

# TA11

DATA RELIABILITY  
MD-11-DZTAE-B

EP-DZTAE-B-DL-A  
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**digital**  
MADE IN USA

This microfiche card contains a grid of frames. The frames on the left side contain various data tables and diagrams, including:

- Tables with multiple columns and rows of data.
- Flowcharts and diagrams with arrows and boxes.
- Text blocks containing labels and descriptions.

The right side of the card is mostly blank, with some faint markings and a small, illegible label in the bottom right corner.

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MAINDEC-11-DZTAE-B.P11

IDENTIFICATION

PRODUCT CODE: MAINDEC-11-DZTAE-B-D

PRODUCT NAME: TAIL DATA RELIABILITY

DATE CREATED: 21 JUNE 76

MAINTAINER: DIAGNOSTIC ENGINEERING

AUTHOR: JIM LACEY

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4.3 PROGRAM & OPERATOR ACTION  
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1. LOAD PROGRAM INTO MEMORY (SEE SECTION 3.)
2. LOAD A WRITE ENABLED CASSETTE IN BOTH DRIVES
3. LOAD ADDRESS 200.
4. SET SWITCHES (SEE SECTION 4.1)
5. PRESS START.

\*\*\* 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  
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STARTING THE PROGRAM AT 200 WILL RESULT IN AUTOMATIC SELECTION OF DRIVES "A" AND "B" TO BE TESTED.

STARTING THE PROGRAM AT 204 OR 210 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	:DRIVES A AND B SELECTED
DRIVE(S)? AB	:DRIVES A AND B SELECTED
DRIVE(S)? B,A	:DRIVES B AND A SELECTED
DRIVE(S)? B	:DRIVE B SELECTED
DRIVE(S)? SB?	:DRIVE S IS IMPOSSIBLE
DRIVE(S)?	:ASK FOR DRIVE

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4.3.2 ADDRESS SELECTION

STARTING THE PROGRAM AT 210 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 RESPONDES 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?

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5. OPERATING PROCEDURE  
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5.1 OPERATIONAL SWITCH SETTINGS  
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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<15:10>=0 THE PROGRAM WILL PRINT OUT ON ERRORS AND CONTINUE IN TEST.  
THE SWITCH SETTINGS ARE:

- SW<15>=1...HALT ON ERROR
- SW<14>=1...LOOP ON TEST
- SW<13>=1...INHIBIT ERROR TYPEOUTS
- SW<10>=1...RING BELL ON ERROR
- SW<09>=1...HALT AFTER NEXT "END-OF-TEST" TYPEOUT
- SW<08>=1...AT NEXT "END-OF-TAPE" (EOT) GO TO "END-OF-TEST"
- SW<07>=1...PERFORM PASS AS PER SWR<1:0>
  - SWR<1:0>=00=FORMAT
  - SWR<1:0>=01=READ ONLY
  - SWR<1:0>=10=WRITE ONLY
  - SWR<1:0>=11=READ ONLY

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5.2 SUBROUTINE ABSTRACTS  
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5.2.1 SCOPE  
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THIS SUBROUTINE CALL (VIA AN IOT INSTRUCTION) IS PLACED AT AN OPTIMUM POSITION IN THE INSTRUCTION SECTION OF THE "FORMAT", "READONLY" AND "WRITEONLY" CODE.

IF SWR<14>=1 THE PROGRAM WILL LOOP THROUGH A SPECIFIC SEQUENCE DEPENDING ON THE TYPE OF PASS BEING PERFORMED.  
\*\*\* THIS ROUTINE SUPPORTS THE S/W SWITCH REG FUNCTIONS

5.2.1.1 FORMAT PASS SCOPE LOOP

1. SETUP FOR A WRITE
2. WRITE
3. BACKSPACE BLOCK GAP
4. SETUP FOR A READ
5. READ
6. REPEAT STEPS 1-5 UNTIL "EOT"

5.2.1.2 READONLY PASS SCOPE LOOP

1. SETUP FOR READ
2. READ
3. CHECK FOR SYNC & DATA ERROR
4. BACK SPACE BLOCK GAP
5. REPEAT STEPS 2-4 INDEFINITELY

5.2.1.3 WRITEONLY PASS SCOPE LOOP

1. SETUP FOR WRITE
2. WRITE
3. REPEAT STEP 2 UNTIL "EOT"

5.2.2 TRAPCATCHER  
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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.

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5.2.3 ERROR  
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THIS SUBROUTINE CALL (VIA A EMT INSTRUCTION) IS USED TO REPORT ALL ERRORS. (REFER TO 6.)

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

5.2.4.1 TYPE (\$TYPE)

TYPE AN ASCIZ STRING ON THE TTY

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

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5.2.6 THE FOLLOWING SUBROUTINES ARE CALLED BY A 'JSR'.  
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5.2.6.1 A2OCT

THIS ROUTINE CHANGES AN ASCII STRING TO AN OCTAL NUMBER.

5.2.6.2 ASKDRV

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

5.2.6.3 ASKADR

THIS ROUTINE IS USED TO INPUT THE ADDRESSES OF THE "TACS"  
AND THE VECTOR TO USE.

5.2.6.4 TYPERR

THIS ROUTINE IS USED TO TYPE OUT THE "ERROR" DATA

5.2.6.5 CSRERR

THIS ROUTINE IS USED WHEN AN ERROR  
IS DETECTED. IT WILL EXAMINE THE  
"CONTROL AND STATUS" REGISTER TO  
DETERMINE THE TYPE OF ERROR AND  
TAKE THE APPROPRIATE ACTION.

5.2.6.6 SETUPW

THIS ROUTINE IS USED TO SETUP THE  
PARAMETER BLOCK AND THE WRITE  
BUFFER BEFORE STARTING A "WRITE" FUNCTION

5.2.6.7 FILL

USE TO FILL THE WRITE BUFFER  
WITH A DATA PATTERN.

5.2.6.8 SETUPR

THIS ROUTINE IS USED TO SETUP THE  
PARAMETER BLOCK BEFORE DOING A  
"READ" FUNCTION.

5.2.6.9 SYNCK

THIS ROUTINE IS CALLED AFTER  
PERFORMING A "READ".  
IT CHECKS THE FIRST FOUR BYTES  
OF THE DATA TO INSURE THAT THEY  
CONTAIN THE PROPER FILE AND  
BLOCK NUMBERS.

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## 5.2.6.10 DATCMP

THIS ROUTINE IS USED TO CHECK THE  
DATA IN THE READ BUFFER TO INSURE  
IT IS CORRECT.

## 5.2.6.11 CNTSFT

THIS ROUTINE IS USED TO  
COUNT SOFT DATA ERRORS

## 5.2.6.12 CNTHRD

THIS ROUTINE IS USED TO  
COUNT HARD DATA ERRORS

## 5.2.6.13 SAVRGI OR SAVREG

ROUTINE TO SAVE ALL THE REGISTERS

## 5.2.6.14 CASSETTE PRIMITIVE

THIS IS THE CASSETTE DRIVER

## 5.2.6.15 CASINT

CASSETTE INTERRUPT HANDLER

## 5.2.6.16 DBCD

CHANGES A DOUBLE LENGTH BINARY  
NUMBER TO A DECIMAL ASCIZ STRING

## 5.2.6.17 SBCD

CHANGES A SINGLE LENGTH BINARY  
NUMBER TO A DECIMAL ASCIZ STRING.

## 5.2.6.18 SUPRES

TYPES A DECIMAL ASCII STRING  
SUPPRESSING LEADING ZEROS.

## 5.2.6.19 TYPF

USED TO TYPE THE ASCIZ STRING  
IMMEDIATELY FOLLOWING THE CALL.

## 5.2.6.20 TPDV

TYPES THE DRIVE TO BE TESTED

## 5.2.6.21 EXAM

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THIS ROUTINE EXAMINES THE SELECTED DRIVES  
TO INSURE THEY ARE AVAILABLE FOR TESTING.

5.2.6.22 \$B2OCT

TYPES AN OCTAL NUMBER

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6.

ERRORS

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THERE ARE A NUMBER OF ERRORS THAT CAN OCCUR IN THIS PROGRAM. WHEN AN ERROR IS ENCOUNTERED THE CALL TO THE ERROR(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.

6.1

ERROR TYPES

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THE ERRORS THAT OCCUR IN THIS PROGRAM FALL INTO THREE (3) CATEGORIES DEFINED AND EXPLAINED AS FOLLOWS:

6.1.1

PRETEST ERROR

THESE ERRORS WILL BE DETECTED BEFORE TRYING TO TEST THE DATA RELIABILITY OF THE TA11/TU60.

6.1.2

NON-FATAL ERROR

THESE ERRORS WILL BE DUE TO "CRC" OR "DATA" FAILURES WHICH WILL BE REPORTED AS THEY OCCUR. AFTER REPORTING THE ERROR THE PROGRAM WILL CONTINUE TESTING.

6.1.3

FATAL ERROR

THIS TYPE OF ERROR WILL BE THE RESULT OF ANY KIND OF ERROR THAT CAUSES THE PROGRAM TO LOSE TRACK OF THE TAPE POSITION, OR THE MAXIMUM NUMBER OF DATA ERRORS HAVE OCCURRED.

THIS ERROR WILL BE REPORTED WHEN IT OCCURS, THEN THE PROGRAM WILL ABORT THE TEST AND GO TO THE "END-OF-TEST" TYPEOUT.

6.2

DATA ERRORS

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THERE ARE TWO TYPES OF DATA ERRORS THAT CAN OCCUR WHICH ARE DEFINED AND EXPLAINED AS FOLLOWS:

6.2.1

SOFT ERROR

A SOFT ERROR IS BY DEFINITION ANY "CRC" OR "READ DATA" ERROR THAT OCCURS WHILE READING A BLOCK OF DATA. A SOFT ERROR WILL INVOKE A REREAD OF THE BLOCK.

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6.2.2 HARD ERROR

A HARD ERROR IS DEFINED AS ANY "CRC" OR "READ DATA" ERROR THAT OCCURS ON THE INITIAL READ OF A BLOCK OF DATA AND CAN NOT BE READ CORRECTLY WITHIN THREE (3) RETRYs.

6.3 ERROR RECOVERY  
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6.3.1 PRETEST ERROR

WHEN THIS TYPE OF ERROR OCCURS IT WILL BE REPORTED. THEN DEPENDING ON HOW THE PROGRAM WAS STARTED IT WILL ASK FOR THE DRIVES AND ADDRESSES FOR TESTING OR RETURN TO MONITOR.

6.3.2 NON-FATAL ERROR

WHEN THIS TYPE OF ERROR OCCURS IT WILL BE REPORTED AND THE PROGRAM WILL CONTINUE IN TEST.

6.3.3 FATAL ERROR

WHEN THIS TYPE OF ERROR OCCURS IT WILL BE REPORTED. THE PROGRAM WILL ABORT THE TEST AND GO TO THE "END-OF-TEST" TYPEOUT.

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

8. MISCELLANEOUS  
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8.1 EXECUTION TIME  
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TESTING THE TA11/TU60 TO SPECIFICATION TAKES APPROXIMATELY 2 HOURS 30 MINUTES WITH EACH DRIVE TAKING 75 MINUTES.

8.2 STACK POINTER  
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STACK IS INITIALLY SET TO 1100.

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8.3 END OF TEST  
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WITH ALL SWITCHES ON A "0" THE END OF TEST TYPEOUT WILL OCCUR WHEN THE PROGRAM COMPLETES 18 TAPE PASSES FROM "BOT" TO "EOT" ON THE DRIVE UNDER TEST OR A FATAL ERROR OCCURS.

8.3.1 EXAMPLE OF AN END-OF TEST TYPEOUT

\*\*\* END-OF-TEST \*\*\*  
SOFT ERRORS=0  
HARD ERRORS=0  
BYTES READ=1471488  
BYTES WRITTEN=369000  
TAPE PASSES=18  
FILES/PASS=12  
BLOCKS/FILE=16

8.4 DRIVE COMPATIBILITY  
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THE COMPATIBILITY BETWEEN DRIVES CAN BE TESTED BY DOING A "FORMAT" PASS ON ONE DRIVE AND THEN READING IT ON ANOTHER DRIVE.

8.4.1 DRIVE COMPATIBILITY PROCEDURE EXAMPLE #1  
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THIS EXAMPLE FORMATS ON DRIVE A AND READS FROM DRIVE B

8.4.1.1 "FORMAT" DRIVE "A"

1. PLACE A WRITE ENABLED TAPE IN DRIVE "A"
2. INSURE DRIVE "B" IS EMPTY
3. LOAD ADDRESS 200
4. SET SW09 AND SW08 TO "1" ALL OTHERS TO "0"
5. PRESS START
6. PROGRAM WILL PERFORM A "FORMAT" PASS ON DRIVE "A", TYPE "END-OF-TEST" STATISTICS AND HALT

8.4.1.2 "READ" DRIVE "B"

1. REMOVE THE TAPE FROM DRIVE "A" AND PLACE IT IN DRIVE "B"
2. LOAD ADDRESS 200
3. SET SW09, SW08, SW07 AND SW00 TO A "1" ALL OTHERS TO A "0"
4. PRESS START
5. PROGRAM WILL PERFORM A "READONLY" PASS ON DRIVE "B", TYPE "END-OF-TEST" STATISTICS AND HALT.

9.4.2 DRIVE COMPATIBILITY PROCEDURE EXAMPLE #2

THIS EXAMPLE READS KNOWN GOOD TAPE(S)

8.4.2.1 "READ"

1. PLACE THE KNOWN GOOD TAPE(S) IN THE DRIVE(S) TO BE TESTED. (NOTE: IT MIGHT BE WISE TO HAVE THE TAPE(S) WRITE LOCKED.)
2. LOAD ADDRESS 200
3. SET SW08, SW07 AND SW00 TO A "1" ALL OTHERS TO A "0"
4. PRESS START
5. PROGRAM WILL PERFORM A "READONLY" PASS AND TYPE "END-CF-TEST" STATISTICS ON DRIVE(S) TO BE TESTED.

8.5 DATA FORMAT

THE DATA FORMAT USED IN THIS PROGRAM WILL RESULT IN APPROXIMATELY ELEVEN (11) FILES OF 8192 BYTES TO BE WRITTEN ON TAPE.

8.5.1 FILE STRUCTURE

EACH FILE WILL CONSIST OF SIXTEEN (16) BLOCKS OF DATA, WITH EACH BLOCK CONTAINING AN UNIQUE DATA PATTERN.

8.5.2 BLOCK STRUCTURE

EACH BLOCK WILL HAVE AN "ID" CODE AS THE FIRST FOUR (4) BYTES OF DATA. THIS "ID" WILL BE THE FILE NUMBER AND BLOCK NUMBER AND THEIR COMPLEMENTS. THE DATA FOLLOWING THE "ID" IS A PATTERN THAT REPEATS ITSELF EVERY EIGHT (8) BYTES FOR THE LENGTH OF THE BLOCK.

8.5.3 BLOCK SIZE AND PATTERN

BLOCK NUMBER	BLOCK SIZE	BLOCK PATTERN
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1	512	314 231 063 146

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8.5.3 (CONT.)

BLOCK NUMBER	BLOCK SIZE	BLOCK PATTERN
2	1024	001 002 004 010 020 040 100 200
3	256	177 277 337 357 367 373 375 376
4	1024	252 125 252 125 252 125 252 125
5	128	000 111 222 333 044 155 266 377
6	1024	000 044 111 155 222 266 333 377

8.5.3 (CONT.)

	BLOCK NUMBER	BLOCK SIZE	BLOCK PATTERN
	-----	-----	-----
731			
732			
733			
734			
735			
736			
737			
738	7	64	000
739			222
740			044
741			266
742			111
743			333
744			155
745			377
746			
747	8	1024	001
748			003
749			007
750			017
751			037
752			077
753			177
754			377
755			
756	9	32	376
757			374
758			370
759			360
760			340
761			300
762			200
763			000
764			
765	10	128	001
766			376
767			002
768			375
769			004
770			373
771			010
772			367
773			
774	11	256	020
775			357
776			040
777			337
778			100
779			277
780			200
781			177
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8.5.3 (CONT.)

<u>BLOCK NUMBER</u>	<u>BLOCK SIZE</u>	<u>BLOCK PATTERN</u>
12	512	000 000 000 000 000 000 000
13	1024	377 377 377 377 377 377 377
14	32	000 377 000 377 000 377
15	128	017 360 207 170 303 074 341 036

8.6 TEST TYPEOUT

THE FOLLOWING EXAMPLE SHOWS A TYPICAL TYPEOUT WHERE BOTH DRIVES WERE TESTED AND NO ERRORS OCCURRED.

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MAINDEC-11-DZTAE-A

DRIVE A AND DRIVE B WILL BE TESTED

\*\*\* FORMAT \*\*\* DRIVE A  
\*\*\* READ \*\*\* DRIVE A  
\*\*\* READ \*\*\* DRIVE A  
\*\*\* READ \*\*\* DRIVE A  
\*\*\* WRITE \*\*\* DRIVE A  
\*\*\* READ \*\*\* DRIVE A  
\*\*\* READ \*\*\* DRIVE A  
\*\*\* READ \*\*\* DRIVE A  
\*\*\* READ \*\*\* DRIVE A  
\*\*\* FORMAT \*\*\* DRIVE A  
\*\*\* READ \*\*\* DRIVE A  
\*\*\* READ \*\*\* DRIVE A  
\*\*\* READ \*\*\* DRIVE A  
\*\*\* WRITE \*\*\* DRIVE A  
\*\*\* READ \*\*\* DRIVE A  
\*\*\* READ \*\*\* DRIVE A  
\*\*\* READ \*\*\* DRIVE A  
\*\*\* READ \*\*\* DRIVE A

\*\*\* END-OF-TEST \*\*\*  
SOFT ERRORS=0  
HARD ERRORS=0  
BYTES READ=1476608  
BYTES WRITTEN=370209  
TAPE PASSES=18  
FILES/PASS=12  
BLOCKS/FILE=16

\*\*\* FORMAT \*\*\* DRIVE B  
\*\*\* READ \*\*\* DRIVE B  
\*\*\* READ \*\*\* DRIVE B  
\*\*\* READ \*\*\* DRIVE B  
\*\*\* WRITE \*\*\* DRIVE B  
\*\*\* READ \*\*\* DRIVE B  
\*\*\* READ \*\*\* DRIVE B  
\*\*\* READ \*\*\* DRIVE B  
\*\*\* READ \*\*\* DRIVE B  
\*\*\* FORMAT \*\*\* DRIVE B  
\*\*\* READ \*\*\* DRIVE B  
\*\*\* READ \*\*\* DRIVE B  
\*\*\* READ \*\*\* DRIVE B  
\*\*\* WRITE \*\*\* DRIVE B  
\*\*\* READ \*\*\* DRIVE B  
\*\*\* READ \*\*\* DRIVE B  
\*\*\* READ \*\*\* DRIVE B  
\*\*\* READ \*\*\* DRIVE B

\*\*\* END-OF-TEST \*\*\*  
SOFT ERRORS=0  
HARD ERRORS=0  
BYTES READ=1504096  
BYTES WRITTEN=376868

892  
893  
894

TAPE PASSES=18  
FILES/PASS=12  
BLOCKS/FILE=16

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## 9. PROGRAM DESCRIPTION

-----

THIS PROGRAM IS DESIGNED AROUND THREE PRIMARY ROUTINES THAT WILL TRANSFER DATA TO AND/OR FROM THE TAI1/TU50 GOING FROM "BOT" TO "EOT" OF THE TAPE. EACH OF THESE ROUTINES MAKE USE OF COMMON SUBROUTINES TO MANIPULATE TAPE MOTION, KEEP TRACK OF TAPE POSITION, SETUP DATA BUFFERS AND CHECK, COUNT AND REPORT ERRORS. THESE ROUTINES ARE DEFINED AND EXPLAINED BELOW.

