS             ;LOAD A "BSBG"
1062  004256  032714  010000            BIT     #WRTLOCK,@TACS          ;IS "WRITE LOCK ERROR" = "0"
1063  004262  001401                    BEQ     768                     ;BR IF YES
1064  004264  104001                    ERROR   1                       ;"WRITE LOCK ERROR" NOT EQUAL "0"
1065  004266                        768:
1066  004266  112714  000012            MOVB    #SFFG,@TACS             ;LOAD A "SFFG"
1067  004272  032714  010000            BIT     #WRTLOCK,@TACS          ;IS "WRITE LOCK ERROR" = "0"
1068  004276  001401                    BEQ     778                     ;BR IF YES
1069  004300  104001                    ERROR   1                       ;"WRITE LOCK ERROR" NOT EQUAL "0"
1070  004302                        778:
1071  004302  112714  000014            MOVB    #SFBG,@TACS             ;LOAD A "SFBG"
1072  004306  032714  010000            BIT     #WRTLOCK,@TACS          ;IS "WRITE LOCK ERROR" = "0"
1073  004312  001401                    BEQ     788                     ;BR IF YES
1074  004314  104001                    ERROR   1                       ;"WRITE LOCK ERROR" NOT EQUAL "0"
1075  004316                        788:
1076  004316  112714  000016            MOVB    #REWIND,@TACS           ;LOAD A "REWIND"
1077  004322  032714  010000            BIT     #WRTLOCK,@TACS          ;IS "WRITE LOCK ERROR" = "0"
1078  004326  001401                    BEQ     798                     ;BR IF YES
1079  004330  104001                    ERROR   1                       ;"WRITE LOCK ERROR" NOT EQUAL "0"
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1080  004332                                  798:
1081                                          ;;*****************************************************************
1082                                          ;*TEST 13       TEST "WRITE LOCK" WITHOUT ANY ERRORS
1083                                          ;;*****************************************************************
1084  004332  000004                         TST13:  SCOPE
1085  004334  012767  004364  174544                 MOV     #1$,$LPADR      ;;SET SCOPE LOOP ADDRESS
1086  004342  012767  004644  174620                 MOV     #TST14,$ESCAPE  ;;ESCAPE TO TEST 14 ON ERROR
1087  004350  000005                                 RESET
1088  004352  010314                                 MOV     DRIVE,@TACS             ;SELECT DRIVE
1089  004354  032714  067000                         BIT     #CRCERR!LEADER!FGAP!TIMERR!OFFLINE,@TACS        ;CHECK STATUS
1090  004360  001401                                 BEQ     1$                      ;BR IF OK TO TEST "WRITE LOCK"
1091  004362  104001                                 ERROR   1                       ;TAPE ISN'T POSITIONED PROPERLY
1092  004364                                  1$:
1093  004364  112714  000000                         MOVB    #WFG,@TACS              ;LOAD A "WFG"
1094  004370  032714  010000                         BIT     #WRTLOCK,@TACS          ;IS "WRITE LOCK ERROR" = "1"
1095  004374  001001                                 BNE     64$                     ;BR IF YES
1096  004376  104001                                 ERROR   1                       ;"WRITE LOCK ERROR" NOT EQUAL "1"
1097  004400                                  64$:
1098  004400  112714  000002                         MOVB    #WRITE,@TACS            ;LOAD A "WRITE"
1099  004404  032714  010000                         BIT     #WRTLOCK,@TACS          ;IS "WRITE LOCK ERROR" = "1"
1100  004410  001001                                 BNE     65$                     ;BR IF YES
1101  004412  104001                                 ERROR   1                       ;"WRITE LOCK ERROR" NOT EQUAL "1"
1102  004414                                  65$:
1103  004414  112714  000004                         MOVB    #READ,@TACS             ;LOAD A "READ"
1104  004420  032714  010000                         BIT     #WRTLOCK,@TACS          ;IS "WRITE LOCK ERROR" = "0"
1105  004424  001401                                 BEQ     66$                     ;BR IF YES
1106  004426  104001                                 ERROR   1                       ;"WRITE LOCK ERROR" NOT EQUAL "0"
1107  004430                                  66$:
1108  004430  112714  000006                         MOVB    #BSFG,@TACS             ;LOAD A "BSFG"
1109  004434  032714  010000                         BIT     #WRTLOCK,@TACS          ;IS "WRITE LOCK ERROR" = "0"
1110  004440  001401                                 BEQ     67$                     ;BR IF YES
1111  004442  104001                                 ERROR   1                       ;"WRITE LOCK ERROR" NOT EQUAL "0"
1112  004444                                  67$:
1113  004444  112714  000010                         MOVB    #BSBG,@TACS             ;LOAD A "BSBG"
1114  004450  032714  010000                         BIT     #WRTLOCK,@TACS          ;IS "WRITE LOCK ERROR" = "0"
1115  004454  001401                                 BEQ     68$                     ;BR IF YES
1116  004456  104001                                 ERROR   1                       ;"WRITE LOCK ERROR" NOT EQUAL "0"
1117  004460                                  68$:
1118  004460  112714  000012                         MOVB    #SFFG,@TACS             ;LOAD A "SFFG"
1119  004464  032714  010000                         BIT     #WRTLOCK,@TACS          ;IS "WRITE LOCK ERROR" = "0"
1120  004470  001401                                 BEQ     69$                     ;BR IF YES
1121  004472  104001                                 ERROR   1                       ;"WRITE LOCK ERROR" NOT EQUAL "0"
1122  004474                                  69$:
1123  004474  112714  000014                         MOVB    #SFBG,@TACS             ;LOAD A "SFBG"
1124  004500  032714  010000                         BIT     #WRTLOCK,@TACS          ;IS "WRITE LOCK ERROR" = "0"
1125  004504  001401                                 BEQ     70$                     ;BR IF YES
1126  004506  104001                                 ERROR   1                       ;"WRITE LOCK ERROR" NOT EQUAL "0"
1127  004510                                  70$:
1128  004510  112714  000016                         MOVB    #REWIND,@TACS           ;LOAD A "REWIND"
1129  004514  032714  010000                         BIT     #WRTLOCK,@TACS          ;IS "WRITE LOCK ERROR" = "0"
1130  004520  001401                                 BEQ     71$                     ;BR IF YES
1131  004522  104001                                 ERROR   1                       ;"WRITE LOCK ERROR" NOT EQUAL "0"
1132  004524                                  71$:
1133  004524  112714  000000                         MOVB    #WFG,@TACS              ;CHECK "ERROR" WITH "WFG"
1134  004530  005714                                 TST     @TACS                   ;SAMPLE THE "ERROR" BIT
1135  004532  100401                                 BMI     72$                     ;BR IF "ERROR" = 1
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1136  004534  104001                          ERROR   1                       ;"ERROR" NOT = 1
1137  004536                          728:
1138  004536  112714  000002                  MOVB    #WRITE,@TACS            ;CHECK "ERROR" WITH "WRITE"
1139  004542  005714                          TST     @TACS                   ;SAMPLE THE "ERROR" BIT
1140  004544  100401                          BMI     73$                     ;BR IF "ERROR" = 1
1141  004546  104001                          ERROR   1                       ;"ERROR" NOT = 1
1142  004550                          73$:
1143  004550  112714  000004                  MOVB    #READ,@TACS             ;CHECK "ERROR" WITH "READ"
1144  004554  005714                          TST     @TACS                   ;SAMPLE THE "ERROR" BIT
1145  004556  100001                          BPL     74$                     ;BR IF "ERROR" = 0
1146  004560  104001                          ERROR   1                       ;"ERROR" NOT = 0
1147  004562                          74$:
1148  004562  112714  000006                  MOVB    #BSFG,@TACS             ;CHECK "ERROR" WITH "BSFG"
1149  004566  005714                          TST     @TACS                   ;SAMPLE THE "ERROR" BIT
1150  004570  100001                          BPL     75$                     ;BR IF "ERROR" = 0
1151  004572  104001                          ERROR   1                       ;"ERROR" NOT = 0
1152  004574                          75$:
1153  004574  112714  000010                  MOVB    #BSBG,@TACS             ;CHECK "ERROR" WITH "BSBG"
1154  004600  005714                          TST     @TACS                   ;SAMPLE THE "ERROR" BIT
1155  004602  100001                          BPL     76$                     ;BR IF "ERROR" = 0
1156  004604  104001                          ERROR   1                       ;"ERROR" NOT = 0
1157  004606                          76$:
1158  004606  112714  000012                  MOVB    #SFFG,@TACS             ;CHECK "ERROR" WITH "SFFG"
1159  004612  005714                          TST     @TACS                   ;SAMPLE THE "ERROR" BIT
1160  004614  100001                          BPL     77$                     ;BR IF "ERROR" = 0
1161  004616  104001                          ERROR   1                       ;"ERROR" NOT = 0
1162  004620                          77$:
1163  004620  112714  000014                  MOVB    #SFBG,@TACS             ;CHECK "ERROR" WITH "SFBG"
1164  004624  005714                          TST     @TACS                   ;SAMPLE THE "ERROR" BIT
1165  004626  100001                          BPL     78$                     ;BR IF "ERROR" = 0
1166  004630  104001                          ERROR   1                       ;"ERROR" NOT = 0
1167  004632                          78$:
1168  004632  112714  000016                  MOVB    #REWIND,@TACS           ;CHECK "ERROR" WITH "REWIND"
1169  004636  005714                          TST     @TACS                   ;SAMPLE THE "ERROR" BIT
1170  004640  100001                          BPL     79$                     ;BR IF "ERROR" = 0
1171  004642  104001                          ERROR   1                       ;"ERROR" NOT = 0
1172  004644                          79$:
1173                                  ;;*******************************************************************
1174                                  ;*TEST 14        TEST "WRITE LOCK" WITH FILE GAP=1
1175                                  ;;*******************************************************************
1176  004644  000004                  TST14:  SCOPE
1177  004646  012767  004726  174232          MOV     #1$,$LPADR      ;;SET SCOPE LOOP ADDRESS
1178  004654  012767  005206  174306          MOV     #TST15,$ESCAPE  ;;ESCAPE TO TEST 15 ON ERROR
1179  004662  000005                          RESET                           ;CLEAR THE INTERFACE
1180  004664  010314                          MOV     DRIVE,@TACS             ;SELECT @TACS
1181  004666  112714  000017                  MOVB    #REWIND!GO,@TACS
1182  004672  104412                          WAITREADY
1183  004674  112714  000005                  MOVB    #READ!GO,@TACS          ;START A READ
1184  004700  104413                          WAITXFER
1185  004702  052714  000020                  BIS     #ILBS,@TACS             ;SHUT DOWN
1186  004706  104412                          WAITREADY
1187  004710  112714  000013                  MOVB    #SFFG!GO,@TACS          ;GO TO THE FILE GAP
1188  004714  104412                          WAITREADY                       ;WAIT ON "READY"
1189  004716  032714  004000                  BIT     #FGAP,@TACS             ;CHECK FOR FILE GAP
1190  004722  001001                          BNE     1$                      ;BR IF IN A GAP
1191  004724  104001                          ERROR   1                       ;FILE GAP = 0
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1192  004726                        18$:
1193  004726  112714  000000              MOVB    #WFG,@TACS              ;LOAD A "WFG"
1194  004732  032714  010000              BIT     #WRTLOCK,@TACS          ;IS "WRITE LOCK ERROR" = "1"
1195  004736  001001                      BNE     64$                     ;BR IF YES
1196  004740  104001                      ERROR   1                       ;"WRITE LOCK ERROR" NOT EQUAL "1"
1197  004742                        64$:
1198  004742  112714  000002              MOVB    #WRITE,@TACS            ;LOAD A "WRITE"
1199  004746  032714  010000              BIT     #WRTLOCK,@TACS          ;IS "WRITE LOCK ERROR" = "1"
1200  004752  001001                      BNE     65$                     ;BR IF YES
1201  004754  104001                      ERROR   1                       ;"WRITE LOCK ERROR" NOT EQUAL "1"
1202  004756                        65$:
1203  004756  112714  000004              MOVB    #READ,@TACS             ;LOAD A "READ"
1204  004762  032714  010000              BIT     #WRTLOCK,@TACS          ;IS "WRITE LOCK ERROR" = "0"
1205  004766  001401                      BEQ     66$                     ;BR IF YES
1206  004770  104001                      ERROR   1                       ;"WRITE LOCK ERROR" NOT EQUAL "0"
1207  004772                        66$:
1208  004772  112714  000006              MOVB    #BSFG,@TACS             ;LOAD A "BSFG"
1209  004776  032714  010000              BIT     #WRTLOCK,@TACS          ;IS "WRITE LOCK ERROR" = "0"
1210  005002  001401                      BEQ     67$                     ;BR IF YES
1211  005004  104001                      ERROR   1                       ;"WRITE LOCK ERROR" NOT EQUAL "0"
1212  005006                        67$:
1213  005006  112714  000010              MOVB    #BSBG,@TACS             ;LOAD A "BSBG"
1214  005012  032714  010000              BIT     #WRTLOCK,@TACS          ;IS "WRITE LOCK ERROR" = "0"
1215  005016  001401                      BEQ     68$                     ;BR IF YES
1216  005020  104001                      ERROR   1                       ;"WRITE LOCK ERROR" NOT EQUAL "0"
1217  005022                        68$:
1218  005022  112714  000012              MOVB    #SFFG,@TACS             ;LOAD A "SFFG"
1219  005026  032714  010000              BIT     #WRTLOCK,@TACS          ;IS "WRITE LOCK ERROR" = "0"
1220  005032  001401                      BEQ     69$                     ;BR IF YES
1221  005034  104001                      ERROR   1                       ;"WRITE LOCK ERROR" NOT EQUAL "0"
1222  005036                        69$:
1223  005036  112714  000014              MOVB    #SFBG,@TACS             ;LOAD A "SFBG"
1224  005042  032714  010000              BIT     #WRTLOCK,@TACS          ;IS "WRITE LOCK ERROR" = "0"
1225  005046  001401                      BEQ     70$                     ;BR IF YES
1226  005050  104001                      ERROR   1                       ;"WRITE LOCK ERROR" NOT EQUAL "0"
1227  005052                        70$:
1228  005052  112714  000016              MOVB    #REWIND,@TACS           ;LOAD A "REWIND"
1229  005056  032714  010000              BIT     #WRTLOCK,@TACS          ;IS "WRITE LOCK ERROR" = "0"
1230  005062  001401                      BEQ     71$                     ;BR IF YES
1231  005064  104001                      ERROR   1                       ;"WRITE LOCK ERROR" NOT EQUAL "0"
1232  005066                        71$:
1233  005066  112714  000000              MOVB    #WFG,@TACS              ;CHECK "ERROR" WITH "WFG"
1234  005072  005714                      TST     @TACS                   ;SAMPLE THE "ERROR" BIT
1235  005074  100401                      BMI     72$                     ;BR IF "ERROR" = 1
1236  005076  104001                      ERROR   1                       ;"ERROR" NOT = 1
1237  005100                        72$:
1238  005100  112714  000002              MOVB    #WRITE,@TACS            ;CHECK "ERROR" WITH "WRITE"
1239  005104  005714                      TST     @TACS                   ;SAMPLE THE "ERROR" BIT
1240  005106  100401                      BMI     73$                     ;BR IF "ERROR" = 1
1241  005110  104001                      ERROR   1                       ;"ERROR" NOT = 1
1242  005112                        73$:
1243  005112  112714  000004              MOVB    #READ,@TACS             ;CHECK "ERROR" WITH "READ"
1244  005116  005714                      TST     @TACS                   ;SAMPLE THE "ERROR" BIT
1245  005120  100401                      BMI     74$                     ;BR IF "ERROR" = 1
1246  005122  104001                      ERROR   1                       ;"ERROR" NOT = 1
1247  005124                        74$:
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1248  005124  112714  000006                  MOVB    #BSFG,@TACS             ;CHECK "ERROR" WITH "BSFG"
1249  005130  005714                          TST     @TACS                   ;SAMPLE THE "ERROR" BIT
1250  005132  100001                          BPL     75$                     ;BR IF "ERROR" = 0
1251  005134  104001                          ERROR   1                       ;"ERROR" NOT = 0
1252  005136                          75$:
1253  005136  112714  000010                  MOVB    #BSBG,@TACS             ;CHECK "ERROR" WITH "BSBG"
1254  005142  005714                          TST     @TACS                   ;SAMPLE THE "ERROR" BIT
1255  005144  100001                          BPL     76$                     ;BR IF "ERROR" = 0
1256  005146  104001                          ERROR   1                       ;"ERROR" NOT = 0
1257  005150                          76$:
1258  005150  112714  000012                  MOVB    #SFFG,@TACS             ;CHECK "ERROR" WITH "SFFG"
1259  005154  005714                          TST     @TACS                   ;SAMPLE THE "ERROR" BIT
1260  005156  100001                          BPL     77$                     ;BR IF "ERROR" = 0
1261  005160  104001                          ERROR   1                       ;"ERROR" NOT = 0
1262  005162                          77$:
1263  005162  112714  000014                  MOVB    #SFBG,@TACS             ;CHECK "ERROR" WITH "SFBG"
1264  005166  005714                          TST     @TACS                   ;SAMPLE THE "ERROR" BIT
1265  005170  100401                          BMI     78$                     ;BR IF "ERROR" = 1
1266  005172  104001                          ERROR   1                       ;"ERROR" NOT = 1
1267  005174                          78$:
1268  005174  112714  000016                  MOVB    #REWIND,@TACS           ;CHECK "ERROR" WITH "REWIND"
1269  005200  005714                          TST     @TACS                   ;SAMPLE THE "ERROR" BIT
1270  005202  100001                          BPL     79$                     ;BR IF "ERROR" = 0
1271  005204  104001                          ERROR   1                       ;"ERROR" NOT = 0
1272  005206                          79$:
1273                                  ;;*******************************************************************
1274                                  ;*TEST 15       TRY WRITING ON TAPE WHEN "WRITE LOCKED"
1275                                  ;;*******************************************************************
1276  005206  000004                  TST15:  SCOPE
1277  005210  012767  000001  173750          MOV     #1,@TIMES       ;;DO 1 ITERATION
1278  005216  012767  005266  173662          MOV     #3$,$LPADR      ;;SET SCOPE LOOP ADDRESS
1279  005224  012767  005362  173736          MOV     @TST16,$ESCAPE  ;;ESCAPE TO TEST 16 ON ERROR
1280  005232  000005                          RESET                           ;CLEAR ALL
1281  005234  010314                          MOV     DRIVE,@TACS             ;SELECT DRIVE
1282  005236  112714  000017                  MOVB    #REWIND!GO,@TACS        ;GO TO BOT
1283  005242  104412                          WAITREADY                       ;WAIT ON READY FLAG
1284  005244  112714  000005          1$:     MOVB    #READ!GO,@TACS          ;START A READ
1285  005250  104413                          WAITXFER                        ;WAIT ON "XFER REQ"
1286  005252  052714  000020                  BIS     #ILBS,@TACS             ;SHUT DOWN
1287  005256  104412                          WAITREADY                       ;WAIT ON READY
1288  005260  112714  000015                  MOVB    #SFBG!GO,@TACS          ;SPACE OVER THE 2ND BLOCK
1289  005264  104412                          WAITREADY                       ;WAIT ON READY FLAG
1290  005266  000005          3$:     RESET                           ;CLEAR ALL FLAGS
1291  005270  010314                          MOV     DRIVE,@TACS             ;SELECT DRIVE
1292  005272  104412                          WAITREADY                       ;WAIT ON READY
1293  005274  112714  000003                  MOVB    #WRITE!GO,@TACS         ;START A "WRITE"
1294  005300  005001                          CLR     R1                      ;TIMER
1295  005302  105201          4$:     INCB    R1                      ;COUNT THE COUNTER GIVING
1296  005304  001376                          BNE     4$                      ;    "XFER REQ" TIME TO SET IF IT
1297                                                                  ;     IS GOING TO
1298  005306  105714                          TSTB    @TACS                   ;CHECK "XFER REQ"
1299  005310  100001                          BPL     5$                      ;BR IF IT DIDN'T SET
1300  005312  104001                          ERROR   1                       ;"XFER REQ" SET
1301  005314  104412          5$:     WAITREADY                       ;WAIT ON READY
1302  005316  005714                          TST     @TACS                   ;CHECK ERROR FLAG
1303  005320  100401                          BMI     6$                      ;BR IF IT IS SET
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 1304  005322  104001                          ERROR   1                       ;ERROR ISN'T SET
 1305  005324  112714  000017          68:     MOVB    @REWIND!GO,@TACS        ;GO TO BOT
 1306  005330  104412                          WAITREADY                       ;WAIT ON READY FLAG
 1307  005332  012701  000002                  MOV     #2,R1                   ;GET OVER THE TWO DATA BLOCKS
 1308  005336  112714  000005          78:     MOVB    @READ!GO,@TACS          ;START A READ
 1309  005342  005301                          DEC     R1                      ;COUNT THIS BLOCK
 1310  005344  002405                          BLT     88                      ;BR IF OVER THE 2ND BLOCK?
 1311  005346  104413                          WAITXFER                        ;WAIT ON "XFER REQ"
 1312  005350  052714  000020                  BIS     #ILBS,@TACS             ;SHUT DOWN
 1313  005354  104412                          WAITREADY                       ;WAIT ON READY
 1314  005356  000767                          BR      78                      ;GO DO ANOTHER BLOCK
 1315  005360  104412          88:     WAITREADY                               ;IF "XFER REQ" COMES UP THERE
 1316                                                                          ;     IS MORE THAN TWO BLOCKS ON TAPE
 1317                                                                          ;       "WRITE" CAUSED DATA TO BE WRITTEN ON TAP
 1318                                  ;;*******************************************************************
 1319                                  ;*TEST 16        TRY "WFG" WHEN WRITE LOCKED
 1320                                  ;;*******************************************************************
 1321  005362  000004                  TST16:  SCOPE
 1322  005364  012767  000001  173574          MOV     #1,@TIMES       ;;DO 1 ITERATION
 1323  005372  012767  005500  173570          MOV     #TST17,@ESCAPE  ;;ESCAPE TO TEST 17 ON ERROR
 1324  005400  000005                          RESET
 1325  005402  010314                          MOV     DRIVE,@TACS             ;SELECT DRIVE
 1326  005404  112714  000017                  MOVB    @REWIND!GO,@TACS        ;GO TO BOT
 1327  005410  104412                          WAITREADY                       ;WAIT ON READY
 1328  005412  112714  000005                  MOVB    @READ!GO,@TACS          ;GET PAST THE FIRST BLOCK
 1329  005416  104413                          WAITXFER                        ;WAIT ON TRANSFER REQ.
 1330  005420  052714  000020                  BIS     #ILBS,@TACS             ;SHUT DOWN
 1331  005424  104412                          WAITREADY                       ;WAIT ON READY
 1332  005426  000005                          RESET                           ;CLEAR THE WORLD
 1333  005430  010314                          MOV     DRIVE,@TACS             ;SELECT DRIVE
 1334  005432  104412                          WAITREADY                       ;WAIT ON THE READY FLAG
 1335  005434  112714  000001                  MOVB    @WFG!GO,@TACS           ;START A "WFG"
 1336  005440  104412                          WAITREADY                       ;WAIT ON READY
 1337  005442  112714  000017                  MOVB    @REWIND!GO,@TACS        ;GO TO BOT
 1338  005446  104412                          WAITREADY
 1339  005450  112714  000005                  MOVB    @READ!GO,@TACS          ;GET PAST 1ST BLOCK
 1340  005454  104413                          WAITXFER
 1341  005456  052714  000020                  BIS     #ILBS,@TACS             ;SHUT DOWN
 1342  005462  104412                          WAITREADY
 1343  005464  112714  000005                  MOVB    @READ!GO,@TACS          ;SEE IF 2ND BLOCK IS STILL ON TAPE
 1344  005470  104413                          WAITXFER                        ;IF READY COMES UP THE "WFG"
 1345                                                                          ;  COMMAND WROTE ON THE TAPE
 1346  005472  052714  000020                  BIS     #ILBS,@TACS             ;SHUT DOWN
 1347  005476  104412                          WAITREADY                       ;WAIT ON READY
 1348                                  ;;*******************************************************************
 1349                                  ;*TEST 17        TEST "WFG" ON CLEAR LEADER AND WRITE LOCKED
 1350                                  ;;*******************************************************************
 1351  005500  000004                  TST17:  SCOPE
 1352  005502  012767  000001  173456          MOV     #1,@TIMES       ;;DO 1 ITERATION
 1353  005510  012767  005532  173370          MOV     #18,@LPADR      ;;SET SCOPE LOOP ADDRESS
 1354  005516  012767  005564  173444          MOV     #TST20,@ESCAPE  ;;ESCAPE TO TEST 20 ON ERROR
 1355  005524  000005                          RESET
 1356  005526  010314                          MOV     DRIVE,@TACS             ;SELECT DRIVE
 1357  005530  104412                          WAITREADY                       ;WAIT ON THE READY FLAG
 1358  005532  112714  000017          18:     MOVB    @REWIND!GO,@TACS        ;GO TO BOT
 1359  005536  104412                          WAITREADY
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1360  005540  112714  000001                  MOVB    #WFG!GO,@TACS           ;START A "WFG"
1361  005544  104412                          WAITREADY                       ;WAIT FOR READY
1362  005546  005714                          TST     @TACS                   ;CHECK ERROR
1363  005550  100401                          BMI     20                      ;BR IF ERROR=1
1364  005552  104001                          ERROR   1                       ;ERROR ISN'T ON AN ONE
1365  005554  032714  020000          20:     BIT     #LEADER,@TACS           ;CHECK IF STILL ON CLEAR LEADER
1366  005560  001001                          BNE     TST20           ;;GO TO THE NEXT TEST IF IT IS
1367  005562  104001                          ERROR   1                       ;NOT ON CLEAR LEADER
1368                                  ;;**********************************************************************
1369                                  ;*TEST 20        TEST "WRITE" WITH WRITE LOCK ON AND AT CLEAR LEADER
1370                                  ;;**********************************************************************
1371  005564  000004                  TST20:  SCOPE
1372  005566  012767  000001  173372          MOV     #1,$TIMES       ;;DO 1 ITERATION
1373  005574  012767  005610  173304          MOV     #10$,$LPADR     ;;SET SCOPE LOOP ADDRESS
1374  005602  012767  005642  173360          MOV     #TST21,$ESCAPE  ;;ESCAPE TO TEST 21 ON ERROR
1375  005610  000005                  10$:    RESET                           ;CLEAR THE WORLD
1376  005612  010314                          MOV     DRIVE,@TACS             ;SELECT THE DRIVE
1377  005614  104412                          WAITREADY                       ;WAIT ON READY
1378  005616  112714  000017                  MOVB    #REWIND!GO,@TACS        ;GO TO BOT
1379  005622  104412                          WAITREADY                       ;WAIT TILL READY = 1
1380  005624  112714  000003                  MOVB    #WRITE!GO,@TACS         ;TRY TO START A WRITE
1381  005630  104412                          WAITREADY                       ;IF TRANSFER REQ. COMES UP
1382                                                                          ;THERE IS A PROBLEM WITH WRITE LOCK
1383  005632  032714  020000                  BIT     #LEADER,@TACS           ;MAKE SURE STILL A CLEAR LEADER
1384  005636  001001                          BNE     TST21           ;;BR IF AT CLEAR LEADER
1385  005640  104001                          ERROR   1                       ;TAPE MOVED OFF OF CLEAR LEADER
1386                                  ;;**********************************************************************
1387                                  ;*TEST 21        TEST "WRITE ENABLE"
1388                                  ;;**********************************************************************
1389  005642  000004                  TST21:  SCOPE
1390  005644  012767  000012  173314          MOV     #10.,$TIMES     ;;DO 10. ITERATIONS
1391  005652  012767  005670  173226          MOV     #11$,$LPADR     ;;SET SCOPE LOOP ADDRESS
1392  005660  004037  007436                  JSR     R0,@#ASKQUES
1393  005664  013040                          MLAST
1394  005666  000240                          NOP
1395  005670  000005                  11$:    RESET
1396  005672  010314                          MOV     DRIVE,@TACS
1397  005674  112714  000017                  MOVB    #REWIND!GO,@TACS
1398  005700  104412                          WAITREADY
1399  005702  112714  000000                  MOVB    #WFG,@TACS              ;LOAD A "WFG" COMMAND
1400  005706  032714  011000                  BIT     #WRTLOCK!OFFLINE,@TACS  ;MAKE SURE THE CASSETTE IS
1401  005712  001401                          BEQ     TST22           ;;      "WRITE ENABLED" AND "ON LINE"
1402  005714  104001                          ERROR   1
1403                                  ;;**********************************************************************
1404                                  ;*TEST 22        END OF TEST CODE
1405                                  ;;**********************************************************************
1406  005716  000004                  TST22:  SCOPE
1407  005720  012767  000001  173240          MOV     #1,$TIMES       ;;DO 1 ITERATION
1408  005726  000005                          RESET
1409  005730  010314                          MOV     DRIVE,@TACS             ;SELECT DRIVE
1410  005732  112714  000017                  MOVB    #REWIND!GO,@TACS
1411  005736  104412                          WAITREADY
1412                                  .SBTTL  END OF PASS ROUTINE
1413
1414                                  ;;**********************************************************************
1415                                  ;*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.

