

IDENTIFICATION  
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PRODUCT CODE: MAINDEC-08-DHTMD-A-D  
PRODUCT NAME: TM8-E DATA RELIABILITY 9 TRACK  
DATE CREATED: DECEMBER 4, 1972  
MAINTAINER: DIAGNOSTIC GROUP  
AUTHOR: LEONARD E. BEYERSDORFER

**TMREL9**

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MAYNARD, MASS. 01754



NOTE  
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THERE ARE SIX DIAGNOSTIC PROGRAMS ASSOCIATED WITH THE TM8-E DECMAGTAPE CONTROL AND ITS TRANSPORT SYSTEM, ALTHOUGH PHYSICALLY SEPARATE, THESE PROGRAMS MUST BE TREATED AS A LARGE INTEGRATED TEST, AND TO ENSURE PROPER SYSTEM OPERATION, THESE TESTS MUST BE EXECUTED IN THE ORDER DELINEATED BELOW:

IF A GIVEN TEST SHOULD FAIL AND IT APPEARS THAT A FIX HAS BEEN FOUND, ALL PROGRAMS MUST ONCE AGAIN BE RUN, ONLY WHEN ALL TESTS HAVE RUN WITHOUT ANY UNACCEPTABLE ERRORS CAN THE TM8-E SYSTEM BE CONSIDERED UP.

TM8-E DIAGNOSTIC PROGRAMS' ORDER OF EXECUTION  
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1. TM8-E CONTROL TEST PART 1 (MAINDEC-08-DHTMA)
2. TM8-E CONTROL TEST PART 2 (MAINDEC-08-DHTMB)
3. TM8-E DRIVE FUNCTION TIMER (MAINDEC-08-DHTMC)
4. TM8-E DATA RELIABILITY 9 TRACK (MAINDEC-08-DHTMD)
5. TM8-E DATA RELIABILITY 7 TRACK (MAINDEC-08-DHTME)
6. TM8-E RANDOM EXERCISER (MAINDEC-08-DHTMF)

TABLE OF CONTENTS

1.	ABSTRACT
2.	REQUIREMENTS
2.1	HARDWARE
2.2	MEMORY
2.3	PRELIMINARY PROGRAMS
3.	PROGRAM LOADING PROCEDURE
4.	PROGRAM STARTING PROCEDURE
5.	STANDARD TEST PROCEDURE
5.1	DRIVE SELECTION
5.2	TEST SELECTION
5.2.1	TEST SEQUENCE SELECTION TABLE (TST)
5.2.2	DATA PATTERN SELECTION TABLE (PAT)
5.2.3	PARITY SELECTION (PAR)
5.2.4	DENSITY SELECTION (DEN)
5.2.5	RECORD LENGTH SEQUENCE SELECTION (RLS)
5.2.6	WRITE STOP MODE SELECTION (WMO)
5.2.7	READ STOP MODE SELECTION (RMO)
6.	SWITCH REGISTER CONTROLS
7.	ERROR REPORTS
7.1	ACCUMULATED WRITE ERRORS REPORT
7.2	WRITE STATUS ERROR REPORT
7.3	ACCUMULATED READ ERRORS REPORT
7.4	READ STATUS ERROR REPORT
8.	RESTRICTIONS
9.	PROGRAM DESCRIPTION
10.	LISTING



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WARNING: ANY PROGRAM INTERRUPT THAT OCCURS FROM A DEVICE OTHER THAN  
THE TMB-E IS A FATAL ERROR AND WILL RESULT IN A PROGRAM HALT.

1. ABSTRACT  
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THE TMB-E DATA RELIABILITY TEST (9 TRACK) IS PRIMARILY DESIGNED FOR THE COLLECTION OF STATISTICAL INFORMATION PERTAINING TO THE DATA RELIABILITY OF THE 9 TRACK TAPE DRIVES ASSOCIATED WITH THE TMB-E DECMAGTAPE CONTROL. THE PROGRAM IS ALSO DESIGNED TO BE USEABLE AS AN AID IN THE CHECKOUT AND MAINTENANCE OF THE TMB-E AND ASSOCIATED 9 TRACK DRIVES.

THIS PROGRAM MAY ALSO BE USED AS AN EXTENDED DATA RELIABILITY ACCEPTANCE TEST FOR 9 TRACK DRIVES.

ALL TAPE OPERATIONS ARE DONE IN 9 TRACK COMPATIBLE MODE. CORE DUMP MODE IS NOT UTILIZED.

2. REQUIREMENTS  
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2.1 HARDWARE  
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PDP-8/E, 8/M, 8/F  
TELETYPE OR COMPATIBLE DEVICE (TTY)  
TMB-E DECMAGTAPE CONTROL  
TU10 MASTER/SLAVE TRANSPORT SYSTEM WITH FROM ONE TO EIGHT  
9 TRACK DRIVES.

2.2 MEMORY  
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THIS PROGRAM REQUIRES 4K OF MEMORY AND MAY RESIDE IN ANY MEMORY FIELD.

2.3 PRELIMINARY PROGRAMS  
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ALL PROCESSOR/MEMORY DIAGNOSTICS  
TMB-E CONTROL TEST PART 1  
TMB-E CONTROL TEST PART 2  
TMB-E DRIVE FUNCTION TIMER

3. PROGRAM LOADING PROCEDURE

LOAD THE PROGRAM INTO ANY DESIRED MEMORY FIELD USING THE STANDARD BINARY LOADER TECHNIQUE.

4. PROGRAM STARTING PROCEDURE

- A. LOAD ADDRESS 0200.
- B. LOAD THE EXTENDED ADDRESS WITH THE PROGRAM FIELD.
- C. CLEAR ALL SWITCHES.
- E. THE PROGRAM WILL PRINT ITS TITLE AND MAINDEC NUMBER, THEN ASK FOR DRIVE SELECTION, PRIOR TO MAKING DRIVE SELECTION GO TO THE STANDARD TEST PROCEDURE IN PARAGRAPH 5.

NOTE: THE PROGRAM MAY BE RESTARTED AT ANY TIME AT ADDRESS 0201. IN THIS CASE THE PROGRAM ASKS IMMEDIATELY FOR DRIVE SELECTION.

5. STANDARD TEST PROCEDURE

USE OF THE STANDARD TEST PROCEDURE RESULTS IN EACH SELECTED TEST SEQUENCE RUNNING FROM BOT TO EOT. NO REPORTS WILL OCCUR WHEN NON-FATAL ERRORS ARE DETECTED. HOWEVER, THESE ERRORS WILL BE ACCUMULATED AND REPORTED AT THE END OF EACH PASS OF TAPE. ANY VARIATIONS FROM THIS SCHEME ARE CONTROLLED THROUGH THE SWITCH REGISTER OPTIONS AS LISTED IN PARAGRAPH 6. ERROR REPORT DESCRIPTIONS AND RELATED INFORMATION ARE GIVEN IN PARAGRAPH 7.

5.1 DRIVE SELECTION

ACCOMPLISH THE FOLLOWING STEPS TO SETUP AND SELECT THOSE 9 TRACK DRIVES TO BE TESTED.

- A. PLACE A SPARE REEL OF INDUSTRY COMPATIBLE MAGNETIC TAPE WITH THE FILE PROTECT RING IN PLACE (WRITE ENABLED) ON EACH DRIVE TO BE TESTED.
- B. LOAD THE TAPE, POSITION TO BOT AND SWITCH THE DRIVE ON LINE.
- C. START THE PROGRAM AS DESCRIBED IN PARAGRAPH 4.
- D. THE PROGRAM WILL EVENTUALLY PRINT "SELECT DRIVES".
- E. TYPE THE DRIVE NUMBERS OF THOSE 9 TRACK DRIVES TO BE TESTED. TYPING THE SAME DRIVE NUMBER TWICE WILL DELETE THAT DRIVE FROM THE SELECTION.

F. WHEN ALL DRIVE NUMBERS HAVE BEEN TYPED IN, TYPE CARRIAGE RETURN.

TEST SELECTION  
-----

ACCOMPLISH THE FOLLOWING STEPS TO SELECT THE DESIRED TEST SEQUENCES,

- A. AFTER DRIVE SELECTION IS COMPLETE, THE PROGRAM WILL PRINT  
"TST PAT PAR DEN RLS WMO RMO"
- B. RESPOND BY TYPING THE DESIRED CODE FOR EACH OF THE PARAMETERS USING THE TABLE BELOW AND REFERENCING THE INDICATED PARAGRAPH,

PARAMETER	DEFINITION	REFERENCE PARA.
TST	TEST SEQUENCE	5,2,1
PAT	DATA PATTERN	5,2,2
PAR	PARITY	5,2,3
DEN	DENSITY	5,2,4
RLS	RECORD LENGTH	5,2,5
WMO	WRITE STOP MODE	5,2,6
RMO	READ STOP MODE	5,2,7

- C. AFTER ALL PARAMETERS FOR A SPECIFIED TEST SEQUENCE HAVE BEEN ENTERED, TYPE A SPACE, IF THE SELECTION IS VALID, THE PROGRAM WILL PRINT "O.K."
- D. REPEAT STEPS B AND C FOR ALL DESIRED TEST SEQUENCES.
- E. WHEN ALL DESIRED TEST SEQUENCES HAVE BEEN SPECIFIED AND "O.K." HAS BEEN PRINTED BY THE PROGRAM FOR EACH SET OF TEST SEQUENCE PARAMETERS, TYPE CARRIAGE RETURN.
- F. THE PROGRAM WILL NOW START EXECUTING THE SELECTED TEST SEQUENCES ON THE DRIVES UNDER TEST.
- G. AS EACH TEST SEQUENCE IS COMPLETED ON EACH DRIVE, THE ACCUMULATED ERRORS DETECTED WILL BE REPORTED, REFERENCE PARAGRAPH 7 FOR DETAILS.

5.2,1 TEST SEQUENCE SELECTION TABLE (TST)

THE FIRST SELECTION MADE IS "TST", TYPE IN THE NUMBER OF THE TEST DESIRED.