### 9.1 FORMAT PASS

-----

THIS IS A WRITE, BACKSPACE AND READ ROUTINE STARTING AT "BOT" THE FOLLOWING PROCEDURE IS PREFORMED:

1. WRITE A BLOCK OF DATA
2. BACKSPACE A BLOCK GAP
3. READ THE BLOCK
4. CHECK FOR SYNC ERROR
5. CHECK FOR DATA ERROR
6. REPEAT STEPS 1-5 SIXTEEN TIMES
7. WRITE A FILE GAP
8. REPEAT STEPS 1-7 UNTIL "EOT"

### 9.2 WRITEONLY PASS

-----

THIS IS A WRITE ONLY ROUTINE. STARTING AT "BOT" THE FOLLOWING PROCEDURE IS PREFORMED:

1. WRITE SIXTEEN BLOCKS OF DATA
2. WRITE A FILE GAP
3. REPEAT STEPS 1 & 2 TO "EOT"

### 9.3 READONLY PASS

-----

THIS IS A READ ONLY ROUTINE AND REQUIRES THAT A "FORMAT" OR "WRITEONLY" PASS HAS ALREADY BEEN PREFORMED. STARTING AT "BOT" THE FOLLOWING PROCEDURE IS PREFORMED:

1. READ A BLOCK OF DATA
  2. CHECK FOR SYNC ERROR
  3. CHECK FOR DATA ERROR
  4. REPEAT STEPS 1-3 SIXTEEN (16) TIMES
  5. SPACE FORWARD FILE GAP
  6. REPEAT STEPS 1-5 UNTIL THE LAST BLOCK OF THE LAST FILE HAS BEEN READ.
- %

THE TAI1 DATA RELIABILITY MAINDEC-11-DZTAE-B  
 ;\*COPYRIGHT (C) 1973, 1976  
 ;\*DIGITAL EQUIPMENT CORP.  
 ;\*MAYNARD, MASS. 01754

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```
;*
;*PROGRAM BY JIM LACEY
;*
;*THIS PROGRAM WAS ASSEMBLED USING THE PDP-11 MAINDEC SYSMAC
;*PACKAGE (MAINDEC-11-DZQAC-CD),MAR 21, 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

-----

BIT	NAME	INIT 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!

```

1002 .SBTTL OPERATIONAL SWITCH SETTINGS
1003 :*
1004 :* SWITCH USE
1005 :* -----
1006 :* 15 HALT ON ERROR
1007 :* 14 LOOP ON TEST
1008 :* 13 INHIBIT ERROR TYPEOUTS
1009 :* 10 DING BELL ON ERROR
1010 :* 9 HALT AFTER NEXT "END-OF-TEST" TYPE OUT
1011 :* 8 AT NEXT "EOT" GOTO "END-OF-TEST"
1012 :* 7 PERFORM AS PER SWR<1:0>
1013 :* 00=FORMAT
1014 :* 01=READONLY
1015 :* 10=WRITEONLY
1016 :* 11=READONLY
1017 :*
1018 :*
1019 :*
1020 .SBTTL BASIC DEFINITIONS
1021 :*INITIAL ADDRESS OF THE STACK POINTER *** 1100 ***
1022 :STACK= 1100
1023 001100 .EQUIV EMT,ERROR ; BASIC DEFINITION OF ERROR CALL
1024 .EQUIV IOT,SCOPE ; ;BASIC DEFINITION OF SCOPE CALL
1025
1026 :*MISCELLANEOUS DEFINITIONS
1027 :*
1028 000011 HT= 11 ; ;CODE FOR HORIZONTAL TAB
1029 000012 LF= 12 ; ;CODE FOR LINE FEED
1030 000015 CR= 15 ; ;CODE FOR CARRIAGE RETURN
1031 000200 CRLF= 200 ; ;CODE FOR CARRIAGE RETURN-LINE FEED
1032 177776 PS= 177776 ; ;PROCESSOR STATUS WORD
1033 .EQUIV PS,PSW
1034 177774 STKLMT= 177774 ; ;STACK LIMIT REGISTER
1035 177772 PIRQ= 177772 ; ;PROGRAM INTERRUPT REQUEST REGISTER
1036 177570 DSWR= 177570 ; ;HARDWARE SWITCH REGISTER
1037 177570 DDISP= 177570 ; ;HARDWARE DISPLAY REGISTER
1038
1039 :*GENERAL PURPOSE REGISTER DEFINITIONS
1040 000000 R0= %0 ; ;GENERAL REGISTER
1041 000001 R1= %1 ; ;GENERAL REGISTER
1042 000002 R2= %2 ; ;GENERAL REGISTER
1043 000003 R3= %3 ; ;GENERAL REGISTER
1044 000004 R4= %4 ; ;GENERAL REGISTER
1045 000005 R5= %5 ; ;GENERAL REGISTER
1046 000006 R6= %6 ; ;GENERAL REGISTER
1047 000007 R7= %7 ; ;GENERAL REGISTER
1048 .EQUIV R6,SP ; ;STACK POINTER
1049 .EQUIV R7,PC ; ;PROGRAM COUNTER
1050
1051 :*PRIORITY LEVEL DEFINITIONS
1052 000000 PR0= 0 ; ;PRIORITY LEVEL 0
1053 000040 PR1= 40 ; ;PRIORITY LEVEL 1
1054 000100 PR2= 100 ; ;PRIORITY LEVEL 2
1055 000140 PR3= 140 ; ;PRIORITY LEVEL 3
1056 000200 PR4= 200 ; ;PRIORITY LEVEL 4
1057 000240 PR5= 240 ; ;PRIORITY LEVEL 5

```

1058 000300 PR6= 300 ;:PRIORITY LEVEL 6  
1059 000340 PR7= 340 ;:PRIORITY LEVEL 7

.\*"SWITCH REGISTER" SWITCH DEFINITIONS

1061		SW15=	100000
1062	100000	SW14=	40000
1063	040000	SW13=	20000
1064	020000	SW12=	10000
1065	010000	SW11=	4000
1066	004000	SW10=	2000
1067	002000	SW09=	1000
1068	001000	SW08=	400
1069	000400	SW07=	200
1070	000200	SW06=	100
1071	000100	SW05=	40
1072	000040	SW04=	20
1073	000020	SW03=	10
1074	000010	SW02=	4
1075	000004	SW01=	2
1076	000002	SW00=	1
1077	000001	.EQUIV	SW09,SW9
1078		.EQUIV	SW08,SW8
1079		.EQUIV	SW07,SW7
1080		.EQUIV	SW06,SW6
1081		.EQUIV	SW05,SW5
1082		.EQUIV	SW04,SW4
1083		.EQUIV	SW03,SW3
1084		.EQUIV	SW02,SW2
1085		.EQUIV	SW01,SW1
1086		.EQUIV	SW00,SW0

.\*DATA BIT DEFINITIONS (BIT00 TO BIT15)

1089		BIT15=	100000
1090	100000	BIT14=	40000
1091	040000	BIT13=	20000
1092	020000	BIT12=	10000
1093	010000	BIT11=	4000
1094	004000	BIT10=	2000
1095	002000	BIT09=	1000
1096	001000	BIT08=	400
1097	000400	BIT07=	200
1098	000200	BIT06=	100
1099	000100	BIT05=	40
1100	000040	BIT04=	20
1101	000020	BIT03=	10
1102	000010	BIT02=	4
1103	000004	BIT01=	2
1104	000002	BIT00=	1
1105	000001	.EQUIV	BIT09,BIT9
1106		.EQUIV	BIT08,BIT8
1107		.EQUIV	BIT07,BIT7
1108		.EQUIV	BIT06,BIT6
1109		.EQUIV	BIT05,BIT5
1110		.EQUIV	BIT04,BIT4
1111		.EQUIV	BIT03,BIT3
1112		.EQUIV	BIT02,BIT2
1113		.EQUIV	BIT01,BIT1
		.EQUIV	BIT00,BIT0

```

1114 .EQUIV BIT01,BIT1
1115 .EQUIV BIT00,BIT0
1116
1117 .*BASIC "CPU" TRAP VECTOR ADDRESSES
1118 000004 ERRVEC= 4 ;: TIME OUT AND OTHER ERRORS
1119 000010 RESVEC= 10 ;: RESERVED AND ILLEGAL INSTRUCTIONS
1120 000014 TBITVEC=14 ;: "T" BIT
1121 000014 TRTVEC= 14 ;: TRACE TRAP
1122 000014 BPTVEC= 14 ;: BREAKPOINT TRAP (BPT)
1123 000020 IOTVEC= 20 ;: INPUT/OUTPUT TRAP (IOT) **SCOPE**
1124 000024 PWRVEC= 24 ;: POWER FAIL
1125 000030 EMTVEC= 30 ;: EMULATOR TRAP (EMT) **ERROR**
1126 000034 TRAPVEC=34 ;: "TRAP" TRAP
1127 000060 TKVEC= 60 ;: TTY KEYBOARD VECTOR
1128 000064 TPVEC= 64 ;: TTY PRINTER VECTOR
1129 000240 PIRQVEC=240 ;: PROGRAM INTERRUPT REQUEST VECTOR
1130 ;:*****
1131
1132 ;*****TA11 FUNCTIONS*****
1133 000000 XWFG= 0 ;: WRITE FILE GAP FUNCTION
1134 000002 XWRITE= 2 ;: WRITE FUNCTION
1135 000004 XREAD= 4 ;: READ FUNCTION
1136 000006 XBSFG= 6 ;: BACK SPACE FILE GAP FUNCTION
1137 000010 XBSBG= 10 ;: BACK SPACE BLOCK GAP FUNCTION
1138 000012 XSFFG= 12 ;: SPACE FWD FILE GAP FUNCTION
1139 000014 XSFBG= 14 ;: SPACE FWD BLOCK GAP FUNCTION
1140 000016 XRWND= 16 ;: REWIND FUNCTION
1141
1142 ;*****TA11 BIT ASSIGNMENT*****
1143 100000 ERROR= BIT15
1144 040000 CRCERR= BIT14
1145 020000 LEADER= BIT13
1146 010000 WRTLOCK=BIT12
1147 004000 FGAP= BIT11
1148 002000 TIMERR= BIT10
1149 001000 OFFLINE=BIT09
1150 000400 UNIT= BIT08
1151 000200 TR.REQ= BIT07
1152 000100 INT.EN= BIT06
1153 000040 READY= BIT05
1154 000020 ILBS= BIT04
1155 000010 FUNC2= BIT03
1156 000004 FUNC1= BIT02
1157 000002 FUNC0= BIT01
1158 000001 GO= BIT00
1159 000016 FUNCTION= FUNC2+FUNC1+FUNC0
1160

```

```

1161          .SBTTL TRAP CATCHER
1162
1163          000000          .=0
1164          : *ALL UNUSED LOCATIONS FROM 4 - 776 CONTAIN A ".+2,HALT"
1165          : *SEQUENCE TO CATCH ILLEGAL TRAPS AND INTERRUPTS
1166          : *LOCATION 0 CONTAINS 0 TO CATCH IMPROPERLY LOADED VECTORS
1167
1168          000174          000174          .=174
1169          000176          000000
1170          DISPREG: .WORD 0          ;; SOFTWARE DISPLAY REGISTER
1171          SWREG:   .WORD 0          ;; SOFTWARE SWITCH REGISTER
1172          .SBTTL STARTING ADDRESS(ES)
1173          JMP      0#BEGIN1          ;; JUMP TO STARTING ADDRESS OF PROGRAM
1174          JMP      0#BEGIN2          ;SELECT DRIVE(S) BEFORE STARTING TEST
1175          JMP      0#BEGIN3          ;SELECT DRIVE(S) AND ADDRESSES BEFORE TESTING
1176          : *****

```



1232	001224	000000		RDRYS: .WORD	0	: KEEPS COUNT OF REREADS
1233	001226	000000		WRTRYS: .WORD	0	: KEEPS COUNT OF REWRITES
1234	001230	000000	000000	BYTNUM: .WORD	0,0	: THE NUMBER OF BYTES "READ" OR "WRITTEN : DURING AN OPERATION
1235						
1236	001234	000017		LASTBK: .WORD	15.	: WILL CONTAIN THE # OF THE LAST BLOCK : AFTER A "FORMAT" OR "WRITE" PASS
1237						
1238	001236	000011		LASTFL: .WORD	9.	: WILL CONTAIN THE # OF THE LAST FILE : AFTER A "FORMAT" OR "WRITE" PASS
1239						
1240						
1241						
1242	001240	177500		TACSL: 177500		: ADDRESS OF TACS
1243	001242	177502		TADBL: 177502		: ADDRESS OF TADB
1244	001244	000260	000262	TAVEC: 260,262		: TAIL VECTOR ADDRESS
1245	001250	000300		TAPRIO: 300		: TAIL BR LEVEL 6
1246	001252	000000	000000	DRVKEY: 0,0		
1247	001256	001252		DRVPNT: DRVKEY		
1248	001260	000003		MAXRDS: .WORD	3	: MAX REREADS BEFORE CALLING IT A HARD ERROR
1249	001262	000003		MAXERR: .WORD	3	: MAX HARD ERRORS ALLOWED
1250	001264	000022		MAXEOT: .WORD	18.	: NUMBER OF TAPE PASSES BEFORE END-OF-TEST
1251	001266	000000		PASCNT: .WORD	0	: COUNT # OF TAPE PASSES
1252	001270	001274	000000	PSCNTL: .WORD	FORPAS,0	: CONTROLS THE TYPE OF PASS
1253	001274	000001		FORPAS: .WORD	1	: 1 FORMAT PASS
1254	001276	000003		RD1PAS: .WORD	3	: 3 READONLY PASSES
1255	001300	000001		WRTPAS: .WORD	1	: 1 WRITEONLY PASS
1256	001302	000004		RD2PAS: .WORD	4	: 4 READONLY PASSES
1257	001304	000		FILE: .BYTE	0	: FILE NUMBER
1258	001305	377				: 1'S COMPLEMENT ON FILE NUMBER
1259	001306	000		BLOCK: .BYTE	0	: BLOCK NUMBER
1260	001307	377				: 1'S COMPLEMENT OF BLOCK NUMBER
1261	001310	000020		FILESZ: .WORD	16.	: NUMBER OF BLOCKS PER FILE



				;////////////////////////////////////	
				.SBTTL	DATA PATTERNS
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1306					
1307					
1308					
1309					
1310	001412	314	063	314	PAT0: .BYTE 314,063,314,063,146,231,146,231
1311	001415	063	146	231	
1312	001420	146	231		
1313	001422	314	231	063	PAT1: .BYTE 314,231,063,146,314,231,063,146
1314	001425	146	314	231	
1315	001430	063	146		
1316	001432	001	002	004	PAT2: .BYTE 001,002,004,010,020,040,100,200
1317	001435	010	020	040	
1318	001440	100	200		
1319	001442	177	277	337	PAT3: .BYTE 177,277,337,357,367,373,375,376
1320	001445	357	367	373	
1321	001450	375	376		
1322	001452	252	125	252	PAT4: .BYTE 252,125,252,125,252,125,252,125
1323	001455	125	252	125	
1324	001460	252	125		
1325	001462	000	111	222	PAT5: .BYTE 000,111,222,333,044,155,266,377
1326	001465	333	044	155	
1327	001470	266	377		
1328	001472	000	044	111	PAT6: .BYTE 000,044,111,155,222,266,333,377
1329	001475	155	222	266	
1330	001500	333	377		
1331	001502	000	222	044	PAT7: .BYTE 000,222,044,266,111,333,155,377
1332	001505	266	111	333	
1333	001510	155	377		
1334	001512	001	003	007	PAT8: .BYTE 001,003,007,017,037,077,177,377
1335	001515	017	037	077	
1336	001520	177	377		
1337	001522	376	374	370	PAT9: .BYTE 376,374,370,360,340,300,200,000
1338	001525	360	340	300	
1339	001530	200	000		
1340	001532	001	376	002	PAT10: .BYTE 001,376,002,375,004,373,010,367
1341	001535	375	004	373	
1342	001540	010	367		
1343	001542	020	357	040	PAT11: .BYTE 020,357,040,337,100,277,200,177
1344	001545	337	100	277	
1345	001550	200	177		
1346	001552	000	000	000	PAT12: .BYTE 000,000,000,000,000,000,000,000
1347	001555	000	000	000	
1348	001560	000	000		
1349	001562	377	377	377	PAT13: .BYTE 377,377,377,377,377,377,377,377
1350	001565	377	377	377	
1351	001570	377	377		
1352	001572	000	377	000	PAT14: .BYTE 000,377,000,377,000,000,377,377
1353	001575	377	000	000	
1354	001600	377	377		
1355	001602	017	360	207	PAT15: .BYTE 017,360,207,170,303,074,341,036
1356	001605	170	303	074	
1357	001610	341	036		
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.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

\$ERRTB:

;;\*\*\*\*\*  
;;\*\*\*\*\*  
;;\*\*\*\*\*

ITEMSO: ;ITEMS 001-002

;NOTE: ALL NUMBERS WILL BE TYPED AS 6 DIGIT OCTAL NUMBERS  
; UNLESS OTHERWISE NOTED

;ITEM 1  
EM1 ;:DATA ERROR  
DH1 ;:PC FILE BLOCK BYTE GDDAT BDDAT GDADR BDADR  
DT1 ;:\$ERRPC \$REGO \$REG2 BYTNUM \$GDDAT \$BDDAT \$GDADR \$BDADR  
DF1 ;:FILE,BLOCK AND BYTE ARE TYPED IN DECIMAL

;ITEM 2  
EM2 ;:SYNC ERROR  
DH2 ;: EXPT'D EXPT'D RCV'D RCV'D  
;:PC FILE BLOCK FILE BLOCK  
DT2 ;:\$ERRPC \$REGO \$REG2 \$TMPD \$TMP2  
DF2 ;:ALL NUMBERS EXCEPT \$ERRPC ARE TYPED IN DECIMAL

;;\*\*\*\*\*  
;;\*\*\*\*\*  
;;\*\*\*\*\*

ITEMS1: ;ITEMS 101-107

EM101 ;:DRIVE IS OFF-LINE  
DH101 ;:PC FILE BLOCK FUNCTION  
DT101 ;:\$ERRPC \$REGO \$REG2 \$TMPD  
0 ;:FILE AND BLOCK WILL BE TYPED IN DECIMAL  
;: \$TMPD WILL BE TYPED AS A FUNCTION NAME

EM102 ;:DRIVE IS WRITE-LOCK  
DH101 ;:PC FILE BLOCK FUNCTION  
DT101 ;:\$ERRPC \$REGO \$REG2 \$TMPD  
0 ;:FILE AND BLOCK WILL BE TYPED IN DECIMAL  
;: \$TMPD WILL BE TYPED AS A FUNCTION NAME

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001622 012220  
001624 012511  
001626 011744  
001630 012026

001632 012233  
001634 012607

001636 011756  
001640 012036

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001642 012246  
001644 012724  
001646 012002  
001650 000000

001652 012270  
001654 012724  
001656 012002  
001660 000000

1426 001662 012314  
 1427 001664 012724  
 1428 001666 012002  
 1429 001670 000000  
 1430  
 1431  
 1432 001672 012337  
 1433 001674 012724  
 1434 001676 012002  
 1435 001700 000000  
 1436  
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 1438 001702 012356  
 1439 001704 012724  
 1440 001706 012002  
 1441 001710 000000  
 1442  
 1443  
 1444 001712 012373  
 1445 001714 012724  
 1446 001716 012002  
 1447 001720 000000  
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 1450 001722 012415  
 1451 001724 012724  
 1452 001726 012002  
 1453 001730 000000  
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 1460 001732  
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 1462 001732 012437  
 1463 001734 012765  
 1464 001736 012014  
 1465 001740 000000  
 1466  
 1467 001742 012466  
 1468 001744 013002  
 1469 001746 012022  
 1470 001750 000000  
 1471

EM103 ;CLEAR LEADER ERROR  
 DH101 ;PC FILE BLOCK FUNCTION  
 DT101 ;\$ERRPC \$REGO \$REG2 \$TMPO  
 0 ;FILE AND BLOCK WILL BE TYPED IN DECIMAL  
 ;\$TMPO WILL BE TYPED AS A FUNCTION NAME

EM104 ;FILE GAP ERROR  
 DH101 ;PC FILE BLOCK FUNCTION  
 DT101 ;\$ERRPC \$REGO \$REG2 \$TMPO  
 0 ;FILE AND BLOCK WILL BE TYPED IN DECIMAL  
 ;\$TMPO WILL BE TYPED AS A FUNCTION NAME

EM105 ;TIMING ERROR  
 DH101 ;PC FILE BLOCK FUNCTION  
 DT101 ;\$ERRPC \$REGO \$REG2 \$TMPO  
 0 ;FILE AND BLOCK WILL BE TYPED IN DECIMAL  
 ;\$TMPO WILL BE TYPED AS A FUNCTION NAME

EM106 ;BLOCK CHECK ERROR  
 DH101 ;PC FILE BLOCK FUNCTION  
 DT101 ;\$ERRPC \$REGO \$REG2 \$TMPO  
 0 ;FILE AND BLOCK WILL BE TYPED IN DECIMAL  
 ;\$TMPO WILL BE TYPED AS A FUNCTION NAME

EM107 ;UNKNOWN INTERRUPT  
 DH101 ;PC FILE BLOCK FUNCTION  
 DT101 ;\$ERRPC \$REGO \$REG2 \$TMPO  
 0 ;FILE AND BLOCK WILL BE TYPED IN DECIMAL  
 ;\$TMPO WILL BE TYPED AS A FUNCTION NAME

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ITEMS2: ;ITEMS 201-202

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

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

```

1472 ;////////////////////////////////////
1473 ;////////////////////////////////////
1474 ;////////////////////////////////////
1475 ;*****
1476 ;BEGIN1 IS FOR NORMAL START
1477 ;BEGIN2 IS FOR DRIVE SELECTION
1478 ;BEGIN3 IS FOR DRIVE & ADDRESS SELECTION
1479
1480 ;*****
1481
1482 001752 005005 BEGIN1: CLR R5 ;NORMAL START
1483 001754 012737 041101 00125L MOV #AB, @DRVKEY
1484 001762 122737 000005 000041 CMPB #5, @41 ;CASSETTE DDP?
1485 001770 001012 BNE BGNCMN ;GO BEGIN COMMON CODE IF NO
1486 001772 022737 000260 001244 CMP #260, @TAVEC ;STANDARD VECTOR?
1487 002000 001006 BNE BGNCMN ;GO BEGIN COMMON CODE IF NO
1488 002002 000403 BR BEGIN3 ;GET DRIVES AND ADDRESSES
1489 002004 012705 000001 BEGIN2: MOV #1, R5 ;ASK FOR DRIVES FLAG
1490 002010 000402 BR BGNCMN ;BEGIN COMMON CODE
1491 002012 012705 000002 BEGIN3: MOV #2, R5 ;ASK FOR DRIVES AND ADDRESSES
1492 002016 BGNCMN:
1493 .SBTTL INITIALIZE THE COMMON TAGS
1494 ;;CLEAR THE COMMON TAGS ($CMTAG) AREA
1495 002016 012706 001100 MOV #CMTAG, R6 ;;FIRST LOCATION TO BE CLEARED
1496 002022 005026 CLR (R6)+ ;;CLEAR MEMORY LOCATION
1497 002024 022706 001140 CMP #SWR, R6 ;;DONE?
1498 002030 001374 BNE -6 ;;LOOP BACK IF NO
1499 002032 012706 001100 MOV #STACK, SP ;;SETUP THE STACK POINTER
1500 ;;INITIALIZE A FEW VECTORS
1501 002036 012737 004750 000020 MOV #SCOPE, @IOTVEC ;;IOT VECTOR FOR SCOPE ROUTINE
1502 002044 012737 000340 000022 MOV #340, @IOTVEC+2 ;;LEVEL 7
1503 002052 012737 005050 000030 MOV #ERROR, @EMTVEC ;;EMT VECTOR FOR ERROR ROUTINE
1504 002060 012737 000340 000032 MOV #340, @EMTVEC+2 ;;LEVEL 7
1505 002066 012737 011512 000034 MOV #TRAP, @TRAPVEC ;;TRAP VECTOR FOR TRAP CALLS
1506 002074 012737 000340 000036 MOV #340, @TRAPVEC+2 ;;LEVEL 7
1507 002102 012737 011562 000024 MOV #PWRDN, @PWRVEC ;;POWER FAILURE VECTOR
1508 002110 012737 000340 000026 MOV #340, @PWRVEC+2 ;;LEVEL 7
1509 002116 016767 002314 002304 MOV SENDCT, $EOPCT ;;SETUP END-OF-PROGRAM COUNTER
1510 002124 012767 002124 176754 MOV #, $LPADR ;;INITIALIZE THE LOOP ADDRESS FOR SCOPE
1511 ;;SIZE FOR A HARDWARE SWITCH REGISTER. IF NOT FOUND OR IT IS
1512 ;;EQUAL TO A "-1" SETUP FOR A SOFTWARE SWITCH REGISTER.
1513 002132 013746 000004 MOV @ERRVEC, -(SP) ;;SAVE ERROR VECTOR
1514 002136 012737 002172 000004 MOV #64$, @ERRVEC ;;SET UP ERROR VECTOR
1515 002144 012767 177570 176766 MOV #DSWR, SWR ;;SETUP FOR A HARDWARE SWICH REGISTER
1516 002152 012767 177570 176762 MOV #DDISP, DISPLAY ;;AND A HARDWARE DISPLAY REGISTER
1517 002160 022777 177777 176752 CMP #-1, @SWR ;;TRY TO REFERENCE HARDWARE SWR
1518 002166 001012 BNE 66$ ;;BRANCH IF NO TIMEOUT TRAP OCCURRED
1519 ;;AND THE HARDWARE SWR IS NOT = -1
1520 002170 000403 BR 65$ ;;BRANCH IF NO TIMEOUT
1521 002172 012716 002200 64$: MOV #65$, (SP) ;;SET UP FOR TRAP RETURN
1522 002176 000002 RTI
1523 002200 012767 000176 176732 65$: MOV #SWREG, SWR ;;POINT TO SOFTWARE SWR
1524 002206 012767 000174 176726 MOV #DISPREG, DISPLAY
1525 002214 012637 000004 66$: MOV (SP)+, @ERRVEC ;;RESTORE ERROR VECTOR
1526
1527 .SBTTL TYPE PROGRAM NAME

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1528      ;:TYPE THE NAME OF THE PROGRAM IF FIRST PASS
1529 002220 005227 177777      INC      #-1      ;:FIRST TIME?
1530 002224 001036      BNE      67$      ;:BRANCH IF NO
1531 002226 022737 004716 000042      CMP      #SENDAD, @#42      ;:ACT-11?
1532 002234 001432      BEQ      67$      ;:BRANCH IF YES
1533 002236 104400 002274      TYPE     68$      ;:TYPE ASCIZ STRING
1534      .SBTTL GET VALUE FOR SOFTWARE SWITCH REGISTER
1535 002242 005737 000042      TST      @#42      ;:ARE WE RUNNING UNDER XXDP/ACT?
1536 002246 001006      BNE      69$      ;:BRANCH IF YES
1537 002250 026727 176664 000176      CMP      SWR, #SWREG      ;:SOFTWARE SWITCH REG SELECTED?
1538 002256 001005      BNE      70$      ;:BRANCH IF NO
1539 002260 104404      GTSWR      ;:GET SOFT-SWR SETTINGS
1540 002262 000403      BR      70$
1541 002264 112767 000001 176642 69$:      MOVB     #1, $AUTOB      ;:SET AUTO-MODE INDICATOR
1542 002272      70$:
1543 002272 000413      BR      67$      ;:GET OVER THE ASCIZ
1544      ;:68$: .ASCIZ <CRLF>/MAINDEC-11-DZTAE-B/<CRLF>
1545 002322      67$:
1546      ;:*****
1547      ;:*****
1548
1549      ;THE CONTENTS OF R5 DETERMINES WHAT WILL BE DONE
1550
1551      R5=2      ASK FOR DRIVE(S) AND ADDRESSES (TACS AND VECTOR)
1552      R5=1      ASK FOR DRIVE(S)
1553      R5=0      DON'T ASK FOR ANYTHING
1554
1555      ;*****
1556 002322 010504      BEGINX: MOV     R5, R4      ;COPY R5
1557 002324 005305      DEC     R5      ;ASK FOR DRIVES?
1558 002326 002406      BLT     CHKADR      ;BR IF NO
1559 002330 004737 007610      JSR     PC, @#ASKDRV      ;GO GET DRIVES TO BE TESTED
1560 002334 005305      DEC     R5      ;ASK FOR ADDRESSES?
1561 002336 002402      BLT     CHKADR      ;BR IF NO
1562 002340 004737 007720      JSR     PC, @#ASKADR      ;GO GET TA11 ADDRESSES
1563      ;:*****
1564      ;:*****
1565
1566      ;CHECK THAT "TACS" WILL RESPOND TO ADDRESSING
1567
1568      I.      TIMEOUT OCCURRED
1569      A. TYPE ERROR MESSAGE
1570      B. EXAMINE R4
1571          1. R4>0 GOTO BEGINX
1572          2. R4=0 EXAMINE (42)
1573              A. (42)=0 GOTO BEGINX
1574              B. (42)>0 GOTO SENDAD
1575
1576      II.     TIMEOUT DIDN'T OCCUR
1577      A. CONTINUE
1578
1579      ;*****
1580 002344 012737 002362 000004      CHKADR: MOV     #15, @#ERRVEC      ;IN CASE OF TIMEOUTS
1581 002352 005000      CLR     R0      ;USE AS A SWITCH
1582 002354 005777 176660      TST     @TACSL      ;SEE IF TA11 RESPONDS
1583 002360 000402      BR      2$      ;BR IF NO TIMEOUT

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1621 002436 012700 001252
1622 002442 004737 010164
1623 002446 000410
1624 002450 116010 000001
1625 002454 001412
1626 002456 004737 010164
1627 002462 000407
1628 002464 005010
1629 002466 000405
1630 002470 005200
1631 002472 004737 010164
1632 002476 000401
1633 002500 105010
1634 002502 012700 001252
1635 002506 010037 001256
1636 002512 121060 000001
1637 002516 001002
1638 002520 105060 000001
1639 002524 005710
1640 002526 001424
1641 002530 112037 001613
1642 002534 104400 001203
1643 002540 106237 001613
1644 002544 004737 007554
1645 002550 111037 001613
1646 002554 001406
1647 002556 104400 013174
1648 002562 106237 001613
1649 002566 004737 007554
1650 002572 104400 013201
1651 002576 000412
1652 002600 104202
1653 002602 012705 000002
    
```