005740                                  $EOP:
005740  000004                                  $SCOPE
005742  005067  173134                         CLR     $TSTNM          ;;ZERO THE TEST NUMBER
005746  005067  173214                         CLR     $TIMES          ;;ZERO THE NUMBER OF ITERATIONS
005752  005267  173122                         INC     $PASS           ;;INCREMENT THE PASS NUMBER
005756  042767  100000  173114                BIC     #100000,$PASS   ;;DON'T ALLOW A NEG. NUMBER
005764  005327                                  DEC     (PC)+           ;;LOOP?
005766  000001                          $EOPCT: .WORD   1
005770  003015                                  BGT     $DOAGN          ;;YES
005772  012737                                  MOV     (PC)+,@(PC)+    ;;RESTORE COUNTER
005774  000001                          $ENDCT: .WORD   1
005776  005766                                  $EOPCT
006000  104401  006033                         TYPE    ,$ENDMG         ;;TYPE "END PASS"
006004  013700  000042                 $GET42: MOV     @#42,R0         ;;GET MONITOR ADDRESS
006010  001405                                  BEQ     $DOAGN          ;;BRANCH IF NO MONITOR
006012  000005                                  RESET                   ;;CLEAR THE WORLD
006014  004710                          $ENDAD: JSR     PC,(R0)         ;;GO TO MONITOR
006016  000240                                  NOP                     ;;SAVE ROOM
006020  000240                                  NOP                     ;;FOR
006022  000240                                  NOP                     ;;ACT11
006024                                  $DOAGN:
006024  000137                                  JMP     @(PC)+          ;;RETURN
006026  002204                          $RTNAD: .WORD   START
006030     377     377     000          $ENULL: .BYTE   -1,-1,0         ;;NULL CHARACTER STRING
006033     015  042412  042116          $ENDMG: .ASCIZ  <15><12>/END PASS/
006040  050040  051501  000123
```

```
                                        .SBTTL  SCOPE HANDLER ROUTINE
                                        ;;*************************************************************************
                                        ;*THIS ROUTINE CONTROLS THE LOOPING OF SUBTESTS. IT WILL INCREMENT
                                        ;*AND LOAD THE TEST NUMBER(STSTNM) 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

006046                                  $SCOPE:
006046  104406                                  CKSWR                   ;;TEST  FOR CHANGE IN SOFT-SWR
006050  032777  040000  173062          1$:     BIT     #BIT14,@#SWR    ;;LOOP ON PRESENT TEST?
006056  001111                                  BNE     $OVER           ;;YES IF SW14=1
                                        ;#####START OF CODE FOR THE XOR TESTER#####
006060  000416                          $XTSTR: BR      6$              ;;IF RUNNING ON THE "XOR" TESTER CHANGE
                                                                        ;;THIS INSTRUCTION TO A "NOP" (NOP=240)
006062  013746  000004                          MOV     @#ERRVEC,-(SP)  ;;SAVE THE CONTENTS OF THE ERROR VECTOR
006066  012737  006106  000004                  MOV     #5$,@#ERRVEC    ;;SET FOR TIMEOUT
006074  005737  177060                          TST     @#177060        ;;TIME OUT ON XOR?
006100  012637  000004                          MOV     (SP)+,@#ERRVEC  ;;RESTORE THE ERROR VECTOR
006104  000463                                  BR      $SVLAD          ;;GO TO THE NEXT TEST
006106  022626                          5$:     CMP     (SP)+,(SP)+     ;;CLEAR THE STACK AFTER A TIME OUT
006110  012637  000004                          MOV     (SP)+,@#ERRVEC  ;;RESTORE THE ERROR VECTOR
006114  000423                                  BR      7$              ;;LOOP ON THE PRESENT TEST
006116                                  6$:;#####END OF CODE FOR THE XOR TESTER#####
006116  032777  000400  173014                  BIT     #BIT08,@#SWR    ;;LOOP ON SPEC. TEST?
006124  001404                                  BEQ     2$              ;;BR IF NO
006126  127767  173006  172746                  CMPB    @#SWR,$TSTNM    ;;ON THE RIGHT TEST?    SWR<7:0>
006134  001462                                  BEQ     $OVER           ;;BR IF YES
006136  105767  172741          2$:     TSTB    $ERFLG          ;;HAS AN ERROR OCCURRED?
006142  001421                                  BEQ     3$              ;;BR IF NO
006144  126767  172745  172731                  CMPB    $ERMAX,$ERFLG   ;;MAX. ERRORS FOR THIS TEST OCCURRED?
006152  101015                                  BHI     3$              ;;BR IF NO
006154  032777  001000  172756                  BIT     #BIT09,@#SWR    ;;LOOP ON ERROR?
006162  001404                                  BEQ     4$              ;;BR IF NO
006164  016767  172720  172714          7$:     MOV     $LPERR,$LPADR   ;;SET LOOP ADDRESS TO LAST SCOPE
006172  000443                                  BR      $OVER
006174  105067  172703                  4$:     CLRB    $ERFLG          ;;ZERO THE ERROR FLAG
006200  005067  172762                          CLR     $TIMES          ;;CLEAR THE NUMBER OF ITERATIONS TO MAKE
006204  000415                                  BR      1$              ;;ESCAPE TO THE NEXT TEST
006206  032777  004000  172724          3$:     BIT     #BIT11,@#SWR    ;;INHIBIT ITERATIONS?
006214  001011                                  BNE     1$              ;;BR IF YES
006216  005767  172656                          TST     $PASS           ;;IF FIRST PASS OF PROGRAM
006222  001406                                  BEQ     1$              ;;      INHIBIT ITERATIONS
006224  005267  172654                          INC     $ICNT           ;;INCREMENT ITERATION COUNT
006230  026767  172732  172646                  CMP     $TIMES,$ICNT    ;;CHECK THE NUMBER OF ITERATIONS MADE
006236  002021                                  BGE     $OVER           ;;BR IF MORE ITERATION REQUIRED
006240  012767  000001  172636          1$:     MOV     #1,$ICNT        ;;REINITIALIZE THE ITERATION COUNTER
006246  016767  000044  172712                  MOV     $MXCNT,$TIMES   ;;SET NUMBER OF ITERATIONS TO DO
006254  105267  172622                  $SVLAD: INCB    $TSTNM          ;;COUNT TEST NUMBERS
006260  011667  172622                          MOV     (SP),$LPADR     ;;SAVE SCOPE LOOP ADDRESS
```