TEST NUMBER DESCRIPTION

- 0 WRITE TO EOT ON ONE DRIVE, TYPE ACCUMULATED WRITE ERRORS, CHANGE DRIVES.
- 1 WRITE ONE RECORD LENGTH SEQUENCE OR 256 RECORDS, CHANGE DRIVES, AS EACH DRIVE REACHES EOT TYPE ACCUMULATED WRITE ERRORS.
- 2 WRITE ONE RECORD, CHANGE DRIVES, AS EACH DRIVE REACHES EOT TYPE ACCUMULATED WRITE ERRORS.
- 3 WRITE TO EOT, TYPE ACCUMULATED WRITE ERRORS, REWIND, CHANGE DRIVES, READ TO EOT, TYPE ACCUMULATED READ ERRORS, CHANGE DRIVES.
- 4 WRITE ONE RECORD LENGTH SEQUENCE, BACKSPACE, READ, CHANGE DRIVES AS EACH DRIVE REACHES EOT TYPE ACCUMULATED WRITE AND READ ERROR INFORMATION.
- 5 WRITE ONE RECORD, BACKSPACE, READ, CHANGE DRIVES, AS EACH DRIVE REACHES EOT TYPE OUT ACCUMULATED ERROR INFORMATION.
- 6 WRITE ONE RECORD LENGTH SEQUENCE OR 256 RECORDS, CHANGE DRIVES, BACKSPACE, CHANGE DRIVES, READ, CHANGE DRIVES, AS EACH DRIVE REACHES EOT TYPE ACCUMULATED ERROR INFORMATION.
- 7 WRITE ONE RECORD, CHANGE DRIVES, BACKSPACE, CHANGE DRIVES, READ, CHANGE DRIVES, AS EACH DRIVE REACHES EOT TYPE ACCUMULATED ERROR INFORMATION.
- 8 TEST 8 RUNS DIFFERENTLY DEPENDING ON THE WMO AND RMO SELECTION, IF BOTH ARE SELECTED 0 (NONSTOP), EACH WRITE AND READ PASS WILL BE MADE TO THE END OF A RECORD LENGTH SEQUENCE BEFORE CHANGING DRIVES, IF EITHER SELECTION IS START/STOP (1) OR RANDOM (2) THAT PASS WILL BE MADE WITH DRIVE CHANGE BETWEEN EACH RECORD, (I.E., WMO=0 AND RMO=1, THE WRITE PASS IS MADE NONSTOP ON EACH DRIVE TO END OF RLS, THE READ PASS IS MADE START STOP WITH A DRIVE CHANGE BETWEEN EACH RECORD).

361 000 } Good test to check heads

TEST 9 IS A READ ONLY TEST THAT MAY BE USED TO TEST DRIVE COMPATIBILITY OR MULTIPLE READ PASSES OVER DATA PREVIOUSLY WRITTEN. EITHER PATTERN 7 (RANDOM DATA) IS NOT A VALID SELECTION FOR TEST 9 EXCEPT WITH CERTAIN RESTRICTIONS.

- A. TEST 9 SELECTION FOLLOWS TEST 3,
- B. TEST 9 SELECTION FOLLOWS TEST 6 WITH SR0=1
- C. TEST 9 SELECTION FOLLOWS TEST 8 WITH SR0=1
- D. TEST 9 SELECTION FOLLOWS TEST 5 WITH SR0=1 AND ONLY A SINGLE DRIVE WAS SELECTED.

5.2.2 DATA PATTERN SELECTION TABLE (PAT)

THE SECOND SELECTION IS "PAT".  
 TYPE IN THE NUMBER OF THE DATA PATTERN DESIRED; USE TABLE "A" IF PARITY SELECTION WILL BE EVEN, TABLE "B" IF PARITY WILL BE ODD.

A. EVEN PARITY DATA PATTERNS

PAT	DATA	DESCRIPTION
0	0014	HIGH FREQUENCY OUTSIDE SKEW
1	0377	SLIDING NO BIT (0)
	0177	CHARACTER PATTERN
	0277	
	0337	
	0357	
	0367	
	0373	
	0375	
	0376	
2	0103	HIGH FREQUENCY EVERY OTHER TRACK
3	0273	HALF FREQUENCY OUTSIDE TRACKS HIGH FREQUENCY ALL INSIDE TRACKS
4	0001	INCREMENTING CHARACTER PATTERN
	0002	NO 00 CODES
	0003	
	0004	

THREE 0 BITS EACH TRACK  
EVERY 7TH WORD

0377  
0177  
0277  
0337  
0397  
0567  
0373  
0375  
0376

ALL 1'S ALL TRACKS

0377

RANDOM DATA PATTERN WITH NO 00  
CODES

RANDOM

8. 000 PARITY DATA PATTERNS  
-----

DESCRIPTION  
-----

HALF FREQUENCY OUTSIDE  
SKEW

SLIDING 1 BIT CHAR=  
ACTER PATTERN (ISO=  
LATED BIT)

HIGH FREQUENCY EVERY OTHER TRACK

THREE 0'S, THREE 1'S, THREE 0'S,  
THREE 2'S, SIX 0'S EVERY TRACK

DATA  
----

0004

0000  
0200  
0100  
0040  
0020  
0010  
0004  
0002  
0001

0274

0037  
0076  
0201  
0174  
0003  
0370  
0007  
0360

5

6

7

8

PAT  
---

0

1

2

3

INCREMENTING CHARACTER PATTERN  
00 CODES INCLUDED

0001  
0002  
0003  
0004

EACH TRACK 3 BITS EVERY  
SEVENTH WORD

0000  
0200  
0100  
0040  
0020  
0010  
0004  
0002  
0001

ALL ONES HIGH FREQUENCY ALL TRACKS

0377

RANDOM DATA WORD PATTERN 03 CODES  
INCLUDED

RANDOM

5.2.3 PARITY SELECTION (PAR)

THE THIRD SELECTION IS "PAR".  
SPECIFY PARITY BY TYPING THE DESIRED CODE AS DESCRIBED BELOW.

CODE PARITY

0 EVEN  
1 ODD

5.2.4 DENSITY SELECTION (DEN)

AFTER PARITY HAS BEEN SELECTED, 800 BPI WILL AUTOMATICALLY  
BE SELECTED AND PRINTED BY THE PROGRAM.

5.2.5 RECORD LENGTH SEQUENCE SELECTION (RLS)

AFTER THE DENSITY SELECTION SPECIFY THE DESIRED RECORD LENGTH SEQUENCE SELECTION (RLS) BY TYPING THE DESIRED CODE AS DEFINED BELOW.

CODE RECORD LENGTH SEQUENCE

- 0 ALL RECORDS ARE 24 WORDS (24 CHARACTERS)
- 1 ALL RECORDS ARE 4008 WORDS (4008 CHARACTERS)
- 2 RECORDS PROGRESS FROM 24 WORDS TO 4008 WORDS (MIN TO MAX)
- 3 RECORDS PROGRESS FROM 4008 WORDS TO 24 WORDS (MAX TO MIN)

5.2.6 WRITE STOP MODE SELECTION (WMO)

AFTER THE RECORD LENGTH SEQUENCE SELECTION, SPECIFY THE APPROPRIATE CODE FOR THE DESIRED WRITE STOP MODE (WMO).

CODE WRITE STOP MODE

- 0 NONSTOP, THE NEXT WRITE OPERATION IS INITIATED WITHOUT WAITING FOR TAPE UNIT READY.
- 1 START/STOP. ALL WRITE OPERATIONS ARE INITIATED AFTER TAPE UNIT READY.
- 2 RANDOM, COMBINED NONSTOP, START/STOP AND RANDOM STALL OPERATIONS.

5.2.7 READ STOP MODE SELECTION (RMO)

AFTER WRITE STOP MODE SELECTION, SPECIFY THE APPROPRIATE CODE FOR THE DESIRED READ STOP MODE (RMO).

CODE READ STOP MODE

- 0 NONSTOP, THE NEXT READ-COMPARE OPERATION IS INITIATED WITHOUT WAITING FOR TAPE UNIT READY.
- 1 START/STOP, ALL READ-COMPARE OPERATIONS ARE INITIATED AFTER TAPE UNIT READY.
- 2 RANDOM, COMBINED NONSTOP, START/STOP AND RANDOM STALL READ-COMPARE OPERATIONS.



6. SWITCH REGISTER CONTROLS

THE FOLLOWING TABLE INDICATES THE CONTROL THE SWITCH REGISTER HAS OVER PROGRAM OPERATION WHEN A PARTICULAR SR BIT IS SET TO THE "1" STATE.

SR BIT	FUNCTION
0	DUMP ERROR COUNTERS AND PROCEED TO NEXT TEST SEQUENCE AT THE END OF ONE RECORD LENGTH SEQUENCE. (256 RECORDS FOR RLS=0 OR 1, ONE MIN TO MAX SEQUENCE FOR RLS=2, OR ONE MAX TO MIN SEQUENCE FOR RLS=3.)
1	DELETE WRITE WITH EXTENDED INTERRECORD GAP; USE OF THIS SWITCH WILL CAUSE RECORDS WITH WRITE ERRORS TO BE LEFT ON TAPE.
2	REPORT ALL WRITE ERRORS AS THEY OCCUR.
3	SELECT WRITE STATISTICAL RECOVERY. USE OF THIS SWITCH WILL SELECT THE BACKSPACE 2 RECORDS; SPACE FORWARD 1 RECORD; REWRITE SEQUENCE; THIS SEQUENCE CAUSES THE SAME RECORD TO BE REWRITTEN ON APPROXIMATELY THE SAME AREA OF TAPE IF A WRITE ERROR OCCURS.
4	REPORT ALL READ-COMPARE STATUS AND DATA ERRORS AS THEY OCCUR.
5	DELETE READ RETRIES. THIS SWITCH IS AN AID TO SCOPING READ CIRCUITS BY DELETING THE BACKSPACE, REREAD THICE SEQUENCE.
6	INCREMENT PATTERN SELECTION AND REPEAT LAST TEST SEQUENCE; PATTERN SELECTION IS RESET TO ITS ORIGINAL SELECTION AFTER PATTERN 7 HAS BEEN EXERCISED.
7	COMPLEMENT PARITY SELECTION AND REPEAT TEST SEQUENCE IF NEW PARITY SELECTION IS DIFFERENT THAN THE ORIGINAL TEST SEQUENCE.

NO FUNCTION

INCREMENT RLS SELECTION TO THE NEXT SEQUENCE, AFTER MAX. TO MIN. HAS BEEN EXERCISED RESET RLS SELECTION TO ITS ORIGINAL TEST SEQUENCE SELECTION.

INCREMENT WMO TO THE NEXT STOP MODE, AFTER RANDOM START/STOP HAS BEEN EXERCISED, RESET WMO TO ITS ORIGINAL TEST SELECTION.