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;*****
;*****
;MAKE SURE THE DRIVES IN THE DRIVE TABLE CAN BE TESTED
;I. DESIRED DRIVES CAN NOT BE TESTED
;A. TYPE ERROR MESSAGE
;B. EXAMINE R4
;    1. R4>0 GOTO BEGINX
;    2. R4=0 EXAMINE (42)
;       A. (42)=0 GOTO BEGINX
;       B. (42)>0 GOTO $ENDAD
;II. BOTH DRIVES IN THE TABLE BUT ONLY ONE OF THEM CAN BE TESTED
;A. CLEAR BAD DRIVE FROM THE DRIVE TABLE
;B. TYPE THE DRIVE TO BE TESTED
;C. CONTINUE IN PROGRAM
;III. DESIRED DRIVE(S) CAN BE TESTED
;A. TYPE THE DRIVE(S) TO BE TESTED
;B. CONTINUE IN PROGRAM
;*****
CHKDRV: MOV    #DRVKEY,RO ;PICKUP ADDRESS OF ASCII DRIVE KEY
        JSR    PC,@#EXAM ;GO EXAMINE FIRST DRIVE
        BR     1$ ;OK TO TEST---GO CHECK NEXT
        MOVB  1(RO),(RO) ;REPLACE 1ST WITH 2ND
        BEQ   2$ ;BR IF NO 2ND DRIVE SELECTED
        JSR    PC,@#EXAM ;GO EXAMINE DRIVE
        BR     2$ ;OK TO TEST
        CLR   (RO) ;CLEAR DRIVE CODES
        BR     2$
1$: INC   RO ;POINT TO 2ND
        JSR    PC,@#EXAM ;GO EXAMINE DRIVE
        BR     2$ ;OK TO TEST
        CLRB  (RO) ;CLEAR 2ND
        BR     2$ ;RESET ADDRESS POINTERS
2$: MOV   #DRVKEY,RO
        MOV   RO,@#DRVPNT
        CMPB (RO),1(RO) ;1ST = 2ND?
        BNE  3$ ;BR IF NO
        CLRB 1(RO) ;YES---CLEAR 2ND
        TST  (RO) ;ANY DRIVES?
        BEQ  5$ ;BR IF NO
        MOVB (RO)+,@#PARMBK+1 ;SETUP TO TYPE THIS DRIVE
        TYPE $CRLF ;TYPE "CR" & "LF"
        ASRB @#PARMBK+1 ;ADJUST FOR TYPING
        JSR  PC,@#TPDRV ;GO TYPE DRIVE
        MOVB (RO),@#PARMBK+1 ;GET 2ND
        BEQ  4$ ;BR IF NONE
        TYPE MSG9 ;"AND"
        ASRB @#PARMBK+1 ;ADJUST FOR TYPING
        JSR  PC,@#TPDRV ;GO TYPE THE 2ND DRIVE
        TYPE MSG10 ;"WILL BE TESTED"<CRLF>
        BR   $START
4$: TYPE  MSG10
5$: ERROR 202 ;NO DRIVES AVAILABLE
        MOV  #2,R5 ;DRIVES & ADDRESS
    
```

1654 002606 005704  
1655 002610 001244  
1656 002612 013700 000042  
1657 002616 001641  
1658 002620 000137 004716

TST R4  
BNE BEGINX  
MOV @#42,R0  
BEQ BEGINX  
JMP @#\$ENDAD

:OPERATOR INPUTS?  
:BR IF YES  
:GET MONITOR RETURN ADDRESS  
:NO MONITOR  
:GO TO END

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1672 002624 012700 001114
1673 002630 012701 000005
1674 002634 004737 002760
1675 002640 012700 001206
1676 002644 012701 000014
1677 002650 004737 002760
1678 002654 013701 001256
1679 002660 112100
1680 002662 006200
1681 002664 042700 177776
1682 002670 110037 001613
1683 002674 105711
1684 002676 001002
1685 002700 012701 001252
1686 002704 010137 001256
1687 002710 012737 000011 001236
1688 002716 012737 000017 001234
1689 002724 013737 001260 001224
1690 002732 013737 001262 001226
1691 002740 012737 001274 001270
1692 002746 005037 001272
1693 002752 005037 001266
1694 002756 000404
1695 002760 005020
1696 002762 005301
1697 002764 003375
1698 002766 000207

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////////////////////////////////////
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*****
*****
1. CLEAR THE VARIABLE STORAGE AREA
2. SETUP FOR THE DRIVE THAT IS TO BE TESTED
3. SETUP "LASTFL" AND "LASTBK" INCASE OPERATOR SELECTS "READONLY" PASS
4. SETUP THE MAX. NUMBER OF RETRYS FOR READS AND WRITES
5. SETUP TO START WITH A "FORMAT" PASS
6. CLEAR THE PASS COUNTER
*****
*****
START:  MOV    #SITEMB,RO           ;CLEAR VARIABLE STORAGE AREA
        MOV    #SBODAT-SITEMB/2,R1
        JSR    PC,2#CLEAR           ;CLEAR AREA
        MOV    #SOFTNM,RO
        MOV    #LASTFL-SOFTNM/2,R1
        JSR    PC,2#CLEAR
        MOV    2#DRVPNT,R1         ;GET DRIVE POINTER
        MOVSB  (R1)+,RO           ;SETUP THE DRIVE
        ASR    RO
        BIC    #1CBIT00,RO
        MOVSB  RO,2#PARMBK+1
        TSTB  (R1)
        BNE   2$
        MOV    #DRVKEY,R1
        MOV    R1,2#DRVPNT
        MOV    #9,2#LASTFL
        MOV    #15,2#LASTBK
        MOV    2#MAXROS,2#RDTRYS
        MOV    2#MAXERR,2#WRTRYS
        MOV    #FORPAS,2#PSCNTL
        CLR   2#PSCNTL+2
        CLR   2#PSCNT
        BR    LOOPER
        CLEAR: CLR    (RO)+
              DEC    R1
              BGT   CLEAR
              RTS   PC
        ;END OF DRIVE TABLE?
        ;BR IF NO
        ;RESET DRIVE TABLE POINTER
        ;RESTORE THE DRIVE POINTER
        ;SET "LAST FILE" & "LAST BLOCK" INCASE
        ;OPERATOR SELECTS "READONLY" PASS
        ;SETUP MAX. # OF REREAD TRYS
        ;SETUP MAX. # OF REWRITE TRYS
        ;DO A FORMAT PASS
        ;CLEAR THE PASS COUNT
        ;GET AROUND CLEAR

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- I. CHECK SWR<7>
  - A. SWR<7>=1 PERFORM AS PER SWR<1:0>
    - 1. 00=FORMAT PASS
    - 2. 01=READ ONLY PASS
    - 3. 10=WRITE ONLY PASS
    - 4. 11=READ ONLY PASS
  - B. SWR<7>=0
    - 1. UPDATE PASCNT
    - 2. PERFORM AS PER (PSCNTL+2)
      - A. FORMAT
      - B. READONLY
      - C. WRITEONLY
      - D. READONLY

\*\*\*\*\*

```

LOOPER:  MOVB  @SWR,@STMPD      ;IF SWR<7>=1 ; DO PER SWR<1:0>
          BICB  @C<BIT07!BIT01!BIT00>,@STMPD
          BMI   3$
          CMP   @PASCNT,@PSCNTL ;BR IF SWR<7>=1
          BLT   2$              ;IS THE COUNTER AT MAX.?
          CLR   @PASCNT         ;BR IF NO
          ADD   @2,@PSCNTL      ;RESET THE COUNTER
          INC   @PSCNTL+2       ;MOVE TO THE NEXT PASS TYPE
          CMP   @PSCNTL,@R02PAS+2 ;TIME TO RESET PASS TYPE?
          BNE   1$              ;BR IF NO
          MOV   @FORPAS,@PSCNTL ;YES---RESET THE PASS CONTROL WORDS
          CLR   @PSCNTL+2
          BR    1$              ;GO CHECK THE COUNT
          INC   @PASCNT         ;COUNT THIS PASS
          MOV   @PSCNTL+2,@STMPD ;PICKUP THE TYPE OF PASS TO DO NEXT
          3$:
          CLR   -(SP)
          MOVB  @STMPD,(SP)     ;PICKUP THE DISPATCH INDEX
          ASLB  (SP)           ;POSITION THE INDEX
          ASLB  (SP)           ;BEFORE USING IT
          ADD   (SP)+,PC       ;GO TO THE ROUTINE
          JMP   @FORMAT
          JMP   @READONLY
          JMP   @WRITEONLY
          JMP   @READONLY

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.SBTTL "FORMAT" ROUTINE

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: THIS ROUTINE PERFORMS THE FOLLOWING SEQUENCE

- 1. REWIND TO BOT
- 2. WRITE FILE GAP
- 3. WRITE BLOCK OF DATA
- 4. BACK BLOCK GAP
- 5. READ BLOCK OF DATA
- 6. CHECK FOR SYNC ERROR
- 7. CHECK FOR DATA ERROR
  - A. DATA ERROR OCCURRED
    - 1.) (RDTRYS)<(MAXRDS) GOTO 4.
    - 2.) (RDTRYS)=(MAXRDS)
      - A.) (WRTRYS)<(MAXERR)
        - 1.) BACK BLOCK GAP
        - 2.) GOTO 3.
      - B.) (WRTRYS)=(MAXERR) GOTO SEOP
    - B. NO DATA ERROR --- GOTO B.
- 8. UPDATE THE BLOCK NUMBER
- 9. END OF FILE?
  - A. NO --- GOTO 3.
  - B. YES
    - 1.) UPDATE FILE NUMBER
    - 2.) RESET BLOCK NUMBER TO 0
    - 3.) GOTO 2.

\*\*\*\*\*

1784	003126	012737	003126	001106
1785	003134	104400	013222	
1786	003140	004737	007554	
1787	003144	104400	001203	
1788	003150	012737		
1789	003152	000	377	
1790	003154	001306		
1791	003156	012737		
1792	003160	000	377	
1793	003162	001304		
1794				
1795				
1796				
1797	003164	012700	001612	
1798	003170	004737	006746	
1799	003174	105737	001612	
1800	003200	001775		
1801	003202	100022		
1802	003204	004037	005526	

```

FORMAT: MOV    #FORMAT,2#SLPADR      ;SETUP SCOPE LOOP ADDRESS
          TYPE   MSG11                ;"*** FORMAT ***"
          JSR    PC,2#TPDRV           ;GO TYPE THE DRIVE
          TYPE   $CRLF
          MOV    (PC)+,2(PC)+         ;INITIALIZE THE BLOCK NUMBER
          .BYTE 0,377                ;SET BYTE 0 TO 0 AND BYTE 1
          .WORD BLOCK                ;TO THE 1'S COMP. OF BYTE 0
          MOV    (PC)+,2(PC)+         ;INITIALIZE THE FILE NUMBER
          .BYTE 0,377                ;SET BYTE 0 TO 0 AND BYTE 1
          .WORD FILE                 ;TO THE 1'S COMP. OF BYTE 0

```

////////////////////////////////////  
"REWIND" TO "BOT"  
////////////////////////////////////

```

MOV    #PARMBK,R0                    ;R0=1ST ADDRESS OF PARAMETER BLOCK
JSR    PC,2#REWIND                  ;GO TO REWIND
18:   TSTB   2#PARMBK                ;WAIT ON FLAG
      BEQ    18
      BPL    48                      ;BR IF NO ERROR
      JSR    R0,2#CSRERR             ;GO TO CSR ERROR CHECK

```

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1803 003210 000137 004406          JMP      @#SEOP          ;GO TO END OF PROGRAM
1804                               ;////////////////////////////////////
1805                               ;"WRITE-FILL-GAP"
1806                               ;////////////////////////////////////
1807 003214          2$:
1808 003214 012700 001612          MOV      @PARMBK,RO      ;RO=1ST ADDRESS OF PARAMETER BLOCK
1809 003220 004737 006712          JSR      PC,@#WFG      ;GO TO WFG
1810 003224 105737 001612          3$: TSTB     @#PARMBK      ;WAIT ON FLAG
1811 003230 001775          BEQ      3$
1812 003232 100006          BPL      4$          ;BR IF NO ERROR
1813 003234 004037 005526          JSR      RO,@#CSRERR   ;GO TO CSR ERROR CHECK
1814 003240 000137 004406          JMP      @#SEOP        ;GO TO END OF PROGRAM
1815 003244 000137 004360          JMP      @#CKEOTS
1816                               ;////////////////////////////////////
1817                               ;"WRITE" A BLOCK OF DATA
1818                               ;////////////////////////////////////
1819 003250 012737 003256 001106 4$: MOV      @SS,@#SLPADR   ;SETUP SCOPE LOOP ADDRESS
1820 003256 004737 006062          5$: JSR      PC,@#SETUPW ;GO SETUP FOR A WRITE
1821 003262 012700 001612          MOV      @PARMBK,RO   ;RO=1ST ADDRESS OF PARAMETER BLOCK
1822 003266 004737 006716          JSR      PC,@#WRITE   ;GO TO WRITE
1823 003272 105737 001612          6$: TSTB     @#PARMBK      ;WAIT ON FLAG
1824 003276 001775          BEQ      6$
1825 003300 100006          BPL      7$          ;BR IF NO ERROR
1826 003302 004037 005526          JSR      RO,@#CSRERR   ;GO TO CSR ERROR CHECK
1827 003306 000137 004406          JMP      @#SEOP        ;GO TO END OF PROGRAM
1828 003312 000137 004360          JMP      @#CKEOTS
1829                               ;////////////////////////////////////
1830                               ;"BACK-SPACE-BLOCK-GAP"
1831                               ;////////////////////////////////////
1832 003316          7$:
1833 003316 012700 001612          MOV      @PARMBK,RO   ;RO=1ST ADDRESS OF PARAMETER BLOCK
1834 003322 004737 006732          JSR      PC,@#BSBG    ;GO TO BSBG
1835 003326 105737 001612          8$: TSTB     @#PARMBK      ;WAIT ON FLAG
1836 003332 001775          BEQ      8$
1837 003334 100004          BPL      9$          ;BR IF NO ERROR
1838 003336 004037 005526          JSR      RO,@#CSRERR   ;GO TO CSR ERROR CHECK
1839 003342 000137 004406          JMP      @#SEOP        ;GO TO END OF PROGRAM
1840                               ;////////////////////////////////////
1841                               ;"READ" A BLOCK OF DATA
1842                               ;////////////////////////////////////
1843 003346 004737 006210          9$: JSR      PC,@#SETUPR   ;GO SETUP FOR A READ
1844 003352 012700 001612          MOV      @PARMBK,RO   ;RO=1ST ADDRESS OF PARAMETER BLOCK
1845 003356 004737 006722          JSR      PC,@#READ    ;GO TO READ
1846 003362 105737 001612          10$: TSTB    @#PARMBK      ;WAIT ON FLAG
1847 003366 001775          BEQ      10$
1848 003370 100004          BPL     11$          ;BR IF NO ERROR
1849 003372 004037 005526          JSR      RO,@#CSRERR   ;GO TO CSR ERROR CHECK
1850 003376 000137 004406          JMP      @#SEOP
1851 003402 000004          11$: SCOPE
1852                               ;////////////////////////////////////
1853                               ;CHECK FOR SYNC ERROR
1854                               ;////////////////////////////////////
1855 003404 004737 006244          JSR      PC,@#SYNCK   ;SYNC ERROR?
1856 003410 000403          BR       12$          ;RETURN HERE IF NO
1857 003412 104002          ERROR   2           ;SYNC ERROR
1858 003414 000137 004406          JMP      @#SEOP

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1862 003420 004737 005346
1863 003424 000430
1864 003426 104001
1865 003430 004037 006540
1866 003434 000730
1867 003436 004037 006576
1868 003442 000402
1869 003444 000137 004406
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1873 003450 005337 001226
1874 003454 002414
1875 003456 012700 001612
1876 003462 004737 006732
1877 003466 105737 001612
1878 003472 001775
1879 003474 100265
1880 003476 004037 005526
1881 003502 000137 004406
1882 003506 013737 001260 001224
1883 003514 013737 001262 001226
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1887 003522 062737
1888 003524 001 377
1889 003526 001306
1890 003530 123737 001310 001306
1891 003536 003244
1892 003540 062737
1893 003542 001 377
1894 003544 001304
1895 003546 012737
1896 003550 000 377
1897 003552 001306
1898 003554 000617

: ////////////////////////////////////////////////////////////////////
: CHECK FOR DATA ERROR IF SOFT REREAD
: ////////////////////////////////////////////////////////////////////
12$: JSR PC, @DATCMP ; CHECK THE DATA
BR 15$ ; RETURN HERE IF DATA IS GOOD
ERROR 1 ; DATA ERROR
JSR RO, @CNTSFT ; COUNT SOFT ERROR
BR 7$ ; GO REREAD
JSR RO, @CNTHRD ; COUNT HARD ERROR
BR 13$ ; REWRITE
JMP @SEOP ; TO MANY HARD ERRORS
: ////////////////////////////////////////////////////////////////////
: IF HARD ERROR REWRITE
: ////////////////////////////////////////////////////////////////////
13$: DEC @WRTRYS ; TRY TO REWRITE THIS BLOCK?
BLT 15$ ; BR IF NO
MOV @PARMBK, RO ; RO=1ST ADDRESS OF PARAMETER BLOCK
JSR PC, @BSBG ; GO TO BSBG
14$: TSTB @PARMBK ; WAIT ON FLAG
DEQ 14$
BPL 4$ ; GO START A WRITE IF NO ERROR
JSR RO, @CSRERR ; GO TO CSR ERROR CHECK
JMP @SEOP
15$: MOV @MAXRDS, @RDTRYS ; RESET THE REREAD COUNT
MOV @MAXERR, @WRTRYS ; RESET THE REWRITE COUNT
: ////////////////////////////////////////////////////////////////////
: UPDATE BLOCK # & FILE #
: ////////////////////////////////////////////////////////////////////
ADD (PC)+, @PC+ ; INCREMENT THE BLOCK NUMBER
.BYTE 1, -1
.WORD BLOCK
CMPB @FILESZ, @BLOCK ; TIME FOR A FILE GAP?
BGT 4$ ; BR IF NO--GO START A WRITE
ADD (PC)+, @PC+ ; INCREMENT THE FILE NUMBER
.BYTE 1, -1
.WORD FILE
MOV (PC)+, @PC+ ; INITIALIZE THE BLOCK NUMBER
.BYTE 0, 377 ; SET BYTE 0 TO 0 AND BYTE 1
.WORD BLOCK ; TO THE 1'S COMP. OF BYTE 0
BR 2$ ; GO WRITE FILE GAP

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003556			
003556	012737	003556	001106
003564	104400	013241	
003570	004737	007554	
003574	104400	001203	
003600	012737		
003602	000	377	
003604	001306		
003606	012737		
003610	000	377	
003612	001304		
003614	012700	001612	
003620	004737	006746	
003624	105737	001612	
003630	001775		
003632	100004		
003634	004037	005526	
003640	000137	004406	

////////////////////////////////////  
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.SBTTL "READ ONLY" ROUTINE

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\*\*\*\*\*

: THIS ROUTINE PERFORMS THE FOLLOWING SEQUENCE

1. REWIND TO BOT
2. READ BLOCK OF DATA
3. CHECK FOR SYNC ERROR
4. CHECK FOR DATA ERROR
  - A. DATA ERROR OCCURRED
    - 1.) (RDTRYS)<(MAXRDS)
      - A.) BACK BLOCK GAP
      - B.) GOTO 2.
    - 2.) (RDTRYS)=(MAXRDS)
      - A.) (WRTRYS)<(MAXERR) GOTO 5.
      - B.) (WRTRYS)=(MAXERR) GOTO \$EOP
  - B. NO DATA ERROR --- GOTO 5.
5. UPDATE THE BLOCK NUMBER
6. END OF FILE?
  - A. NO --- GOTO 2.
  - B. YES
    - 1.) UPDATE FILE NUMBER
    - 2.) RESET BLOCK NUMBER TO 0
    - 3.) SPACE FORWARD FILE GAP
    - 4.) GOTO 2.