```
 1504  006264  011667  172620                MOV     (SP),$LPERR     ;;SAVE ERROR LOOP ADDRESS
 1505  006270  005067  172674                CLR     $ESCAPE         ;;CLEAR THE ESCAPE FROM ERROR ADDRESS
 1506  006274  112767  000001  172613        MOVB    #1,$ERMAX       ;;ONLY ALLOW ONE(1) ERROR ON NEXT TEST
 1507  006302  016777  172574  172632 $OVER:  MOV     $TSTNM,@DISPLAY ;;DISPLAY TEST NUMBER
 1508  006310  016716  172572                MOV     $LPADR,(SP)     ;;FUDGE RETURN ADDRESS
 1509  006314  000002                        RTI                     ;;FIXES PS
 1510  006316  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

006320                          $ERROR:
006320  104406                          CKSWR                   ;;TEST FOR CHANGE IN SOFT-SWR
006322  011437  001162                  MOV     @TACS,@#$REG0           ;SAVE THE STATUS REG.
006326  011537  001164                  MOV     @TADB,@#$REG1           ;SAVE THE DATA BUFFER
006332  010037  001124                  MOV     R0,@#$GDDAT             ;R0 WILL CONTAIN THE GOOD DATA
006336  010137  001126                  MOV     R1,@#$BDDAT             ;R1 WILL CONTAIN THE BAD DATA
006342  105267  172535          7$:     INCB    $ERFLG          ;;SET THE ERROR FLAG
006346  001775                          BEQ     7$              ;;DON'T LET THE FLAG GO TO ZERO
006350  016777  172526  172564          MOV     $TSTNM,@DISPLAY ;;DISPLAY TEST NUMBER AND ERROR FLAG
006356  032777  002000  172554          BIT     @BIT10,@SWR     ;;BELL ON ERROR?
006364  001402                          BEQ     1$              ;;NO - SKIP
006366  104401  001172                  TYPE    ,$BELL          ;;RING BELL
006372  005267  172514          1$:     INC     $ERTTL          ;;COUNT THE NUMBER OF ERRORS
006376  011667  172514                  MOV     (SP),$ERRPC     ;;GET ADDRESS OF ERROR INSTRUCTION
006402  162767  000002  172506          SUB     #2,$ERRPC
006410  117767  172502  172476          MOVB    @$ERRPC,$ITEMB  ;;STRIP AND SAVE THE ERROR ITEM CODE
006416  032777  020000  172514          BIT     $BIT13,@SWR     ;;SKIP TYPEOUT IF SET
006424  001004                          BNE     20$             ;;SKIP TYPEOUTS
006426  004767  000060                  JSR     PC,TYPERR       ;;GO TO USER ERROR ROUTINE
006432  104401  001177                  TYPE    ,$CRLF
006436                          20$:
006436  005777  172476          2$:     TST     @SWR            ;;HALT ON ERROR
006442  100002                          BPL     3$              ;;SKIP IF CONTINUE
006444  000000                          HALT                    ;;HALT ON ERROR!
006446  104406                          CKSWR                   ;;TEST FOR CHANGE IN SOFT-SWR
006450  032777  001000  172462  3$:     BIT     @BIT09,@SWR     ;;LOOP ON ERROR SWITCH SET?
006456  001402                          BEQ     4$              ;;BR IF NO
006460  016716  172424                  MOV     $LPERR,(SP)     ;;FUDGE RETURN FOR LOOPING
006464  005767  172500          4$:     TST     $ESCAPE         ;;CHECK FOR AN ESCAPE ADDRESS
006470  001402                          BEQ     5$              ;;BR IF NONE
006472  016716  172472                  MOV     $ESCAPE,(SP)    ;;FUDGE RETURN ADDRESS FOR ESCAPE
006476                          5$:
006476  022737  006014  000042          CMP     @#$ENDAD,@#42   ;;ACT-11 AUTO-ACCEPT?
006504  001001                          BNE     6$              ;;BRANCH IF NO
006506  000000                          HALT                    ;;YES
006510                          6$:
006510  000002                          RTI                     ;;RETURN
```

```
1563                                    ;;**********************************************************************
1564                                    ;THIS ROUTINE WILL TYPEOUT THE ERROR MESSAGES
1565
1566  006512  104401  001177   TYPERR: TYPE    ,$CRLF                  ;TYPE A CARRIAGE RETURN & LINE FEED
1567  006516  010046                    MOV     R0,-(SP)                ;SAVE R0
1568  006520  113700  001114           MOVB    @#$ITEMB,R0             ;PICKUP THE ITEM INDEX
1569  006524  005300                    DEC     R0                      ;ADJUST THE INDEX
1570  006526  006300                    ASL     R0                      ;SO IT WILL WORK FOR
1571  006530  006300                    ASL     R0                      ;THE ERROR TABLE
1572  006532  006300                    ASL     R0
1573  006534  062700  001236           ADD     #$ERRTB,R0              ;FORM THE TABLE POINTER
1574  006540  012067  000002           MOV     (R0)+,1$                ;PICKUP "ERROR MESSAGE" POINTER
1575  006544  104401                    TYPE                            ;TYPE "ERROR MESSAGE"
1576  006546  000000            1$:     0                               ;"ERROR MESSAGE POINTER" GOES HERE
1577  006550  104401  001177           TYPE    ,$CRLF
1578  006554  012067  000004           MOV     (R0)+,2$                ;PICKUP "DATA HEADER" POINTER
1579  006560  001404                    BEQ     3$                      ;IF "0" DON'T TYPE
1580  006562  104401                    TYPE                            ;TYPE "DATA HEADER
1581  006564  000000            2$:     0                               ;"DATA HEADER" POINTER GOES HERE
1582  006566  104401  001177           TYPE    ,$CRLF
1583  006572  012000            3$:     MOV     (R0)+,R0                ;PICKUP "DATA POINTER"
1584  006574  001004                    BNE     5$                      ;IF THERE IS DATA TO TYPE GO DO IT
1585  006576  012600            4$:     MOV     (SP)+,R0                ;RESTORE R0
1586  006600  104401  001177           TYPE    ,$CRLF                  ;TYPE A CARRAGE RETURN&LINE FEED
1587  006604  000207                    RTS     PC                      ;RETURN
1588  006606                    5$:
1589  006606  013046                    MOV     0(R0)+,-(SP)    ;;SAVE 0(R0)+ FOR TYPEOUT
1590                                                            ;;TYPE DATA
1591  006610  104402                    TYPOC                   ;;GO TYPE--OCTAL ASCII(ALL DIGITS)
1592  006612  005710                    TST     (R0)                    ;TERMINATOR?
1593  006614  001770                    BEQ     4$                      ;BR IF YES
1594  006616  104401  006624           TYPE    ,6$                     ;TYPE 2 SPACES
1595  006622  000771                    BR      5$                      ;LOOP
1596  006624  020040      000   6$:     .ASCIZ  /  /                    ;ASCII STRING OF 2 SPACES
1597            006630                  .EVEN
```

```
                                        ;;*****************************************************************
                                        ;ROUTINE TO WAIT ON THE READY BIT

                                        WAIT.ON.READY:
                                                CLR     WAIT2                   ;SETUP MAX. TIME TO WAIT ON "READY"
                                                MOV     MAXCNT,HGHTIM
                                                MOV     (SP)+,@#SAVPC           ;GET THE PC OF THE WAITREADY INSTRUCTION
                                                SUB     #2,@#SAVPC
                                                MOV     (SP)+,@#SAVPS           ;SAVE THE PS
                                        WAIT1:  BIT     #READY,@TACS            ;READY=1?
                                                BNE     WAIT3                   ;GO ON IF YES
                                                TSTB    @TACS                   ;CHECK TRANSFER REQUEST
                                                BPL     WAIT4
                                                ERROR   4                       ;"TRANSFER REQUEST" SET WHILE WAITING ON "READY"
                                                BR      WAIT3
                                        WAIT4:  INC     (PC)+                   ;COUNT FAST COUNTER
                                        WAIT2:  0
                                                BNE     WAIT1                   ;GO CHECK "READY" AGAIN
                                                DEC     (PC)+                   ;COUNT LOOP COUNTER
                                        HGHTIM: 0
                                                BGT     WAIT1                   ;GO LOOP AGAIN
                                                ERROR   2                       ;"READY" FAILED TO SET
                                        WAIT3:  MOV     @#SAVPS,-(SP)           ;GET THE STATUS BACK
                                                MOV     @#SAVPC,-(SP)           ;GET THE PC
                                                ADD     #2,(SP)
                                                RTI
                                        MAXCNT: 0

                                        ;;*****************************************************************
                                        ;ROUTINE TO WAIT ON TRANSFER REQUEST

                                        WAIT.FOR.XFER.REQ:
                                                CLR     2$                      ;SETUP WASTE TIME LOOP
                                                MOV     @#MAXCNT,3$
                                                MOV     (SP)+,@#SAVPC           ;GET THE PC OF THE WAITXFER INSTRUCTION
                                                SUB     #2,@#SAVPC
                                                MOV     (SP)+,@#SAVPS           ;SAVE THE PS
                                        1$:     TSTB    @TACS                   ;CHECK XFER REQ
                                                BMI     4$                      ;EXIT IF SET
                                                BIT     #READY,@TACS            ;LOOK AT READY
                                                BEQ     5$                      ;BR IF "READY" ISN'T SET
                                                ERROR   4                       ;"READY" SET WHILE WAITING FOR "XFER REQ"
                                                BR      4$
                                        5$:     INC     (PC)+                   ;COUNT
                                        2$:     0
                                                BNE     1$                      ;BR IF MORE TO DO
                                                DEC     (PC)+
                                        3$:     0
                                                BGT     1$
                                                ERROR   3                       ;"TRANSFER REQUEST" FAILED TO SET
                                        4$:     MOV     @#SAVPS,-(SP)           ;GET THE STATUS BACK
                                                MOV     @#SAVPC,-(SP)           ;GET THE PC
                                                ADD     #2,(SP)
                                                RTI                             ;GO BACK
```

```
1652                                    ;;*****************************************************************
1653
1654                                    .SBTTL          ROUTINE TO ASK THE OPERATOR WHAT DRIVE(S) TO TEST
1655
1656                                    ;CALL
1657                                    ;       JSR     PC,@#ASKDRV
1658                                    ;       RETURN                  ;NOTE: R0 AND R1 ARE DESTROYED
1659
1660  007036  104401  012552      ASKDRV: TYPE    ,MSGDRV                 ;<CRLF>"DRIVE(S)? "
1661  007042  005067  172156              CLR     DRVKEY
1662  007046  104410                      RDLIN                           ;GO GET A DRIVE
1663  007050  012600                      MOV     (SP)+,R0                ;SETUP TO CHECK FOR VALID DRIVE(S)
1664  007052  105710                      TSTB    @R0                     ;WAS A DRIVE SELECTED?
1665  007054  001425                      BEQ     NOTLGL                  ;BR IF NO
1666  007056  012701  001224              MOV     #DRVKEY,R1
1667  007062  122710  000101      LOOP:   CMPB    #'A,@R0                 ;WAS DRIVE "A" SELECTED?
1668  007066  001002                      BNE     NOTA                    ;BR IF NO
1669  007070  112021                      MOVB    (R0)+,(R1)+             ;SET KEY FOR DRIVE "A"
1670  007072  000411                      BR      NEXT
1671  007074  122710  000102      NOTA:   CMPB    #'B,@R0                 ;WAS DRIVE "B" SELECTED?
1672  007100  001002                      BNE     NOTB                    ;BR IF NO
1673  007102  112021                      MOVB    (R0)+,(R1)+             ;SET KEY FOR DRIVE "B"
1674  007104  000404                      BR      NEXT
1675  007106  122710  000054      NOTB:   CMPB    #54,@R0                 ;WAS A COMMA TYPED?
1676  007112  001006                      BNE     NOTLGL                  ;BR IF NO
1677  007114  105720                      TSTB    (R0)+                   ;DUMP THE COMMA
1678  007116  105710              NEXT:   TSTB    @R0                     ;TERMINATOR?
1679  007120  001406                      BEQ     EXIT                    ;BR IF YES
1680  007122  022701  001226              CMP     #DRVKEY+2,R1            ;TWO DRIVES SELECTED?
1681  007126  101355                      BHI     LOOP                    ;BR IF NO
1682  007130  104401  001176      NOTLGL: TYPE    ,#QUES                  ;ILLEGAL INPUT DETECTED
1683  007134  000740                      BR      ASKDRV                  ;GO TRY AGAIN
1684  007136  005767  172062      EXIT:   TST     DRVKEY                  ;ANY DRIVE SELECTED?
1685  007142  001772                      BEQ     NOTLGL                  ;BR IF NO
1686  007144  000207                      RTS     PC
1687
```

```
1688                                    ;;**********************************************************************
1689                                    ;CALL
1690                                    ;JSR    PC,@#ASKADR
1691
1692  007146  010046                    ASKADR: MOV     R0,-(SP)                ;SAVE R0
1693  007150  104401  012566            1$:     TYPE    ,MSGASK                 ;"TACS?"
1694  007154  104411                            RDOCT                           ;GET VALUE
1695  007156  012600                            MOV     (SP)+,R0                ;PICK UP THE OCTAL NUMBER
1696  007160  001423                            BEQ     3$                      ;IF "0" USE OLD VALUES
1697  007162  020027  160000                    CMP     R0,#160000              ;MAKE SURE IT IS A BUS ADDRESS
1698  007166  103770                            BLO     1$
1699  007170  010037  001206                    MOV     R0,@#TACSL              ;SAVE FOR TACS
1700  007174  062700  000002                    ADD     #2,R0                   ;STEP TO TADB ADDRESS
1701  007200  010037  001212                    MOV     R0,@#TADBL              ;AND SAVE IT
1702  007204  013737  001206  001210            MOV     @#TACSL,@#TACSH         ;SET UP TACS UPPER
1703  007212  005237  001210                    INC     @#TACSH                 ;BYTE POINTER
1704
1705  007216  013737  001212  001214            MOV     @#TADBL,@#TADBH         ;SET UP TADB UPPER
1706  007224  005237  001214                    INC     @#TADBH                 ;BYTE POINTER
1707  007230  104401  012576            3$:     TYPE    ,MSGVEC                 ;"VECTOR?"
1708  007234  104411                            RDOCT
1709  007236  012600                            MOV     (SP)+,R0
1710  007240  001411                            BEQ     5$
1711  007242  020027  001000                    CMP     R0,#1000                ;MAKE SURE ADDRESS IS IN VECTOR AREA
1712  007246  103370                            BHIS    3$
1713  007250  010037  001216                    MOV     R0,@#TAVEC              ;SAVE AS VECTOR ADDRESS
1714  007254  062700  000002                    ADD     #2,R0
1715  007260  010037  001220                    MOV     R0,@#TAVEC+2
1716  007264  104401  012606            5$:     TYPE    ,MSGPRI                 ;ASK FOR PRIORITY
1717  007270  104411                            RDOCT
1718  007272  012600                            MOV     (SP)+,R0
1719  007274  001413                            BEQ     6$                      ;IF "0" USE OLD VALUE
1720  007276  020027  000007                    CMP     R0,#7                   ;MAKE SURE ITS VALID
1721  007302  101370                            BHI     5$
1722  007304  000300                            SWAB    R0                      ;PUT INTO HIGH BYTE
1723  007306  006200                            ASR     R0                      ;AND SHIFT
1724  007310  006200                            ASR     R0                      ;INTO PROPER
1725  007312  006200                            ASR     R0                      ;POSITION
1726  007314  042700  177437                    BIC     #^C<340>,R0             ;SAVE ONLY PRIORITY BITS
1727  007320  010037  001222                    MOV     R0,@#TAPRIO             ;STORE IT AWAY
1728  007324  104401  012620            6$:     TYPE    ,MTACS                  ;TACS=
1729  007330  016746  171652                    MOV     TACSL,-(SP)     ;;SAVE TACSL FOR TYPEOUT
1730  007334  104402                            TYPOC                   ;;GO TYPE--OCTAL ASCII(ALL DIGITS)
1731  007336  104401  012626                    TYPE    ,MTADB                  ;"TADB="
1732  007342  016746  171644                    MOV     TADBL,-(SP)     ;;SAVE TADBL FOR TYPEOUT
1733  007346  104402                            TYPOC                   ;;GO TYPE--OCTAL ASCII(ALL DIGITS)
1734  007350  104401  012635                    TYPE    ,MTAVEC                 ;"VECTOR="
1735  007354  016746  171636                    MOV     TAVEC,-(SP)     ;;SAVE TAVEC FOR TYPEOUT
1736  007360  104402                            TYPOC                   ;;GO TYPE--OCTAL ASCII(ALL DIGITS)
1737  007362  104401  012646                    TYPE    ,MTAPRI                 ;"PRIORITY="
1738  007366  016746  171630                    MOV     TAPRIO,-(SP)    ;;SAVE TAPRIO FOR TYPEOUT
1739  007372  104402                            TYPOC                   ;;GO TYPE--OCTAL ASCII(ALL DIGITS)
1740  007374  104401  012661                    TYPE    ,MSGOK                  ;"OK?"
1741  007400  104407                            RDCHR                           ;GO READ ONE CHARACTER
1742  007402  012600                            MOV     (SP)+,R0                ;GET IT
1743  007404  022700  000015                    CMP     #15,R0                  ;IS IT "CR"?
```