INCREMENT RMO TO THE NEXT READ STOP MODE, AFTER READ RANDOM START/STOP HAS BEEN EXERCISED, RESET RMO TO ITS ORIGINAL TEST SELECTION.

7. ERROR REPORTS

THE NORMAL MODE (SR=0000) OF OPERATION FOR THIS TEST IS TO SIMPLY ACCUMULATE THE ERRORS THAT OCCUR AND TO DUMP THE CONTENTS OF THE COUNTERS ON THE TTY AS EACH DRIVE REACHES EOT. THE ONLY ERROR REPORT THAT CAN OCCUR IN THIS MODE IS IF THE SYSTEM FAILS TO WRITE THE SAME RECORD FOUR TIMES IN A ROW WITH EXTENDED INTERRECORD GAP.

SWITCH REGISTER BITS 2 AND 4 ALTR THIS MODE OF ERROR REPORTING BY FORCING REPORTS FOR ALL WRITE AND READ=COMPARE ERRORS, RESPECTIVELY, AS THEY OCCUR.

7.1 ACCUMULATED WRITE ERRORS REPORT

WHEN A WRITE OPERATION ENCOUNTERS EOT, THE FOLLOWING REPORT IS PRINTED.

END OF TAPE  
DRV PAT PAR DEN MODE RECORDS LENGTH  
1 7 1 000 SSTP 02954 2016 MAX TO MIN  
WRITE ERRORS=0009  
RECOVERED AT 1 0002  
RECOVERED AT 2 0003  
RECOVERED AT 3 0001  
PERMANENT BAD\$PT 0003

WITH THE FOLLOWING DEFINITIONS:

SYMBOL DEFINITION

DRV DRIVE NUMBER  
PAT SELECTED DATA PATTERN

14  
 SELECTED PARITY  
 SELECTED DENSITY  
 WRITE STOP MODE  
 NUMBER OF RECORDS WRITTEN  
 SELECTED RECORD LENGTH SEQUENCE  
 (2016 SHOWN IS AVERAGE LENGTH)  
 TOTAL WRITE ERRORS  
 NUMBER OF WRITE ERRORS RECOVERED ON THE NTH  
 REWRITE  
 PERMANENT BADSPT NUMBER OF WRITE ERRORS NOT  
 RECOVERED AFTER 7 REWRITES

A SIMILAR REPORT WILL OCCUR WHEN THE END OF A RECORD LENGTH  
 SEQUENCE IS REACHED AND SR0=1. HOWEVER "END OF TAPE" IS REPLACED  
 BY "WRITE DUMP".

7.2 WRITE STATUS ERROR REPORT  
 \*\*\*\*\*

IF SR2=1 WHEN A WRITE ERROR IS DETECTED, THE FOLLOWING ERROR REPORT  
 WILL BE PRINTED.

WRITE STATUS ERROR  
 COMD FUNCTN STATUS WRDCNT CURADR RECORDS LENGTH  
 NNNN NNNN NNNN NNNN NNNN NNNN NNNN

WITH THE FOLLOWING DEFINITIONS.

SYMBOL	DEFINITION
COMD	COMMAND REGISTER
FUNCTN	FUNCTION/STATUS REGISTER
STATUS	MAIN STATUS REGISTER
WRDCNT	WORD COUNT REGISTER
CURADR	CURRENT ADDRESS REGISTER
RECORDS	RECORD NUMBER
LENGTH	RECORD LENGTH

THE ABOVE REPORT WILL ALSO BE FORCED, REGARDLESS OF SM SETTINGS,  
 IF A WRITE ERROR PERSISTS AFTER FOUR REWRITES WITH EXTENDED  
 INTERRECORD GAP. THE REPORT IS AMENDED WITH:

"XRIG WRITTEN 4 TIMES".

7.3 ACCUMULATED READ ERRORS REPORT  
\*\*\*\*\*

WHEN A READ-COMPARE OPERATION ENCOUNTERS END, THE FOLLOWING REPORT IS PRINTED.

READ PASS  
END OF TAPE  
DRP PAT PAR DEN MODE RECORDS LENGTH  
1 7 1 800 NSTP 02954 2016 MAX TO MIN  
READ ERRORS=0010  
NON RECOVERABLE=0002  
DATA ERRORS=0003  
DATA NO STATUS=0001

WITH THE FOLLOWING DEFINITIONS (REFER TO 7.1):

SYMBOL DEFINITION  
\*\*\*\*\*

READ ERRORS TOTAL NUMBER OF READ ERRORS INCLUDING ERRORS ON REREAD.  
NON RECOVERABLE TOTAL NUMBER OF NON RECOVERABLE READ ERRORS (AFTER TWO REREADS)  
DATA ERRORS TOTAL NUMBER OF DATA (READ-COMPARE) ERRORS NOT INCLUDING REREADS.  
DATA NO STATUS TOTAL NUMBER OF DATA ERRORS NOT INCLUDING REREADS, WITHOUT ACCOMPANYING PARITY ERRORS OR OTHER STATUS ERRORS. THIS TYPE OF ERROR SHOULD ALWAYS BE CONSIDERED NON RECOVERABLE IN NATURE.

A SIMILAR REPORT WILL OCCUR WHEN THE END OF A RECORD LENGTH SEQUENCE IS REACHED AND SR0=1. HOWEVER "END OF TAPE" IS REPLACED BY "READ DUMP".

7.4 READ STATUS ERROR REPORT  
\*\*\*\*\*

IF SR4=1 WHEN A READ-COMPARE STATUS ERROR IS DETECTED, THE FOLLOWING ERROR REPORT WILL BE PRINTED.

READ STATUS ERROR  
COMD FUNCTN STATUS WRDCNT CURADR RECORDS LENGTH  
NNNN NNNN NNNN NNNN NNNN NNNN NNNN

REFER TO 7.2 FOR SYMBOL DEFINITIONS.

8. RESTRICTIONS  
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IF ANY DEVICE OTHER THAN THE TM0-E CAUSES A PROGRAM INTERRUPT, THE PROGRAM WILL HALT. THE REASON FOR THIS RESTRICTION IS THAT EXTREMELY TIME CRITICAL OPERATIONS ARE BEING EXECUTED IN THE BACKGROUND WHILE RECORDS ARE BEING WRITTEN AND READ. COMPARED, THE PROGRAM MUST CONSTANTLY MONITOR THE TM0-E CURRENT ADDRESS REGISTER AS DATA TRANSFERS ARE TAKING PLACE.

9.  
PROGRAM DESCRIPTION  
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THIS PROGRAM IS DESIGNED AROUND TWO MAIN SUBROUTINES AND A SERIES OF SHORTER SUBROUTINES FOR MANIPULATING DRIVE SELECTION AND ERROR AND RECORD POSITION TABLES.

THE TWO MAIN SUBROUTINES ARE THE WRITE AND READ-COMPARE ROUTINES. THE WRITE ROUTINE EXITS AFTER EVERY RECORD, EVERY RECORD LENGTH SEQUENCE, OR AT END OF TAPE. THE READ ROUTINE EXITS WHEN THE LAST RECORD WRITTEN ON TAPE HAS BEEN READ. SOME TESTS MANIPULATE THE LAST RECORD COUNTER SO THE READ ROUTINE EXITS AFTER EVERY RECORD.

OTHER SUBROUTINES USED SET UP DRIVE SELECTION TO THE LOWEST DRIVE NUMBER, CHANGE DRIVE SELECTION TO THE NEXT HIGHEST DRIVE, AND GET AND SAVE ERROR AND POSITION TABLES FOR THE DRIVE CURRENTLY SELECTED.

ALL THESE SUBROUTINES ARE TIED TOGETHER IN VARIOUS SEQUENCES FOR TEST SELECTIONS 0 THROUGH 9.

ALL DATA IS CHECKED USING THE READ-COMPARE FUNCTION. THE READ FUNCTION IS NEVER USED. BY USING THIS METHOD, RECORDS ARE USED WHICH ARE MUCH LONGER THAN COULD EVER BE POSSIBLE IN A 4K SYSTEM THAT ALSO CONTAINS THIS PROGRAM. THE OVERALL CONCEPT USED TO ALLOW UTILIZING LONG RECORDS IN THIS PROGRAM IS TO USE A RELATIVELY SHORT DATA BUFFER, THEN MONITORING THE CURRENT ADDRESS REGISTER, RESET THE CURRENT ADDRESS TO THE START OF THE BUFFER WHEN IT REACHES THE END OF THE BUFFER. THIS TECHNIQUE INVOLVES TIME CRITICAL PROGRAM EXECUTION, HENCE NO PROGRAM INTERRUPTS ARE ALLOWED OTHER THAN THOSE CAUSED BY THE TMB-E.

10.  
LISTING (ATTACHED  
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/IMBE DATA RELIABILITY TEST (9 TRACK) MAINDEC-08-DHTMD-A=L  
/THIS PROGRAM WILL RUN IN ANY EXISTING MEMORY FIELD;  
/ COPYRIGHT 1971-1972, DIGITAL EQUIPMENT CORP.,  
/ MAYNARD, MASS,  
/

6244 RMF=6244  
6201 CDF=6201  
6224 RIF=6224

/MAGNETIC TAPE IOT EQUALITIES

6701 LWCR=6701  
6702 CWCR=6702  
6703 LCAR=6703  
6704 CCAR=6704  
6705 LCMR=6705  
6706 LFGR=6706  
6707 LOBR=6707

6711 RWCR=6711  
6713 RCAR=6713  
6714 RMSR=6714  
6715 RCMR=6715  
6716 RFSR=6716  
6717 ROBR=6717

6721 SKEF=6721  
6722 SKCB=6722  
6723 SKTD=6723  
6724 SKTR=6724  
6725 CLF=6725  
6712 CLT=6712  
6726 SOLE=6726  
6727 SBRM=6727

0000 /FIELD0 /PROGRAM FIELD /SET UP FOR HIGH SPEED DUMP,  
0001 / / /CHANGED AS SHOWN FOR INTERRUPT  
5001 JUMP 1 /RNF /JMP I 2 /HANDLING;  
0002 2 /JMP I 3/POINTER /SUCH A SYSTEM ENABLES THIS PROGRAM  
0003 3 / / /TO RUN IN ANY EXISTING MEMORY FIELD;

/PERMANENT VALUES  
WRBUF, 3400 /READ=WRITE BUFFER STARTING ADDRESS  
MAXLEN, 7680 /MAXIMUM RECORD LENGTH  
MINLEN, 30 /MINIMUM RECORD LENGTH