\*\*\*\*\*

READONLY:

```

MOV      #READONLY, @#$LPADR      ;SETUP SCOPE LOOP ADDRESS
TYPE     MSG12                    ;"*** READ ***"
JSR      PC, @#TPDRV              ;GO TYPE DRIVE TO BE TESTED
TYPE     $CRLF
MOV      (PC)+, @ (PC)+           ;INITIALIZE THE BLOCK NUMBER
.BYTE    0, 377                   ;SET BYTE 0 TO 0 AND BYTE 1
.WORD    BLOCK                    ;TO THE 1'S COMP. OF BYTES 0
MOV      (PC)+, @ (PC)+           ;INITIALIZE THE FILE NUMBER
.BYTE    0, 377                   ;SET BYTE 0 TO 0 AND BYTE 1
.WORD    FILE                      ;TO THE 1'S COMP. OF BYTE 0

```

////////////////////////////////////  
"REWIND" TO "BOT"  
////////////////////////////////////

```

MOV      #PARMBK, RO              ;RO=1ST ADDRESS OF PARAMETER BLOCK
JSR      PC, @#REWIND             ;GO TO REWIND
1$:      TSTB @#PARMBK            ;WAIT ON FLAG
BEQ      1$
BPL      2$                       ;BR IF NO ERROR
JSR      RO, @#CSRERR             ;GO TO CSR ERROR CHECK
JMP      @#$EOP                  ;GO TO END-OF-PROGRAM

```

////////////////////////////////////

```

1955      :          SETUP FOR "READ"
1956      :          ////////////////////////////////////////////////////
1957 003644 004737 006210 2$: JSR    PC,@#SETUPR      ;SETUP FOR "READ"
1958 003650 000417      BR      5$          ;GO START A READ
1959      :          ////////////////////////////////////////////////////
1960      :          "BSBG"--IF SCOPE OR SOFT DATA ERROR
1961      :          ////////////////////////////////////////////////////
1962 003652 012737 003710 001106 3$: MOV    #5$,@#SLPADR      ;SETUP THE SCOPE LOOP ADDRESS
1963 003660 012700 001612      MOV    #PARMBK,RO      ;RO=1ST ADDRESS OF PARAMETER BLOCK
1964 003664 004737 006732      JSR    PC,@#BSBG      ;GO TO BSBG
1965 003670 105737 001612 4$: TSTB   @#PARMBK      ;WAIT ON FLAG
1966 003674 001775      BEQ    4$
1967 003676 100004      BPL    5$          ;GO TRY TO REREAD
1968 003700 004037 005526      JSR    RO,@#CSRERR      ;GO CHECK CSR ERROR
1969 003704 000137 004406      JMP    @#$EOP          ;GO TO END-OF-PROGRAM
1970      :          ////////////////////////////////////////////////////
1971      :          "READ" BLOCK OF DATA
1972      :          ////////////////////////////////////////////////////
1973 003710 012737 003652 001106 5$: MOV    #3$,@#SLPADR      ;SET THE LOOP ADDRESS
1974 003716 012700 001612      MOV    #PARMBK,RO      ;RO=1ST ADDRESS OF PARAMETER BLOCK
1975 003722 004737 006722      JSR    PC,@#READ      ;GO TO READ
1976 003726 105737 001612 6$: TSTB   @#PARMBK      ;WAIT ON FLAG
1977 003732 001775      BEQ    6$
1978 003734 100004      BPL    7$          ;BR IF NO ERROR
1979 003736 004037 005526      JSR    RO,@#CSRERR      ;GO TO CSR ERROR CHECK
1980 003742 000137 004406      JMP    @#$EOP          ;GO TO END-OF-PROGRAM
1981      :          ////////////////////////////////////////////////////
1982      :          CHECK FOR SYNC ERROR
1983      :          ////////////////////////////////////////////////////
1984 003746 004737 006244 7$: JSR    PC,@#SYNCK      ;GO CHECK FOR SYNC ERROR
1985 003752 000403      BR      8$          ;RETURN HERE IF NO ERROR
1986 003754 104002      ERROR  2            ;SYNC ERROR
1987 003756 000137 004406      JMP    @#$EOP          ;GO TO END-OF-PROGRAM
1988      :          ////////////////////////////////////////////////////
1989      :          CHECK FOR DATA ERROR
1990      :          ////////////////////////////////////////////////////
1991 003762 004737 006346 8$: JSR    PC,@#DATCMP      ;GO CHECK THE DATA
1992 003766 000411      BR      9$          ;RETURN HERE IF NO ERROR
1993 003770 104001      ERROR  1            ;DATA ERROR
1994 003772 004037 006540      JSR    RO,@#CNTSFT      ;COUNT SOFT ERROR
1995 003776 000725      BR      3$          ;TRY TO REREAD
1996 004000 004037 006576      JSR    RO,@#CNTHRD      ;COUNT HARD ERROR
1997 004004 000402      BR      9$          ;MOVE TO NEXT BLOCK
1998 004006 000137 004406      JMP    @#$EOP          ;TO MANY HARD ERRORS
1999 004012 000004 9$: SCOPE
2000      :          ////////////////////////////////////////////////////
2001      :          IF LAST FILE OF LAST BLOCK GOTO CKEOTS
2002      :          ////////////////////////////////////////////////////
2003 004014 013737 001260 001224 MOV    @#MAXRDS,@#RDTRYS ;RESET THE REREAD TRYS
2004 004022 123737 001236 001304 CMPB   @#LASTFL,@#FILE   ;LAST FILE
2005 004030 003007      BGT    10$          ;BR IF NO
2006 004032 123737 001234 001306 CMPB   @#LASTBK,@#BLOCK ;LAST BLOCK
2007 004040 003003      BGT    10$          ;BR IF NO
2008 004042 005237 001212      INC    @#EOTS          ;COUNT END-OF-TAPE
2009 004046 000544      BR      CKEOTS        ;CHECK FOR END-OF-PASS
2010      :          ////////////////////////////////////////////////////

```

```

2011                                     ; UPDATE BLOCK # & FILE #
2012                                     ; ////////////////////////////////////////////////////
2013 004050                             10$: ADD      (PC)+,2(PC)+          ; INCREMENT THE BLOCK NUMBER
2014 004050 062737                       .BYTE 1,-1
2015 004052 001 377                       .WORD BLOCK
2016 004054 001306                       CMPB    2#FILESZ,2#BLOCK          ; TIME FOR A FILE GAP?
2017 004056 123737 001310 001306         BGT     2$                      ; BR IF NO
2018 004064 003267                       ADD      (PC)+,2(PC)+          ; INCREMENT THE FILE NUMBER
2019 004066 062737                       .BYTE 1,-1
2020 004070 001 377                       .WORD FILE
2021 004072 001304                       MOV      (PC)+,2(PC)+          ; INITIALIZE THE BLOCK NUMBER
2022 004074 012737                       .BYTE 0,377                   ; SET BYTE 0 TO 0 AND BYTE 1
2023 004076 000 377                       .WORD BLOCK                   ; TO THE 1'S COMP. OF BYTE 0
2024 004100 001306
2025                                     ; ////////////////////////////////////////////////////
2026                                     ; "SPACE-FORWARD-FILE-GAP"
2027                                     ; ////////////////////////////////////////////////////
2028 004102 012700 001612                 MOV      #PARMBK,RO            ; RO=1ST ADDRESS OF PARAMETER BLOCK
2029 004106 004737 006736                 JSR     PC,2#SFFG             ; GO TO SFFG
2030 004112 105737 001612                 11$: TSTB 2#PARMBK           ; WAIT ON FLAG
2031 004116 001775                         BEQ     11$
2032 004120 100251                         BPL     2$                    ; GO READ
2033 004122 004037 005526                 JSR     RO,2#CSRERR           ; GO CHECK CSR ERROR
2034 004126 000137 004406                 JMP     2#$EOP                ; GO TO END-OF-PROGRAM
2035

```



# K04

TA11 DATA RELIABILITY  
DZTAE8.P11

MAINDEC-11-DZTAE-B  
"WRITE ONLY" ROUTINE

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```

2092 004244 000137 004406      JMP      @#SEOP                ;GO TO END-OF-PROGRAM
2093 004250 000137 004360      JMP      @#CKEOTS
2094                               ;////////////////////
2095                               ;"WRITE" A BLOCK OF DATA
2096                               ;////////////////////
2097 004254 004737 006062      4$:    JSR      PC,@#SETUPW      ;GO SETUP FOR "WRITE"
2098 004260 012737 004266 001106  MOV      #5$,@#SLPADR          ;SETUP SCOPE LOOP ADDRESS
2099 004266
2100 004266 012700 001612      5$:    MOV      #PARMBK,RO        ;RO=1ST ADDRESS OF PARAMETER BLOCK
2101 004272 004737 006716      JSR      PC,@#WRITE           ;GO TO WRITE
2102 004276 105737 001612      6$:    TSTB     @#PARMBK        ;WAIT ON FLAG
2103 004302 001775
2104 004304 100006
2105 004306 004037 005526      BPL     7$                    ;BR IF NO ERROR
2106 004312 000137 004406      JSR      RO,@#CSRERR          ;GO TO CSR ERROR CHECK
2107 004316 000137 004360      JMP      @#SEOP                ;GO TO END-OF-PROGRAM
2108 004322 000004      7$:    JMP      @#CKEOTS
2109                               ;////////////////////
2110                               ;UPDATE BLOCK # & FILE #
2111                               ;////////////////////
2112 004324 062737      ADD      (PC)+,@(PC)+          ;INCREMENT THE BLOCK NUMBER
2113 004326 001 377      .BYTE   1,-1
2114 004330 001306      .WORD   BLOCK
2115 004332 123737 001310 001306  CMPB     @#FILESZ,@#BLOCK      ;TIME FOR A FILE GAP?
2116 004340 003345      BGT     4$                    ;BR IF NO
2117 004342 062737      ADD      (PC)+,@(PC)+          ;INCREMENT THE FILE NUMBER
2118 004344 001 377      .BYTE   1,-1
2119 004346 001304      .WORD   FILE
2120 004350 012737      MOV      (PC)+,@(PC)+          ;INITIALIZE THE BLOCK NUMBER
2121 004352 000 377      .BYTE   0,377                 ;SET BYTE 0 TO 0 AND BYTE 1
2122 004354 001306      .WORD   BLOCK                 ;TO THE 1'S COMP. OF BYTE 0
2123 004356 000720      BR      2$                    ;START A FILE GAP

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////////////////////////////////////  
////////////////////////////////////

.SBTTL CHECK "EOTS"

\*\*\*\*\*  
\*\*\*\*\*

WHEN A "FORMAT" OR "WRITEONLY" PASS HITS "EOT" OR A  
"READONLY" PASS READS THE LAST BLOCK OF THE LAST FILE  
THEY WILL COME HERE

- 1. (EOTS) IS CHECKED
  - A. (EOTS)=(MAXEOT) GOTO \$EOP
  - B. (EOTS)<(MAXEOT) GOTO 2
- 2. SWR<8> = 1?
  - A. YES -- GOTO \$EOP
  - B. NO -- GOTO LOOPER

\*\*\*\*\*

004360	000004		
004362	023737	001212	001264
004370	002006		
004372	032777	000400	174540
004400	001002		
004402	000137	002770	

```

CKEOTS: SCOPE
CMP      @#EOTS,@#MAXEOT      ;MAX. EOTS OCCURRED?
BGE      $EOP                  ;BR IF YES
BIT      #SW08,@SWR           ;IF SWR<08> = 1
BNE      $EOP                  ;GOTO END-OF-TEST
JMP      @#LOOPER             ;NO--LOOP

```

.SBTTL END OF PASS ROUTINE

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

\$EOP:

```
SCOPE
CLR $STNM ; ZERO THE TEST NUMBER
INC $PASS ; INCREMENT THE PASS NUMBER
BIC #100000,$PASS ; DON'T ALLOW A NEG. NUMBER
DEC (PC)+ ; LOOP?
$EOPCT: .WORD 1
BGT $DOAGN ; YES
MOV (PC)+,@(PC)+ ; RESTORE COUNTER
$ENDCT: .WORD 1
$EOPCT
TYPE $SENDMG ; TYPE "END PASS"
$GET42: MOV @#42,RO ; GET MONITOR ADDRESS
BEQ $DOAGN ; BRANCH IF NO MONITOR
SCOPE
```

```
////////////////////////////////////
; TYPE END-OF-TEST STATISTICS
////////////////////////////////////
```

```
MOV #PARMBK,RO ; RO=PARAMETER BLOCK ADDRESS
JSR PC,@#REWIND ; START A REWIND
TYPE ,MSG1 ; <CR LF>"*** END-OF-TEST ***"

MSG2 ; <CR LF>"SOFT ERRORS="
MOV @#SOFTNM,-(SP) ; PICKUP SINGLE PRECISION BINARY NUMBER
JSR PC,@#$SB2D ; CHANGE IT TO DECIMAL ASCIZ
JSR PC,@#$SUPRS ; TYPE WITHOUT LEADING ZEROS

MSG3 ; <CR LF>"HARD ERRORS="
MOV @#HARDNM,-(SP) ; PICKUP SINGLE PRECISION BINARY NUMBER
JSR PC,@#$SB2D ; CHANGE IT TO DECIMAL ASCIZ
JSR PC,@#$SUPRS ; TYPE WITHOUT LEADING ZEROS

MSG4 ; <CR LF>"BYTES READ="
MOV @#RB^TTL,-(SP) ; GET ADDRESS OF DOUBLE PRECISION BINARY #
JSR PC,@#$DB2D ; CHANGE IT TO DECIMAL ASCIZ
JSR PC,@#$SUPRS ; TYPE IT WITHOUT LEADING ZERO

MSG5 ; <CR LF>"BYTES WRITTEN="
MOV @#WEYTTL,-(SP) ; GET ADDRESS OF DOUBLE PRECISION BINARY #
JSR PC,@#$DB2D ; CHANGE IT TO DECIMAL ASCIZ
JSR PC,@#$SUPRS ; TYPE IT WITHOUT LEADING ZERO

MSG6 ; <CR LF>"TAPE PASSES="
MOV @#EOTS,-(SP) ; PICKUP SINGLE PRECISION BINARY NUMBER
JSR PC,@#$SB2D ; CHANGE IT TO DECIMAL ASCIZ
JSR PC,@#$SUPRS ; TYPE WITHOUT LEADING ZEROS
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2161 004406  
2162 004406 000004  
2163 004410 005067 174466  
2164 004414 005267 174460  
2165 004420 042767 100000 174452  
2166 004426 005327  
2167 004430 000001  
2168 004432 003135  
2169 004434 012737  
2170 004436 000001  
2171 004440 004430  
2172 004442 104400 004735  
2173 004446 013700 000042  
2174 004452 001525  
2175 004454 000004  
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2179 004456 012700 001612  
2180 004462 004737 006746  
2181 004466 104400 013005  
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2183 004472 104400 013032  
2184 004476 013746 001206  
2185 004502 004737 007356  
2186 004506 004737 007412  
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2188 004512 104400 013050  
2189 004516 013746 001210  
2190 004522 004737 007356  
2191 004526 004737 007412  
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2193 004532 104400 013066  
2194 004536 012746 001214  
2195 004542 004737 007162  
2196 004546 004737 007412  
2197  
2198 004552 104400 013103  
2199 004556 012746 001220  
2200 004562 004737 007162  
2201 004566 004737 007412  
2202  
2203 004572 104400 013123  
2204 004576 013746 001212  
2205 004602 004737 007356  
2206 004606 004737 007412

```

2207
2208 004612 104400 013141 TYPE MSG7 ;<CRLF>"FILES/PASS="
2209 004616 013700 001236 MOV @#LASTFL,RO ;PICKUP THE LAST FILE NUMBER
2210 004622 105200 INCB RO ;ADD 1 TO MAKE IT # OF FILES
2211 004624 010046 MOV RO,-(SP) ;PUT IT ON THE STACK
2212 004626 004737 007356 JSR PC,@#$$SB2D ;CHANGE IT TO DECIMAL ASCIZ
2213 004632 004737 007412 JSR PC,@#$$SUPRS ;TYPE IT WITHOUT LEADING ZEROS
2214
2215 004636 104400 013156 TYPE MSG8 ;<CRLF>"BLOCKS/FILE="
2216 004642 013746 001310 MOV @#FILESZ,-(SP) ;PICKUP SINGLE PRECISION BINARY NUMBER
2217 004646 004737 007356 JSR PC,@#$$SB2D ;CHANGE IT TO DECIMAL ASCIZ
2218 004652 004737 007412 JSR PC,@#$$SUPRS ;TYPE WITHOUT LEADING ZEROS
2219
2220 004656 104400 001204 TYPE ,SLF
2221 ;////////////////////////////////////
2222 ; CHECK HALT AT END-OF-TEST SWITCH
2223 ;////////////////////////////////////
2224 004662 032777 001000 174250 BIT #SW09,@SWR ;HALT AT END-OF-TEST?
2225 004670 001406 BEQ 100$ ;BR IF NO
2226 004672 000000 HALT ;YES
2227
2228 004674 022767 000176 174236 CMP #SWREG,SWR ;USING S/W SWITCH REG?
2229 004702 001001 BNE 20$ ;NO- GET OUT
2230 004704 104404 GTSWR ;GET VALUE
2231 004706 20$: ;CONTINUE
2232 004706 100$:
2233 004706 013700 000042 MOV @#42,RO ;INSURE RO CONTAINS THE MONITORS
2234 004712 001405 BEQ $DOAGN ;RETURN ADDRESS
2235 004714 000005 RESET ;CLEAR THE WORLD
2236 004716 004710 $ENDAD: JSR PC,(RO) ;GO TO MONITOR
2237 004720 000240 NOP ;SAVE ROOM
2238 004722 000240 NOP ;FOR
2239 004724 000240 NOP ;ACT11
2240 004726 $DOAGN:
2241 004726 000137 JMP @PC)+ ;RETURN
2242 004730 002624 $RTNAD: .WORD START
2243 004732 377 377 000 $ENULL: .BYTE -1,-1,0 ;NULL CHARACTER STRING
2244 004735 015 042412 042116 $ENDMG: .ASCIZ <15><12>/END PASS/
2245 004742 050040 051501 000123

```

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2278

.SBTTL SCOPE HANDLER ROUTINE

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

\$SCOPE:  
CKSWR ;;TEST FOR CHANGE IN SOFT-SWR  
15: BIT #BIT14,CKSWR ;;LOOP ON PRESENT TEST?  
BNE \$OVER ;;YES IF SW14=1  
\*\*\*\*\*START OF CODE FOR THE XOR TESTER\*\*\*\*\*  
\$XTSTR: BR B5 ;;IF RUNNING ON THE "XOR" TESTER CHANGE  
;;THIS INSTRUCTION TO A "NOP" (NOP=24D)  
MOV @ERRVEC, -(SP) ;;SAVE THE CONTENTS OF THE ERROR VECTOR  
MOV @SS, @ERRVEC ;;SET FOR TIMEOUT  
TST @177060 ;;TIME OUT ON XOR?  
MOV (SP)+, @ERRVEC ;;RESTORE THE ERROR VECTOR  
BR \$SVLAD ;;GO TO THE NEXT TEST  
55: CMP (SP)+, (SP)+ ;;CLEAR THE STACK AFTER A TIME OUT  
MOV (SP)+, @ERRVEC ;;RESTORE THE ERROR VECTOR  
BR \$OVER ;;LOOP ON THE PRESENT TEST  
65: \*\*\*\*\*END OF CODE FOR THE XOR TESTER\*\*\*\*\*  
\$SVLAD: INCB \$TSTNM ;;COUNT TEST NUMBERS  
MOV (SP), \$LPADR ;;SAVE SCOPE LOOP ADDRESS  
CLRB \$ERFLG ;;ZERO THE ERROR FLAG  
\$OVER: MOV \$TSTNM, @DISPLAY ;;DISPLAY TEST NUMBER  
MOV \$LPADR, (SP) ;;FUDGE RETURN ADDRESS  
RT: ;;FIXES PS

004750  
004750 104405  
004752 032777 040000 174160  
004760 001025  
004762 000416  
004764 013746 000004  
004770 012737 005010 000004  
004776 005737 177060  
005002 012637 000004  
005006 000404  
005010 022626  
005012 012637 000004  
005016 000406  
005020  
005020 105267 174056  
005024 011667 174056  
005030 105067 174047  
005034 016777 174042 174100  
005042 016716 174040  
005046 000002