```
1744  007410  001406                    BEQ     7$                      ;BRANCH IF YES
1745  007412  022700  000131            CMP     #'Y,R0                  ;IS IT "Y"?
1746  007416  001403                    BEQ     7$                      ;IT WAS
1747  007420  104401  001176            TYPE    ,$QUES                  ;TYPE "?"
1748  007424  000651                    BR      1$                      ;AND LET HIM CORRECT THEM
1749  007426  104401  012667    7$:     TYPE    ,MYES                   ;TYPE OUT "YES"
1750  007432  012600                    MOV     (SP)+,R0                ;RESTORE R0
1751  007434  000207                    RTS     PC                      ;AND RETURN
```

```
                                ;;*****************************************************************
                                ;;*****************************************************************
                                ;ROUTINE TO TYPE DIRECTIONS TO OPERATOR AND WAIT FOR RESPONSE
                                ;CALL:
                                ;       JSR     R0,@#ASKQUES
                                ;       RETURN HERE ON A RESPONSE OF "Y"
                                ;       RETURN HERE ON A RESPONSE OF "N"

007436                          ASKQUES:
007436  010146                         MOV     R1,-(SP)                ;SAVE R1
007440  012067  000006                  MOV     (R0)+,2$                ;PICKUP THE MESSAGE POINTER
007444  104401  001177                  TYPE    ,$CRLF                  ;TYPE A "CR" AND "LF"
007450  104401                  1$:     TYPE                            ;TYPE THE MESSAGE
007452  000000                  2$:     0                               ;MESSAGE POINTER GOES HERE
007454  104407                          RDCHR                           ;GET ONE CHARACTER FROM THE TTY
007456  012601                          MOV     (SP)+,R1                ;AND PUT IT IN R1
007460  020127  000015                  CMP     R1,#15                  ;CHECK THIS CHARACTER
007464  001443                          BEQ     4$                      ;BR IF ITS A "CR"
007466  020127  000116                  CMP     R1,#'N                  ;IS IT A "N"?
007472  001415                          BEQ     3$                      ;BR IF YES
007474  020127  000131                  CMP     R1,#'Y                  ;IS IT A "Y"
007500  001007                          BNE     5$                      ;BR IF NOT "Y"
007502  104401  007510                  TYPE    ,65$            ;;TYPE ASCIZ STRING
007506  000403                          BR      64$             ;;GET OVER THE ASCIZ
                                ;;65$:  .ASCIZ  / YES/
007516                          64$:
007516  000426                          BR      4$                      ;GO TO EXIT
007520  104401  001176          5$:     TYPE    ,$QUES                  ;UNKNOWN REQUEST
007524  000751                          BR      1$                      ;GO ASK AGAIN
007526                          3$:
007526  104401  007534                  TYPE    ,67$            ;;TYPE ASCIZ STRING
007532  000415                          BR      66$             ;;GET OVER THE ASCIZ
                                ;;67$:  .ASCIZ  * NO---SKIPPING THIS TEST*
007566                          66$:
007566  005720                          TST     (R0)+                   ;STEP OVER "CR" RETURN
007570  005037  001166                  CLR     @#$TIMES                ;CLEAR ITERATIONS
007574  104401  001177          4$:     TYPE    ,$CRLF
007600  012601                          MOV     (SP)+,R1                ;RESTORE R1
007602  000200                          RTS     R0                      ;RETURN
```

```
                                ;////////////////////////////////////////////////////////////////////////
                                ;////////////////////////////////////////////////////////////////////////
                                ;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".
                                ;;**********************************************************************
007604  012706  001100          WFGSUB: MOV     #STACK,SP               ;KEEP THE STACK OUT OF THE WAY
007610  013704  001206                  MOV     @#TACSL,TACS            ;SETUP THE TA11 STATUS AND
007614  013705  001212                  MOV     @#TADBL,TADB            ;DATA BUFFER REGISTERS
007620  000005                          RESET                           ;RESET THE WORLD
007622  012737  007604  001110          MOV     #WFGSUB,@#LPERR                 ;SETUP THE LOOP ON ERROR ADDRESS
007630  004737  010610                  JSR     PC,@#NXTDRV             ;GO SETUP FOR NEXT DRIVE
007634  010314                          MOV     DRIVE,@TACS             ;SELECT DRIVE
007636  112714  000017                  MOVB    #REWIND!GO,@TACS        ;SEND TAPE TO "BOT"
007642  032714  000040          1008:   BIT     #READY,@TACS            ;WAIT ON READY
007646  001775                          BEQ     1008
007650  112714  000001          18:     MOVB    #WFG!GO,@TACS           ;WRITE A FILE GAP
007654  104412                          WAITREADY                       ;WAIT ON READY
007656  032714  020000                  BIT     #LEADER,@TACS           ;AT "CLEAR LEADER"?
007662  001772                          BEQ     18                      ;BR IF NO
007664  000000                          HALT                            ;STOP IF YES
007666  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="
                                ;;**********************************************************************
007670  004737  010352          WRTSUB: JSR     PC,@#SETBUF             ;GET BLOCK SIZE AND PATTERN
007674  012706  001100          WLOOP:  MOV     #STACK,SP               ;KEEP THE STACK OUT OF THE WAY
007700  013704  001206                  MOV     @#TACSL,TACS            ;SETUP THE TA11 STATUS AND
007704  013705  001212                  MOV     @#TADBL,TADB            ;DATA BUFFER REGISTERS
007710  000005                          RESET                           ;RESET THE WORLD
007712  012737  007674  001110          MOV     #WLOOP,@#LPERR          ;SETUP THE LOOP ON ERROR ADDRESS
007720  004737  010610                  JSR     PC,@#NXTDRV             ;GO SETUP FOR NEXT DRIVE
007724  010314                          MOV     DRIVE,@TACS             ;SELECT DRIVE
007726  112714  000017                  MOVB    #REWIND!GO,@TACS        ;SEND TAPE TO "BOT"
007732  032714  000040          1008:   BIT     #READY,@TACS            ;WAIT ON READY
007736  001775                          BEQ     1008
```

```
 1848  007740  004737  010466          10$:    JSR     PC,@#WRTBLK             ;WRITE A BLOCK
 1849  007744  032714  020000                  BIT     #LEADER,@TACS           ;AT "CLEAR LEADER"?
 1850  007750  001773                          BEQ     10$                     ;BR IF NO
 1851  007752  000000                          HALT                            ;STOP IF "EOT"
 1852  007754  000747                          BR      WLOOP                   ;LOOP IF CONT.
 1853
 1854
 1855                                  ;;*****************************************************************
 1856                                  ;       READ CONTINUOUS BLOCKS OF DATA
 1857                                          ;START AT 230
 1858                                          ;THIS ROUTINE CAN BE USED TO ADJUST THE "SIGNAL MONO"
 1859                                          ;AND THE "THRESHOLD POT".
 1860                                  ;;*****************************************************************
 1861  007756  012706  001100          RDSUB:  MOV     #STACK,SP               ;KEEP THE STACK OUT OF THE WAY
 1862  007762  013704  001206                  MOV     @#TACSL,TACS            ;SETUP THE TA11 STATUS AND
 1863  007766  013705  001212                  MOV     @#TADBL,TADB            ;DATA BUFFER REGISTERS
 1864  007772  000005                          RESET                           ;RESET THE WORLD
 1865  007774  012737  007756  001110          MOV     #RDSUB,@#LPERR          ;SETUP THE LOOP ON ERROR ADDRESS
 1866  010002  004737  010610                  JSR     PC,@#NXTDRV             ;GO SETUP FOR NEXT DRIVE
 1867  010006  010314                          MOV     DRIVE,@TACS             ;SELECT DRIVE
 1868  010010  112714  000017                  MOVB    #REWIND!GO,@TACS        ;SEND TAPE TO "BOT"
 1869  010014  032714  000040          10$:    BIT     #READY,@TACS            ;WAIT ON READY
 1870  010020  001775                          BEQ     10$
 1871  010022  004737  010530          10$:    JSR     PC,@#RDBLK              ;READ A BLOCK
 1872  010026  032714  020000                  BIT     #LEADER,@TACS           ;AT "CLEAR LEADER"?
 1873  010032  001351                          BNE     RDSUB                   ;BR IF YES---LOOP
 1874  010034  000772                          BR      10$
 1875
 1876
 1877                                  ;;*****************************************************************
 1878                                  ;       WRITE A FILE GAP AND A BLOCK OF DATA FROM BOT TO EOT
 1879                                          ;START AT 234
 1880                                          ;THE PROGRAM WILL HALT THREE(3) TIMES
 1881                                          ;AFTER EACH HALT SET THE SWR AND PRESS CONTINUE
 1882                                          ;HALT 1 --- SWR<7:0> = NUMBER OF BYTES PER BLOCK
 1883                                          ;HALT 2 --- SWR<7:0> = PATTERN DESIRED
 1884                                          ;HALT 3 --- SWR<15:0> = OPERATIONAL SWITCH SETTINGS
 1885                                          ;THIS ROUTINE CAN BE USED TO ADJUST THE "WRITE GAP MONO"
 1886                                          ;** IF USING SOFTWARE SWITCH REGISTER, AFTER
 1887                                  ;               EACH HALT OPERATOR WILL BE PROMPTED
 1888                                  ;               FOR THE VALUE WITH "SWR=XXXXXX NEW="
 1889                                          ;AND THE "GAP TIME MONO".
 1890                                  ;;*****************************************************************
 1891  010036  004737  010352          WGPBLK: JSR     PC,@#SETBUF             ;GET BLOCK SIZE AND PATTERN
 1892  010042  012706  001100          WGBLOP: MOV     #STACK,SP               ;KEEP THE STACK OUT OF THE WAY
 1893  010046  013704  001206                  MOV     @#TACSL,TACS            ;SETUP THE TA11 STATUS AND
 1894  010052  013705  001212                  MOV     @#TADBL,TADB            ;DATA BUFFER REGISTERS
 1895  010056  000005                          RESET                           ;RESET THE WORLD
 1896  010060  012737  010042  001110          MOV     #WGBLOP,@#LPERR                 ;SETUP THE LOOP ON ERROR ADDRESS
 1897  010066  004737  010610                  JSR     PC,@#NXTDRV             ;GO SETUP FOR NEXT DRIVE
 1898  010072  010314                          MOV     DRIVE,@TACS             ;SELECT DRIVE
 1899  010074  112714  000017                  MOVB    #REWIND!GO,@TACS        ;SEND TAPE TO "BOT"
 1900  010100  032714  000040          10$:    BIT     #READY,@TACS            ;WAIT ON READY
 1901  010104  001775                          BEQ     10$
 1902  010106  112714  000001          10:     MOVB    #WFG!GO,@TACS           ;WRITE A FILE GAP
 1903  010112  104412                          WAITREADY                       ;WAIT ON READY
```

DZTACC.NEW WRITE A FILE GAP AND A BLOCK OF DATA FROM BOT TO EOT

```
1904  010114  032714  020000          BIT     @LEADER,@TACS           ;AT "CLEAR LEADER"?
1905  010120  001005                  BNE     2$                      ;BR IF YES
1906  010122  004737  010466          JSR     PC,@#WRTBLK             ;WRITE A BLOCK
1907  010126  032714  020000          BIT     @LEADER,@TACS           ;AT "CLEAR LEADER"?
1908  010132  001765                  BEQ     1$                      ;BR IF NO
1909  010134  000000          2$:     HALT                            ;STOP AT "EOT"
1910  010136  000741                  BR      WGBLOP                  ;START OVER ON CONT.
1911
1912
1913                          ;;*****************************************************************
1914                          ;       READ A BLOCK OF DATA AND A FILE GAP
1915                                  ;START AT 240
1916                                  ;THIS ROUTINE IS USED AFTER "WRITE A BLOCK AND A FILE GAP" ROUTINE
1917                                  ;IT CAN BE USED TO ADJUST THE "SIGNAL MONO", THE THRESHOLD POT"
1918                                  ;AND THE "TAPE BLANK MONO".
1919                          ;;*****************************************************************
1920  010140  012706  001100  RGPBLK: MOV     @#STACK,SP              ;KEEP THE STACK OUT OF THE WAY
1921  010144  013704  001206          MOV     @#TACSL,TACS            ;SETUP THE TA11 STATUS AND
1922  010150  013705  001212          MOV     @#TADBL,TADB            ;DATA BUFFER REGISTERS
1923  010154  000005                  RESET                           ;RESET THE WORLD
1924  010156  012737  010140  001110  MOV     #RGPBLK,@#LPERR                 ;SETUP THE LOOP ON ERROR ADDRESS
1925  010164  004737  010610          JSR     PC,@#NXTDRV             ;GO SETUP FOR NEXT DRIVE
1926  010170  010314                  MOV     DRIVE,@TACS             ;SELECT DRIVE
1927  010172  112714  000017          MOVB    #REWIND!GO,@TACS        ;SEND TAPE TO "BOT"
1928  010176  032714  000040  100$:   BIT     #READY,@TACS            ;WAIT ON READY
1929  010202  001775                  BEQ     100$
1930  010204  004737  010530  1$:     JSR     PC,@#RDBLK              ;READ A BLOCK OF DATA
1931  010210  032714  020000          BIT     @LEADER,@TACS           ;AT "CLEAR LEADER"?
1932  010214  001351                  BNE     RGPBLK                  ;BR IF YES
1933  010216  112714  000015          MOVB    @#FBG!GO,@TACS          ;GET INTO A FILE GAP
1934  010222  104412                  WAITREADY
1935  010224  032714  020000          BIT     @LEADER,@TACS           ;AT "CLEAR LEADER"?
1936  010230  001343                  BNE     RGPBLK                  ;BR IF YES
1937  010232  000764                  BR      1$                      ;LOOP
1938
1939
1940                          ;;*****************************************************************
1941                          ;       SPACE FORWARD FILE GAP FROM "BOT" TO "EOT"
1942                                  ;START AT 244
1943                                  ;THIS ROUTINE CAN BE USED AFTER "WRITE FILE GAP" FOR LOW SPEED
1944                                  ;SPACE FOWARD (TAPE BLANK MONO CAN BE ADJUSTED), OR AFTER READ OR
1945                                  ;WRITE A FILE GAP AND A BLOCK OF DATA FOR HIGH SPEED SPACE FORWARD
1946                                  ;(SIGNAL MONO CAN BE CHECKED).
1947                          ;;*****************************************************************
1948  010234  012706  001100  SFFGSB: MOV     @#STACK,SP              ;KEEP THE STACK OUT OF THE WAY
1949  010240  013704  001206          MOV     @#TACSL,TACS            ;SETUP THE TA11 STATUS AND
1950  010244  013705  001212          MOV     @#TADBL,TADB            ;DATA BUFFER REGISTERS
1951  010250  000005                  RESET                           ;RESET THE WORLD
1952  010252  012737  010234  001110  MOV     #SFFGSB,@#LPERR                 ;SETUP THE LOOP ON ERROR ADDRESS
1953  010260  004737  010610          JSR     PC,@#NXTDRV             ;GO SETUP FOR NEXT DRIVE
1954  010264  010314                  MOV     DRIVE,@TACS             ;SELECT DRIVE
1955  010266  112714  000017          MOVB    #REWIND!GO,@TACS        ;SEND TAPE TO "BOT"
1956  010272  032714  000040  100$:   BIT     #READY,@TACS            ;WAIT ON READY
1957  010276  001775                  BEQ     100$
1958  010300  112714  000013  1$:     MOVB    @#SFFG!GO,@TACS         ;SPACE INTO A FILE GAP
1959  010304  104412                  WAITREADY                       ;WAIT ON READY
```