/PAGE POINTERS  
XRRANUM, RANGEN  
XRRWIND, REWIND  
XCLRTB, CLRTBL  
XGOSKW, GOSKWD  
XRDIT, READIT  
XWRIT, WRIT  
XTSING, TESING  
XGENPT, GENPAT  
XRDRNC, RDINCR  
XSVCTR, SVCTRS  
XNVCTR, MCVTRS  
XWATKY, WAITKY  
XCHGDR, CHGDRV  
XALEOT, ALLEOT  
XRSFOV, RSFORV  
XCLRAL, CLRALL  
XDCPRT, DECPRT  
XTYPTD, TYPDAT  
XTXT, TEXTX  
XOTY, OTY  
XGOT1, GOT1  
XTSP3, TSP3  
XTIN, TIN  
XTSR, TSR  
XLEOT1, LBEOT1  
XLEOT2, LBEOT2  
XLBSAV, LBSAV  
XLBINT, LBINT  
XLBWAT, LBWAT  
XLBSET, LBSET

PAUSE

0130 3400  
0131 7680  
0132 0030

0133 5675  
0134 5345  
0135 5066  
0136 5127  
0137 4200  
0140 2444  
0141 3102  
0142 5400  
0143 4462  
0144 1000  
0145 1007  
0146 1142  
0147 1071  
0150 1236  
0151 1051  
0152 1035  
0154 5101  
0155 6000  
0156 6155  
0157 6033  
0160 6040  
0161 6164  
0162 6122  
0163 1300  
0164 1314  
0165 1327  
0166 1335  
0167 1344  
0170 1712

```

/ TM8E DATA RELIABILITY TEST - TAPE 2 (9 TRACK)
/ PARAMETER AND TEST SELECTIONS VIA KEYBOARD
*200
RELIAB, SKP
0200 0200
0201 7410
0202 7420
0203 4570
0204 4555
0205 6701
0206 3022
0207 4546
0208 7041
0209 1360
0210 TAD K0215
0211 SNA CLA
0212 JMP REL1
0213 TAD CHARIN
0214 AND K0370
0215 TAD K7520
0216 SNA CLA
0217 JMP VLDDRV
0220 TAD K0277
0221 JMS I XOTY
0222 TAD K025
0223 JMS I XOTY
0224 JMP RELIAB+6
0225 TAD MSBITS
0226 SNA
0227 JMP RELIAB+3
0230 JMP SLTSTS

/SET UP INTERRUPT SERVICE
/PRINT TEXT.
"SELECT DRIVES"
/CLEAR DRIVE SELECT
/WAIT FOR CHARACTER FROM KEYBOARD

/IS CHARACTER CAR RET
/YES,
/NO

/IS CHARACTER A VALID DRIVE NUMBER
/YES, SAVE
/NO, TYPE "?"
/TYPE ",,"

/ANY DRIVES SELECTED?
/NO
/YES, SELECT TESTS

```

```

REL1.
/ HAVE VALID DRIVE SELECTED
VLDDRV, TAD K0254
/TYPE ",,"
JMS I XOTY
TAD CHARIN
AND K0007
DCA CDRIVE
TAD CDRIVE
CMA DELAY
DCA DELAY
STL
RAR DELAY
IS2 DELAY
JMP .-2
DCA DELAY
TAD DELAY
AND MSBITS
CIA
CLL RAL
TAD DELAY
TAD MSBITS
DCA MSBITS
JMP RELIAB+6

/TEMP STORAGE FOR = DRIVE NUMBER
/MOVE SELECT BIT RIGHT ONE PLACE
/IS THIS DRIVE SELECTED
/NO

/GET CHARACTER
/MASK TO FIND DRIVE NUMBER

/COMBINE DRIVE SELECT BITS

```

```

0231 1361
0232 4556
0233 1054
0234 0106
0235 3023
0236 1023
0237 7040
0240 3047
0241 7120
0242 7010
0243 2047
0244 5242
0245 3047
0246 1047
0247 0222
0250 7041
0251 7104
0252 1047
0253 1022
0254 3022
0255 5206

```



0020	*20		
0021	PASSNS,	0	/PARAMETER STORAGE
0022	MSBITS,	0	/PARAMETER STORAGE
0023	CDRIVE,	0	/MASTER DRIVE SELECT BITS
0024	PATNUM,	0	/CURRENT DRIVE
0025	PARBIT1,	0	/PATTERN NUMBER SELECTED
0026	DRVDEN,	0	/PARITY SELECTION
0027	RLTROL,	0	/DRIVE AND DENSITY SELECTED
0030	MODBIT,	0	/RECORD LENGTH CONTROL
0031	READMO,	0	/WRITE STOP MODE
0032	RECSYS,	0	/READ STOP MODE
0033	EXITMO,	0	/READ PASS IS SELECTED
0034	STRLEN,	0	/EXIT MODE
0035	COMAND,	0	/STARTING BLOCK LENGTH
0036	BLKING,	0	/COMMAND, DRIVE, PAR, DEN
0037	WRPASS,	0	/BLOCK LENGTH INCREMENT
0040	NUMTST,	0	/WRITE RECOVERY COUNT
0041	TBLCNT,	0	/NUMBER OF TESTS SELECTED
0042	EXETST,	0	/NUMBER OF TESTS EXECUTED
0043	SWTEST,	0	/TESTS BEING EXECUTED
0044	EOSFLG,	0	/CLEARED IF PARAMETER INPUT IS THRU SWITCHES
0045	SVRECR,	0	/CLEARED AT END OF RLS
0046		0	/TEMP STORAGE
0047	DELAY,	0	/DELAY COUNTER
0050	DELAY1,	0	/DELAY COUNTER
0051	RDPASS,	0	/COUNT READ PASSES
0052	STATRO,	0	/SAVE MAGTAPE STATUS WORD
0053	STATRE,	0	
0054	CHARIN,	0	/CHARACTER INPUT FROM KEYBOARD

0055	0000	/WRITE ERROR AND RECORD CONTROL REGISTERS
0056	0000	WRCHK, 0
0057	0000	RECV1, 0
0060	0000	RECV2, 0
0061	0000	RECV3, 0
0062	0000	RECV4, 0
0063	0000	RECV5, 0
0064	0000	RECV6, 0
0065	0000	RECV7, 0
0066	0000	PERMS, 0
0067	0000	RECORD, 0
0070	0000	0
0071	0000	LASRCR, 0
0072	0000	0
0073	0000	WRTEOT, 0
0074	0000	WRTLEN, 0
0075	0000	WRRECR, 0
		0

/PERMANENT BAD SPOT ON TAPE  
 /RECORD COUNT  
 /RECORD COUNT OVERFLOW  
 /LAST RECORD

/WRITE BLOCK LENGTH  
 /SAVE STARTING RECORD

0076	0000	/READ ERROR AND RECORD CONTROL REGISTERS
0077	0000	READLN, 0
0100	0000	RNOSTA, 0
0101	0000	CMPEER, 0
0102	0000	NRREAD, 0
0103	0000	RDERRS, 0
0104	0003	RDEOT, 0
0105	0004	K0003, 3
0106	0007	K0004, 4
0107	0010	K0007, 7
0110	0017	K0010, 10
0111	0020	K0017, 17
0112	0030	K0020, 20
0113	0040	K0030, 30
0114	0060	K0040, 40
0115	0100	K0060, 60
0116	0177	K0100, 100
0117	0200	K0177, 177
0120	0240	K0200, 200
0121	0300	K0240, 240
0122	0400	K0300, 300
0123	7443	K0400, 400
0124	7751	K7443, 7443
0125	7770	K7751, 7751
0126	7771	K7770, 7770
	7771	K7771, 7771
	7775	K7771, 7771
	7775	K7775, 7775

/READ BLOCK LENGTH  
 /COUNT READ ERRORS

```

0256 4555 /SELECT TESTS
0257 6715 JMS I XTEXT
0260 3040 SLTSTS, TEXT31
0261 7610 DCA NUMTST
0262 7477 SKP CLA
0263 1262 TSTTBL=1
0264 3016 TAD :=1
0265 4561 DCA 16
0266 4846 JMS I XTIN
0267 7041 JMS I XMAIKY
0270 1360 CIA
0271 7650 TAD K0215
0272 5313 SNA CLA
0273 1054 JMP TSTYGS+3
0274 0365 TAD CHARIN
0275 1366 AND K0370
0276 7650 TAD K7520
0277 5321 SNA CLA
0300 1054 JMP VLDTST
0301 7041 TAD CHARIN
0302 1362 CIA
0303 7450 TAD K0270
0304 5321 SNA VLDTST
0305 7001 IAC
0306 7650 SNA CLA
0307 5321 JMP VLDTST
0310 1363 TAD K0277
0311 4556 JMS I XOTY
0312 5265 JMP SLTSTS+7
0313 7200 CLA
0314 1040 TAD NUMTST
0315 7450 SNA TSTYGS
0316 5310 JMP I ,+1
0317 5720 EXECUT
0320 0601

/IS CHAR A VALID NUMBER 0=7?
/IS CHARACTER A CAR RET
/YES, SEE IF TESTS SELECTED
/NO
/IS CHAR AN 8?
/YES
/IS CHAR A 9?
/YES
/CHARACTER WAS NOT 0-9
/TYPE "?"
/TRY AGAIN
/ANY TESTS SELECTED?
/NO
/YES, EXECUTE SELECTED

```

/HAVE VALID TEST NUMBER SELECTED  
VLOTST, CLA CLL / T VALID TEST NUMBER  
TAD CHARIN /MOVE INTO POSITION  
AND K0017

PASSWS+1 /SAVE IT  
JMS I XTSP3 /TYPE 3 SPACES  
JMS I XWATKY /WAIT FOR PATTERN KEY  
AND K0370

TAD K7520 /IS KEY VALID FOR PATTERN?  
SEA CLA /NO  
JMP TSTYQS /YES  
TAD CHARIN /MASK OCTAL  
AND K0007 /SAVE IT

DCA PASSWS /WAIT FOR PARITY KEY  
JMS I XTSP3  
JMS I XWATKY  
AND K0376

TAD K7520 /IS KEY VALID FOR PARITY? (0 OR 1)  
SEA CLA /NO  
JMP TSTYQS /YES  
TAD CHARIN /ROTATE INTO POSITION

RAH /MASK PARITY BIT  
RTL /COMBINE PARITY WITH PATTERN  
AND K0010 /SAVE IT  
TAD PASSWS  
DCA PASSWS  
JMS I XTSP3  
JMP I .+1