```

2279 .SBTTL ERROR HANDLER ROUTINE
2280
2281 ::*****
2282 *THIS ROUTINE WILL INCREMENT THE ERROR FLAG AND THE ERROR COUNT,
2283 *SAVE THE ERROR ITEM NUMBER AND THE ADDRESS OF THE ERROR CALL
2284 *AND GO TO TYPERR ON ERROR
2285 *THE SWITCH OPTIONS PROVIDED BY THIS ROUTINE ARE:
2286 *SW15=1 HALT ON ERROR
2287 *SW13=1 INHIBIT ERROR TYPEOUTS
2288 *SW10=1 BELL ON ERROR
2289 *CALL
2290 *
2291 ERROR N ;;ERROR=EMT AND N=ERROR ITEM NUMBER
2292
2293 $ERROR:
2294
2295 005050 104405 174025 7$: CKSWR ;;TEST FOR CHANGE IN SOFT-SWR
2296 005052 105267 174025 7$: INCB $ERFLG ;;SET THE ERROR FLAG
2297 005056 001775 174025 7$: BEQ 7$ ;;DON'T LET THE FLAG GO TO ZERO
2298 005060 016777 174016 174054 7$: MOV $STNM,$DISPLAY ;;DISPLAY TEST NUMBER AND ERROR FLAG
2299 005066 032777 002000 174044 7$: BIT $BIT10,$SWR ;;BELL ON ERROR?
2300 005074 001402 174025 7$: BEQ 1$ ;;NO - SKIP
2301 005076 104400 005174 7$: TYPE $BELL ;;RING BELL
2302 005102 005267 174004 1$: INC $ERTTL ;;COUNT THE NUMBER OF ERRORS
2303 005106 011667 174004 1$: MOV (SP),$ERRPC ;;GET ADDRESS OF ERROR INSTRUCTION
2304 005112 162767 000002 173776 1$: SUB #2,$ERRPC
2305 005120 117767 173772 173766 1$: MOVB $ERRPC,$ITEMB ;;STRIP AND SAVE THE ERROR ITEM CODE
2306 005126 032777 020000 174004 1$: BIT $BIT13,$SWR ;;SKIP TYPEOUT IF SET
2307 005134 001004 174025 1$: BNE 20$ ;;SKIP TYPEOUTS
2308 005136 004767 000036 1$: JSR PC,TYPERR ;;GO TO USER ERROR ROUTINE
2309 005142 104400 001203 1$: TYPE , $CRLF
2310 005146 005777 173766 20$: TST $SWR ;;HALT ON ERROR
2311 005152 100002 173766 2$: BPL 3$ ;;SKIP IF CONTINUE
2312 005154 000000 173766 2$: HALT ;;HALT ON ERROR!
2313 005156 104405 173766 2$: CKSWR ;;TEST FOR CHANGE IN SOFT-SWR
2314 005160 022737 004716 000042 3$: CMP #SENDAD,$#42 ;;ACT-11 AUTO-ACCEPT?
2315 005166 001001 004716 000042 3$: BNE 6$ ;;BRANCH IF NO
2316 005170 000000 004716 000042 3$: HALT ;;YES
2317 005172 000002 000377 6$: RTI ;;RETURN
2318 005174 177607 000377 6$: $BELL: .ASCIZ (<207><377><377>) ;;ASCII CODE FOR BELL
2319

```

```

2320          :*****
2321          :THIS ROUTINE WILL TYPEOUT THE ERROR MESSAGES
2322 005200 104400 001203  TYPERR: TYPE      $CRLF          ;TYPE "CR" & "LF"
2323          MOV      R0,-(SP)          ;SAVE R0
2324 005206 010146          MOV      R1,-(SP)          ;SAVE R1
2325 005210 005046          CLR      -(SP)          ;PICKUP THE ITEM BYTE
2326 005212 113716 001114  MOVB    @#SITEMB,(SP)
2327 005216 005316          DEC      (SP)          ;ADJUST THE INDEX SO IT
2328 005220 006316          ASL      (SP)          ;WILL WORK FOR THE
2329 005222 006316          ASL      (SP)          ;ERROR TABLE
2330 005224 006316          ASL      (SP)
2331 005226 116601 000001  MOVB    1(SP),R1          ;GET THE ERROR TYPE
2332 005232 112600          MOVB    (SP)+,R0          ;GET THE ERROR NUMBER
2333 005234 066100 005242  ADD     1$ (R1),R0          ;FORM THE TABLE POINTER
2334 005240 000403          BR      2$
2335 005242 001622          1$: ITEMS0
2336 005244 001642          ITEMS1
2337 005246 001732          ITEMS2
2338
2339 005250 012067 000002  2$: MOV     (R0)+,3$          ;PICKUP "ERROR MESSAGE" POINTER
2340 005254 104400          TYPE    ;TYPE "ERROR MESSAGE"
2341 005256 000000          3$: 0
2342 005260 104400 001203  TYPE    $CRLF          ;TYPE "CR" & "LF"
2343 005264 012067 000002  MOV     (R0)+,4$          ;PICKUP "DATA HEADER" POINTER
2344 005270 104400          TYPE    ;TYPE "DATA HEADER"
2345 005272 000000          4$: 0
2346 005274 104400 001203  TYPE    $CRLF          ;TYPE "CR" & "LF"
2347 005300 060107          ADD     R1,PC          ;GO TYPE THE DATA
2348 005302 000402          BR      ERROR0
2349 005304 000430          BR      ERROR1
2350 005306 000473          BR      ERROR2
2351
2352          :////////////////////
2353 005310 010246  ERROR0: MOV     R2,-(SP)          ;SAVE R2
2354 005312 012001          MOV     (R0)+,R1          ;PICKUP THE "DATA POINTER"
2355 005314 012002          MOV     (R0)+,R2          ;PICKUP "FORMAT" POINTER
2356 005316 000402          BR      2$
2357 005320 104400 013277  1$: TYPE    MSG14          ;" "
2358 005324 012100          2$: MOV     (R1)+,R0          ;GET ADDRESS OF DATA WORD
2359 005326 001473          BEQ     EREXT1          ;GO TO EXIT IF 0
2360 005330 105722          TSTB   (R2)+          ;TYPE DECIMAL OR OCTAL?
2361 005332 001003          BNE    3$          ;BR IF DECIMAL
2362 005334 011046          MOV     (R0),-(SP)      ;;SAVE (R0) FOR TYPEOUT
2363 005336 104401          TYPOC          ;;GO TYPE--OCTAL ASCII(ALL DIGITS)
2364 005340 000767          BR      1$          ;GO GET NEXT DATA WORD
2365 005342 010046          3$: MOV     R0,-(SP)
2366 005344 004737 007162  JSR     PC,@#SDB2D          ;CHANGE NUMBER TO ASCIZ
2367 005350 062716 000004  ADD     #4,(SP)          ;TYPE 6 DIGITS
2368 005354 012667 000002  MOV     (SP)+,4$
2369 005360 104400          TYPE    ;CALL TYPE ASCII MESSAGE ROUTINE
2370 005362 000000          4$: .WORD 0          ;ADDRESS OF ASCII STRING
2371 005364 000755          BR      1$          ;GO GET NEXT DATA WORD

```

E05

TAII DATA RELIABILITY  
DZTAE8.P11

MAINDEC-11-DZTAE-B  
ERROR TYPEOUT ROUTINE

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```

2372
2373 005366 011001
2374 005370 013146
2375
2376 005372 104401
2377 005374 012767 000003 000006
2378
2379 005402 104400 013277
2380 005406 005327
2381 005410 000000
2382 005412 001412
2383 005414 012146
2384 005416 004737 007162
2385 005422 062716 000004
2386 005426 012667 000002
2387 005432 104400
2388 005434 000000
2389 005436 000761
2390 005440 013101
2391 005442 016167 005456 000002
2392 005450 104400
2393 005452 000000
2394 005454 000421
2395
2396
2397 005456 012043
2398 005460 012062
2399 005462 012070
2400 005464 012075
2401 005466 012121
2402 005470 012144
2403 005472 012167
2404 005474 012211
2405
2406
2407 005476 011000
2408 005500 005710
2409 005502 001406
2410 005504 013046
2411 005506 104401
2412 005510 104400 013277
2413 005514 000771
2414
2415
2416 005516 012602
2417 005520 012601
2418 005522 012600
2419 005524 000207
2420
2421

```

```

////////////////////////////////////
ERROR1: MOV (R0),R1 ;PICKUP THE "DATA POINTER"
MOV @ (R1)+,-(SP) ;;SAVE @ (R1)+ FOR TYPEOUT
;;SERRPC
TYPOC ;;GO TYPE--OCTAL ASCII(ALL DIGITS)
MOV #3,2$ ;PRINT 2 SPACES 3 TIMES
;AND 2 DECIMAL #'S 2 TIMES
1$: TYPE MSG14
DEC (PC)+ ;TYPE ANOTHER # ?
2$: .WORD 0
BEQ 4$ ;BR IF NO
MOV (R1)+,-(SP) ;YES---PICKUP ADDRESS OF #
JSR PC,@#0B2D ;GO CHANGE TO DECIMAL ASCIZ
ADD #4,(SP) ;ONLY TYPE THE LAST 6 DIGITS
MOV (SP)+,3$ ;SAVE ADDRESS OF ASCIZ STRING
TYPE ;CALL THE TYPE ROUTINE
3$: .WORD 0 ;POINTER GOES HERE
BR 1$ ;LOOP
4$: MOV @ (R1)+,R1 ;PICKUP FUNCTION INDEX
MOV BADFUN(R1),5$ ;GET THE FUNCTION MESSAGE
TYPE ;AND TYPE IT
5$: .WORD 0 ;MESSAGE POINTER GOES HERE
BR EREXT2 ;GO TO EXIT
;THIS TABLE CONTAINS THE POINTERS TO THE DIFFERENT ASCIZ MESSAGES
;FOR THE FUNCTION BEING PERFORMED WHEN THE ERROR OCCURRED.
BADFUN: MXWFG ;WRITE-FILE-GAP
MXWRIT ;WRITE
MXREAD ;READ
MXBSFG ;BACK-SPACE-FILE-GAP
MXBSBG ;BACK-SPACE-BLK-GAP
MXSFFG ;SPACE-FWD-FILE-GAP
MXSFBG ;SPACE-FWD-BLK-GAP
MXRWIND ;REWIND
////////////////////////////////////
ERROR2: MOV (R0),R0 ;PICKUP THE DATA POINTER
1$: TST (R0) ;ALL DATA TYPED?
BEQ EREXT2 ;BR IF YES
MOV @ (R0)+,-(SP) ;;SAVE @ (R0)+ FOR TYPEOUT
TYPOC ;;GO TYPE--OCTAL ASCII(ALL DIGITS)
TYPE MSG14
BR 1$ ;LOOP
////////////////////////////////////
EREXT1: MOV (SP)+,R2 ;R:STORE R2
EREXT2: MOV (SP)+,R1 ;R:STORE R1
MOV (SP)+,R0 ;R:STORE R0
RTS PC ;RETURN

```

```

2422          :////////////////////////
2423          :////////////////////////
2424          .SBTTL          DETERMINE CONTROL AND STATUS ERROR
2425
2426 005526 113737 001304 001162 CSRERR: MOVB  @#FILE,@#$REG0      ;GET THE FILE NUMBER
2427 005534 113737 001306 001166        MOVB  @#BLOCK,@#$REG2    ;GET THE BLOCK NUMBER
2428 005542 013746 007160                MOV   @#FUNLOC,-(SP)    ;GET THE LAST FUNCTION
2429 005546 042716 177761                BIC   @#CFUNCTION,(SP) ;CLEAR AWAY THE JUNK
2430 005552 011637 001172                MOV   (SP),@#STMP0     ;SAVE THE FUNCTION CODE
2431 005556 113766 001612 000001        MOVB  @#PARMBK,1(SP)   ;COMBINE THE ST/ER WITH
2432 005564 012601                MOV   (SP)+,R1        ;THE FUNCTION
2433 005566 005046                CLR   -(SP)          ;FIND OUT WHAT CAUSED THE ERROR
2434 005570 032701 001000                BIT   @#OFFLINE,R1    ;OFF LINE?
2435 005574 001025                BNE   6$             ;BR IF YES
2436 005576 032701 010000                BIT   @#WRTLOCK,R1   ;WRITE LOCK?
2437 005602 001021                BNE   5$             ;BR IF YES
2438 005604 032701 020000                BIT   @#LEADER,R1    ;BOT/EOT?
2439 005610 001015                BNE   4$             ;BR IF YES
2440 005612 032701 004000                BIT   @#FGAP,R1      ;FILE GAP?
2441 005616 001011                BNE   3$             ;BR IF YES
2442 005620 032701 002000                BIT   @#TIMERR,R1    ;TIMING?
2443 005624 001005                BNE   2$             ;BR IF YES
2444 005626 032701 040000                BIT   @#CRCERR,R1    ;BLOCK CHECK?
2445 005632 001001                BNE   1$             ;BR IF YES
2446 005634 005216                INC   (SP)           ; 6 = UNKNOWN
2447 005636 005216          1$: INC   (SP)           ; 5 = CRCERR
2448 005640 005216          2$: INC   (SP)           ; 4 = TIMERR
2449 005642 005216          3$: INC   (SP)           ; 3 = FGAP
2450 005644 005216          4$: INC   (SP)           ; 2 = LEADER
2451 005646 005216          5$: INC   (SP)           ; 1 = WRTLOCK
2452 005650                6$:
2453 005650 106316                ASLB  (SP)           ;POSITION INDEX
2454 005652 062607                ADD   (SP)+,PC       ;BR TO THE ROUTINE
2455 005654 000406                BR    OL.ERR
2456 005656 000407                BR    WL.ERR
2457 005660 000410                BR    CL.ERR
2458 005662 000462                BR    FG.ERR
2459 005664 000463                BR    TM.ERR
2460 005666 000464                BR    BC.ERR
2461 005670 000472                BR    X.ERR
2462
2463 005672 104101          OL.ERR: ERROR 101      ;DRIVE IS OFFLINE
2464 005674 000200                RTS   RO
2465
2466 005676 104102          WL.ERR: ERROR 102      ;DRIVE IS WRITE LOCK
2467 005700 000200                RTS   RO
2468

```





```

2566 006164 012022      MOV      (R0)+,(R2)+          ;INTO THE BUFFER AREA.
2567 006166 012022      MOV      (R0)+,(R2)+
2568 006170 012022      MOV      (R0)+,(R2)+
2569 006172 005301      DEC      R1
2570 006174 001371      BNE     1$
2571 006176 012603      MOV      (SP)+,R3          ;;POP STACK INTO R3
2572 006200 012602      MOV      (SP)+,R2          ;;POP STACK INTO R2
2573 006202 012601      MOV      (SP)+,R1          ;;POP STACK INTO R1
2574 006204 012600      MOV      (SP)+,R0          ;;POP STACK INTO R0
2575 006206 000207      RTS      PC
2576
2577      ;;*****
2578      ;;*****
2579      .SBTTL          ROUTINE TO SETUP FOR A READ
2580
2581      ;THIS ROUTINE WILL SETUP THE BYTE COUNT AND ADD THE SIZE OF THIS
2582      ;BLOCK TO THE TOTAL NUMBER OF BYTES READ.
2583
2584      ;CALL
2585      ;      JSR      PC,SETUPR
2586
2587
2588 006210 013700 001306      SETUPR: MOV      2*BLOCK,R0          ;GET THE BLOCK NUMBER
2589 006214 042700 177760      BIC      #1C15.,R0          ;KEEP MAX PATTERN
2590 006220 006300          ASL      R0                  ;X2
2591 006222 066037 001312 001214      ADD      BLKSZ(R0),2*RBYTTL    ;ADD THE BLOCK SIZE TO THE TOTAL
2592 006230 005537 001216          ADC      2*RBYTTL+2          ;NUMBER OF BYTES READ
2593 006234 016037 001312 001620      MOV      BLKSZ(R0),2*PARMBK+6 ;SET THE BYTE COUNT
2594 006242 000207          RTS      PC                  ;RETURN
2595
2596      ;;*****
2597      .SBTTL          ROUTINE TO CHECK FOR SYNC PROBLEMS
2598
2599      ;THIS ROUTINE CHECKS THE FIRST FOUR BYTES OF THE DATA
2600      ;BUFFER TO INSURE THE PROPER BLOCK WAS READ
2601      ;BYTE 1 = FILE NUMBER
2602      ;BYTE 2 = FILE NUMBER COMPLEMENT
2603      ;BYTE 3 = BLOCK NUMBER
2604      ;BYTE 4 = BLOCK NUMBER COMPLEMENT
2605
2606      ;CALL
2607      ;      JSR      PC,2*SYNCK
2608      ;      NORMAL RETURN
2609      ;      ERROR RETURN
2610
2611
2612
2613 006244 012700 013440      SYNCK:  MOV      #BUFFER,R0          ;ADDRESS OF FIRST WORD
2614 006250 011001          MOV      (R0),R1          ;CHECK FILE # WAS READ OK
2615 006252 000301          SWAB    R1                ;BYTE 1 SHOULD BE THE
2616 006254 062001          ADD      (R0)+,R1          ;COMPLEMENT OF BYTE 0
2617 006256 005101          COM     R1
2618 006260 001031          BNE     2$                ;BR IF FILE NUMBER READ WRONG
2619 006262 011001          MOV      (R0),R1          ;CHECK BLOCK # WAS READ OK
2620 006264 000301          SWAB    R1                ;BYTE 3 SHOULD BE THE
2621 006266 062001          ADD      (R0)+,R1          ;COMPLEMENT OF BYTE 2

```



# K05

TA11 DATA RELIABILITY  
DZTAEB.P11

MAINDEC-11-DZTAE-B  
ROUTINE TO CHECK THE READ DATA

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```
2678 006524 105737 001612 5$: TSTB 2#PARMBK ;DATA IS GOOD BUT WHAT ABOUT
2679 ;THE ERROR FLAG
2680 006530 100002 BPL 6$ ;BR IF ERROR FLAG=0
2681 006532 062716 000004 ADD #4,(SP) ;SETUP TO TAKE ERROR2 EXIT
2682 006536 000207 6$: RTS PC ;RETURN
2683
2684 ;*****
2685
2686 .SBTTL COUNT SOFT DATA ERROR
2687
2688 ;CALL
2689 JSR RD,2#CNTSFT
2690 RETURN FOR SOFT RETRY
2691 RETURN FOR HARD
2692
2693 CNTSFT: INC 2#SOFTNM ;COUNT THIS SOFT ERROR
2694 DEC 2#RDTRYS ;REREAD THE RECORD?
2695 BGE 1$ ;BR IF YES
2696 MOV 2#MAXRDS,2#RDTRYS ;RESET REREAD COUNT
2697 SUB 2#MAXRDS,2#SOFTNM ;DON'T COUNT AS SOFT
2698 DEC 2#SOFTNM
2699 TST (RD)+ ;STEP OVER THE REREAD RETURN
2700 1$: RTS RD ;RETURN
2701 ;*****
2702
2703 .SBTTL COUNT HARD ERROR
2704
2705 ;CAL
2706 JSR RD,2#CNTHRD
2707 RETURN MORE ERRORS ALLOWED
2708 RETURN MAX. ERRORS HAVE OCCURRED
2709
2710 CNTHRD: INC 2#HARDNM ;COUNT THIS HARD ERROR
2711 CMP 2#HARDNM,2#MAXERR ;MAX. HARD ERRORS OCCURRED
2712 BLT 1$ ;BR IF NO
2713 TST (RD)+ ;TAKE FATAL EXIT
2714 1$: RTS RD ;RETURN
```

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006616  
006616 010046  
006620 010146  
006622 010246  
006624 010346  
006626 010446  
006630 010546  
006632 016646 000022  
006636 016646 000022  
006642 016646 000022  
006646 016646 000022  
006652 000002  
  
  
  
  
  
006654  
006654 012666 000022  
006660 012666 000022  
006664 012666 000022  
006670 012666 000022  
006674 012605  
006676 012604  
006700 012603  
006702 012602  
006704 012601  
006706 012600  
006710 000002

```
;;*****  
.SBTTL SAVE AND RESTORE R0-R5 ROUTINES  
;;*****  
;*SAVE R0-R5  
;*CALL:  
* SAVREG  
;*UPON RETURN FROM $$SAVREG THE STACK WILL LOOK LIKE:  
*  
*TOP---(+16)  
* +2---(+18)  
* +4---R5  
* +6---R4  
* +8---R3  
*+10---R2  
*+12---R1  
*+14---R0  
  
$$SAVREG:  
MOV R0,-(SP) ;; PUSH R0 ON STACK  
MOV R1,-(SP) ;; PUSH R1 ON STACK  
MOV R2,-(SP) ;; PUSH R2 ON STACK  
MOV R3,-(SP) ;; PUSH R3 ON STACK  
MOV R4,-(SP) ;; PUSH R4 ON STACK  
MOV R5,-(SP) ;; PUSH R5 ON STACK  
MOV 22(SP),-(SP) ;; SAVE PS OF MAIN FLOW  
MOV 22(SP),-(SP) ;; SAVE PC OF MAIN FLOW  
MOV 22(SP),-(SP) ;; SAVE PS OF CALL  
MOV 22(SP),-(SP) ;; SAVE PC OF CALL  
RTI  
  
;*RESTORE R0-R5  
;*CALL:  
* RESREG  
$$RESREG:  
MOV (SP)+,22(SP) ;; RESTORE PC OF CALL  
MOV (SP)+,22(SP) ;; RESTORE PS OF CALL  
MOV (SP)+,22(SP) ;; RESTORE PC OF MAIN FLOW  
MOV (SP)+,22(SP) ;; RESTORE PS OF MAIN FLOW  
MOV (SP)+,R5 ;; POP STACK INTO R5  
MOV (SP)+,R4 ;; POP STACK INTO R4  
MOV (SP)+,R3 ;; POP STACK INTO R3  
MOV (SP)+,R2 ;; POP STACK INTO R2  
MOV (SP)+,R1 ;; POP STACK INTO R1  
MOV (SP)+,R0 ;; POP STACK INTO R0  
RTI
```