```
1960  010306  032714  020000          BIT     #LEADER,@TACS           ;AT "CLEAR LEADER"?
1961  010312  001772                  BEQ     1$                      ;BR IF NO
1962  010314  000000                  HALT                            ;STOP AT "EOT"
1963  010316  000746                  BR      $FFGSB                  ;LOOP ON CONT.
1964
1965
1966                          ;;*****************************************************************
1967                          ;       BACK SPACE FILE GAP
1968                                  ;START AT 250
1969                                  ;THIS ROUTINE CAN BE USED TO ADJUST OR CHECK THE "SIGNAL MONO".
1970                          ;;*****************************************************************
1971  010320  000005          BSFGSB: RESET                           ;RESET THE WORLD
1972  010322  012737  010320  001110          MOV     #BSFGSB,@#LPERR         ;LOOP ON ERROR ADDRESS
1973  010330  010314                  MOV     DRIVE,@TACS             ;SELECT DRIVE
1974  010332  112714  000007  1$:     MOVB    #BSFG!GO,@TACS          ;BACK SPACE A FILE GAP
1975  010336  104412                  WAITREADY                       ;WAIT ON READY
1976  010340  032714  020000          BIT     #LEADER,@TACS           ;AT "CLEAR LEADER"?
1977  010344  001772                  BEQ     1$                      ;BR IF NO
1978  010346  000000                  HALT                            ;STOP AT BOT
1979  010350  000763                  BR      BSFGSB                  ;START OVER ON CONT.
1980
1981
1982                          ;;*****************************************************************
1983                          ;       SETUP BLOCK SIZE AND PATTERN FOR SUBROUTINES
1984                          ;;*****************************************************************
1985  010352  005000          SETBUF: CLR     R0
1986  010354  000000                  HALT                            ;OPERATOR PUTS BYTE COUNT IN SWR<7:0>
1987  010356  022767  000176  170554          CMP     #SWREG,SWR              ;USING S/W SWITCH REG?
1988  010364  001001                  BNE     20$                     ;NO- GET OUT
1989  010366  104405                  GTSWR                           ;GET VALUE
1990  010370                  20$:                                    ;CONTINUE
1991  010370  157700  170544                  BISB    @SWR,R0         ;PICKUP THE BYTE COUNT
1992  010374  001006                  BNE     2$                      ;BR IF NON-ZERO
1993  010376  105777  170537                  TSTB    @SWR+1                  ;CHECK IF GREATER THAN 377
1994  010402  001402                  BEQ     1$                      ;BR IF NO
1995  010404  012703  000376                  MOV     #376,R0                 ;SET FOR MAX ALLOWED
1996  010410  005200                  INC     R0                      ;MAKE IT 377 OR 1
1997  010412  010037  010462  2$:     MOV     R0,@#BLKLIM             ;SETUP THE BLOCK LIMIT
1998  010416  005037  010464          CLR     @#PATTRN
1999  010422  000000                  HALT                            ;OPERATOR PUTS PATTERN IN SWR<7:0>
2000  010424  022767  000176  170506          CMP     #SWREG,SWR              ;USING S/W SWITCH REG?
2001  010432  001001                  BNE     21$                     ;NO- GET OUT
2002  010434  104405                  GTSWR                           ;GET VALUE
2003  010436                  21$:                                    ;CONTINUE
2004  010436  117737  170476  010464          MOVB    @SWR,@#PATTRN           ;PICK UP THE PATTERN
2005  010444  000000                  HALT                            ;SET OPERATIONAL SWITCHES
2006  010446  022767  000176  170464          CMP     #SWREG,SWR              ;USING S/W SWITCH REG?
2007  010454  001001                  BNE     22$                     ;NO- GET OUT
2008  010456  104405                  GTSWR                           ;GET VALUE
2009  010460                  22$:                                    ;CONTINUE
2010  010460  000207                  RTS     PC                      ;RETURN
2011  010462  000000          BLKLIM: 0                               ;READ AND WRITE BLOCK SIZE
2012  010464  000000          PATTRN: 0                               ;PATTERN TO GO ON THE TAPE
2013
2014
2015                          ;;*****************************************************************
```

```
 2016                                          ;       WRITE ROUTINE FOR THE MANUAL OPERATIONS
 2017                                          ;;*****************************************************************
 2018  010466  013701  010462                 WRTBLK: MOV     @#BLKLIM,R1             ;PICKUP THE BLOCK SIZE
 2019  010472  112714  000003                         MOVB    #WRITE!GO,@TACS         ;START A WRITE
 2020  010476  104413                         1$:     WAITXFER                        ;WAIT ON TRANSFER REQUEST
 2021  010500  032714  000040                         BIT     #READY,@TACS            ;DID READY SET?
 2022  010504  001010                                 BNE     3$                      ;BR IF YES
 2023  010506  005301                                 DEC     R1                      ;COUNT THIS REQUEST
 2024  010510  002403                                 BLT     2$                      ;BR IF TIME FOR ILBS
 2025  010512  113715  010464                         MOVB    @#PATTRN,@TADB          ;PUT DATA ON TAPE
 2026  010516  000767                                 BR      1$                      ;LOOP
 2027  010520  052714  000020                 2$:     BIS     #ILBS,@TACS             ;WRITE CRC AND SHUT DOWN
 2028  010524  104412                                 WAITREADY                       ;WAIT ON THE READY FLAG
 2029  010526  000207                         3$:     RTS     PC
 2030
 2031
 2032                                          ;;*****************************************************************
 2033                                          ;       READ ROUTINE FOR THE MANUAL OPERATIONS
 2034                                          ;;*****************************************************************
 2035  010530  013702  010462                 RDBLK:  MOV     @#BLKLIM,R2             ;PICKUP THE BLOCK SIZE
 2036  010534  013700  010464                         MOV     @#PATTRN,R0             ;USE THIS DATA PATTERN TO COMPARE TO
 2037  010540  112714  000005                         MOVB    #READ!GO,@TACS          ;START A READ
 2038  010544  104413                         1$:     WAITXFER                        ;WAIT ON TRANSFER REQUEST
 2039  010546  032714  000040                         BIT     #READY,@TACS            ;IS READY SET?
 2040  010552  001012                                 BNE     3$                      ;BR IF YES
 2041  010554  005302                                 DEC     R2                      ;COUNT THIS REQUEST
 2042  010556  002405                                 BLT     2$                      ;BR IF TIME FOR ILBS
 2043  010560  011501                                 MOV     @TADB,R1                ;READ THE DATA BUFFER
 2044  010562  120001                                 CMPB    R0,R1                   ;CHECK THE DATA
 2045  010564  001767                                 BEQ     1$                      ;BR IF OK
 2046  010566  104005                                 ERROR   5                       ;BAD DATA
 2047  010570  000406                                 BR      4$                      ;GET OUT
 2048  010572  052714  000020                 2$:     BIS     #ILBS,@TACS             ;READ ILBS
 2049  010576  104412                                 WAITREADY                       ;WAIT ON READY
 2050  010600  005714                         3$:     TST     @TACS                   ;CHECK FOR ERROR
 2051  010602  100001                                 BPL     4$                      ;BR IF NONE
 2052  010604  104001                                 ERROR   1                       ;ERROR OCCURRED
 2053  010606  000207                         4$:     RTS     PC                      ;RETURN
 2054
 2055
 2056                                          ;;*****************************************************************
 2057                                          ;       ROUTINE TO CHANGE DRIVES
 2058  010610  105777  170324                 NXTDRV: TSTB    @SWR                    ;IS SW07 ON A (1)?
 2059  010614  100416                                 BMI     3$                      ;BR IF YES
 2060  010616  005003                                 CLR     DRIVE                   ;SET DRIVE TO "A"
 2061  010620  013701  001230                         MOV     @#DRVPNT,R1             ;GET DRIVE POINTER
 2062  010624  122127  000101                         CMPB    (R1)+,#'A               ;IS IT DRIVE "A"?
 2063  010630  001402                                 BEQ     1$                      ;BR IF YES
 2064  010632  012703  000400                         MOV     #UNIT,DRIVE             ;SET DRIVE TO "B"
 2065  010636  105711                         1$:     TSTB    (R1)                    ;LAST DRIVE BEEN SELECTED
 2066  010640  001002                                 BNE     2$                      ;BR IF NO
 2067  010642  012701  001224                         MOV     #DRVKEY,R1              ;RESET DRIVE POINTER
 2068  010646  010137  001230                 2$:     MOV     R1,@#DRVPNT             ;SAVE DRIVE POINTER FOR NEXT TIME
 2069  010652  000207                         3$:     RTS     PC                      ;GO BACK
```

```
2070                                    ;;*****************************************************************
2071                                    ;
2072                                    .SBTTL          ROUTINE TO EXAMINE DRIVE(S) FOR AVAILABLITY
2073
2074                                    ;CALL:
2075                                    ;       MOV     @DRVKEY,R0
2076                                    ;       JSR     PC,@#EXAM               ;R1 IS DESTROYED
2077                                    ;       NORMAL RETURN
2078                                    ;       ERROR RETURN
2079
2080  010654  013701  001206    EXAM:   MOV     @#TACSL,R1              ;PICKUP THE "CONTROL & STATUS" REG. ADR.
2081  010660  005011                    CLR     (R1)                    ;DRIVE="A", FUNCTION="NFG"
2082  010662  122710  000101            CMPB    #'A,(R0)                ;EXAMINE DRIVE "A"?
2083  010666  001402                    BEQ     1$                      ;BR IF YES
2084  010670  052711  000400            BIS     #UNIT,(R1)              ;SELECT DRIVE "B"
2085  010674  032711  000040    1$:     BIT     #READY,(R1)             ;WAIT ON READY
2086  010700  001775                    BEQ     1$
2087  010702  005711                    TST     (R1)                    ;ANY ERROR?
2088  010704  100024                    BPL     4$                      ;BR IF NO
2089  010706  032711  001000            BIT     #OFFLINE,(R1)           ;ERROR DUE TO "OFF LINE"?
2090  010712  001017                    BNE     3$                      ;BR IF YES
2091  010714  032711  010000            BIT     #WRTLOCK,(R1)           ;ERROR DUE TO "WRITE LOCK"?
2092  010720  001411                    BEQ     2$                      ;BR IF NO
2093  010722  122777  000201  170210    CMPB    #BIT07!BIT00,@#WR       ;"READONLY" SELECTED? (RD1PAS)
2094  010730  001412                    BEQ     4$                      ;BR IF YES
2095  010732  122777  000203  170200    CMPB    #BIT07!BIT01!BIT00,@#WR ;(RD2PAS)?
2096  010740  001406                    BEQ     4$                      ;BR IF YES
2097  010742  000403                    BR      3$                      ;TAKE THE ERROR EXIT
2098  010744  032711  020000    2$:     BIT     #LEADER,(R1)            ;ERROR DUE TO "CLEAR LEADER"?
2099  010750  001002                    BNE     4$                      ;BR IF YES
2100  010752  062716  000002    3$:     ADD     #2,(SP)                 ;TAKE ERROR RETURN
2101  010756  000207            4$:     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
                                ;*
                                
010760  105767  170173        $TYPE:  TSTB    $TPFLG          ;;IS THERE A TERMINAL?
010764  100002                        BPL     1$              ;;BR IF YES
010766  000000                        HALT                    ;;HALT HERE IF NO TERMINAL
010770  000407                        BR      3$              ;;LEAVE
010772  010046                  1$:   MOV     R0,-(SP)        ;;SAVE R0
010774  017600  000002                MOV     02(SP),R0       ;;GET ADDRESS OF ASCIZ STRING
011000  112046                  2$:   MOVB    (R0)+,-(SP)     ;;PUSH CHARACTER TO BE TYPED ONTO STACK
011002  001005                        BNE     4$              ;;BR IF IT ISN'T THE TERMINATOR
011004  005726                        TST     (SP)+           ;;IF TERMINATOR POP IT OFF THE STACK
011006  012600                  60$:  MOV     (SP)+,R0        ;;RESTORE R0
011010  062716  000002          3$:   ADD     #2,(SP)         ;;ADJUST RETURN PC
011014  000002                        RTI                     ;;RETURN
011016  122716  000011          4$:   CMPB    #HT,(SP)        ;;BRANCH IF <HT>
011022  001430                        BEQ     8$
011024  122716  000200                CMPB    #CRLF,(SP)      ;;BRANCH IF NOT <CRLF>
011030  001006                        BNE     5$
011032  005726                        TST     (SP)+           ;;POP  <CR><LF> EQUIV
011034  104401                        TYPE                    ;;TYPE A CR AND LF
011036  001177                        $CRLF
011040  105067  000130                CLRB    $CHARCNT        ;;CLEAR CHARACTER COUNT
011044  000755                        BR      2$              ;;GET NEXT CHARACTER
011046  004767  000056          5$:   JSR     PC,$TYPEC       ;;GO TYPE THIS CHARACTER
011052  126726  170100          6$:   CMPB    $FILLC,(SP)+    ;;IS IT TIME FOR FILLER CHARS.?
011056  001350                        BNE     2$              ;;IF NO GO GET NEXT CHAR.
011060  016746  170070                MOV     $NULL,-(SP)     ;;GET # OF FILLER CHARS. NEEDED
                                                              ;;AND THE NULL CHAR.
011064  105366  000001          7$:   DECB    1(SP)           ;;DOES A NULL NEED TO BE TYPED?
011070  002770                        BLT     6$              ;;BR IF NO--GO POP THE NULL OFF OF STACK
011072  004767  000032                JSR     PC,$TYPEC       ;;GO TYPE A NULL
011076  105367  000072                DECB    $CHARCNT        ;;DO NOT COUNT AS A COUNT
011102  000770                        BR      7$              ;;LOOP

                                ;HORIZONTAL TAB PROCESSOR

011104  112716  000040          8$:   MOVB    #' ,(SP)        ;;REPLACE TAB WITH SPACE
011110  004767  000014          9$:   JSR     PC,$TYPEC       ;;TYPE A SPACE
011114  132767  000007  000052        BITB    #7,$CHARCNT     ;;BRANCH IF NOT AT
011122  001372                        BNE     9$              ;;TAB STOP
011124  005726                        TST     (SP)+           ;;POP SPACE OFF STACK
```

```
 2158  011126  000724                          BR      2$              ;;GET NEXT CHARACTER
 2159  011130  105777  170014          $TYPEC: TSTB    @#TPS           ;;WAIT UNTIL PRINTER IS READY
 2160  011134  100375                          BPL     $TYPEC
 2161  011136  116677  000002  170006          MOVB    2(SP),@#TPB     ;;LOAD CHAR TO BE TYPED INTO DATA REG.
 2162  011144  122766  000015  000002          CMPB    #CR,2(SP)       ;;IS CHARACTER A CARRIAGE RETURN?
 2163  011152  001003                          BNE     1$              ;;BRANCH IF NO
 2164  011154  105067  000014                  CLRB    $CHARCNT        ;;YES--CLEAR CHARACTER COUNT
 2165  011160  000406                          BR      $TYPEX          ;;EXIT
 2166  011162  122766  000012  000002  1$:     CMPB    #LF,2(SP)       ;;IS CHARACTER A LINE FEED?
 2167  011170  001402                          BEQ     $TYPEX          ;;BRANCH IF YES
 2168  011172  105227                          INCB    (PC)+           ;;COUNT THE CHARACTER
 2169  011174  000000          $CHARCNT:.WORD  0               ;;CHARACTER COUNT STORAGE
 2170  011176  000207          $TYPEX: RTS     PC
 2171
 2172                          .SBTTL  TTY INPUT ROUTINE
 2173
 2174                          ;;**********************************************************************
 2175                          .ENABL  LSB
 2176
 2177                          ;;**********************************************************************
 2178                          ;*SOFTWARE SWITCH REGISTER CHANGE ROUTINE.
 2179                          ;*ROUTINE IS ENTERED FROM THE TRAP HANDLER, AND WILL
 2180                          ;*SERVICE THE TEST FOR CHANGE IN SOFTWARE SWITCH REGISTER TRAP CALL
 2181                          ;*WHEN OPERATING IN TTY FLAG MODE.
 2182  011200  022767  000176  167732  $CKSWR: CMP     @#SWREG,SWR     ;;IS THE SOFT-SWR SELECTED?
 2183  011206  001074                          BNE     15$             ;;BRANCH IF NO
 2184  011210  105777  167730                  TSTB    @#TKS           ;;CHAR THERE?
 2185  011214  100071                          BPL     15$             ;;IF NO, DON'T WAIT AROUND
 2186  011216  117746  167724                  MOVB    @#TKB,-(SP)     ;;SAVE THE CHAR
 2187  011222  042716  177600                  BIC     #^C177,(SP)     ;;STRIP-OFF THE ASCII
 2188  011226  022726  000007                  CMP     #7,(SP)+        ;;IS IT A CONTROL G?
 2189  011232  001062                          BNE     15$             ;;NO, RETURN TO USER
 2190  011234  126727  167674  000001          CMPB    @AUTOB,#1       ;;ARE WE RUNNING IN AUTO-MODE?
 2191  011242  001456                          BEQ     15$             ;;BRANCH IF YES
 2192
 2193  011244  104401  011725                  TYPE    ,$CNTLG         ;;ECHO THE CONTROL-G (^G)
 2194  011250  104401  011732          $GTSWR: TYPE    ,$MSWR          ;;TYPE CURRENT CONTENTS
 2195  011254  016746  166716                  MOV     SWREG,-(SP)     ;;SAVE SWREG FOR TYPEOUT
 2196  011260  104402                          TYPOC                   ;;GO TYPE--OCTAL ASCII(ALL DIGITS)
 2197  011262  104401  011743                  TYPE    ,$MNEW          ;;PROMPT FOR NEW SWR
 2198  011266  005046                  19$:    CLR     -(SP)           ;;CLEAR COUNTER
 2199  011270  005046                          CLR     -(SP)           ;;THE NEW SWR
 2200  011272  105777  167646          7$:     TSTB    @#TKS           ;;CHAR THERE?
 2201  011276  100375                          BPL     7$              ;;IF NOT TRY AGAIN
 2202
 2203  011300  117746  167642                  MOVB    @#TKB,-(SP)     ;;PICK UP CHAR
 2204  011304  042716  177600                  BIC     #^C177,(SP)     ;;MAKE IT 7-BIT ASCII
 2205
 2206
 2207
 2208  011310  021627  000025          9$:     CMP     (SP),#25        ;;IS IT A CONTROL-U?
 2209  011314  001005                          BNE     10$             ;;BRANCH IF NOT
 2210  011316  104401  011720                  TYPE    ,$CNTLU         ;;YES, ECHO CONTROL-U (^U)
 2211  011322  062706  000006          20$:    ADD     #6,SP           ;;IGNORE PREVIOUS INPUT
 2212  011326  000757                          BR      19$             ;;LET'S TRY IT AGAIN
 2213
```