K0215,  
K0254,  
K0270,  
K0277,  
K0376,  
K0370,  
K7520,

- 0321 7300
- 0322 1054
- 0323 0110
- 0324 7010
- 0325 7012
- 0326 7012
- 0327 3021
- 0330 4560
- 0331 4546
- 0332 0365
- 0333 1366
- 0334 7640
- 0335 5310
- 0336 1054
- 0337 0106
- 0340 3020
- 0341 4560
- 0342 4546
- 0343 0364
- 0344 1366
- 0345 7640
- 0346 5310
- 0347 1054
- 0350 7004
- 0351 7006
- 0352 0107
- 0353 1020
- 0354 3020
- 0355 4560
- 0356 5757
- 0357 0400
- 0360 0215
- 0361 0254
- 0362 0270
- 0363 0277
- 0364 0376
- 0365 0370
- 0366 7520

\*400

0400  
 1104  
 0401  
 1021  
 0402  
 3021  
 0403  
 1311  
 0404  
 4556  
 0405  
 1310  
 0406  
 4556  
 0407  
 1310  
 0410  
 4556  
 0411  
 1120  
 0412  
 4556  
 0413  
 4546  
 0414  
 0313  
 0415  
 1312  
 0416  
 7040  
 0417  
 5707  
 0420  
 1054  
 0421  
 7006  
 0422  
 7006  
 0423  
 0114  
 0424  
 1020  
 0425  
 3020

TAD K0003  
 TAD PASSWS+1  
 DCA PASSWS+1  
 TAD K270  
 JMS I XOTY  
 TAD K0260  
 JMS I XOTY  
 TAD K0260  
 JMS I XOTY  
 TAD K0240  
 JMS I XOTY  
 JMS I XWATKY  
 AND K0374  
 TAD KX7520  
 SZA CLA  
 JMP I XTSP3  
 TAD CHARIN  
 RTL  
 RTL  
 AND K0060  
 TAD PASSWS  
 DCA PASSWS

/DENSITY IS 800 BPI 9 TRACK  
 /COMBINE DENSITY OF 800 WITH TEST  
 /SAVE  
 /ECHO 2 ZEROS (00)  
 /WAIT FOR RECORD LENGTH KEY  
 /NO, PRINT "?"  
 /YES  
 /MOVE RECORD LENGTH INTO POSITION  
 /COMBINE RECORD LENGTH WITH PAR AND PAT  
 /SAVE IT

/IS KEY FOR RECORD LENGTH 0-1-2-3

0426  
 4560  
 0427  
 4546  
 0430  
 0313  
 0431  
 1312  
 0432  
 7640  
 0433  
 5707  
 0434  
 1034  
 0435  
 0104  
 0436  
 1127  
 0437  
 7650  
 0440  
 5707  
 0441  
 1054  
 0442  
 7006  
 0443  
 7006  
 0444  
 7006  
 0445  
 2121  
 0446  
 1020  
 0447  
 3020  
 0450  
 4560  
 0451  
 4546  
 0452  
 0313  
 0453  
 1312  
 0454  
 7640  
 0455  
 5707

JMS I XTSP3  
 JMS I XWATKY  
 AND K0374  
 TAD KX7520  
 SZA CLA  
 JMP I XTSP3  
 TAD CHARIN  
 AND K0003  
 TAD K7775  
 SNA CLA  
 JMP I XTSP3  
 TAD CHARIN  
 RTL  
 RTL  
 RTL  
 AND K0300  
 TAD PASSWS  
 DCA PASSWS  
 JMS I XTSP3  
 JMS I XWATKY  
 AND K0374  
 TAD KX7520  
 SZA CLA  
 JMP I XTSP3

/WAIT FOR WRITE STOP MODE KEY  
 /NO, PRINT "?"  
 /IS KEY FOR WRITE STOP MODE 0-1-2-3  
 /YES, PRINT "3"  
 /NO  
 /MOVE INTO POSITION  
 /COMBINE WRITE STOP MODE WITH RECORD LENGTH, PAR, PAT  
 /SAVE IT  
 /WAIT FOR READ MODE KEY  
 /NO, PRINT "?"  
 /IS KEY FOR READ STOP MODE 0-1-2-3

```

0456 1054 TAD CHARIN /YES
0457 0104 AND K0003
0460 1127 TAD K7775
0461 7680 SNA CLA /IS KEY AN INVALID 3?
0462 9707 JMP I XTSYQS /YES, PRINT "7"
0463 1054 TAD CHARIN /MOVE INTO POSITION
0464 7004 RAL
0465 7006 RTL
0466 0112 AND K0030
0467 1021 TAD PASSWS+1 /COMBINE READ STOP MODE WITH TEST AND DENSITY
0470 3021 DCA PASSWS+1 /SAVE IT
0471 4546 JMS I XWATKY
0472 7041 CIA
0473 1120 TAD K0240
0474 7440 SZA
0475 5305 JMP ,+10
0476 1020 TAD PASSWS
0477 3416 DCA I 16
0500 1021 TAD PASSWS+1 /SAVE TEST PARAMETERS
0501 3416 DCA I 16 /SAVE TEST PARAMETERS
0502 2040 ISZ NUMTST /+1 TO TESTS COUNTED
0503 4555 JMS I XTEXT /"O,K,"
0504 6750 TEXT32
0505 5706 JMP I ,+1
0506 0265 SLTSTS+7
0507 0310 XTSYQS, TSTYQS
0510 0260 K0260, 200
0511 0270 K270, 270
0512 7520 K07520, 7520
0513 0374 K0374, 374
0514 0000 /TABLE OF TEST POINTERS
0515 7200 TESTX, 0
0516 1042 CLA EXETST /TEST NUMBER
0517 1323 TAD TBLTST /+ TEST POINTER
0520 3321 DCA ,+1
0521 4724 JMS I TBLTST+1 /MODIFIED, JMS TO TEST X
0522 5714 JMP I TESTX

0523 4724 TBLTST, JMS I ,+1
0524 1400 TEST0
0525 1414 TEST1
0526 1437 TEST2
0527 1462 TEST3
0530 1506 TEST4
0531 1535 TEST5
0532 1600 TEST6
0533 1645 TEST7
0534 2000 TEST10
0535 2200 TEST11

0536 0000 L0TEXT, 0
0537 4562 JMS I XTSR
0540 1501 TEXT "MAINDEC-08-DHTMD-A"
0541 1116

```

0542 0405  
0543 0355  
0544 6070  
0545 5504  
0546 1024  
0547 1504  
0550 5501  
0551 0000  
0552 4961  
0553 5736

JMS I XTIN  
JMP I LBTEXT

```

0600
0601 0514
0602 7610
0603 7500
0604 1202
0605 3375
0606 3041
0607 1775
0610 3020
0611 2375
0611 1775
0612 3021
0613 1021
0614 7006
0615 7006
0616 7004
0617 0110
0620 3042
0621 7410
0622 1200
0623 4622
0624 3374
0625 4555
0626 6756
0627 1042
0630 1120
0631 1111
0632 4556
0633 4560
0634 1041
0635 4553
0636 4560
0637 1374
0640 4553
0641 7240
0642 3043
0643 4600
0644 2374

/ XTESTX, TESTX
/ EXECUTE TESTS SELECTED BY KEYBOARD
EXECUT, CLA SKP
      TSITBL
      TAD *-1
      DCA TSTDEX
      DCA TBLCNT
      TAD I TSTDEX
      DCA PASSWS
      ISZ TSTDEX
      TAD I TSTDEX
      DCA PASSWS+1
      TAD PASSWS+1
      RPL
      RPL
      RAL
      AND K0017
      DCA EXETSY
      SKP
      PARAMS
      JMS I *-1
      DCA EXECNT
      JMS I XTEXT
      TEXT33
      TAD EXETST
      TAD K0240
      TAD K0020
      JMS I XOTY
      JMS I XTSP3
      TAD TBLCNT
      JMS I XDCPRT
      JMS I XTSP3
      TAD EXECNT
      JMS I XDCPRT
      CLA CMA
      DCA SWTEST
      JMS I XTESTX
      ISZ EXECNT

TSRUNL,
/TEST
/PRINT TEST NUMBER
/PRINT TABLE POSITION
/PRINT TEST EXECUTE COUNT

GOTST,

```



/SEE IF READ MODE IS TO CHANGE

0645	7604	LAS	
0646	7010	RAR	
0647	7620	SNL CLA	/CHANGE READ MODE IF AC SW11#1
0650	5270	JMP INCHMO	/NO
0651	1127	TAD K7775	
0652	1042	TAD EXETST	
0653	7710	SPA CLA	
0654	5270	JMP INCHMO	
0655	1107	TAD K0010	
0656	1031	TAD READMO	
0657	3031	DCA READMO	
0660	1031	TAD READMO	/+1 TO READ MODE
0661	7041	CIA	
0662	1112	TAD K0030	
0663	7640	SEA CLA	/DONE ALL READ MODES?
0664	5225	JMP TSRUNL	/NO, EXECUTE THIS NEW MODE
0665	1021	TAD PASSWS+1	/YES, RE-INITIALIZE READ MODE
0666	0112	AND K0030	
0667	3031	DCA READMO	

/SEE IF WRITE MODE IS TO CHANGE

0670	7604	INCHMO, LAS	
0671	7012	RTR	
0672	7620	SNL CLA	/CHANGE WRITE MODE IF AC SW 10#1
0673	5307	JMP INCRCLC	/NO
0674	1030	TAD MODBIT	
0675	1115	TAD K0100	/+1 TO WRITE MODE
0676	3030	DCA MODBIT	
0677	1030	TAD MODBIT	
0700	7041	CIA	
0701	1121	TAD K0300	
0702	7640	SEA CLA	/DONE ALL WRITE MODES?
0703	5225	JMP TSRUNL	/NO, EXECUTE THIS NEW MODE
0704	1020	TAD PASSWS	/YES, REINITIALIZE WRITE MODE
0705	0121	AND K0300	
0706	3030	DCA MODBIT	