```

2764 ;*****
2765
2766 .SBTTL          CASSETTE PRIMITIVES ROUTINE
2767
2768 ;CALLED VIA     JSR  PC,(FUNCTION)
2769 ;WITH RD POINTING TO:
2770
2771 .BYTE          0
2772 .BYTE          DRIVE # (0=A,1=B)
2773 .WORD          POINTER TO STATUS/ERROR BYTE
2774 .WORD          BUFFER ADDRESS
2775 .WORD          BYTE COUNT
2776
2777 WFG:           MOV      PC,-(SP)          ; WRITE A FILE GAP
2778 FUNTAB:       BR       IOCOM
2779 WRITE:        MOV      PC,-(SP)          ; WRITE A BLOCK OF DATA
2780              BR       IOCOM
2781 READ:         MOV      PC,-(SP)          ; READ A BLOCK OF DATA
2782              BR       IOCOM
2783 BSFG:         MOV      PC,-(SP)          ; BACK SPACE A FILE GAP
2784              BR       IOCOM
2785 BSBG:         MOV      PC,-(SP)          ; BACK SPACE A BLOCK GAP
2786              BR       IOCOM
2787 SFFG:         MOV      PC,-(SP)          ; SPACE FORWARD A FILE GAP
2788              BR       IOCOM
2789 SFBG:         MOV      PC,-(SP)          ; SPACE FORWARD A BLOCK GAP
2790              BR       IOCOM
2791 REWIND:       MOV      PC,-(SP)          ; REWIND TO BEGINNING OF TAPE
2792 IOCOM:        SUB      #FUNTAB,(SP)     ; PC ON STACK IS USED TO DETERMINE
2793              ASR      (SP)             ; FUNCTION
2794              BIT      #40,@TACSL       ; READY BIT UP?
2795              BEQ      CHKRDY           ; WAIT ON IT
2796              MOV      (SP)+,FUNLOC     ; PUT FUNC. IN BITS 1-3 OF FUNLOC
2797              MOV      R1,-(SP)
2798              MOV      R0,-(SP)
2799              MOV      #CASPAR,R1      ;PT. TO INT. HANDLER PARAM. BLK.
2800              MOV      2(R0),(R1)     ;PTR. TO ST/ERR WD. INTO P.BLK.
2801              CLRB   @R1+             ;ZERO ST/ERR B'ITE
2802              INC    R0
2803 CHANOK:      BISB   (R0)+,FUNLOC+1    ;COPY CHAN. NUM. TO FUNC. WORD
2804              TST   (R0)+
2805              MOV   (R0)+,2(R1)       ;BUFF. ADR.
2806              MOV   (R0),(R1)+       ;BYTE COUNT
2807              TST   (R1)+
2808              BISB   #101,(R1)        ;ADD INT. ENABLE AND GO BITS
2809              ;TO THE FUNCTION
2810 DOFUN:       MOV   (R1),@TACSL       ;START THE FUNCTION
2811              MOV   (SP)+,R0
2812              MOV   (SP)+,R1
2813              RTS    PC

```

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2814                                     ;*****
2815                                     ;
2816                                     ;.SBTTL          CASSETTE INTERRUPT HANDLER
2817                                     ;
2818                                     ;
2819 007046                               ;CASINT:
2820 007046 010146                       MOV     R1,-(SP)          ;;PUSH R1 ON STACK
2821 007050 010246                       MOV     R2,-(SP)          ;;PUSH R2 ON STACK
2822 007052 016702 172162                 MOV     TACSL,R2
2823 007056 012701 007154                 MOV     #CBCNT,R1      ;PARAM. BLOCK
2824 007062 105712                       TSTB   (R2)             ;TRANSFER REQUEST?
2825 007064 100411                       BMI    TREQ             ;YES
2826 007066 011204                       MOV     (R2),R4
2827 007070 000304                       SWAB   R4
2828 007072 052704 000001                 BIS    #1,R4           ;SET THE DONE BIT
2829 007076 110451                       MOVB   R4,@-(R1)       ;LOAD ST/ERR BYTE
2830 007100 105012                       CLRB   (R2)            ;TURN OFF INTERS.
2831 007102 012602                       MOV     (SP)+,R2       ;;POP STACK INTO R2
2832 007104 012601                       MOV     (SP)+,R1       ;;POP STACK INTO R1
2833 007106 000002                       RTI
2834
2835 007110 005321                       ;TREQ:  DEC    (R1)+
2836 007112 100412                       BMI    RWILBS          ;WHEN COUNT NEG., DONE
2837 007114 032712 000004                 BIT    #4,(R2)        ;CHECK READ OR WRITE FUNC.
2838 007120 001003                       BNE    READR
2839 007122 113177 172114                 MOVB   @-(R1)+,@TADBL ;WRITE BYTE
2840 007126 000402                       BR     RWDONE
2841 007130 117731 172106                 READR: MOVB   @TADBL,@(R1)+ ;READ BYTE
2842 007134 005241                       RWDONE: INC    -(R1)   ;BU"UP  ADDR.
2843 007136 000402                       BR     BACK           ;GET BACK
2844
2845 007140 052712 000020                 ;RWILBS: BIS    #20,(R2) ;INIT. LAST BYTE SEQ.
2846 007144
2847 007144 012602                       BACK:  MOV     (SP)+,R2  ;;POP STACK INTO R2
2848 007146 012601                       MOV     (SP)+,R1      ;;POP STACK INTO R1
2849 007150 000002                       RTI
2850
2851                                     ;
2852                                     ; CASSETTE INTER. HANDLER PARAM. BLOCK
2853                                     ;
2854 007152 000000                 CASPAR: .WORD 0 ;STATUS/ERROR POINTER
2855 007154 000000                 CBCNT:  .WORD 0 ;WORKING BYTE COUNT
2856 007156 000000                 .WORD 0 ;WORKING BUFFER ADDRESS
2857 007160 000000                 FUNLOC: .WORD 0 ;FUNC. WORD BUILT HERE
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2859

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*****
.SBTL  DOUBLE LENGTH BINARY TO DECIMAL ASCII CONVERT ROUTINE
*****
*THIS ROUTINE WILL CONVERT A 32-BIT BINARY NUMBER TO AN UNSIGNED
*DECIMAL (ASCII) NUMBER. THE SIGN OF THE BINARY NUMBER MUST BE
*POSITIVE.
*CALL
*   MOV      #PNTR, -(SP)      ;; POINTER TO LOW WORD OF BINARY NUMBER
*   JSR      PC, @SDB2D      ;; THE FIRST ADDRESS OF ASCII
*   RETURN   ;; IS ON THE STACK

SDB2D:  SAVREG      ;; SAVE REGISTERS
        MOV      2(SP), R2    ;; PICKUP THE DATA POINTER
        MOV      #SDECVL, R0  ;; GET ADDRESS OF "SDECVL" STRING
        MOV      R0, 2(SP)    ;; PUT ADDRESS OF ASCII STRING ON STACK
        MOV      (R2)+, R1    ;; PICKUP THE BINARY NUMBER
        MOV      (R2)+, R2
        MOV      #10, R4     ;; SET UP TO DO 10 CONVERSIONS
        MOV      #STNPNR, R4  ;; ADDRESS OF TEN POWER
        MOV      #STNPNR+2, R5
        CLR      R3          ;; CLEAR PARTIAL
        SUB      (R4), R1    ;; SUBTRACT TEN POWER
        SBC      R2
        SUB      (R5), R2
        BLT      3$         ;; BR IF TEN POWER TOO LARGE
        INC      R3          ;; ADD 1 TO PARTIAL
        BR      2$         ;; LOOP
        ADD      (R4)+, R1   ;; RESTORE SUBTRACTED VALUE
        ADC      R2
        ADD      (R4)+, R2
        CMP      (R5)+, (R5)+ ;; MOVE TO NEXT TEN POWER
        BIS      #0, R3      ;; CHANGE PARTIAL TO ASCII
        MOV      R3, (R0)+   ;; SAVE IT
        DEC      (PC)+      ;; DONE?
        .WORD   0
        BNE     1$         ;; BR IF NO
        CLRB    (R0)+      ;; TERMINATOR
        RESREG  ;; RESTORE REGISTERS
        RTS     PC         ;; RETURN
STNPNR: 145000      ;; 1.0E09
        35632
        160400      ;; 1.0E08
        2765
        113200      ;; 1.0E07
        230
        041100      ;; 1.0E06
        17
        103240      ;; 1.0E05
        1
        23420       ;; 1.0E04
        0
        1750       ;; 1.0E03
        0

```

007162 104411  
007164 016602 000002  
007170 012700 007342  
007174 010066 000002  
007200 012201  
007202 012202  
007204 012767 000012 000046  
007212 012704 007272  
007216 012705 007274  
007222 005003  
007224 161401  
007226 005602  
007230 161502  
007232 002402  
007234 005203  
007236 000772  
007240 062401  
007242 005502  
007244 062402  
007246 022525  
007250 052703 000060  
007254 110320  
007256 005327  
007260 000000  
007262 001357  
007264 105020  
007266 104412  
007270 000207  
007272 145000  
007274 035632  
007276 160400  
007300 002765  
007302 113200  
007304 000230  
007306 041100  
007310 000017  
007312 103240  
007314 000001  
007316 023420  
007320 000000  
007322 001750  
007324 000000

2916 007326 000144  
2917 007330 000000  
2918 007332 000012  
2919 007334 000000  
2920 007336 000001  
2921 007340 000000  
2922 007342 000014  
2934 007356 016667 000002 000022  
2935 007364 012746 007406  
2936 007370 004737 007162  
2937 007374 062716 000005  
2938 007400 012666 000002  
2939 007404 000207  
2940 007406 000000 000000  
2951 007412 010046  
2952 007414 016600 000004  
2953 007420 105710  
2954 007422 001403  
2955 007424 122720 000060  
2956 007430 001773  
2957 007432 005300  
2958 007434 010067 000002  
2959 007440 104400  
2960 007442 000000  
2961 007444 012600  
2962 007446 012616  
2963 007450 000207  
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144      ;:1.0E02
0
12      ;:1.0E01
0
1      ;:1.0E00
0
$DECVL: .BLKB 12.      ;:RESERVE STORAGE FOR ASCIZ STRING
.SBTTL SINGLE LENGTH BINARY TO DECIMAL ASCII ROUTINE

;*****
;THIS ROUTINE WILL CONVERT A 16-BIT UNSIGNED BINARY NUMBER TO AN
;UNSIGNED DECIMAL ASCII NUMBER.
;CALL
;*      MOV      NUMBER, -(SP)      ;:PUT BINARY NUMBER ON THE STACK
;*      JSR      PC, @#$S82D      ;:CALL
;*      RETURN     ;:ADDRESS OF THE 1ST ASCII CHAR. IS ON THE STACK

$S82D:  MOV      2(SP), 1$      ;:SAVE BINARY NUMBER
        MOV      @1$, -(SP)      ;:SET POINTER
        JSR      PC, @#$S82D      ;:CALL DOUBLE LENGTH CONVERT
        ADD      @5, (SP)      ;:ONLY ALLOW FIVE CHARACTERS
        MOV      (SP)+, 2(SP)      ;:PICKUP POINTER
        RTS      PC      ;:RETURN
1$:      .WORD    0, 0
.SBTTL TYPE NUMERICAL ASCII STRING SUPPRESS LEADING ZEROS

;*****
;THIS ROUTINE IS USED TO TYPE AN ASCII NUMBER SUPPRESSING THE
;LEADING NUMBERS.
;CALL
;*      MOV      @NUMADR, -(SP)      ;:FIRST ADDRESS OF ASCII STRING
;*      JSR      PC, @#$SUPRS

$SUPRS: MOV      R0, -(SP)      ;:SAVE R0
        MOV      4(SP), R0      ;:PICKUP THE POINTER
1$:      TSTB     (R0)      ;:TERMINATECR?
        BEQ      2$      ;:BR IF YES
        CMPB     #'0, (R0)+      ;:IS THIS AN ASCII "0" ?
        BEQ      1$      ;:BR IF YES
2$:      DEC      R0      ;:BACKUP BY "1"
        MOV      R0, 3$      ;:SAVE FOR TYPING
        TYPE     ;:GO TYPE
3$:      .WORD    0      ;:ASCII POINTER GOES HERE
        MOV      (SP)+, R0      ;:RESTORE R0
        MOV      (SP)+, (SP)      ;:RESTORE THE STACK
        RTS      PC      ;:RETURN
.SBTTL READ AN OCTAL NUMBER FROM THE TTY

;*****
;THIS ROUTINE WILL READ AN OCTAL (ASCII) NUMBER FROM THE TTY AND
;CHANGE IT TO BINARY.
;CALL:
;*      RDOCT     ;:READ AN OCTAL NUMBER
;*      RETURN    HERE      ;:LOW ORDER BITS ARE ON TOP OF THE STACK
```

```

2972          ;*          ;;HIGH ORDER BITS ARE IN $HIOCT
2973
2974 007452 011646          $RDOCT: MOV      (SP),-(SP)          ;; PROVIDE SPACE FOR THE
2975 007454 016666 000004 000202  MOV      4(SP),2(SP)      ;; INPUT NUMBER
2976 007462 010046          MOV      R0,-(SP)          ;; PUSH R0 ON STACK
2977 007464 010146          MOV      R1,-(SP)          ;; PUSH R1 ON STACK
2978 007466 010246          MOV      R2,-(SP)          ;; PUSH R2 ON STACK
2979 007470 104407          1$:  RDLIN          ;; READ AN ASCII LINE
2980 007472 012600          MOV      (SP)+,R0          ;; GET ADDRESS OF 1ST CHARACTER
2981 007474 005001          CLR      R1          ;; CLEAR DATA WORD
2982 007476 005002          CLR      R2
2983 007500 112046          2$:  MOVB      (R0)+,-(SP)      ;; PICKUP THIS CHARACTER
2984 007502 001412          BEQ      3$          ;; IF ZERO GET OUT
2985 007504 006301          ASL      R1          ;; *2
2986 007506 006102          ROL      R2
2987 007510 006301          ASL      R1          ;; *4
2988 007512 006102          ROL      R2
2989 007514 006301          ASL      R1          ;; *8
2990 007516 006102          ROL      R2
2991 007520 042716 177770  BIC      *1C7,(SP)      ;; STRIP THE ASCII JUNK
2992 007524 062601          ADD      (SP)+,R1      ;; ADD IN THIS DIGIT
2993 007526 000764          BR       2$          ;; LOOP
2994 007530 005726          3$:  TST      (SP)+          ;; CLEAN TERMINATOR FROM STACK
2995 007532 010166 000012  MOV      R1,12(SP)      ;; SAVE THE RESULT
2996 007536 010267 000010  MOV      R2,$HIOCT
2997 007542 012602          MOV      (SP)+,R2      ;; POP STACK INTO R2
2998 007544 012601          MOV      (SP)+,R1      ;; POP STACK INTO R1
2999 007546 012600          MOV      (SP)+,R0      ;; POP STACK INTO R0
3000 007550 000002          RTI          ;; RETURN
3001 007552 000000          $HIOCT: .WORD 0          ;; HIGH ORDER BITS GO HERE

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3002 ;*****
3003 .SBTTL ROUTINE TO TYPE DRIVE
3004
3005 ;CALL
3006 JSR PC,2*TPDRV
3007
3008
3009
3010 TPDRV: TYPE MSG15 ;" DRIVE "
3011 MOV B #PARMBK+1,-(SP) ;PICKUP THE DRIVE NUMBER
3012 BIC #1,(SP) ;STRIP ANY JUNK
3013 ADD #'A,(SP) ;MAKE IT ASCIZ
3014 MOV (SP)+,1$ ;SAVE IT FOR TYPEOUT
3015 TYPE ;TYPE IT
3016 IS
3017 RTS PC
3018 IS: .WORD 0

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3019 ;*****
3020
3021 .SBTTL ROUTINE TO ASK THE OPERATOR WHAT DRIVE(S) TO TEST
3022
3023 ;CALL
3024 ; JSR PC,@ASKDRV
3025 ; RETURN ;NOTE: R0 AND R1 ARE DESTROYED
3026
3027 007610 104400 013312 ASKDRV: TYPE MSGDRV ;<CRLF>"DRIVE(S)"
3028 007614 005067 171432 CLR DRVKEY
3029 007620 104407 RDLIN ;GO GET A DRIVE
3030 007622 012600 MOV (SP)+,R0 ;SETUP TO CHECK FOR VALID DRIVE(S)
3031 007624 105710 TSTB @R0 ;WAS A DRIVE SELECTED?
3032 007626 001425 BEQ NOTLGL ;BR IF NO
3033 007630 012701 001252 MOV #DRVKEY,R1
3034 007634 122710 000101 LOOP: CMPB #'A,@R0 ;WAS DRIVE "A" SELECTED?
3035 007640 001002 BNE NOTA ;BR IF NO
3036 007642 112021 MOVB (R0)+,(R1)+ ;SET KEY FOR DRIVE "A"
3037 007644 000411 BR NEXT
3038 007646 122710 000102 NOTA: CMPB #'B,@R0 ;WAS DRIVE "B" SELECTED?
3039 007652 001002 BNE NOTB ;BR IF NO
3040 007654 112021 MOVB (R0)+,(R1)+ ;SET KEY FOR DRIVE "B"
3041 007656 000404 BR NEXT
3042 007660 122710 000054 NOTB: CMPB #54,@R0 ;WAS A COMMA TYPED?
3043 007664 001006 BNE NOTLGL ;BR IF NO
3044 007666 105720 TSTB (R0)+ ;DUMP THE COMMA
3045 007670 105710 NEXT: TSTB @R0 ;TERMINATOR?
3046 007672 001406 BEQ EXIT ;BR IF YES
3047 007674 022701 001254 CMP #DRVKEY+2,R1 ;TWO DRIVES SELECTED?
3048 007700 101355 BHI LOOP ;BR IF NO
3049 007702 104400 001202 NOTLGL: TYPE ,SQUES ;ILLEGAL INPUT DETECTED
3050 007706 000740 BR ASKDRV ;GO TRY AGAIN
3051 007710 005767 171336 EXIT: TST DRVKEY ;ANY DRIVE SELECTED?
3052 007714 001772 BEQ NOTLGL ;BR IF NO
3053 007716 000207 RTS PC
3054

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3055      ::*****
3056      :SBTTL ROUTINE TO INPUT CSR,DBR, AND VECTOR ADDRESS AND PRIORITY
3057      :CALL
3058      :JSR   PC,@ASKADR
3059
3060      ASKAL  MOV     RO,-(SP)           ;SAVE RO
3061      1$:   TYPE   ,MSGASK           ;"TACS?"
3062      RDOCT ;GET VALUE
3063      MOV   (SP)+,RO           ;PICK UP THE OCTAL NUMBER
3064      BEQ   3$                ;IF "0" USE OLD VALUES
3065      CMP   RO,#160000        ;MAKE SURE IT IS A BUS ADDRESS
3066      BLC   1$
3067      MOV   RO,@TACSL         ;SAVE THE TACS
3068      ADD   #2,RO            ;STEP TO TADB ADDRESS
3069      MOV   RO,@TADBL        ;AND SAVE IT
3070      3$:   TYPE   ,MSGVEC         ;"VECTOR?"
3071      RDOCT
3072      MOV   (SP)+,RO
3073      BEQ   5$
3074      CMP   RO,#1000         ;MAKE SURE ADDRESS IS IN VECTOR AREA
3075      BHIS  3$
3076      MOV   RO,@TAVEC        ;SAVE AS VECTOR ADDRESS
3077      ADD   #2,RO
3078      MOV   RO,@TAVEC+2
3079      5$:   TYPE   ,MSGPRI         ;ASK FOR PRIORITY
3080      RDOCT
3081      MOV   (SP)+,RO
3082      BEQ   6$                ;IF "0" USE OLD VALUE
3083      CMP   RO,#7           ;MAKE SURE ITS VALID
3084      BHI   5$
3085      SWAB  RO                ;PUT INTO HIGH BYTE
3086      ASR   RO                ;AND SHIFT
3087      ASR   RO                ;INTO PROPER
3088      ASR   RO                ;POSITION
3089      BIC   #1C<340>,RO      ;SAVE ONLY PRIORITY BITS
3090      MOV   RO,@TAPRIO        ;STORE IT AWAY
3091      6$:   TYPE   ,MTACS         ;TACS="
3092      MOV   TACSL,-(SP)      ;;SAVE TACSL FOR TYPEOUT
3093      TYPOC ;GO TYPE--OCTAL ASCII(ALL DIGITS)
3094      TYPE  ,MTADB          ;"TADB="
3095      MOV   TADBL,-(SP)      ;;SAVE TADBL FOR TYPEOUT
3096      TYPOC ;GO TYPE--OCTAL ASCII(ALL DIGITS)
3097      TYPE  ,MTAVEC        ;"VECTOR="
3098      MOV   TAVEC,-(SP)     ;;SAVE TAVEC FOR TYPEOUT
3099      TYPOC ;GO TYPE--OCTAL ASCII(ALL DIGITS)
3100      TYPE  ,MTAPRI        ;"PRIORITY="
3101      MOV   TAPRIO,-(SP)   ;;SAVE TAPRIO FOR TYPEOUT
3102      TYPOC ;GO TYPE--OCTAL ASCII(ALL DIGITS)
3103      TYPE  ,MSGOK         ;"OK?"
3104      RDCHR ;GO READ ONE CHARACTER
3105      MOV   (SP)+,RO        ;GET IT
3106      CMF   #15,RO          ;IS IT "CR"?
3107      BEQ   7$              ;BRANCH IF YES
3108      CMP   #'Y,RO          ;IS IT "Y"?
3109      BEQ   7$              ;IT WAS
3110      TYPE  ,SQUES         ;TYPE "?"
```



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3115 ;:*****
3116 ;
3117 ;.SBTTL          ROUTINE TO EXAMINE DRIVE(S) FOR AVAILABILITY
3118 ;
3119 ;CALL:
3120 ;           MOV      #DRVKEY,RO
3121 ;           JSR      PC,@#EXAM          ;R1 IS DESTROYED
3122 ;           NORMAL RETURN
3123 ;           ERROR RETURN
3124 ;
3125 010164 013701 001240 EXAM: MOV      @#TACSL,R1          ;PICKUP THE "CONTROL & STATUS" REG. ADR.
3126 010170 005011      CLR      (R1)          ;DRIVE="A" FUNCTION="WFG"
3127 010172 122710 000101      CMPB   #'A,(R0)          ;EXAMINE DRIVE "A"?
3128 010176 001402      BEQ     1$          ;BR IF YES
3129 010200 052711 000400      BIS    #UNIT,(R1)          ;SELECT DRIVE "B"
3130 010204 032711 000040 1$: BIT    #READY,(R1)          ;WAIT ON READY
3131 010210 001775      BEQ     1$
3132 010212 005711      TST    (R1)          ;ANY ERROR?
3133 010214 100024      BPL    4$          ;BR IF NO
3134 010216 032711 001000      BIT    #OFFLINE,(R1)          ;ERROR DUE TO "OFF LINE"?
3135 010222 001017      BNE    3$          ;BR IF YES
3136 010224 032711 010000      BIT    #WRTLOCK,(R1)          ;ERROR DUE TO "WRITE LOCK"?
3137 010230 001411      BEQ     2$          ;BR IF NO
3138 010232 122777 000201 170700      CMPB   #BIT07!BIT00,@SWR          ;"READONLY" SELECTED? (RD1PAS)
3139 010240 001412      BEQ     4$          ;BR IF YES
3140 010242 122777 000203 170670      CMPB   #BIT07:BIT01!BIT00,@SWR          ;(RD2PAS)?
3141 010250 001406      BEQ     4$          ;BR IF YES
3142 010252 000403      BR     3$          ;TAKE THE ERROR EXIT
3143 010254 032711 020000 2$: BIT    #LEADER,(R1)          ;ERROR DUE TO "CLEAR LEADER"?
3144 010260 001002      BNE    4$          ;BR IF YES
3145 010262 062716 000002 3$: ADD    #2,(SP)          ;TAKE ERROR RETURN
3146 010266 000207 4$: RTS    PC          ;RETURN

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.SBTTL TYPE ROUTINE

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010270 105767 170663  
010274 100002  
010276 000000  
010300 000407  
010302 010046  
010304 017600 000002  
010310 112046  
010312 001005  
010314 005726  
010316 012600  
010320 062716 000002  
010324 000002  
010326 122716 000011  
010332 001430  
010334 122716 000200  
010340 001006  
010342 005726  
010344 104400  
010346 001203  
010350 105067 000130  
010354 000755  
010356 004767 000056  
010362 126726 170570  
010366 001350  
010370 016746 170560  
  
010374 105366 000001  
010400 002770  
010402 004767 000032  
010406 105367 000072  
010412 000770  
  
010414 112716 000040  
010420 004767 000014  
010424 132767 000007 000052  
010432 001372  
010434 005726