```
2214
2215  011330  021627  000015          198:  CMP     (SP),#15        ;;IS IT A <CR>?
2216  011334  001022                        BNE     168             ;;BRANCH IF NO
2217  011336  005766  000004                TST     4(SP)           ;;YES, IS IT THE FIRST CHAR?
2218  011342  001403                        BEQ     118             ;;BRANCH IF YES
2219  011344  016677  000002  167566        MOV     2(SP),@SWR      ;;SAVE NEW SWR
2220  011352  062706  000006          118:  ADD     #6,SP           ;;CLEAR UP STACK
2221  011356  104401  001177          148:  TYPE    ,#CRLF          ;;ECHO <CR> AND <LF>
2222  011362  126727  167547  000001        CMPB    @INTAG,#1       ;;RE-ENABLE TTY KBD INTERRUPTS?
2223  011370  001003                        BNE     158             ;;BRANCH IF NOT
2224  011372  012777  000100  167544        MOV     #100,@#TKS      ;;RE-ENABLE TTY KBD INTERRUPTS
2225  011400  000002                  158:  RTI                     ;;RETURN
2226  011402  004767  177522          168:  JSR     PC,@TYPEC       ;;ECHO CHAR
2227  011406  021627  000060                CMP     (SP),#60        ;;CHAR < 0?
2228  011412  002420                        BLT     188             ;;BRANCH IF YES
2229  011414  021627  000067                CMP     (SP),#67        ;;CHAR > 7?
2230  011420  003015                        BGT     188             ;;BRANCH IF YES
2231  011422  042726  000060                BIC     #60,(SP)+       ;;STRIP-OFF ASCII
2232  011426  005766  000002                TST     2(SP)           ;;IS THIS THE FIRST CHAR
2233  011432  001403                        BEQ     178             ;;BRANCH IF YES
2234  011434  006316                        ASL     (SP)            ;;NO, SHIFT PRESENT
2235  011436  006316                        ASL     (SP)            ;;    CHAR OVER TO MAKE
2236  011440  006316                        ASL     (SP)            ;;    ROOM FOR NEW ONE.
2237  011442  005266  000002          178:  INC     2(SP)           ;;KEEP COUNT OF CHAR
2238  011446  056616  177776                BIS     -2(SP),(SP)     ;;SET IN NEW CHAR
2239  011452  000707                        BR      78              ;;GET THE NEXT ONE
2240  011454  104401  001176          188:  TYPE    ,#QUES          ;;TYPE ?<CR><LF>
2241  011460  000720                        BR      208             ;;SIMULATE CONTROL-U
2242                                .DSABL  LSB
2243
2244
2245                                ;;**************************************************************************
2246                                ;*THIS ROUTINE WILL INPUT A SINGLE CHARACTER FROM THE TTY
2247                                ;*CALL:
2248                                ;*      RDCHR                   ;;INPUT A SINGLE CHARACTER FROM THE TTY
2249                                ;*      RETURN HERE             ;;CHARACTER IS ON THE STACK
2250                                ;*                              ;;WITH PARITY BIT STRIPPED OFF
2251                                ;
2252
2253  011462  011646          @RDCHR: MOV     (SP),-(SP)      ;;PUSH DOWN THE PC
2254  011464  016666  000004  000002        MOV     4(SP),2(SP)     ;;SAVE THE PS
2255  011472  105777  167446          18:   TSTB    @#TKS           ;;WAIT FOR
2256  011476  100375                        BPL     18              ;;A CHARACTER
2257  011500  117766  167442  000004        MOVB    @#TKB,4(SP)     ;;READ THE TTY
2258  011506  042766  177600  000004        BIC     #^C<177>,4(SP)  ;;GET RID OF JUNK IF ANY
2259  011514  026627  000004  000023        CMP     4(SP),#23       ;;IS IT A CONTROL-S?
2260  011522  001013                        BNE     38              ;;BRANCH IF NO
2261  011524  105777  167414          28:   TSTB    @#TKS           ;;WAIT FOR A CHARACTER
2262  011530  100375                        BPL     28              ;;LOOP UNTIL ITS THERE
2263  011532  117746  167410                MOVB    @#TKB,-(SP)     ;;GET CHARACTER
2264  011536  042716  177600                BIC     #^C177,(SP)     ;;MAKE IT 7-BIT ASCII
2265  011542  022627  000021                CMP     (SP)+,#21       ;;IS IT A CONTROL-Q?
2266  011546  001366                        BNE     28              ;;IF NOT DISCARD IT
2267  011550  000750                        BR      18              ;;YES, RESUME
2268  011552  026627  000004  000140  38:   CMP     4(SP),#140      ;;IS IT UPPER CASE?
2269  011560  002407                        BLT     48              ;;BRANCH IF YES
```

```
 2270  011562  026627  000004  000175          CMP     4(SP),#175      ;;IS IT A SPECIAL CHAR?
 2271  011570  003003                          BGT     4$              ;;BRANCH IF YES
 2272  011572  042766  000040  000004          BIC     #40,4(SP)       ;;MAKE IT UPPER CASE
 2273  011600  000002                  4$:     RTI                     ;;GO BACK TO USER
 2274                                          ;;**************************************************************
 2275                                          ;*THIS ROUTINE WILL INPUT A STRING FROM THE TTY
 2276                                          ;*CALL:
 2277                                          ;*      RDLIN                   ;;INPUT A STRING FROM THE TTY
 2278                                          ;*      RETURN HERE             ;;ADDRESS OF FIRST CHARACTER WILL BE ON THE STACK
 2279                                          ;*                              ;;TERMINATOR WILL BE A BYTE OF ALL 0'S
 2280
 2281  011602  010346                  $RDLIN: MOV     R3,-(SP)        ;;SAVE R3
 2282  011604  012703  011710          1$:     MOV     #$TTYIN,R3      ;;GET ADDRESS
 2283  011610  022703  011720          2$:     CMP     #$TTYIN+8.,R3   ;;BUFFER FULL?
 2284  011614  101405                          BLOS    4$              ;;BR IF YES
 2285  011616  104407                          RDCHR                   ;;GO READ ONE CHARACTER FROM THE TTY
 2286  011620  112613                          MOVB    (SP)+,(R3)      ;;GET CHARACTER
 2287  011622  122713  000177          10$:    CMPB    #177,(R3)       ;;IS IT A RUBOUT
 2288  011626  001003                          BNE     3$              ;;SKIP IF NOT
 2289  011630  104401  001176          4$:     TYPE    ,$QUES          ;;TYPE A '?'
 2290  011634  000763                          BR      1$              ;;CLEAR THE BUFFER AND LOOP
 2291  011636  111367  000044          3$:     MOVB    (R3),9$         ;;ECHO THE CHARACTER
 2292  011642  104401  011706                  TYPE    ,9$
 2293  011646  122723  000015                  CMPB    #15,(R3)+       ;;CHECK FOR RETURN
 2294  011652  001356                          BNE     2$              ;;LOOP IF NOT RETURN
 2295  011654  105063  177777                  CLRB    -1(R3)          ;;CLEAR RETURN (THE 15)
 2296  011660  104401  001200                  TYPE    ,$LF            ;;TYPE A LINE FEED
 2297  011664  012603                          MOV     (SP)+,R3        ;;RESTORE R3
 2298  011666  011646                          MOV     (SP),-(SP)      ;;ADJUST THE STACK AND PUT ADDRESS OF THE
 2299  011670  016666  000004  000002          MOV     4(SP),2(SP)     ;;      FIRST ASCII CHARACTER ON IT
 2300  011676  012766  011710  000004          MOV     #$TTYIN,4(SP)
 2301  011704  000002                          RTI                     ;;RETURN
 2302  011706     000                  9$:     .BYTE   0               ;;STORAGE FOR ASCII CHAR. TO TYPE
 2303  011707     000                          .BYTE   0               ;;TERMINATOR
 2304  011710  000010                  $TTYIN: .BLKB   8.              ;;RESERVE 8 BYTES FOR TTY INPUT
 2305  011720  052536  005015     000  $CNTLU: .ASCIZ  /^U/<15><12>    ;;CONTROL "U"
 2306  011725     136  006507  000012  $CNTLG: .ASCIZ  /^G/<15><12>    ;;CONTROL "G"
 2307  011732  005015  053523  020122  $MSWR:  .ASCIZ  <15><12>/SWR = /
 2308  011740  020075     000
 2309  011743     040  047040  053505  $MNEW:  .ASCIZ  /  NEW = /
 2310  011750  036440  000040
 2311                                  .SBTTL  READ AN OCTAL NUMBER FROM THE TTY
 2312
 2313                                          ;;**************************************************************
 2314                                          ;*THIS ROUTINE WILL READ AN OCTAL (ASCII) NUMBER FROM THE TTY AND
 2315                                          ;*CHANGE IT TO BINARY.
 2316                                          ;*CALL:
 2317                                          ;*      RDOCT                   ;;READ AN OCTAL NUMBER
 2318                                          ;*      RETURN HERE             ;;LOW ORDER BITS ARE ON TOP OF THE STACK
 2319                                          ;*                              ;;HIGH ORDER BITS ARE IN $HIOCT
 2320
 2321  011754  011646                  $RDOCT: MOV     (SP),-(SP)      ;;PROVIDE SPACE FOR THE
 2322  011756  016666  000004  000002          MOV     4(SP),2(SP)     ;;INPUT NUMBER
 2323  011764  010046                          MOV     R0,-(SP)        ;;PUSH R0 ON STACK
 2324  011766  010146                          MOV     R1,-(SP)        ;;PUSH R1 ON STACK
 2325  011770  010246                          MOV     R2,-(SP)        ;;PUSH R2 ON STACK
```

```
 2326  011772  104410                  18:     RDLIN                   ;;READ AN ASCIZ LINE
 2327  011774  012600                          MOV     (SP)+,R0        ;;GET ADDRESS OF 1ST CHARACTER
 2328  011776  005001                          CLR     R1              ;;CLEAR DATA WORD
 2329  012000  005002                          CLR     R2
 2330  012002  112046                  28:     MOVB    (R0)+,-(SP)     ;;PICKUP THIS CHARACTER
 2331  012004  001412                          BEQ     38              ;;IF ZERO GET OUT
 2332  012006  006301                          ASL     R1              ;;*2
 2333  012010  006102                          ROL     R2
 2334  012012  006301                          ASL     R1              ;;*4
 2335  012014  006102                          ROL     R2
 2336  012016  006301                          ASL     R1              ;;*8
 2337  012020  006102                          ROL     R2
 2338  012022  042716  177770                  BIC     #^C7,(SP)       ;;STRIP THE ASCII JUNK
 2339  012026  062601                          ADD     (SP)+,R1        ;;ADD IN THIS DIGIT
 2340  012030  000764                          BR      28              ;;LOOP
 2341  012032  005726                  38:     TST     (SP)+           ;;CLEAN TERMINATOR FROM STACK
 2342  012034  010166  000012                  MOV     R1,12(SP)       ;;SAVE THE RESULT
 2343  012040  010267  000010                  MOV     R2,$HIOCT
 2344  012044  012602                          MOV     (SP)+,R2        ;;POP STACK INTO R2
 2345  012046  012601                          MOV     (SP)+,R1        ;;POP STACK INTO R1
 2346  012050  012600                          MOV     (SP)+,R0        ;;POP STACK INTO R0
 2347  012052  000002                          RTI                     ;;RETURN
 2348  012054  000000                  $HIOCT: .WORD   0               ;;HIGH ORDER BITS GO HERE
 2349                                  .SBTTL  BINARY TO OCTAL (ASCII) AND TYPE
 2350
 2351                                  ;;**************************************************************************
 2352                                  ;*THIS ROUTINE IS USED TO CHANGE A 16-BIT BINARY NUMBER TO A 6-DIGIT
 2353                                  ;*OCTAL (ASCII) NUMBER AND TYPE IT.
 2354                                  ;*$TYPOS---ENTER HERE TO SETUP SUPPRESS ZEROS AND NUMBER OF DIGITS TO TYPE
 2355                                  ;*CALL:
 2356                                  ;*      MOV     NUM,-(SP)       ;;NUMBER TO BE TYPED
 2357                                  ;*      TYPOS                   ;;CALL FOR TYPEOUT
 2358                                  ;*      .BYTE   N               ;;N=1 TO 6 FOR NUMBER OF DIGITS TO TYPE
 2359                                  ;*      .BYTE   M               ;;M=1 OR 0
 2360                                  ;*                                      ;;1=TYPE LEADING ZEROS
 2361                                  ;*                                      ;;0=SUPPRESS LEADING ZEROS
 2362                                  ;*
 2363                                  ;*$TYPON----ENTER HERE TO TYPE OUT WITH THE SAME PARAMETERS AS THE LAST
 2364                                  ;*$TYPOS OR $TYPOC
 2365                                  ;*CALL:
 2366                                  ;*      MOV     NUM,-(SP)       ;;NUMBER TO BE TYPED
 2367                                  ;*      TYPON                   ;;CALL FOR TYPEOUT
 2368                                  ;*
 2369                                  ;*$TYPOC---ENTER HERE FOR TYPEOUT OF A 16 BIT NUMBER
 2370                                  ;*CALL:
 2371                                  ;*      MOV     NUM,-(SP)       ;;NUMBER TO BE TYPED
 2372                                  ;*      TYPOC                   ;;CALL FOR TYPEOUT
 2373
 2374  012056  017646  000000          $TYPOS: MOV     @(SP),-(SP)     ;;PICKUP THE MODE
 2375  012062  116667  000001  000211          MOVB    1(SP),$0FILL    ;;LOAD ZERO FILL SWITCH
 2376  012070  112667  000207                  MOVB    (SP)+,$OMODE+1  ;;NUMBER OF DIGITS TO TYPE
 2377  012074  062716  000002                  ADD     #2,(SP)         ;;ADJUST RETURN ADDRESS
 2378  012100  000406                          BR      $TYPON
 2379  012102  112767  000001  000171  $TYPOC: MOVB    #1,$0FILL       ;;SET THE ZERO FILL SWITCH
 2380  012110  112767  000006  000165          MOVB    #6,$OMODE+1     ;;SET FOR SIX(6) DIGITS
 2381  012116  112767  000005  000154  $TYPON: MOVB    #5,$OCNT        ;;SET THE ITERATION COUNT
```