/SEE IF RECORD LENGTH IS TO CHANGE

0707	7604	INCRCLC, LAS	
0710	7012	RTR	
0711	7010	RAR	
0712	7620	SNL CLA	/CHANGE RECORD LENGTH IF AC SW9#1
0713	5327	JMP CHGPAT	/NO
0714	1027	TAD RLTR0L	
0715	1111	TAD K0020	/+1 TO RECORD LENGTH
0716	3027	DCA RLTR0L	
0717	1027	TAD RLTR0L	
0720	7041	CIA	
0721	1115	TAD K0100	
0722	7640	SEA CLA	/DONE ALL RECORD LENGTHS?
0723	5225	JMP TSRUNL	/NO, EXECUTE THIS NEW RECORD LENGTH
0724	1020	TAD PASSWS	/YES, REINITIALIZE RECORD LENGTH
0725	0114	AND K0060	
0726	3027	DCA RLTR0L	

```

0727 7604 /SEE IF PATTERN IS TO CHANGE
0730 0113 CHGPAT,
0731 7650 AND K0040
0732 5343 SNA CLA /CHANGE PATTERN IF AC SW 7#1
0733 2024 JMP CHRPAR /NO
0734 1024 ISZ PATNUM /+1 TO PATTERN
0735 0107 TAD PATNUM
0736 7650 AND K0010
0737 5225 SNA CLA /DONE ALL PATTERNS?
0740 1020 JMP TSRUNL /NO, EXECUTE THIS PATTERN
0741 0106 TAD PASSWS /YES, REINITIALIZE PATTERN
0742 3024 DCA PATNUM
/SEE IF PARITY IS \O CHANGE
0743 7604 LAS
0744 0111 AND K0020
0745 7650 SNA CLA /CHANGE PARITY IF AC SW 9#1
0746 5361 JMP RPTTST /NO
0747 1025 TAD PARBT1
0750 7040 CMA /CHANGE PARITY
0751 0107 AND K0010
0752 3025 DCA PARBT1
0753 1020 TAD PASSWS
0754 0107 AND K0010
0755 7041 CIA
0756 1025 TAD PARBT1
0757 7440 SZA
0760 5225 JMP TSRUNL
/CHANGE TEST NUMBER
0761 2375 RPTTST, ISZ TSTDEX
0762 2041 ISZ TBLCNT
0763 1041 TAD TBLCNT
0764 7041 CIA
0765 1040 TAD NUMTST
0766 7640 SZA CLA
0767 5773 JMP I ,+4
0770 7402 HLT
0771 5772 JMP I ,+1
0772 0601 EXECUT
0773 0606 EXECUT+5
0774 0000 EXECNT, 0 /NUMBER OF TIMES TO BE EXECUTED.
0775 0000 TSTDEX, 0 /POINTER TO GET TEST.

```

```

1000
1000 0000
1001 4216
1002 1410
1003 3411
1004 2012
1005 5202
1006 5600

1007 0000
1010 4216
1011 1411
1012 3410
1013 2012
1014 5211
1015 5607

1016 0000
1017 7610
1020 0054
1021 1220
1022 3010
1023 1124
1024 3012
1025 7610
1026 7037
1027 1226
1030 1023
1031 3017
1032 1417
1033 3011
1034 5616

1035 0000
1036 4551
1037 4534
1040 4535
1041 4200
1042 4547
1043 5237
1044 7240
1045 3044
1046 3050
1047 5635
1050 2337

*1000
/SAVE DRIVE RECORD AND ERROR COUNTERS
SVCTRS, 0
JMS CTRDEX
TAD I 10
DCA I 11
ISZ 12
JMP I-3
JMP I SVCTRS

/RESET DRIVE COUNTERS BACK INTO PROGRAM
MVCTRS, 0
JMS CTRDEX
TAD I 11
DCA I 10
ISZ 12
JMP I-3
JMP I MVCTRS

/RESTORE DRIVE COUNTERS

/SET UP INDEX REGISTERS FOR MOVE AND SAVE COUNTERS
CTRDEX, 0
CLA SKP
WRCHEK=1
TAD I-1
DCA 10
TAD K7751
DCA 12
CLA SKP
DRVADR=1
TAD I-1
TAD CDRIVE
DCA 17
TAD I 17
DCA 11
JMP I CTRDEX

/CLEAR ALL DRIVES
CLRALL, 0
JMS I XRSFOV
JMS I XRWIND
JMS I XCLRTB
JMS SVCTRS
JMS I XCHGOV
JMP I-4
CLA CMA
DCA EOSFLG
DCA I I+2
JMP I CLRALL
TIIFLG

/RESET TO FIRST DRIVE
/REWIND
/CLEAR READ AND WRITE TABLES
/SAVE COUNTERS
/DONE ALL DRIVES?
/NO
    
```

```

1051 0000 /RESET DRIVE SELECTION TO LOWEST DRIVE NUMBER
1052 7200 RSFORV, 0
1053 3023 CLA CDRIVE /START WITH 0
1054 1313 TAD K4000
1055 3270 DCA CDRVBT /SAVE BIT FOR 0
1056 1270 TAD CDRVBT
1057 0022 AND MSBITS /MASK WITH DRIVES SELECTED
1060 7640 SZA CLA /DOES DRIVE EXIST
1061 5266 JMP +5 /YES
1062 2023 ISE CDRIVE /NO, +1 TO DRIVE NUMBER
1063 1270 TAD CDRVBT
1064 7110 CLL RAR /MOVE BIT OVER
1065 5255 JMP RSFORV+4 /TRY AGAIN
1066 4315 JMS SETFUN
1067 5651 JMP I RSFORV
1070 0000 CDRVBT, 0

```

```

/SELECT NEXT DRIVE
+1 TO EXIT IF LAST DRIVE TESTED
CHGDRV, 0
1071 0000 CLA
1072 7200 TAD CDRVBT /GET MASK BIT OVER 1
1073 1270 CLL RAR /MOVE OVER 1
1074 7110 ISE CDRIVE /+1 TO DRIVE NUMBER
1075 2023 AND K7760 /MASK FOR 8 DRIVES POSSIBLE
1076 0314 SZA /END OF 8 DRIVES
1077 7440 JMP +4 /NO, SEE IF DRIVE EXISTS
1100 5304 JMS RSFORV
1101 4291 ISE CHGDRV /+1 TO EXIT
1102 2271 JMP I CHGDRV /EXIT
1103 5671 DCA CDRVBT /SAVE CURRENT BIT
1104 3270 TAD CDRVBT
1105 1270 AND MSBITS /MASK DRIVES SELECTED
1106 0022 SNA /DOES DRIVE EXIST?
1107 7450 JMP CHGDRV+1 /NO, SEE IF NEXT EXISTS
1110 5272 JMS SETFUN /EXIT WITHOUT SKIP
1111 4315 JMP I CHGDRV
1112 5671 K4000,
1113 4000 K7760,
1114 7760

```

/SET UP FUNDAMENTAL COMMAND

1115 0000  
 1116 7200  
 1117 1026  
 1120 0104  
 1121 3026  
 1122 6224  
 1123 1026  
 1124 3026  
 1125 1023  
 1126 7100  
 1127 7012  
 1130 7012  
 1131 1026  
 1132 1121  
 1133 3026  
 1134 1025  
 1135 7040  
 1136 1122  
 1137 1026  
 1140 3035  
 1141 5715

SETFUN, 0  
 CLA  
 TAD DRVDEN  
 AND K0003  
 DCA DRVDEN  
 RIF  
 TAD DRVDEN  
 DCA DRVDEN  
 TAD CDRIVE  
 CLL  
 RTR  
 RTR  
 TAD DRVDEN  
 TAD K0300  
 DCA DRVDEN  
 TAD PAR0T1  
 SEA CLA  
 TAD K0400  
 TAD DRVDEN  
 DCA COMAND  
 JMP I SETFUN

/WAIT FOR KBD FLAG AND READ CHARACTER  
 WAITKY, 0

1142 0000  
 1143 6031  
 1144 5343  
 1145 6036  
 1146 6046  
 1147 6041  
 1150 5347  
 1151 3054  
 1152 1054  
 1153 5742  
 1200

KSF  
 JMP .-1  
 KRB  
 TLS  
 TSF  
 JMP .-1  
 DCA CHARIN  
 TAD CHARIN  
 JMP I WAITKY

/ECHO CHARACTER

\*1200

/INITIALIZE TEST PARAMETERS  
 /PATNUM=PARBT1-DRVDEN\*RLTROL=MODBIT\*READMO  
 PARAMS, 0

1200 0000  
 1201 7200  
 1202 1020  
 1203 0106  
 1204 3024  
 1205 1020  
 1206 0107  
 1207 3025  
 1210 1020  
 1211 0235  
 1212 3026  
 1213 1021  
 1214 0104  
 1215 1026  
 1216 1121  
 1217 3026  
 1220 6224  
 1221 1026

CLA  
 TAD PASSWS  
 AND K0007  
 DCA PATNUM  
 TAD PASSWS  
 AND K0010  
 DCA PARBT1  
 TAD PASSWS  
 AND K7000  
 DCA DRVDEN  
 TAD PASSWS+1  
 AND K0003  
 TAD DRVDEN  
 TAD K0300  
 DCA DRVDEN  
 RIF  
 TAD DRVDEN

/PATTERN

/PARITY

/DRIVE NUMBERS AND DENSITY

1222 3026 DCA DRVDEN  
1223 1020 TAD PASSWS  
1224 0114 AND K0060  
1225 3027 DCA RLTR0L  
1226 1020 TAD PASSWS  
1227 0121 AND K0300  
1230 3030 DCA MODBIT

/RECORD LENGTH

/WRITE STOP MODE

1231 1021  
 1232 0112  
 1233 3031  
 1234 5600  
 1235 7000

TAD PASSWS+1  
 AND K0030  
 DCA READMO  
 JMP I PARAMS  
 K7000, 7000  
 /TEST FOR ALL DRIVES TO HAVE REACHED EOT  
 ALLEOT, 0

/READ STOP MODE

1236 0000  
 1237 7200  
 1240 1032  
 1241 7440  
 1242 5254  
 1243 4531  
 1244 4545  
 1245 1072  
 1246 7450  
 1247 5265  
 1250 4547  
 1251 5244  
 1252 2236  
 1253 5636  
 1254 4551  
 1255 4545  
 1256 1103  
 1257 7450  
 1260 5265  
 1261 4547  
 1262 5253  
 1263 2236  
 1264 5636  
 1265 7004  
 1266 7004  
 1267 7620  
 1270 5636  
 1271 1044  
 1272 7440  
 1273 5636  
 1274 2236  
 1275 4077  
 1276 5636  
 1277 2344