```
*****  
*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  
*  
$TYPE: TSTB $TPFLG ;; IS THERE A TERMINAL?  
BPL 1$ ;; BR IF YES  
HALT ;; HALT HERE IF NO TERMINAL  
BR 3$ ;; LEAVE  
1$: MOV RO,-(SP) ;; SAVE RO  
MOV 2$(SP),RO ;; GET ADDRESS OF ASCIZ STRING  
2$: MOVB (RO)+,-(SP) ;; PUSH CHARACTER TO BE TYPED ONTO STACK  
BNE 4$ ;; BR IF IT ISN'T THE TERMINATOR  
TST (SP)+ ;; IF TERMINATOR POP IT OFF THE STACK  
60$: MOV (SP)+,RO ;; RESTORE RO  
3$: ADD #2,(SP) ;; ADJUST RETURN PC  
RTI ;; RETURN  
4$: CMPB #HT,(SP) ;; BRANCH IF <HT>  
BEQ 8$ ;; BRANCH IF NOT <CRLF>  
CMPB #CRLF,(SP) ;; BRANCH IF NOT <CRLF>  
BNE 5$ ;; POP <CR><LF> EQUIV  
TST (SP)+ ;; TYPE A CR AND LF  
TYPE  
$CRLF  
CLRB $CHARCNT ;; CLEAR CHARACTER COUNT  
BR 2$ ;; GET NEXT CHARACTER  
5$: JSR PC,$TYPEC ;; GO TYPE THIS CHARACTER  
6$: CMPB $FILLC,(SP)+ ;; IS IT TIME FOR FILLER CHARS.?  
BNE 2$ ;; IF NO GO GET NEXT CHAR.  
MOV $NULL,-(SP) ;; GET # OF FILLER CHARS. NEEDED  
AND THE NULL CHAR.  
7$: DECB 1(SP) ;; DOES A NULL NEED TO BE TYPED?  
BLT 6$ ;; BR IF NO--GO POP THE NULL OFF OF STACK  
JSR PC,$TYPEC ;; GO TYPE A NULL  
DECB $CHARCNT ;; DO NOT COUNT AS A COUNT  
BR 7$ ;; LOOP  
  
;HORIZONTAL TAB PROCESSOR  
8$: MOVB #' (SP) ;; REPLACE TAB WITH SPACE  
9$: JSR PC,$TYPEC ;; TYPE A SPACE  
BITB #7,$CHARCNT ;; BRANCH IF NOT AT  
BNE 9$ ;; TAB STOP  
TST (SP)+ ;; POP SPACE OFF STACK
```

```

3203 010436 000724          BR      2$          ;;GET NEXT CHARACTER
3204 010440 105777 170504 $TYPEC: TSTB  2$STPS  ;;WAIT UNTIL PRINTER IS READY
3205 010444 100375          BPL      $TYPEC
3206 010446 116677 000002 170476 MOVB    2(SP),2$STPB  ;;LOAD CHAR TO BE TYPED INTO DATA REG.
3207 010454 122766 000015 000002 CMPB    #CR,2(SP)    ;;IS CHARACTER A CARRIAGE RETURN?
3208 010462 001003          BNE      1$          ;;BRANCH IF NO
3209 010464 105067 000014 CLRB    $CHARCNT    ;;YES--CLEAR CHARACTER COUNT
3210 010470 000406          BR      $TYPEX      ;;EXIT
3211 010472 122766 000012 000002 1$: CMPB    #LF,2(SP)    ;;IS CHARACTER A LINE FEED?
3212 010500 001402          BEQ      $TYPEX      ;;BRANCH IF YES
3213 010502 105227          INCB    (PC)+       ;;COUNT THE CHARACTER
3214 010504 000000          $CHARCNT: WORD 0    ;;CHARACTER COUNT STORAGE
3215 010506 000207          $TYPEX: RTS      PC

3216
3217 .SBTTL TTY INPUT ROUTINE
3218
3219 ;:*****
3220 .ENABL LSB
3221
3222 ;:*****
3223 ;*SOFTWARE SWITCH REGISTER CHANGE ROUTINE.
3224 ;*ROUTINE IS ENTERED FROM THE TRAP HANDLER, AND WILL
3225 ;*SERVICE THE TEST FOR CHANGE IN SOFTWARE SWITCH REGISTER TRAP CALL
3226 ;*WHEN OPERATING IN TTY FLAG MODE.
3227 010510 022767 000176 170422 $CKSWR: CMP    #SWREG,SWR  ;;IS THE SOFT-SWR SELECTED?
3228 010516 001074          BNE      15$        ;;BRANCH IF NO
3229 010520 105777 170420 TSTB    2$TKS      ;;CHAR THERE?
3230 010524 100071          BPL      15$        ;;IF NO, DON'T WAIT AROUND
3231 010526 117746 170414 MOVB    2$TKB,-(SP) ;;SAVE THE CHAR
3232 010532 042716 177600 BIC     #1C177,(SP) ;;STRIP-OFF THE ASCII
3233 010536 022726 000007 CMP     #7,(SP)+    ;;IS IT A CONTROL G?
3234 010542 001062          BNE      15$        ;;NO, RETURN TO USER
3235 010544 126727 170364 000001 CMPB    $AUTOB,#1  ;;ARE WE RUNNING IN AUTO-MODE?
3236 010552 001456          BEQ      15$        ;;BRANCH IF YES
3237
3238 010554 104400 011235          TYPE    , $CNTLG   ;;ECHO THE CONTROL-G (↑G)
3239 010560 104400 011242          TYPE    , $MSWR   ;;TYPE CURRENT CONTENTS
3240 010564 016746 167406 MOV     $WREG,-(SP) ;;SAVE SWREG FOR TYPEOUT
3241 010570 104401          TYPOC   ;;GO TYPE--OCTAL ASCII(ALL DIGITS)
3242 010572 104400 011253          TYPE    , $MNEW   ;;PROMPT FOR NEW SWR
3243 010576 005046          19$: CLR    -(SP)  ;;CLEAR COUNTER
3244 010600 005046          CLR     -(SP)    ;;THE NEW SWR
3245 010602 105777 170336          7$: TSTB    2$TKS  ;;CHAR THERE?
3246 010606 100375          BPL      7$        ;;IF NOT TRY AGAIN
3247
3248 010610 117746 170332 MOVB    2$TKB,-(SP) ;;PICK UP CHAR
3249 010614 042716 177600 BIC     #1C177,(SP) ;;MAKE IT 7-BIT ASCII
3250
3251
3252
3253 010620 021627 000025          9$: CMP     (SP),#25  ;;IS IT A CONTROL-U?
3254 010624 001005          BNE     10$        ;;BRANCH IF NOT
3255 010626 104400 011230          TYPE    , $CNTLU  ;;YES, ECHO CONTROL-U (↑U)
3256 010632 062706 000006          20$: ADD    #6,SP  ;;IGNORE PREVIOUS INPUT
3257 010636 000757          BR      19$      ;;LET'S TRY IT AGAIN
3258

```

```

3259
3260 010640 021627 000015      10$: CMP      (SP),#15      ;; IS IT A <CR>?
3261 010644 001022              BNE      16$          ;; BRANCH IF NO
3262 010646 005765 000004      TST      4(SP)        ;; YES, IS IT THE FIRST CHAR?
3263 010652 001403              BEQ      11$          ;; BRANCH IF YES
3264 010654 016677 000002 170256 MOV      2(SP),@SWR   ;; SAVE NEW SWR
3265 010662 062706 000006      11$: ADD      #6,SP      ;; CLEAR UP STACK
3266 010666 104400 001203      14$: TYPE   $CRLF     ;; ECHO <CR> AND <LF>
3267 010672 126727 170237 000001 CMPB     $INTAG,#1   ;; RE-ENABLE TTY KBD INTERRUPTS?
3268 010700 001003              BNE      15$          ;; BRANCH IF NOT
3269 010702 012777 000100 170234 MOV      #100,@STKS  ;; RE-ENABLE TTY KBD INTERRUPTS
3270 010710 000002      15$: RTI                    ;; RETURN
3271 010712 004767 177522      16$: JSR      PC,$TYPEC  ;; ECHO CHAR
3272 010716 021627 000060      CMP      (SP),#60   ;; CHAR < 0?
3273 010722 002420              BLT      18$          ;; BRANCH IF YES
3274 010724 021627 000067      CMP      (SP),#67   ;; CHAR > 7?
3275 010730 003015              BGT      18$          ;; BRANCH IF YES
3276 010732 042726 000060      BIC      #60,(SP)+  ;; STRIP-OFF ASCII
3277 010736 005766 000002      TST      2(SP)      ;; IS THIS THE FIRST CHAR
3278 010742 001403              BEQ      17$          ;; BRANCH IF YES
3279 010744 006316              ASL      (SP)        ;; NO, SHIFT PRESENT
3280 010746 006316              ASL      (SP)        ;; CHAR OVER TO MAKE
3281 010750 006316              ASL      (SP)        ;; ROOM FOR NEW ONE.
3282 010752 005266 000002      17$: INC      2(SP)      ;; KEEP COUNT OF CHAR
3283 010756 056616 177776      BIS      -2(SP),(SP) ;; SET IN NEW CHAR
3284 010762 000707              BR       7$          ;; GET THE NEXT ONE
3285 010764 104400 001202      18$: TYPE   $QUES     ;; TYPE ?<CR><LF>
3286 010770 000720              BR       20$        ;; SIMULATE CONTROL-U
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```

\*\*\*\*\*

\*THIS ROUTINE WILL INPUT A SINGLE CHARACTER FROM THE TTY

\*CALL:

```

*      RDCHR          ;; INPUT A SINGLE CHARACTER FROM THE TTY
*      RETURN HERE   ;; CHARACTER IS ON THE STACK
*                      ;; WITH PARITY BIT STRIPPED OFF

```

```

3298 010772 011646 000004 000002 $RDCHR: MOV      (SP),-(SP)  ;; PUSH DOWN THE PC
3299 010774 016666 000004 000002 MOV      4(SP),2(SP) ;; SAVE THE PS
3300 011002 105777 170136      1$: TSTB   @STKS     ;; WAIT FOR
3301 011006 100375              BPL      1$          ;; A CHARACTER
3302 011010 117766 170132 000004 MOVB     @STKB,4(SP) ;; READ THE TTY
3303 011016 042766 177600 000004 BIC      #177,4(SP)  ;; GET RID OF JUNK IF ANY
3304 011024 026627 000004 000023 CMP      4(SP),#23  ;; IS IT A CONTROL-S?
3305 011032 001013              BNE      3$          ;; BRANCH IF NO
3306 011034 105777 170104      2$: TSTB   @STKS     ;; WAIT FOR A CHARACTER
3307 011040 100375              BPL      2$          ;; LOOP UNTIL ITS THERE
3308 011042 117746 170100 MOVB     @STKB,-(SP) ;; GET CHARACTER
3309 011046 042716 177600 BIC      #177,(SP)  ;; MAKE IT 7-BIT ASCII
3310 011052 022627 000021 CMP      (SP)+,#21  ;; IS IT A CONTROL-Q?
3311 011056 001366              BNE      2$          ;; IF NOT DISCARD IT
3312 011060 000750              BR       1$          ;; YES, RESUME
3313 011062 026627 000004 000140 3$: CMP      4(SP),#140 ;; IS IT UPPER CASE?
3314 011070 002407              BLT      4$          ;; BRANCH IF YES

```

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3315 011072 026627 000004 000175      CMP      4(SP),#175      ;; IS IT A SPECIAL CHAR?
3316 011100 003003                    BGT      4$              ;; BRANCH IF YES
3317 011102 042766 000040 000004      BIC      #40,4(SP)      ;; MAKE IT UPPER CASE
3318 011110 000002                    RTI                          ;; GO BACK TO USER
3319                                     ;; *****
3320                                     ;; THIS ROUTINE WILL INPUT A STRING FROM THE TTY
3321                                     ;; CALL:
3322                                     ;; *
3323                                     ;; *      RDLIN                      ;; INPUT A STRING FROM THE TTY
3324                                     ;; *      RETURN HERE                ;; ADDRESS OF FIRST CHARACTER WILL BE ON THE STACK
3325                                     ;; *                                     ;; TERMINATOR WILL BE A BYTE OF ALL 0'S
3326 011112 010346                    $RDLIN: MOV      R3,-(SP)      ;; SAVE R3
3327 011114 012703 011220              1$:      MOV      #$TTYIN,R3      ;; GET ADDRESS
3328 011120 022703 011230              2$:      CMP      #$TTYIN+8.,R3      ;; BUFFER FULL?
3329 011124 101405                    BLOS     4$              ;; BR IF YES
3330 011126 104406                    RDCHR                      ;; GO READ ONE CHARACTER FROM THE TTY
3331 011130 112613                    MOVB     (SP)+,(R3)      ;; GET CHARACTER
3332 011132 122713 000177              10$:     CMPB     #177,(R3)      ;; IS IT A RUBOUT
3333 011136 001003                    BNE      3$              ;; SKIP IF NOT
3334 011140 104400 001202              4$:      TYPE     $QUES      ;; TYPE A '?'
3335 011144 000763                    BR       1$              ;; CLEAR THE BUFFER AND LOOP
3336 011146 111367 001044              3$:      MOVB     (R3),9$      ;; ECHO THE CHARACTER
3337 011152 104400 011216              TYPE     9$
3338 011156 122723 000015              CMPB     #15,(R3)+      ;; CHECK FOR RETURN
3339 011162 001356                    BNE      2$              ;; LOOP IF NOT RETURN
3340 011164 105063 177777              CLRB     -1(R3)         ;; CLEAR RETURN (THE 15)
3341 011170 104400 001204              TYPE     $LF            ;; TYPE A LINE FEED
3342 011174 012603                    MOV      (SP)+,R3      ;; RESTORE R3
3343 011176 011646                    MOV      (SP),-(SP)    ;; ADJUST THE STACK AND PUT ADDRESS OF THE
3344 011200 016666 000004 000002      MOV      4(SP),2(SP)   ;; FIRST ASCII CHARACTER ON IT
3345 011206 012766 011220 000004      MOV      #$TTYIN,4(SP)
3346 011214 000002                    RTI                          ;; RETURN
3347 011216 000                    9$:      .BYTE     0              ;; STORAGE FOR ASCII CHAR. TO TYPE
3348 011217 000                    .BYTE     0              ;; TERMINATOR
3349 011220 000010                    $TTYIN: .BLKB     8.      ;; RESERVE 8 BYTES FOR TTY INPUT
3350 011230 052536 005015 000          $CNTLU: .ASCIZ  /↑U/<15><12>  ;; CONTROL "U"
3351 011235 0136 006507 000012        $CNTLG: .ASCIZ  /↑G/<15><12>  ;; CONTROL "G"
3352 011242 005015 053523 020122        $MSWR:  .ASCIZ  <15><12>/SWR = /
3353 011250 020075 000
3354 011253 040 047040 053505        $MNEW:  .ASCIZ  / NEW = /
3355 011260 036440 000040

```

.SBTTL BINARY TO OCTAL (ASCII) AND TYPE

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011264 017546 000000  
011270 116667 000001 0C0211  
011276 112667 000207  
011302 062716 000002  
011306 000406  
011310 112767 000001 000171  
011316 112767 000006 000165  
011324 112767 000005 00C154  
011332 010346  
011334 010446  
011336 010546  
011340 116704 000145  
011344 005404  
011346 062704 000006  
011352 110467 000132  
011356 116704 000125  
011362 016605 000C12  
011366 005003  
011370 006105  
011372 000404  
011374 006105  
011376 006105  
011400 006105  
011402 010503  
011404 006103  
011406 105367 000076  
011412 1C0016  
0114.4 042703 177770  
011420 001002  
011422 005704  
011424 001403

```
*****  
*THIS ROUTINE IS USED TO CHANGE A 16-BIT BINARY NUMBER TO A 6-DIGIT  
*OCTAL (ASCII) NUMBER AND TYPE IT.  
*$TYPOS---ENTER HERE TO SETUP SUPPRESS ZEROS AND NUMBER OF DIGITS TO TYPE  
*CALL:  
*      MOV      NUM,-(SP)      ;;NUMBER TO BE TYPED  
*      TYPOS    ;;CALL FOR TYPEOUT  
*      .BYTE   N              ;;N=1 TO 6 FOR NUMBER OF DIGITS TO TYPE  
*      .BYTE   M              ;;M=1 OR 0  
*                               ;;1=TYPE LEADING ZEROS  
*                               ;;0=SUPPRESS LEADING ZEROS  
*$TYPON---ENTER HERE TO TYPE OUT WITH THE SAME PARAMETERS AS THE LAST  
*$TYPOS OR $TYPOC  
*CALL:  
*      MOV      NUM,-(SP)      ;;NUMBER TO BE TYPED  
*      TYPON    ;;CALL FOR TYPEOUT  
*$TYPOC---ENTER HERE FOR TYPEOUT OF A 16 BIT NUMBER  
*CALL:  
*      MOV      NUM,-(SP)      ;;NUMBER TO BE TYPED  
*      TYPOC    ;;CALL FOR TYPEOUT  
$TYPOS: MOV      2(SP),-(SP)    ;;PICKUP THE MODE  
        MOVVB   1(SP), $OFILL   ;;LOAD ZERO FILL SWITCH  
        MOVVB   (SP)+, $OMODE+1 ;;NUMBER OF DIGITS TO TYPE  
        ADD     #2, (SP)        ;;ADJUST RETURN ADDRESS  
        BR      $TYPON  
$TYPOC: MOVVB   #1, $OFILL     ;;SET THE ZERO FILL SWITCH  
        MOVVB   #6, $OMODE+1   ;;SET FOR SIX(6) DIGITS  
$TYPON: MOVVB   #5, $OCNT     ;;SET THE ITERATION COUNT  
        MOV     R3, -(SP)      ;;SAVE R3  
        MOV     R4, -(SP)      ;;SAVE R4  
        MOV     R5, -(SP)      ;;SAVE R5  
        MOVVB   $OMODE+1, R4   ;;GET THE NUMBER OF DIGITS TO TYPE  
        NEG     R4  
        ADD     #6, R4         ;;SUBTRACT IT FOR MAX. ALLOWED  
        MOVVB   R4, $OMODE     ;;SAVE IT FOR USE  
        MOVVB   $OFILL, R4    ;;GET THE ZERO FILL SWITCH  
        MOV     12(SP), R5    ;;PICKUP THE INPUT NUMBER  
        CLR     R3            ;;CLEAR THE OUTPUT WORD  
1$:    ROL     R5            ;;ROTATE MSB INTO "C"  
        BR     3$           ;;GO DO MSB  
2$:    ROL     R5            ;;FORM THIS DIGIT  
        ROL     R5  
        ROL     R5  
        MOV     R5, R3  
3$:    ROL     R3            ;;GET LSB OF THIS DIGIT  
        DECB   $OMODE        ;;TYPE THIS DIGIT?  
        BPL    7$           ;;BR IF NO  
        BIC    #177770, R3   ;;GET RID OF JUNK  
        BNE    4$           ;;TEST FOR 0  
        TST   R4            ;;SUPPRESS THIS 0?  
        BEQ   5$           ;;BR IF YES
```

011426	055204		45:	INC	R4	:: DON'T SUPPRESS ANYMORE 0'S
011430	052703	000060		BIS	0'D,R3	:: MAKE THIS DIGIT ASCII
011434	052703	000040	55:	BIS	0'R3	:: MAKE ASCII IF NOT ALREADY
011440	110367	002040		MOVB,	R3,05	:: SAVE FOR TYPING
011444	104400	011504		TYPE,	05	:: GO TYPE THIS DIGIT
011450	105367	000032	75:	DECB	\$OCNT	:: COUNT BY 1
011454	203347			BGT	25	:: BR IF MORE TO DO
011456	002402			BLT	65	:: BR IF DONE
011460	005204			INC	R4	:: INSURE LAST DIGIT ISN'T A BLANK
011462	000744			BR	25	:: GO DO THE LAST DIGIT
011464	012605		65:	MO.	(SP)+,R5	:: RESTORE R5
011466	012604			MOV	(SP)+,R4	:: RESTORE R4
011470	012603			MOV	(SP)+,R3	:: RESTORE R3
011472	016666	003002 000004		MOV	2(SP),4(SP)	:: SET THE STACK FOR RETURNING
011500	012616			MOV	(SP)+,(SP)	
011502	000002			RTI		:: RETURN
011504	000		85:	.BYTE	0	:: STORAGE FOR ASCII DIGIT
011505	000			.BYTE	00	:: TERMINATOR FOR TYPE ROUTINE
011506	000		\$OCNT:	.BYTE	00	:: OCTAL DIGIT COUNTER
011507	000		\$DFILL:	.BYTE	00	:: ZERO FILL SWITCH
011510	000000		\$MODE:	.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.

011512 010046  
011514 016600 000002  
011520 005740  
011522 111000  
011524 006300  
011526 016000 011534  
011532 000200

\$TRAP: MOV RO, -(SP) ;; SAVE RO  
MOV 2(SP), RO ;; GET TRAP ADDRESS  
TST -(RO) ;; BACKUP BY 2  
MOVB (RO), RO ;; GET RIGHT BYTE OF TRAP  
ASL RO ;; POSITION FOR INDEXING  
MOV \$TRPAD(RO), RO ;; INDEX TO TABLE  
RTS RO ;; GO TO ROUTINE

.SBTTL TRAP TABLE

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

ROUTINE  
-----

011534  
011534 010270  
011536 011310  
011540 011264  
011542 011324  
011544 010560  
011546 010510  
011550 010772  
011552 011112  
011554 007452  
011556 006616  
011560 006654

\$TRPAD: \$TYPE ;; CALL=TYPE TRAP+0(104400) TTY TYPEOUT ROUTINE  
\$TYPOC ;; CALL=TYPOC TRAP+1(104401) TYPE OCTAL NUMBER (WITH LEADING ZEROS)  
\$TYPOS ;; CALL=TYPOS TRAP+2(104402) TYPE OCTAL NUMBER (NO LEADING ZEROS)  
\$TYPON ;; CALL=TYPON TRAP+3(104403) TYPE OCTAL NUMBER (AS PER LAST CALL)  
\$GTSWR ;; CALL=GTSWR TRAP+4(104404) GET SOFT-SWR SETTING  
\$CKSWR ;; CALL=CKSWR TRAP+5(104405) TEST FOR CHANGE IN SOFT-SWR  
\$RDCHR ;; CALL=RDCHR TRAP+6(104406) TTY TYPEIN CHARACTER ROUTINE  
\$RDLIN ;; CALL=RDLIN TRAP+7(104407) TTY TYPEIN STRING ROUTINE  
\$RDOCT ;; CALL=RDOCT TRAP+10(104410) READ AN OCTAL NUMBER FROM TTY  
\$SAVREG ;; CALL=SAVREG TRAP+11(104411) SAVE R0-R5 ROUTINE  
\$RESREG ;; CALL=RESREG TRAP+12(104412) RESTORE R0-R5 ROUTINE

.SBTTL POWER DOWN AND UP ROUTINES

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011562 012737 011726 000024  
011570 012737 000340 000026  
011576 010046  
011600 010146  
011602 010246  
011604 010346  
011606 010446  
011610 010546  
011612 017746 167322  
011616 010667 000110  
011622 012737 011634 000024  
011630 000000  
011632 000776  
  
011634 012737 011726 000024  
011642 016706 000064  
011646 005367 000060  
011652 005267 000054  
011656 001375  
011660 012677 167254  
011664 012605  
011666 012604  
011670 012603  
011672 012602  
011674 012601  
011676 012600  
011700 012737 011562 000024  
011706 012737 000340 000026  
011714 104400  
011716 011734  
011720 012716  
011722 004406  
011724 000002  
011726 000000  
011730 000776  
011732 000000  
011734 005015 047520 042527  
011742 000122