```
 2382  012124  010346                        MOV     R3,-(SP)        ;;SAVE R3
 2383  012126  010446                        MOV     R4,-(SP)        ;;SAVE R4
 2384  012130  010546                        MOV     R5,-(SP)        ;;SAVE R5
 2385  012132  116704  000145                MOVB    $OMODE+1,R4     ;;GET THE NUMBER OF DIGITS TO TYPE
 2386  012136  005404                        NEG     R4
 2387  012140  062704  000006                ADD     #6,R4           ;;SUBTRACT IT FOR MAX. ALLOWED
 2388  012144  110467  000132                MOVB    R4,$OMODE       ;;SAVE IT FOR USE
 2389  012150  116704  000125                MOVB    $0FILL,R4       ;;GET THE ZERO FILL SWITCH
 2390  012154  016605  000012                MOV     12(SP),R5       ;;PICKUP THE INPUT NUMBER
 2391  012160  005003                        CLR     R3              ;;CLEAR THE OUTPUT WORD
 2392  012162  006105                1$:     ROL     R5              ;;ROTATE MSB INTO "C"
 2393  012164  000404                        BR      3$              ;;GO DO MSB
 2394  012166  006105                2$:     ROL     R5              ;;FORM THIS DIGIT
 2395  012170  006105                        ROL     R5
 2396  012172  006105                        ROL     R5
 2397  012174  010503                        MOV     R5,R3
 2398  012176  006103                3$:     ROL     R3              ;;GET LSB OF THIS DIGIT
 2399  012200  105367  000076                DECB    $OMODE          ;;TYPE THIS DIGIT?
 2400  012204  100016                        BPL     7$              ;;BR IF NO
 2401  012206  042703  177770                BIC     #177770,R3      ;;GET RID OF JUNK
 2402  012212  001002                        BNE     4$              ;;TEST FOR 0
 2403  012214  005704                        TST     R4              ;;SUPPRESS THIS 0?
 2404  012216  001403                        BEQ     5$              ;;BR IF YES
 2405  012220  005204                4$:     INC     R4              ;;DON'T SUPPRESS ANYMORE 0'S
 2406  012222  052703  000060                BIS     #'0,R3          ;;MAKE THIS DIGIT ASCII
 2407  012226  052703  000040        5$:     BIS     #' ,R3          ;;MAKE ASCII IF NOT ALREADY
 2408  012232  110367  000040                MOVB    R3,8$           ;;SAVE FOR TYPING
 2409  012236  104401  012276                TYPE    ,8$             ;;GO TYPE THIS DIGIT
 2410  012242  105367  000032        7$:     DECB    $OCNT           ;;COUNT BY 1
 2411  012246  003347                        BGT     2$              ;;BR IF MORE TO DO
 2412  012250  002402                        BLT     6$              ;;BR IF DONE
 2413  012252  005204                        INC     R4              ;;INSURE LAST DIGIT ISN'T A BLANK
 2414  012254  000744                        BR      2$              ;;GO DO THE LAST DIGIT
 2415  012256  012605                6$:     MOV     (SP)+,R5        ;;RESTORE R5
 2416  012260  012604                        MOV     (SP)+,R4        ;;RESTORE R4
 2417  012262  012603                        MOV     (SP)+,R3        ;;RESTORE R3
 2418  012264  016666  000002  000004        MOV     2(SP),4(SP)     ;;SET THE STACK FOR RETURNING
 2419  012272  012616                        MOV     (SP)+,(SP)
 2420  012274  000002                        RTI                     ;;RETURN
 2421  012276     000                8$:     .BYTE   0               ;;STORAGE FOR ASCII DIGIT
 2422  012277     000                        .BYTE   0               ;;TERMINATOR FOR TYPE ROUTINE
 2423  012300     000                $OCNT:  .BYTE   0               ;;OCTAL DIGIT COUNTER
 2424  012301     000                $0FILL: .BYTE   0               ;;ZERO FILL SWITCH
 2425  012302  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.

012304  010046                  $TRAP:  MOV     R0,-(SP)        ;;SAVE R0
012306  016600  000002                  MOV     2(SP),R0        ;;GET TRAP ADDRESS
012312  005740                          TST     -(R0)           ;;BACKUP BY 2
012314  111000                          MOVB    (R0),R0         ;;GET RIGHT BYTE OF TRAP
012316  006300                          ASL     R0              ;;POSITION FOR INDEXING
012320  016000  012340                  MOV     $TRPAD(R0),R0   ;;INDEX TO TABLE
012324  000200                          RTS     R0              ;;GO TO ROUTINE


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

012326  011646                  $TRAP2: MOV     (SP),-(SP)      ;;MOVE THE PC DOWN
012330  016666  000004  000002          MOV     4(SP),2(SP)     ;;MOVE THE PSW DOWN
012336  000002                          RTI                     ;;RESTORE THE PSW

                                        .SBTTL  TRAP TABLE

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

                                        ;       ROUTINE
                                        ;       -------
012340  012326                  $TRPAD: .WORD   $TRAP2
012342  010760                          $TYPE   ;;CALL=TYPE     TRAP+1(104401)  TTY TYPEOUT ROUTINE
012344  012102                          $TYPOC  ;;CALL=TYPOC    TRAP+2(104402)  TYPE OCTAL NUMBER (WITH LEADING ZEROS)
012346  012056                          $TYPOS  ;;CALL=TYPOS    TRAP+3(104403)  TYPE OCTAL NUMBER (NO LEADING ZEROS)
012350  012116                          $TYPON  ;;CALL=TYPON    TRAP+4(104404)  TYPE OCTAL NUMBER (AS PER LAST CALL)

012352  011250                          $GTSWR  ;;CALL=GTSWR    TRAP+5(104405)  GET SOFT-SWR SETTING

012354  011200                          $CKSWR  ;;CALL=CKSWR    TRAP+6(104406)  TEST FOR CHANGE IN SOFT-SWR
012356  011462                          $RDCHR  ;;CALL=RDCHR    TRAP+7(104407)  TTY TYPEIN CHARACTER ROUTINE
012360  011602                          $RDLIN  ;;CALL=RDLIN    TRAP+10(104410) TTY TYPEIN STRING ROUTINE
012362  011754                          $RDOCT  ;;CALL=RDOCT    TRAP+11(104411) READ AN OCTAL NUMBER FROM TTY
012364  006630                          WAIT.ON.READY   ;;CALL=WAITREADY        TRAP+12(104412) WAIT ON THE READY BIT TO
012366  006734                          WAIT.FOR.XFER   ;;CALL=WAITXFER TRAP+13(104413) WAIT ON XFER REQ.
```

```
2470                                        .SBTTL  POWER DOWN AND UP ROUTINES
2471
2472                                        ;;*****************************************************************
2473                                        ;POWER DOWN ROUTINE
2474  012370  012737  012534  000024  $PWRDN: MOV     #$ILLUP,@#PWRVEC ;;SET FOR FAST UP
2475  012376  012737  000340  000026         MOV     #340,@#PWRVEC+2 ;;PRIO:7
2476  012404  010046                        MOV     R0,-(SP)        ;;PUSH R0 ON STACK
2477  012406  010146                        MOV     R1,-(SP)        ;;PUSH R1 ON STACK
2478  012410  010246                        MOV     R2,-(SP)        ;;PUSH R2 ON STACK
2479  012412  010346                        MOV     R3,-(SP)        ;;PUSH R3 ON STACK
2480  012414  010446                        MOV     R4,-(SP)        ;;PUSH R4 ON STACK
2481  012416  010546                        MOV     R5,-(SP)        ;;PUSH R5 ON STACK
2482  012420  017746  166514                MOV     @#WR,-(SP)      ;;PUSH @#WR ON STACK
2483  012424  010667  000110                MOV     SP,$SAVR6       ;;SAVE SP
2484  012430  012737  012442  000024        MOV     #$PWRUP,@#PWRVEC ;;SET UP VECTOR
2485  012436  000000                        HALT
2486  012440  000776                        BR      .-2             ;;HANG UP
2487
2488                                        ;;*****************************************************************
2489                                        ;POWER UP ROUTINE
2490  012442  012737  012534  000024  $PWRUP: MOV     #$ILLUP,@#PWRVEC ;;SET FOR FAST DOWN
2491  012450  016706  000064                MOV     $SAVR6,SP       ;;GET SP
2492  012454  005067  000060                CLR     $SAVR6          ;;WAIT LOOP FOR THE TTY
2493  012460  005267  000054          1$:   INC     $SAVR6          ;;WAIT FOR THE INC
2494  012464  001375                        BNE     1$              ;;OF  WORD
2495  012466  012677  166446                MOV     (SP)+,@#WR      ;;POP STACK INTO @#WR
2496  012472  012605                        MOV     (SP)+,R5        ;;POP STACK INTO R5
2497  012474  012604                        MOV     (SP)+,R4        ;;POP STACK INTO R4
2498  012476  012603                        MOV     (SP)+,R3        ;;POP STACK INTO R3
2499  012500  012602                        MOV     (SP)+,R2        ;;POP STACK INTO R2
2500  012502  012601                        MOV     (SP)+,R1        ;;POP STACK INTO R1
2501  012504  012600                        MOV     (SP)+,R0        ;;POP STACK INTO R0
2502  012506  012737  012370  000024        MOV     #$PWRDN,@#PWRVEC ;;SET UP THE POWER DOWN VECTOR
2503  012514  012737  000340  000026        MOV     #340,@#PWRVEC+2 ;;PRIO:7
2504  012522  104401                        TYPE                    ;REPORT THE POWER FAILURE
2505  012524  012542                $PWRMG: .WORD   $POWER           ;;POWER FAIL MESSAGE POINTER
2506  012526  012716                        MOV     (PC)+,(SP)      ;;RESTART AT PWRST
2507  012530  002172                $PWRAD: .WORD   PWRST            ;;RESTART ADDRESS
2508  012532  000002                        RTI
2509  012534  000000                $ILLUP: HALT                     ;;THE POWER UP SEQUENCE WAS STARTED
2510  012536  000776                        BR      .-2             ;; BEFORE THE POWER DOWN WAS COMPLETE
2511  012540  000000                $SAVR6: 0                        ;;PUT THE SP HERE
2512  012542  005015  047520  042527  $POWER: .ASCIZ  <15><12>"POWER"
2513  012550  000122
2514                                        .EVEN
```

```
2515  012552  042200  044522  042526  MSGDRV: .ASCIZ  <CRLF>"DRIVE(S)? "
2516  012560  051450  037451  000040
2517  012566  005015  040524  051503  MSGASK: .ASCIZ  <15><12>/TACS?/
2518  012574  000077
2519  012576  042526  052103  051117  MSGVEC: .ASCIZ  /VECTOR?/
2520  012604  000077
2521  012606  051120  047511  044522  MSGPRI: .ASCIZ  /PRIORITY?/
2522  012614  054524  000077
2523  012620  040524  051503  000075  MTACS:  .ASCIZ  /TACS=/
2524  012626  052040  042101  036502  MTADB:  .ASCIZ  / TADB=/
2525  012634     000
2526  012635     040  042526  052103  MTAVEC: .ASCIZ  / VECTOR=/
2527  012642  051117  000075
2528  012646  050040  044522  051117  MTAPRI: .ASCIZ  / PRIORITY=/
2529  012654  052111  036531     000
2530  012661     015  047412  037513  MSGOK:  .ASCIZ  <15><12>/OK?/
2531  012666     000
2532  012667     131  051505  000200  MYES:   .ASCIZ  /YES/<CRLF>
2533  012674  047520  042527  020122  MTUPWR: .ASCIZ  /POWER DOWN TU60/
2534  012702  047504  047127  052040
2535  012710  033125  000060
2536  012714  047520  042527  020122  MPWRUP: .ASCIZ  /POWER UP TU60/
2537  012722  050125  052040  033125
2538  012730  000060
2539  012732  042522  047515  042526  MOFFLN: .ASCIZ  /REMOVE CASSETTE FROM DRIVE UNDER TEST/
2540  012740  041440  051501  042523
2541  012746  052124  020105  051106
2542  012754  046517  042040  044522
2543  012762  042526  052440  042116
2544  012770  051105  052040  051505
2545  012776  000124
2546  013000  042522  046120  041501  MTAPE:  .ASCIZ  /REPLACE CASSETTE/
2547  013006  020105  040503  051523
2548  013014  052105  042524     000
2549  013021     123  052105  053440  MWRTLK: .ASCIZ  /SET WRITE LOCK/
2550  013026  044522  042524  046040
2551  013034  041517  000113
2552  013040  042523  020124  051127  MLAST:  .ASCIZ  /SET WRITE ENABLE/
2553  013046  052111  020105  047105
2554  013054  041101  042514     000
2555  013061     123  040524  052524  EM1:    .ASCIZ  /STATUS PROBLEM/
2556  013066  020123  051120  041117
2557  013074  042514  000115
2558  013100  051042  040505  054504  EM2:    .ASCIZ  /"READY" FAILED TO SET/
2559  013106  020042  040506  046111
2560  013114  042105  052040  020117
2561  013122  042523  000124
2562  013126  052042  040522  051516  EM3:    .ASCIZ  /"TRANSFER REQUEST" FAILED TO SET/
2563  013134  042506  020122  042522
2564  013142  052521  051505  021124
2565  013150  043040  044501  042514
2566  013156  020104  047524  051440
2567  013164  052105     000
2568  013167     124  042510  053440  EM4:    .ASCIZ  /THE WRONG FLAG SET/
2569  013174  047522  043516  043040
2570  013202  040514  020107  042523
```

```
2571  013210  000124
2572  013212  040504  040524  050040  EM5:    .ASCIZ  /DATA PROBLEM/
2573  013220  047522  046102  046505
2574  013226     000
2575  013227     120  020103  020040  DH1:    .ASCIZ  /PC      TAC8/
2576  013234  020040  052040  041501
2577  013242  000123
2578  013244  041520  020040  020040  DH2:    .ASCIZ  /PC      TAC8    WAIT ADDRESS/
2579  013252  020040  040524  051503
2580  013260  020040  020040  040527
2581  013266  052111  040440  042104
2582  013274  042522  051523     000
2583  013301     120  020103  020040  DH5:    .ASCIZ  /PC      TAC8    EXPECT  RCV'D/
2584  013306  020040  052040  041501
2585  013314  020123  020040  042440
2586  013322  050130  041505  020124
2587  013330  051040  053103  042047
2588  013336     000
2589          013340                  .EVEN
2590  013340  001116  001162  000000  DT1:    .WORD   $ERRPC,$REG0,0
2591  013346  001116  001162  001202  DT2:    .WORD   $ERRPC,$REG0,SAVPC,0
2592  013354  000000
2593  013356  001116  001162  001124  DT5:    .WORD   $ERRPC,$REG0,$GDDAT,$BDDAT,0
2594  013364  001126  000000
2595  013370  001116  001206  000000  DT201:  .WORD   $ERRPC,TAC8L,0
2596
2597  013376  001116  000000          DT202:  .WORD   $ERRPC,0
2598
2599  013402  040524  030461  043040  EM201:  .ASCIZ  "TA11 FAILED TO RESPOND"
2600  013410  044501  042514  020104
2601  013416  047524  051040  051505
2602  013424  047520  042116     000
2603  013431     116  020117  051104  EM202:  .ASCIZ  "NO DRIVE AVAILABLE"
2604  013436  053111  020105  053101
2605  013444  044501  040514  046102
2606  013452  000105
2607  013454  041520  020040  020040  DH201:  .ASCIZ  /PC      TAC8/
2608  013462  020040  040524  051503
2609  013470     000
2610  013471     120  000103          DH202:  .ASCIZ  /PC/
2611          000001                  .END
```

```
ASKADR  007146           556    16920
ASKDRV  007036           553    16600   1603
ASKKEY  001232          3950     643*    673
ASKQUE  007436           731     789     803     818     885    1392    17600
BEGINX  001730           234    5500     586     588     636     638
BEGIN1  001326           231    4690
BEGIN2  001360           232    4760
BEGIN3  001366           233     475     4780
BEGIN4  001374          4800
BGNCMN  001400           472     474     477     479    4810
BIT0  = 000001          1660
BIT00 = 000001          1560     166     208    2093    2095
BIT01 = 000002          1550     165     207    2095
BIT02 = 000004          1540     164     206
BIT03 = 000010          1530     163     205
BIT04 = 000020          1520     162     204
BIT05 = 000040          1510     161     203
BIT06 = 000100          1500     160     202
BIT07 = 000200          1490     159     201    2093    2095
BIT08 = 000400          1480     158     200    1470
BIT09 = 001000          1470     157     199    1466    1550
BIT1  = 000002          1650
BIT10 = 002000          1460     198    1534
BIT11 = 004000          1450     197    1493
BIT12 = 010000          1440     196
BIT13 = 020000          1430     195    1541
BIT14 = 040000          1420     194    1464
BIT15 = 100000          1410     193     654
BIT2  = 000004          1640
BIT3  = 000010          1630
BIT4  = 000020          1620
BIT5  = 000040          1610
BIT6  = 000100          1600
BIT7  = 000200          1590
BIT8  = 000400          1580
BIT9  = 001000          1570
BLKLIM  010462          1997*   20110   2018    2035
BPTVEC= 000014          1730
BSBG  = 000010          1860     765     921     961    1021    1061    1113    1153    1213    1253
BSFG  = 000006          1850     760     916     956    1016    1056    1108    1148    1208    1248    1974
BSFGSB  010320           241   19710   1972    1979
CHKADR  001752           552     555    5740
CHKDRV  002032          6120
CKSWR = 104406          1463    1526    1549   24640
CR    = 000015           810   2162    2172
CRCERR= 040000          1940    997    1089
CRLF  = 000200           820    538    2133    2172    2515    2532
CURDRV  001234          3960    666*    667
DDISP = 177570           880    364     509
DH1     013227           417   25750
DH2     013244           423     429     435   25780
DH201   013454           449   26070
DH202   013471           454   26100
DH5     013301           441   25830
DISPLA  001142          3640    509*    517*   1507*   1533*
DISPRE  000174           228    517
```

DZTACC.NEW CROSS REFERENCE TABLE -- USER SYMBOLS