CLA  
 TAD RECSYS  
 SZA  
 JMP TRDEOT  
 JMS I XRSFDV  
 JMS I XMVCTR  
 TAD WRTEOT  
 SNA  
 JMP ALLEOS  
 JMS I XCHGDV  
 JMP ALLEOT+6  
 ISZ ALLEOT  
 JMP I ALLEOT  
 JMS I XRSFDV  
 JMS I XMVCTR  
 TAD RDEOT  
 SNA  
 JMP ALLEOS  
 JMS I XCHGDV  
 JMP TRDEOT+1  
 ISZ ALLEOT  
 JMP I ALLEOT  
 LAS

/READ PASS SELECTED?  
 /YES

/TEST EXIT EOS SELECTED

/GET FIRST DRIVE  
 /GET COUNTERS  
 /GET READ TO EOT  
 /THIS DRIVE AT EOT?  
 /NO  
 /ALL AT EOT?  
 /NO  
 /YES

TRDEOT,  
 ALLEOS,  
 RAL  
 SNL  
 JMP I ALLEOT  
 TAD EOSFLG  
 SZA  
 JMP I ALLEOT  
 ISZ ALLEOT  
 JMS I +2  
 JMP I ALLEOT  
 CTROMP  
 PAUSE

/TEST AC SW 0=1  
 /EXIT AT END OF SEQUENCE  
 /NO, GO TO EOT  
 /WRITTEN TO EOS?  
 /NO  
 /SKIP TO END OF TEST  
 /PRINT ERROR COUNTERS

/ROUTINE TO SEE IF EOT IS ERROR CAUSE,  
/IF EOT IS ONLY CAUSE, TAKE NEXT INSTRUCTION,  
/IF OTHER CAUSE, SKIP NEXT INSTRUCTION.

```

LBE0T1, 0
1300 0000
1301 6716
1302 0312
1303 7640
1304 5310
1305 6714
1306 0313
1307 7640
1310 2300
1311 5700
1312 0037
1313 3767

```

/ROUTINE TO SEE IF EOT ERROR CAUSE (USE STATUS SAVED IN MEM?),  
/TAKE NEXT INSTR IF EOT, OTHERWISE SKIP NEXT INSTRUCTION.

```

LBE0T2, 0
1314 0000
1315 7200
1316 1053
1317 0312
1320 7640
1321 5325
1322 1052
1323 0313
1324 7640
1325 2314
1326 5714

```

/ROUTINE TO SAVE STATUS REGISTERS.

```

LBSAV, 0
1327 0000
1330 6714
1331 3052
1332 6716
1333 3053
1334 5727

```

/ROUTINE TO SEE IF INTERRUPT CAUSED BY DEVICE,  
/ERROR HALT IF DEVICE DID NOT CAUSE INTERRUPT.

```

LBINT, 0
1335 0000
1336 6721
1337 7410
1340 5735
1341 6723
1342 7402
1343 5735

```

/ILLEGAL INTERRUPT;

/ROUTINE TO WAIT FOR EF OR MTF.



1344	0000	LBWAT, 0
1345	6721	SKEF
1346	7410	SKP
1347	5744	JMP I LBWAT
1350	6723	SKTD
1351	5345	JMP .-4
1352	5744	JMP I LBWAT

```

1400 /TMBE DATA RELIABILITY TEST - TAPE 3 (9 TRACK)
1401 #1400
1402 /WRITE TO EOT
1403 /REWIND GO TO NEXT DRIVE
1404 TEST0, 0
1405 CLA EXITMO
1406 DCA RECSYS
1407 JMS I XCLRAL
1408 JMS I XCLRRTB
1409 JMS I XGENPT
1410 JMS I XWRIT
1411 JMS I XRWIND
1412 JMS I XCHGDV
1413 JMP TEST0+5
1414 JMS I TEST0
1415 /SET EXIT EOT
1416 /NO READ PASS
1417 /CLEAR ERROR COUNTERS
1418 /CLEAR READ AND WRITE TABLE
1419 /GENERATE PATTERN
1420 /WRITE
1421 /REWIND
1422 /ANY MORE DRIVES?
1423 /YES
1424 /NO, EXIT
    
```

```

1414 /WRITE 1 RECORD LENGTH SEQUENCE OR 256 RECORDS
1415 /CHANGE DRIVES, GO TO EOT
1416 TEST1, 0
1417 CLA K0100
1418 TAD EXITMO
1419 DCA RECSYS
1420 DCA RECSYS
1421 JMS I XCLRAL
1422 JMS I XRSFDV
1423 JMS I XMVCTR
1424 TAD WRTEOT
1425 SZA
1426 JMP +4
1427 JMS I XGENPT
1428 JMS I XWRIT
1429 JMS I XSVCTR
1430 JMS I XCHGDV
1431 JMP TEST1+7
1432 JMS I XALEOT
1433 JMP TEST1+6
1434 JMS I TEST1
1435 /EXIT WRITE ROUTINE AT END OF RLS
1436 /NO READ PASS
1437 /CLEAR ERROR COUNTERS
1438 /GET DRIVE COUNTERS
1439 /IS THIS ONE AT EOT?
1440 /YES
1441 /GENERATE PATTERN
1442 /WRITE
1443 /SAVE COUNTERS THIS DONE
1444 /DONE 1 RLS ALL DRIVES?
1445 /NO, DO NEXT DRIVE
1446 /ALL DRIVES AT EOT?
1447 /NO
1448 /YES, EXIT
    
```

/WRITE ONE RECORD  
/CHANGE DRIVES, GO TO EOT  
TEST2, 0

1437	0000	CLA	K0200	/EXIT WRITE ROUTINE AT EOT
1440	7200	TAD	EXITMO	/NO READ PASS
1441	1117	DCA	RECSYS	
1442	3033	DCA	RECSYS	
1443	3032	JMS	I XCLRAL	
1444	4552	JMS	I XRSFDV	
1445	4551	JMS	I XRVCTR	
1446	4545	TAD	WRTEOT	
1447	1072	SZA		/IS THIS ONE AT EOT
1450	7440	JMP	:+4	/YES
1451	5255	JMS	I XGENPT	/GENERATE PATTERN
1452	4542	JMS	I XWRIT	/WRITE
1453	4540	JMS	I XSVCTR	/SAVE COUNTERS THIS DRIVE
1454	4544	JMS	I XCHGDV	/DONE ALL DRIVES
1455	4547	JMS	TEST2+7	/NO, DO NEXT DRIVE
1456	5246	JMP	I XALEOT	/ALL DRIVES AT EOT
1457	4550	JMS	TEST2+6	/NO
1460	5245	JMP	I TEST2	/YES, EXIT
1461	5637			

/WRITE TO EOT, REWIND  
/CHANGE DRIVES, READ  
TEST3, 0

1462	0000	CLA	EXITMO	/GENERATE PATTERN
1463	7200	DCA	K0400	/GET COUNTERS THIS DRIVE
1464	3033	TAD	K0400	/WRITE
1465	1122	DCA	RECSYS	/REWIND
1466	3032	JMS	I XCLRAL	/DONE ALL DRIVES
1467	4552	JMS	I XGENPT	/NO
1470	4542	JMS	I XRVCTR	/GET COUNTERS THIS DRIVE
1471	4545	JMS	I XWRIT	
1472	4540	JMS	I XRWIND	
1473	4534	JMS	I XCHGDV	
1474	4547	JMP	:-4	
1475	5271	JMS	I XMVCTR	
1476	4545	JMS	I XMVCTR	
1477	7200	CLA	RECORD	
1500	3066	DCA	RECORD+1	
1501	3067	DCA	RECORD+1	
1502	4537	JMS	I XRDIT	/READ
1503	4547	JMS	I XCHGDV	/DONE ALL DRIVES?
1504	5276	JMP	:-6	/NO
1505	5662	JMP	I TEST3	/YES, EXIT

```

1506 0000 /WRITE 1 RLS
1507 7200 /BACKSPACE, READ, CHANGE IVES
1510 1115 /TEST4, 0
1511 3033 CLA K0100 /EXIT AT END OF RLS
1512 1122 DCA EXITMO /READ PASS WRITE RECOVER
1513 3032 TAD K0400 /CLEAR ALL COUNTERS
1514 4552 DCA RECSYS /GET COUNTERS FOR THIS DRIVE
1515 4551 JMS I XCLRAL /GENERATE PATIERN
1516 4545 JMS I XRSFOV
1517 4542 JMS I XMVCTR
1520 7200 CLA /IS THIS DRIVE AT EOT?
1521 1072 TAD WRTEOT /YES
1522 7440 SZA .+5 /WRITE
1523 5330 JMP I XWRIT /BACK UP
1524 4540 JMS I XGOBKW /READ
1525 4536 JMS I XRDIT /SAVE COUNTERS
1526 4537 JMS I XSVCTR /ANY MORE DRIVES?
1527 4544 JMS I XCHGOV /YES
1530 4547 JMP TEST4+10 /TEST FOR ALL DRIVES AT EOT
1531 5316 JMS I XALEOT /NO
1532 4550 JMS I XALEOT /YES, EXIT
1533 5315 JMP TEST4+7
1534 5706 JMP I TEST4

```

```

1535 0000 /WRITE 1 RECORD, BACKSPACE, READ
1536 7200 /THEN CHANGE DRIVES
1537 1117 /TEST5, 0
1540 3033 CLA K0200
1541 1122 DCA EXITMO
1542 3032 TAD K0400
1543 4552 DCA RECSYS
1544 4551 JMS I XCLRAL /WRITE PASS, HEAD RECOVER
1545 4542 JMS I XRSFOV /CLEAR ALL COUNTERS
1546 4545 JMS I XMVCTR /GENERATE PATIERN
1547 7200 CLA
1550 1072 TAD WRTEOT
1551 7440 SZA /IS THIS DRIVE AT EOT?
1552 5330 JMP .+5 /YES
1553 4540 JMS I XWRIT /WRITE
1554 4536 JMS I XGOBKW /BACK UP
1555 4537 JMS I XRDIT /READ
1556 4544 JMS I XSVCTR /SAVE COUNTERS
1557 4547 JMS I XCHGOV /DONE ALL DRIVES?
1560 5345 JMP TEST5+10 /NO
1561 4550 JMS I XALEOT /ALL DRIVES AT EOT?
1562 5344 JMS I XALEOT /NO
1563 5735 JMP I TEST5 /YES, EXIT