```
*****  
:POWER DOWN ROUTINE  
$PWRDN: MOV $SILLUP, @PWRVEC ;; SET FOR FAST UP  
MOV @340, @PWRVEC+2 ;; PRIO:7  
MOV R0, -(SP) ;; PUSH R0 ON STACK  
MOV R1, -(SP) ;; PUSH R1 ON STACK  
MOV R2, -(SP) ;; PUSH R2 ON STACK  
MOV R3, -(SP) ;; PUSH R3 ON STACK  
MOV R4, -(SP) ;; PUSH R4 ON STACK  
MOV R5, -(SP) ;; PUSH R5 ON STACK  
MOV @SWR, -(SP) ;; PUSH @SWR ON STACK  
MOV SP, $SAVR6 ;; SAVE SP  
MOV @PWRUP, @PWRVEC ;; SET UP VECTOR  
HALT  
BR .-2 ;; HANG UP  
  
*****  
:POWER UP ROUTINE  
$PWRUP: MOV $SILLUP, @PWRVEC ;; SET FOR FAST DOWN  
MOV $SAVR6, SP ;; GET SP  
CLR $SAVR6 ;; WAIT LOOP FOR THE TTY  
1$: INC $SAVR6 ;; WAIT FOR THE INC  
BNE 1$ OF WORD  
MOV (SP)+, @SWR ;; POP STACK INTO @SWR  
MOV (SP)+, R5 ;; POP STACK INTO R5  
MOV (SP)+, R4 ;; POP STACK INTO R4  
MOV (SP)+, R3 ;; POP STACK INTO R3  
MOV (SP)+, R2 ;; POP STACK INTO R2  
MOV (SP)+, R1 ;; POP STACK INTO R1  
MOV (SP)+, R0 ;; POP STACK INTO R0  
MOV @PWRDN, @PWRVEC ;; SET UP THE POWER DOWN VECTOR  
MOV @340, @PWRVEC+2 ;; PRIO:7  
TYPE $POWER ;; REPORT THE POWER FAILURE  
$PWRMG: .WORD $POWER ;; POWER FAIL MESSAGE POINTER  
MOV (PC)+, (SP) ;; RESTART AT $EOP  
$PWRAD: .WORD $EOP ;; RESTART ADDRESS  
RTI  
$SILLUP: HALT ;; THE POWER UP SEQUENCE WAS STARTED  
BR .-2 ;; BEFORE THE POWER DOWN WAS COMPLETE  
$SAVR6: 0 ;; PUT THE SP HERE  
$POWER: .ASCIZ <15><12>"POWER"  
  
.EVEN
```







3664	013103	200	054502	042524	MSG5:	.ASCIZ	<CRLF>"BYTES WRITTEN="
3665	013110	020123	051127	052111			
3666	013116	042524	036516	000			
3667	013123	200	040524	042520	MSG6:	.ASCIZ	<CRLF>"TAPE PASSES="
3668	013130	050040	051501	042523			
3669	013136	036523	000				
3670	013141	200	044506	042514	MSG7:	.ASCIZ	<CRLF>"FILES/PASS="
3671	013146	027523	040520	051523			
3672	013154	000075					
3673	013156	041200	047514	045503	MSG8:	.ASCIZ	<CRLF>"BLOCKS/FILE="
3674	013164	027523	044506	042514			
3675	013172	000075					
3676	013174	040440	042116	000	MSG9:	.ASCIZ	" AND"
3677	013201	040	044527	046114	MSG10:	.ASCIZ	" WILL BE TESTED"<CRLF>
3678	013206	041040	020105	042524			
3679	013214	052123	042105	000200			
3680	013222	025052	020052	047506	MSG11:	.ASCIZ	"*** FORMAT ***"
3681	013230	046522	052101	025040			
3682	013236	025052	000				
3683	013241	052	025052	051040	MSG12:	.ASCIZ	"*** READ ***"
3684	013246	040505	020104	020040			
3685	013254	025052	000052				
3686	013260	025052	020052	051127	MSG13:	.ASCIZ	"*** WRITE ***"
3687	013266	052111	020105	025040			
3688	013274	025052	000				
3689	013277	040	000040		MSG14:	.ASCIZ	" "
3690	013302	042040	044522	042526	MSG15:	.ASCIZ	" DRIVE "
3691	013310	000040					
3692	013312	042200	044522	042526	MSGDRV:	.ASCIZ	<CRLF>"DRIVE(S)? "
3693	013320	051450	037451	000040			
3694	013326	052200	041501	037523	MSGASK:	.ASCIZ	<CRLF>"TACS?"
3695	013334	000					
3696	013335	200	042526	052103	MSGVEC:	.ASCIZ	<CRLF>"VECTOR?"
3697	013342	051117	000077				
3698	013346	050200	044522	051117	MSGPRI:	.ASCIZ	<CRLF>"PRIORITY?"
3699	013354	052111	037531	000			
3700	013361	200	040524	051503	MTACS:	.ASCIZ	<CRLF>"TACS="
3701	013366	000075					
3702	013370	052040	042101	036502	MTADB:	.ASCIZ	/ TADB=/
3703	013376	000					
3704	013377	040	053040	041505	MTAVEC:	.ASCIZ	" VECTOR="
3705	013404	047524	036522	000			
3706	013411	040	050040	044522	MTAPRI:	.ASCIZ	" PRIORITY="
3707	013416	051117	052111	036531			
3708	013424	000					
3709	013425	200	045517	000077	MSGOK:	.ASCIZ	<CRLF>"OK?"
3710	013432	042531	100123	000	MYES:	.ASCIZ	"YES"<CRLF>
3711		013440					.EVEN
3712							
3713							.SBTTL
3714							READ AND WRITE BUFFER
3715	013440	002004			BUFFER:	.BLKB	1028.
3716		015444			LASTADDRESS=		.
3717							
3718		000001					.END

















\$REG2	0C1166	1217#	2427*	2629*	2675*	3519	3523	3526										
\$REG3	001170	1218#																
\$RESRE	006654	2750#	3469															
\$RTNAD	004730	2242#																
\$R2A =	***** U	3470																
\$SAVRE	006616	2734#	3468															
\$SAVRS	011732	3483*	3491	3492*	3493*	3511#												
\$SB20	007356	2185	2190	2205	2212	2217	2934#											
\$SCOPE	004750	1501	2257#															
\$SETUP =	000137	1482#	1500	1501	1503	1505	1507	1509	1510	1531	1534	2163	2258	2293				
		2312	2314	3222	3356													
\$STUP =	177777	1482#																
\$SUPRS	007412	2186	2191	2196	2201	2206	2213	2218	2951#									
\$SVLAD	005020	2268	2273#															
\$SWR =	160000	947#	957	1006	1007	1008	1009	1010	1011	1223	1510	1511	2156	2164				
		2175	2241	2243	2252	2253	2274	2259	2271	2273	2275	2279#	2285	2286				
		2287	2288	2289	2297	2304	2309	2313	2319	2320#	3508							
\$SWRHK =	000000	2254																
\$TKB	001146	1206#	3220	3231	3248	3302	3308											
\$TKS	001144	1205#	3220	3229	3245	3269*	3300	3306										
\$TMP0	001172	1219#	1718*	1719*	1732*	1734	1735	2430*	2469	2479	2503	2630*	3523	3526				
\$TMP1	001174	1220#																
\$TMP2	001176	1221#	2631*	3523														
\$TMP3	001200	1222#																
\$TN =	000001	947#	957															
\$TNPWR	007272	2881	2882	2902#														
\$TPB	001152	1208#	3206*	3217														
\$TPFLG	001157	1212#	3164	3217														
\$TPS	001150	1207#	3204	3217														
\$TRAP	011512	1505	3441#															
\$TRP =	000013	3449#	3458#	3459#	3460#	3461#	3462	3463#	3464	3465#	3466#	3467#	3468#	3469#				
		3470#																
\$TRPAD	011534	3446	3456#															
\$TSTNH	001102	1185#	2163*	2251	2273*	2276	2279	2296	2319									
\$TTYIN	011220	3327	3328	3345	3349#													
\$TYPBN =	***** U	3461																
\$TYPOS =	***** U	3461																
\$TYPE	010270	3164#	3449	3457														
\$TYPEC	010440	3185	3192	3199	3204#	3205	3271											
\$TYPEX	010506	3210	3212	3215#														
\$TYPOC	011310	3386#	3458															
\$TYPON	011324	3385	3388#	3460														
\$TYPOS	011264	3381#	3459															
\$XTSTR	004762	2262#																
\$SET4 =	000001	2175#	2233#															
\$OFILL	011507	3382*	3386*	3396	3431#													
\$FOCAT =	***** U	2259	2306															
		1163#	1167#	1182#	1226	1498	1510	1545#	2243	2246	2279	2319	2320	2922#				
		3217	3220	3349#	3350	3356	3486	3510	3711#	3715#	3716							

SGOTO	1161#	2452													
CALL	1161#	1797	1807	1821	1832	1844	1875	1947	1963	1974	2028	2075	2085	2099	
COMMEN	1#	1130#													
DECBLK	1161#	2482													
DECFIL	1161#	2471													
ENDCOM	1#	1130#													
EOPCOD	1161#	2175													
ERROR	1024#	1589	1652	1857	1864	1986	1993	2463	2466	2493	2496	2499	2502	2508	
ESCAPE	1#	1130#													
GETPRI	1#	1130#													
GETSWR	1#	1130#	1534#												
INCBK	1161#	1887	2013	2112											
INCFIL	1161#	1892	2019	2117											
JGOTO	1161#	1723													
MORETA	1161#	1227													
MULT	1#	1130#													
NEWTST	1#	1130#													
OUTDBL	1161#	2194	2199												
OUTSGL	1161#	2184	2189	2204	2216										
POP	1#	1130#	2571	2755	2831	2846	2997	3495	3496						
PUSH	1#	1130#	2554	2735	2819	2976	3476	3482							
REMARK	1161#	1794	1804	1816	1829	1840	1852	1859	1870	1884	1944	1954	1959	1970	1981
	1988	2000	2010	2025	2072	2082	2094	2109	2176	2221					
REPORT	1#	1130#													
SCOPE	1025#	1851	1999	2108	2144	2162	2175								
SETBLK	1161#	1788	1895	1938	2022	2066	2120								
SETFIL	1161#	1791	1941	2069											
SETPRI	1#	1130#													
SETTRA	3449#	3458	3459	3460	3462	3464	3465	3466	3467	3468	3469				
SETUP	1#	1130#	1492												
SKIP	1#	1130#													
SLASH	1#	1130#	1263	1284	1306	1360	1472	1659	1743	1747	1794	1796	1804	1806	1816
	1#18	1829	1831	1840	1842	1852	1854	1859	1861	1870	1872	1884	1886	1899	1944
	1#46	1954	1956	1959	1961	1970	1972	1981	1983	1988	1990	2000	2002	2010	2012
	2025	2027	2036	2072	2074	2082	2084	2094	2096	2109	2111	2124	2176	2178	2221
	2223	2352	2372	2406	2415	2422									
SPACE	1130#														
STARS	1#	957	1130#	1174	1178	1226	1386	1408	1456	1474	1480	1546	1555	1563	1579
	1598	1620	1661	1671	1699	1717	1745	1754	1782	1906	1932	2043	2059	2129	2143
	2153	2248	2281	2320	2510	2533	2577	2596	2635	2684	2701	2715	2719	2764	2814
	2860	2863	2925	2943	2966	3002	3019	3055	3115	3149	3219	3222	3290	3319	3358
	3435	3472	3488	3515	3552										
SWRSU	1#	1130#	1511#												
TRMTRP	3449#														
TYPBIN	1#	1130#													
TYPDEC	1#	1130#													
TYPNAM	1#	1130#	1527												
TYPNUM	1#	1130#													
TYPOCS	1#	1130#													
TYPOCT	1#	1130#	2362	2374	2410	3092	3095	3098	3101	3240					
TYPTXT	1#	1130#													
SSCHRE	1176#	1215	1216	1217	1218										
SSCHTM	1176#	1219	1220	1221	1222										
SSESCA	1#	1130#													
SSNEWT	1#	1130#													
SSSET	3449#	3458	3459	3460	3462	3464	3465	3466	3467	3468	3469				

SSSKIP	10	1130#	
.EQUAT	10	947#	1020
.HEADE	10	947#	
.KT11	10		
.SETUP	10	947#	1482
.SWP4I	10	947#	1002
.SWPLO	1012#		
.SACTI	10		
.SAPT8	10		
.SAPTH	10		
.SAPTY	10		
.SASTA	10		
.SCATC	10	947#	1161
.SCMTA	10	947#	1176
.SDB2D	10	947#	2861
.SDB2O	10		
.SDIV	10		
.SEOP	10	947#	2151
.SERRO	10	947#	2279
.SERRT	10		
.SMULT	10		
.SPOHE	10	947#	3470
.SRAND	10		
.SRDDE	10		
.SROOC	10	947#	2964
.SREAR	10	947#	3217
.SR2AZ	10		
.SSAVE	10	947#	2717
.SSB2D	10	947#	2923
.SSB2O	10		
.SSCOP	10	947#	2246
.SSIZE	10		
.SSPAC	947#		
.SSUPR	10	947#	2941
.STRAP	10	947#	3433
.STYPB	10		
.STYPD	10		
.STYPE	10	947#	3147
.STYFO	10	947#	3356
.S4OCA	10		
.117D	10		

ADC	2527	2592	2891												
ADD	1724	1738	1897	1892	2014	2019	2112	2117	2333	2347	2367	2385	2454	2526	2591
	2616	2621	2632	2672	2676	2681	2890	2892	2937	2992	3013	3068	3077	3145	3174
	3256	3265	3384	3394											
ASL	2328	2329	2330	2525	2590	2646	2985	2987	2989	3279	3280	3281	3445		
ASLB	1736	1737	2453												
ASR	1680	2793	3086	3087	3088										
ASRB	1643	1648													
BEQ	1532	1588	1594	1625	1640	1646	1657	1800	1811	1824	1836	1847	1878	1950	1966
	1977	2031	2078	2089	2103	2174	2225	2234	2295	2298	2359	2382	2409	2489	2627
	2795	2954	2956	2984	3032	3046	3052	3064	3073	3082	3107	3109	3128	3131	3137
	3139	3141	3177	3212	3236	3263	3278	3411							
BGE	2146	2695													
BGT	1697	1891	2005	2007	2018	2116	2168	2663	3275	3316	3418				
BHI	3048	3084													
BHIS	3075														
BIC	1681	2165	2429	2524	2589	2645	2991	3012	3089	3232	3249	3276	3303	3309	3317
	3408														
BICB	1719														
BIS	2828	2845	2894	3129	3283	3413	3414								
BISB	2803	2809													
BIT	2147	2224	2259	2297	2304	2434	2436	2438	2440	2442	2444	2794	2837	3130	3134
	3136	3143													
BITB	3200														
BLO	3066														
BLOS	3329														
BLT	1558	1561	1722	1874	2659	2712	2887	3191	3273	3314	3419				
BMI	1720	2825	2836												
	1485	1487	1498	1518	1530	1536	1538	1592	1637	1655	1684	1727	2148	2229	2260
	2305	2315	2361	2435	2437	2439	2441	2443	2445	2470	2480	2504	2570	2618	2623
	2625	2653	2655	2661	2838	2898	3035	3039	3043	3135	3144	3171	3179	3187	3201
	3208	3228	3234	3254	3261	3268	3305	3311	3333	3339	3409	3494			
BPL	1801	1812	1825	1837	1848	1879	1951	1967	1978	2032	2079	2090	2104	2310	2680
	3133	3165	3205	3230	3246	3301	3307	3407							
BR	1488	1490	1520	1540	1543	1583	1623	1627	1629	1632	1651	1694	1730	1856	1863
	1866	1868	1898	1958	1985	1992	1995	1997	2009	2123	2262	2268	2271	2334	2348
	2349	2350	2356	2364	2371	2389	2394	2413	2455	2456	2457	2458	2459	2460	2461
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	3385	3400	3421	3486	3510										
CLR	1482	1496	1581	1597	1628	1692	1693	1695	1723	1729	1734	2163	2325	2433	2665
	2666	2883	2981	2982	3028	3126	3243	3244	3398	3492					
CLRB	1633	1638	2275	2801	2830	2899	3183	3209	3340						
CMP	1486	1497	1517	1531	1537	1585	1721	1726	2145	2228	2269	2314	2469	2479	2490
	2503	2505	2624	2626	2711	2893	3047	3065	3074	3083	3106	3108	3227	3233	3253
	3260	3272	3274	3304	3310	3313	3315	3328							
CMPB	1484	1636	1890	2004	2006	2017	2115	2652	2660	2955	3034	3038	3042	3127	3138
	3140	3176	3178	3186	3207	3211	3235	3267	3332	3338					
COM	2488	2617	2622												
DEC	1557	1560	1696	1873	2166	2327	2380	2477	2569	2651	2654	2658	2662	2694	2698
	2835	2896	2957												
DECB	3190	3193	3406	3417											
EMT	1024														
HALT	1167	2226	2311	2316	3166	3485	3509								
INC	1529	1584	1630	1725	1731	2008	2164	2300	2446	2447	2448	2449	2450	2451	2491
	2693	2710	2802	2842	2888	3282	3412	3420	3493						



.BYTE	1185	1186	1191	1192	1200	1201	1209	1210	1211	1212	1257	1258	1259	1260	1310
	1313	1316	1319	1322	1325	1328	1331	1334	1337	1340	1343	1346	1349	1352	1355
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.DSABL	3287														
.ENABL	1	947	3220												
.END	3718														
.ENDC	952	960	1009	1010	1011	1012	1024	1116	1130	1131	1172	1175	1179	1183	1185
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	1756	1783	1795	1797	1805	1807	1817	1819	1830	1832	1841	1843	1853	1855	1860
	1862	1871	1873	1885	1887	1903	1908	1933	1945	1947	1955	1957	1960	1962	1971
	1973	1982	1984	1989	1991	2001	2003	2011	2013	2026	2028	2040	2045	2060	2073
	2075	2083	2085	2095	2097	2110	2112	2126	2131	2144	2154	2155	2156	2158	2160
	2163	2168	2171	2172	2173	2175	2177	2179	2222	2224	2233	2235	2241	2243	2246
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	2534	2579	2597	2636	2685	2702	2716	2720	2765	2815	2861	2864	2926	2944	2967
	2969	3002	3003	3020	3056	3116	3150	3170	3220	3221	3223	3251	3287	3291	3319
	3320	3327	3329	3332	3334	3350	3356	3359	3436	3442	3445	3457	3458	3459	3460
	3461	3462	3463	3464	3465	3466	3467	3468	3469	3470	3473	3482	3483	3489	3495
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.EQUIV	1024	1025	1033	1048	1049	1078	1079	1080	1081	1082	1083	1084	1085	1086	1087
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.EVEN	1545	3514	3711												
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	1970	1972	1981	1983	1988	1990	2000	2002	2010	2012	2025	2027	2036	2043	2059
	2072	2074	2082	2084	2094	2096	2109	2111	2124	2129	2143	2153	2154	2155	2156
	2157	2158	2162	2167	2170	2172	2173	2175	2176	2178	2221	2223	2233	2241	2243
	2244	2246	2248	2251	2254	2259	2271	2273	2274	2275	2278	2279	2281	2284	2294
	2297	2304	2306	2307	2309	2313	2314	2318	2319	2320	2352	2372	2406	2415	2422
	2453	2510	2533	2577	2596	2635	2684	2701	2715	2719	2764	2814	2860	2863	2925
	2943	2966	2969	2981	3002	3019	3055	3115	3149	3170	3219	3221	3222	3223	3251
	3290	3291	3319	3327	3328	3332	3333	3349	3350	3356	3358	3435	3441	3445	3449
	3458	3459	3460	3461	3462	3464	3465	3466	3467	3468	3469	3470	3472	3482	3483
	3488	3495	3496	3504	3506	3508	3512	3515	3552						
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	1807	1817	1819	1830	1832	1841	1843	1853	1855	1860	1862	1871	1873	1885	1887
	1899	1906	1933	1945	1947	1955	1957	1960	1962	1971	1973	1982	1984	1989	1991
	2001	2003	2011	2013	2026	2028	2036	2043	2060	2073	2075	2083	2085	2095	2097
	2110	2112	2124	2129	2144	2154	2157	2163	2168	2171	2177	2179	2222	2224	2243
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	2926	2944	2967	3003	3020	3056	3116	3150	3220	3223	3291	3293	3298	3319	3320
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.IFTF	1545	2273	2306	2981	2985	3001	3238	3291	3294						

.IIF	947	952	957	1006	1007	1008	1009	1012	1013	1167	1226	1500	1503	1509	1510
	1511	1531	2155	2156	2244	2164	2243	2246	2252	2253	2254	2258	2275	2279	2285
	2286	2287	2288	2289	2293	2312	2314	2319	2320	2363	2375	2411	3093	3096	3099
	3102	3217	3220	3241	3342	3350	3356	3457	3458	3459	3460	3462	3464	3465	3466
	3467	3468	3469												
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	3482	3495	3496												
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	1459	1472	1473	1474	1482	1511	1531	1534	1545	1546	1547	1548	1563	1564	1565
	1598	1599	1600	1659	1660	1661	1662	1663	1699	1700	1701	1734	1743	1744	1745
	1746	1747	1748	1749	1750	1751	1754	1755	1756	1899	1900	1901	1902	1903	1906
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	2131	2163	2175	2233	2254	2279	2314	2320	2422	2423	2424	2453	2510	2511	2512
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	1752	1904	2041	2127	2151	2246	2279	2320	2424	2512	2534	2579	2597	2636	2686
	2703	2717	2766	2816	2861	2923	2941	2964	3003	3021	3056	3117	3147	3217	3356
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	1256	1261	1267	1268	1269	1270	1271	1272	1273	1274	1275	1276	1277	1278	1279
	1280	1281	1282	1366	1367	1368	1790	1793	1889	1894	1897	1940	1943	2016	2021
	2024	2068	2071	2114	2119	2122	2167	2170	2242	2370	2381	2388	2393	2474	2484
	2854	2855	2856	2857	2897	2940	2960	3001	3018	3214	3432	3505	3507	3519	3523
	3526	3529	3531												

ERRORS DETECTED: 0  
 DEFAULT GLOBALS GENERATED: 0

\* DZTAE.B.SEG/SOL/CRF/PAGNUM/NL: TOC=SYSMAC.CO, DZTAE.B.P11  
 RUN-TIME: 38 52 6 SECONDS

K08

TAII DATA RELIABILITY MAINDEC-11-DZTAE-B MACY11 27(732) 25-SEP-76 11:17 PAGE 105  
DZTAE.B.P11 CROSS REFERENCE TABLE -- PERMANENT SYMBOLS

RUN-TIME RATIO: 188/97=1.9  
CORE USED: 35K (69 PAGES)