```
DRVKEY  001224            3938   394    4708   612    625    646    671    1661*  1666   1688   1684   2067
DRVPNT  001230            3948   626*   646*   657    672*   2061   2068*
DSWR  = 177570             878   363    508
DT1     013340            418    2598
DT2     013346            424    430    436    2918
DT201   013370            458    2958
DT202   013376            455    2978
DT5     013356            442    2938
EMTVEC= 000030            1768   492*   493*
EM1     013061            416    2558
EM2     013100            422    2588
EM201   013402            448    2998
EM202   013431            453    2608
EM3     013126            428    2628
EM4     013167            434    2568
EM5     013212            448    2728
ERROR = 100000            1938
ERRVEC= 000004            1698   506    507*   518*   574*   588*   1469   1478*  1472*  1475*
EXAM    010654            613    617    622    2088
EXIT    007136            1678   1684
FGAP  = 004000            1978   1089   1189
FUNCTI= 000016            2098
FUNC0 = 000002            2078   209
FUNC1 = 000004            2068   209
FUNC2 = 000010            2058   209
GNS   = ****** U          227    537    664    719    723    1776   1784   2457   2458   2459   2468   2462   2464
                          2465   2466   2467   2468   2469
GO    = 000001            2088   303    306    325    328    685    702    704    745    758    755    768    765
                          778    775    788    837    845    856    865    869    892    989    991    1181   1183
                          1187   1282   1284   1288   1293   1385   1388   1326   1328   1335   1337   1339   1343
                          1358   1368   1378   1388   1397   1418   1813   1816   1845   1868   1899   1982   1927
                          1933   1955   1958   1974   2819   2837
GTSWR = 184485             532    679    1989   2882   2888   24628
HERE    001738            523    525    536    5388
HGHTIM  006786            786    1683*  16178
HT    = 888811             798   2131   2172
ILBS  = 888828            2048   852    863    876    995    1185   1286   1312   1338   1341   1346   2827   2848
INT.EN= 888188            2028
IOTVEC= 888828            1748   498*   491*
ITEMS2  881386            4468
LEADER= 828888            1958   897    1889   1365   1383   1818   1849   1872   1984   1987   1931   1935   1968
                          1976   2898
LF    = 888812             888   2166   2172
LOOP    887862            1678   1681
LOOP1   888588             2918   292
LOOP2   888688             3818   312
LOOP3   888788             3238   334
MANUAL  882152             632    6408
MAXCNT  886732             654*   786*   787*   788*   789*   1683   16248  1631
MLAST   813848            1393   2552
MOFFLN  812732             884   2539
MPWRUP  812714             798   2536
MSGASK  812566            1693   2517
MSGDRV  812552            1668   2515
MSGID   881782             526    5388   645
MSGOK   812661            1748   2538
```

F5

F6

```
MSGPRI  012606          1716    2521#
MSGVEC  012576          1707    2519#
MTACS   012620          1720    2523#
MTADB   012626          1731    2524#
MTAPE   013000           819    2546#
MTAPRI  012646          1737    2528#
MTAVEC  012635          1734    2526#
MTUPWR  012674           732    2533#
MWRTLK  013021           886    2549#
MYES    012667          1749    2532#
NEXT    007116          1670    1674    1678#
NOTA    007074          1668    1671#
NOTB    007106          1672    1675#
NOTLGL  007130          1665    1676    1682#   1685
NXTDRV  010610          1811    1843    1866    1897    1925    1953    2058#
OFFLIN= 001000           199#    737     795     809     810     824    1089    1400    2089
OK      002164           641     643#
PATTRN  010464          1998*   2004*   2012#   2025    2036
PIRQ  = 177772            86#
PIRQVE= 000240           100#
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      649*
PSW   = 177776            84#
PWRST   002172           645#    2507
PWRVEC= 000024           175#    496*    497*    2474*   2475*   2484*   2490*   2502*   2503*
RDBLK   010530          1871    1930    2035#
RDCHR = 104407          1741    1766    2285    2465#
RDLIN = 104410          1662    2326    2466#
RDOCT = 104411          1694    1708    1717    2467#
RDSUB   007756           237    1861#   1865    1873
READ  = 000004           184#    328     755     911     951     991    1011    1051    1103    1143    1183    1203    1243
                        1284    1308    1328    1339    1343    2037
READY = 000040           203#    304     311     326     333     686    1607    1637    1814    1846    1869    1900    1920
                        1956    2021    2039    2085
RESVEC= 000010           170#
REWIND= 000016           189#    303     325     685     702     780     837     892     936     976     989    1036    1076
                        1128    1168    1181    1228    1268    1282    1305    1326    1337    1358    1378    1397    1410
                        1813    1845    1868    1899    1927    1955
RGPBLK  010140           239    1920#   1924    1932    1936
SAVPC   001202           384#   1604*   1605*   1621    1632*   1633*   1649    2591
SAVPS   001204           385#   1606*   1620    1634*   1648
SETBUF  010352          1837    1891    1985#
SFBG  = 000014           188#    775     931     971    1031    1071    1123    1163    1223    1263    1288    1933
SFFG  = 000012           187#    770     926     966    1026    1066    1118    1158    1187    1218    1258    1958
SFFGSB  010234           240    1948#   1952    1963
STACK = 001100           748     488    1806    1838    1861    1892    1920    1948
START   002204           644     647#   1444
STKLMT= 177774            85#
SWR     001140           291     309     363#    486     508*    510     516*    530     677    1464    1478    1480    1486
```

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                        1493    1534    1541    1546    1550    1987    1991    1993    2000    2004    2006    2050    2093
                        2095    2102    2219*   2402    2495*
SWREG    000176          229#     516     530     677    1987    2000    2006    2102    2195
SW0    = 000001          138#
SW00   = 000001          120#     130
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          110#
SW11   = 004000          117#    1707
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          300#    1702*   1703*
TACSL    001206          387#     576     650    1699*   1702    1729    1807    1839    1862    1893    1921    1949    2000
                        2595
TADBH    001214          390#    1705*   1706*
TADBL    001212          389#     651    1701*   1705    1732    1808    1840    1863    1894    1922    1950
TAPRIO   001222          392#    1727*   1738
TAVEC    001216          391#     473     647*    648*   1713*   1715*   1735
TBITVE=  000014         1710#
TDRV     002274          659     6618
TIMERR=  002000          198#    1089
TKVEC  = 000060          170#
TPVEC  = 000064          179#
TRAPVE=  000034          177#     494*    495*
TRTVEC=  000014          172#
TR.REQ=  000200          201#
TST1     002422          683     696#
TST10    003224          806     821     825     830#
TST11    003422          881#
TST12    003772          884     984#
TST13    004332          906    1084#
TST14    004644         1086    1176#
TST15    005206         1178    1276#
TST16    005362         1279    1321#
TST17    005500         1323    1351#
TST2     002502          699     713#
TST20    005564         1354    1366    1371#
TST21    005642         1374    1384    1389#
```

DZTACC,NEW CROSS REFERENCE TABLE -- USER SYMBOLS

```
TST22   005716          888    1401    14068
TST3    002646          716     7288
TST4    002714          738     7438
TST5    003062          744     782     7878
TST6    003128          734     796     8018
TST7    003164          811     8168
TYPE  = 104401          526     645     662     667     668     717     721     1434    1536    1544    1566    1575    1577
                       1588    1582    1586    1594    1668    1682    1693    1707    1716    1728    1731    1734    1737
                       1748    1747    1749    1763    1764    1774    1779    1782    1788    2136    2193    2194    2197
                       2218    2221    2248    2289    2292    2296    2469    24578   2584
TYPERR  006512          1543    15668
TYPOC = 104402          1591    1738    1733    1736    1739    2196    24588
TYPON = 104484          24608
TYPOS = 104483          24598
UNIT  = 000408           208    668     2064    2084
WAITRE= 104412           783    785     746     751     756     761     766     771     776     794     838     853     864
                         866    877     893     998     996     1182    1186    1188    1283    1287    1289    1292    1381
                        1386    1313    1315    1327    1331    1334    1336    1338    1342    1347    1357    1359    1361
                        1377    1379    1381    1398    1411    1817    1983    1934    1959    1975    2828    2849    24688
WAITXF= 104413           846    851     857     862     878     875     992     994     1184    1285    1311    1329    1348
                        1344    2828    2838    24698
WAIT.F  006734          16298   2469
WAIT.0  006638          16818   2468
WAIT1   006668          16078   1615    1618
WAIT2   006788          1682*   16148
WAIT3   006714          1688    1612    16288
WAIT4   006676          1618    16138
WFG   = 000888           182*    784     745     865     981     941     1881    1841    1893    1133    1193    1233    1335
                        1368    1399    1816    1982
WFGSUB  007684           235    1886*   1818    1821
WGBLOP  818842          1892*   1896    1918
WGPBLK  818836           238    18918
WLOOP   887674          1838*   1842    1852
WRITE = 888882           183*    386     758     845     856     869     986     946     1886    1846    1898    1138    1198
                        1238    1293    1388    2819
WRTBLK  818466          1848    1986    28188
WRTLOC= 818888           196*    982     987     912     917     922     927     932     937     1842    1847    1852    1857
                        1862    1867    1872    1877    1894    1899    1184    1189    1114    1119    1124    1129    1194
                        1199    1284    1289    1214    1219    1224    1229    1488    2891
WRTSUB  887678           236    1837*
$AUTOB  881134           368*    534*    2198    2311
$BDADR  881122           355*
$BDDAT  881126           357*    1538*   2593
$BELL   881172           379*    1536    1562
$CHARC  811174          2138*   2148*   2155    2164*   2169*
$CKSWR  811288          2182*   2464
$CMTAG  881188           343*    483     484     492     498     499     588
$CM1  = 888882           375*    376*    377*
$CM2  = 888884           375*    376*    377*
$CM3  = 888882           373*    375
$CNTLG  811725          2193    2386*
$CNTLU  811728          2218    2385*
$CRLF   881177           381*    668     1544    1562    1566    1577    1582    1586    1763    1788    2137    2172    2221
                        2385
$DOAGN  886824          1438    1436    1442*
$ENDAD  886814           524     589     639     1438*   1557
```

DZTACC.NEW CROSS REFERENCE TABLE -- USER SYMBOLS

```
$ENDCT  005774          498   1432#
$ENDNG  006033         1434   1446#
$ENULL  006030         1445#
$EOP    005740         1422#
$EOPCT  005766          498*  1429#  1433
$ERFLG  001103          346#  1453   1482   1484   1490*  1511   1531*  1562
$ERMAX  001115          352#   501*  1484   1506*  1511
$ERROR  006320          492   1525#
$ERRPC  001116          353#  1538*  1539*  1540   1562   2590   2591   2593   2595   2597
$ERRTB  001236          411#  1573
$ERTTL  001112          350#  1537*  1562
$ESCAP  001170          378#   500*   744*   832*   884*   986*  1086*  1178*  1279*  1323*  1354*  1374*  1505*
                       1553   1555   1562
$FILLC  001156          371#  2141   2172
$FILLS  001155          370#  2172
$GDADR  001120          354#
$GDDAT  001124          356#  1529*  2593
$GET42  006004         1435#
$GTSWR  011250         2194#  2462
$HD   = 000000           11
$HIOCT  012054         2343*  2348#
$ICNT   001104          347#  1497*  1498   1500*  1510
$ILLUP  012534         2474   2490   2509#
$INTAG  001135          361#  2222   2311
$ITEMB  001114          351#  1540*  1562   1568
$LF     001200          302#  1562   2172   2296   2305
$LPADR  001106          348#   502*   730*   788*   802*   817*   883*   985*  1085*  1177*  1270*  1353*  1373*
                       1391*  1488*  1503*  1508   1510
$LPERR  001110          349#   503*  1488   1504*  1510   1552   1810*  1842*  1865*  1896*  1924*  1952*  1972*
$MAIL = ****** U        520    530   1503   1546   2125
$MNEW   011743         2197   2309#
$MSWR   011732         2194   2307#
$MXCNT  006316         1501   1510#
$NULL   001154          369#  2143   2172
$NWTST= 000001          693#   710#   725#   740#   784#   798#   813#   827#   878#   981#  1081#  1173#  1273#
                       1318#  1348#  1368#  1386#  1403#
$OCNT   012300         2381*  2410*  2423#
$OMODE  012302         2376*  2380*  2385   2388*  2399*  2425#
$OVER   006302         1465   1481   1489   1499   1507#
$PASS   001100          344#   652    698    715   1426*  1427*  1445   1495   1511
$POWER  012542         2505   2512#
$PWRAD  012530         2507#
$PWRDN  012370          496   2474#  2502
$PWRNG  012524         2505#
$PWRUP  012442         2484   2490#
$QUES   001176          380#  1562   1682   1747   1779   2172   2240   2289   2305
$RDCHR  011462         2253#  2465
$RDDEC= ****** U        2460
$RDLIN  011602         2281#  2466
$RDOCT  011754         2321#  2467
$RDSZ = 000010         2274#
$REGAD  001160          373#
$REG0   001162          375#  1527*  2590   2591   2593
$REG1   001164          376#  1528*
$RTNAD  006026         1444#
$R2A  = ****** U        2460
```

DZTACC.NEW CROSS REFERENCE TABLE -- USER SYMBOLS

```
$SAVRE= ****** U        2460
$SAVR6  012540          2483*   2491    2492*   2493*   2511#
$SCOPE  006046           490    1462#
$SETUP= 000137           469#    489     490     492     494     496     498     499     500     502     524     527    1424
                        1463    1526    1549    1557    2177    2311
$STUP = 177777           469#
$SVLAD  006254          1473    1502#
$SWR  = 167400             1#      11      62      63      64      65      66      67      68     377     378     379     499
                         500     502     503     697     714     729     744     788     802     817     831     882     905
                        1085    1177    1277    1322    1352    1372    1390    1407    1417    1425    1437    1443    1445
                        1454    1455    1456    1457    1458    1464    1476    1478    1479    1482    1483    1484    1491
                        1492    1493    1504    1507    1518    1517    1518    1519    1520    1521    1534    1541    1546
                        1550    1562    1787    2500
$SWRMK= 000000           68      69    1458    1459    1480
$TIMES  001166          377#    499*    697*    714*    729*    831*    882*   1277*   1322*   1352*   1372*   1390*   1407*
                        1425*   1491*   1498    1501*   1510    1787*
$TKB    001146          366#   2175    2186    2203    2257    2263
$TKS    001144          365#   2175    2184    2200    2224*   2255    2261
$TN   = 000023             1#      11     693     697#     699     710     714#     716     725     729#     734     738     740
                         744#     782     784     788#     796     798     802#     806     811     813     817#     821     825
                         827     831#     878     882#     884     888     981     985#     986    1001    1005#    1006    1173
                        1177#    1178    1273    1277#    1279    1318    1322#    1323    1348    1352#    1354    1366    1368
                        1372#    1374    1384    1386    1390#    1401    1403    1407#
$TPB    001152          368#   2161*   2172
$TPFLG  001157          372#   2119    2172
$TPS    001150          367#   2159    2172
$TRAP   012304           494   2434#
$TRAP2  012326          2445#   2456
$TRP  = 000014          2449#   2458#   2459#   2460#   2461#   2462    2463#   2464    2465#   2466#   2467#   2468#   2469#
                        2470#
$TRPAD  012340          2439    2456#
$TSTNM  001102           345#    655*   1424*   1453    1480    1502*   1507    1511    1533    1562
$TTYIN  011710          2282    2283    2300    2304#
$TYPBN= ****** U        2461
$TYPDS= ****** U        2461
$TYPE   010760          2119#   2449    2457
$TYPEC  011130          2140    2147    2154    2159#   2160    2226
$TYPEX  011176          2165    2167    2170#
$TYPOC  012102          2379#   2458
$TYPON  012116          2378    2381#   2460
$TYPOS  012056          2374#   2459
$XTSTR  006060          1467#
$$GET4= 000000          1437#
$0FILL  012301          2375*   2379*   2389    2424#
$40CAT= ****** U        1464    1543
.     = 013474           223#    227#    289#    299#    321#    342#    383     487     502     503     530#    665#   1445
                        1448    1510    1511    1562    1597#   1777#   1785#   2172    2175    2304#   2305    2311   2486
                        2510    2589#
```

ERRORS DETECTED: 0
DEFAULT GLOBALS GENERATED: 0

*TACC,TACC/SOL/CRF:SYM=DZTACC.NEW

RUN-TIME: 44 29 2 SECONDS
RUN-TIME RATIO: 171/77=2.2
CORE USED: 25K (49 PAGES)