```

1600 \*1600

/WRITE 1 RLS, CHANGE DRIVES, REPEAT  
/BACKSPACE, CHANGE DRIVES, REPEAT  
/READ, CHANGE DRIVES, REPEAT

```

1600 0000
1601 7200
1602 1115
1603 3033
1604 1122
1605 3032
1606 4552
1607 4531
1610 4542
1611 4545
1612 7200
1613 1072
1614 7440
1615 5220
1616 4540
1617 4544
1620 4547
1621 5211
1622 4545
1623 7200
1624 1103
1625 7450
1626 4536
1627 4544
1630 4547
1631 5222
1632 4545
1633 7200
1634 1103
1635 7450
1636 4537
1637 4544
1640 4547
1641 5232
1642 4550
1643 5207
1644 5600

      CLA
      TAD K0100
      DCA EXITMO
      TAD K2400
      DCA RECSYS
      JMS I XCLRAL
      JMS I XRSFDV
      JMS I XGENPT
      JMS I XMVCTR
      CLA
      TAD WRTEOT
      SZA
      JMP I+3
      JMS I XWRIT
      JMS I XSVCTR
      JMS I XCHGDV
      JMP I-10
      JMS I XMVCTR
      CLA
      TAD RDEOT
      SNA
      JMS I XGOBKW
      JMS I XSVCTR
      JMS I XCHGDV
      JMP I-7
      JMS I XMVCTR
      CLA
      TAD RDEOT
      SNA
      JMS I XRDIT
      JMS I XSVCTR
      JMS I XCHGDV
      JMP I-7
      JMS I XALEOT
      JMP TEST6+7
      JMP I TEST6

/EXIT AT END OF RLS
/WRITE PASS READ RECOVER
/CLEAR ALL COUNTERS
/GENERATE PATTERN
/GET COUNTERS

/AT EOT? /YES
/WRITE COUNTERS
/SAVE COUNTERS
/DONE ALL DRIVES /NO
/GET COUNTERS AGAIN (FOR BKSP)

/READ TO EOT IS SKP
/BACK UP
/SAVE POSITION
/DONE ALL DRIVES /NO
/GET COUNTERS AGAIN (FOR READ)

/READ TO EOT
/NO, READ
/SAVE COUNTERS
/DONE ALL DRIVES /NO
/ALL DRIVES AT EOT?
/NO
/YES, EXIT

```

```

1645 0000 /WRITE 1 RECORD, CHANGE DRIVES, REPEAT
1646 7200 /BACKSPACE, CHANDRIVES, REPEAT
1647 1117 /READ, CHANGE DRIVES, REPEAT
1650 3033 TEST7, 0
1651 1122 CLA
1652 3032 TAD K0200
1653 4552 DCA EXITMO
1654 4531 DCA RECYSYS
1655 4542 JMS I XCLRAL
1656 4545 JMS I XRSFDV
1657 7200 JMS I XGENPT
1660 1072 JMS I XMVCTR
1661 7440 CLA
1662 5265 TAD WRTEOT
1663 4540 SZA
1664 4544 JMP :+3
1665 4547 JMS I XWRIT
1666 5256 JMS I XSVCTR
1667 4545 JMS I XCHGDV
1670 7200 JMP :+10
1671 1103 JMS I XMVCTR
1672 7450 CLA
1673 4536 TAD RDEOT
1674 4544 SNA I XG08KH
1675 4547 JMS I XSVCTR
1676 5267 JMS I XCHGDV
1677 4545 JMP :+7
1700 7200 JMS I XMVCTR
1701 1103 CLA
1702 7450 TAD RDEOT
1703 4537 SNA I XRDIT
1704 4544 JMS I XSVCTR
1705 4547 JMS I XCHGDV
1706 5277 JMP :+7
1707 4550 JMS I XALEOT
1710 5254 JMP TEST7+7
1711 5645 JMP I TEST7
    
```

/EXIT AT EVERY RECORD

/WRITE PASS READ RECOVER  
/CLEAR ALL COUNTERS

/GENERATE PATTERN  
/GET COUNTERS

/AT EOT? /YES  
/WRITE /SAVE COUNTERS  
/DONE ALL DRIVES /NO  
/GET COUNTERS AGAIN (FOR BKSP)

/READ TO EOT IS SKP  
/BACK UP /SAVE POSITION  
/DONE ALL DRIVES /NO  
/GET COUNTERS AGAIN (FOR READ)

/READ TO EOT  
/NO, READ /SAVE COUNTERS  
/DONE ALL DRIVES /NO  
/ALL DRIVES AT EOT?  
/NO /YES, EXIT

```

1712 0000
1713 6201
1714 1340
1715 3735
1716 1341
1717 3736
1720 7001
1721 3737
1722 6224
1723 1313
1724 3325
1725 6201
1726 1342
1727 3001
1730 7430
1731 5712
1732 4355
1733 1743
1734 5712
1735 0001
1736 0002
1737 0003
1740 6244
1741 5403
1742 5402

LBSET, 0
CDF 00
TAD Z1
DCA I P1
TAD Z2
DCA I P2
IAC
DCA I P3
RIF
TAD LBSET+1
DCA ,+1
CDF/PROG FLD,
TAD Z3
DCA 1
SZL
JMP I LBSET
JMS I XTEXT
TEXTLB
JMP I LBSET
1
2
3
RMF
5403
5402

P1,
P2,
P3,
Z1,
Z2,
Z3,

```

```

/SET UP INTERRUPT LINKS.
/DF=0,
/RMF IO LOC1, FLD 0,
/JMP I 3 TO LOC 2, FLD 0,
/1 TO LOC 3, FLD 0,
/CHANGE TO PROG FLD,
/JMP I 2 TO LOC 1, PF,
/TITLE TEXT,
/EXIT,

```

```

1743 0000
1744 4561
1745 4562
1746 2415
1747 7005
1750 4004
1751 0124
1752 0140
1753 2205
1754 1411
1755 0102
1756 1114
1757 1124
1760 3140
1761 7140
1762 2422
1763 1300
1764 4561
1765 4561
1766 4777
1767 5743

TEXTLB, 0
JMS I XTIN
JMS I XTNR
2415
7005
4004
0124
0140
2205
1411
0102
1114
1124
3140
7140
2422
1300
JMS I XTIN
JMS I XTIN
JMS I (LBTEXT
JMP I TEXTLB

```

/TM&E DATA RELIABILITY 9 TRK

1777 0536  
2000

\*2000

/WRITE 1 RECORD, CHANGE DRIVES  
/REPEAT UNTIL END OF RLS  
/BACKSPACE, CHANGE DRIVES  
/READ 1 RECORD, CHANGE DRIVES  
/REPEAT UNTIL END OF RLS  
TEST10: 0

2000	0000	CLA	
2001	7200	TAD MOOBIT	/GET WRITE MODE
2002	1030	SZA CLA	/IS MODE NONSTOP OR START STOP
2003	7640	JMP .+3	
2004	5207	TAD K0100	/NON STOP
2005	1115	SKP	
2006	7410	TAD K0200	/START STOP
2007	1117	DCA EXITMO	
2010	3033	TAD K0400	
2011	1122	DCA RECSYS	/WRITE PASS, READ RECOVER
2012	3032	JMS I XCLRAL	/CLEAR COUNTERS
2013	4552	JMS I XGENPT	/GENERATE PATTERN
2014	4542	JMS I X3FOV	
2015	4551	JMS I XSVCTR	
2016	4545	TAD RECORD	/RESET ALL DRIVES?
2017	1066	DCA WRRECR	/NO, SAVE LAS RCR NEXT DRIVE
2020	3074	TAD RECORD+1	
2021	1067	DCA WRRECR+1	
2022	3075	JMS I XSVCTR	
2023	4544	JMS I XCHGDV	
2024	4547	JMP .-7	
2025	5216	CLA CMA	
2026	7240		

TS10L2:

2027 3044  
2030 4551  
2031 4545  
2032 7200  
2033 1072  
2034 7640  
2035 5251  
2036 1074  
2037 3045  
2040 1075  
2041 3046  
2042 4540  
2043 7200  
2044 1045  
2045 3074  
2046 1046  
2047 3075  
2050 4544

TS10L1:

2027	3044	DCA EOSFLG	
2030	4551	JMS I XRSFOV	
2031	4545	JMS I XMVCTR	/SET TO 0 AT END OF RLS
2032	7200	CLA	
2033	1072	TAD WRTEOT	
2034	7640	SZA CLA	
2035	5251	JMP TS10LS	/HAS DRIVE WRITTEN TO EOT
2036	1074	TAD WRRECR	/YES, DONT WRITE ANYMORE
2037	3045	DCA SVRECR	
2040	1075	TAD WRRECR+1	/SAVE START OF RLS
2041	3046	DCA SVRECR+1	
2042	4540	JMS I XWRIT	/WRITE
2043	7200	CLA	
2044	1045	TAD SVRECR	
2045	3074	DCA WRRECR	
2046	1046	TAD SVRECR+1	
2047	3075	DCA WRRECR+1	
2050	4544	JMS I XSVCTR	/SAVE COUNTERS FOR THIS DRIVE



2051	4547	TS10LS,	JMS I XCHGOV	/ANY DRIVES LEFT?
2052	5231		JMP TS10L1+1	/YES, WRITE ON IT
2053	7200	CLA		
2054	1044	TAD	EOSFLG	
2055	7450	SNA		/DRIVES AT END OF RLS
2056	5265	JMP	.+7	/YES, BACK UP
2057	4545	JMS I XHVCTR		/MOVE COUNTERS
2060	1072	TAD	WRTEOT	/GET WRITTEN EOT FLAG
2061	7450	SNA		/DRIVE AT EOT
2062	5230	JMP	TS10L1	/NO, AT LEAST ONE ISN'T
2063	4547	JMS I XCHGOV		/ALL DRIVES AT EOT
2064	5257	JMP	.-5	/NO
2065	4551	JMS I XRSFDV		/START 1ST DRIVE AGAIN
2066	4545	JMS I XHVCTR		/GET COUNTERS
2067	1103	TAD	RDEOT	
2070	7450	SNA		/DRIVE READ TO EOT
2071	4536	JMS I XG0BKW		/NO, BACK UP
2072	4544	JMS I XSVCTR		
2073	4547	JMS I XCHGOV		/ALL DRIVES BACKED UP?
2074	5265	JMP	.-7	/NO
2075	4551	JMS I XRSFDV		/START 1ST DRIVE AGAIN
2076	4545	JMS I XHVCTR		/GET DRIVE COUNTERS
2077	1103	TAD	RDEOT	
2100	7640	SEA	CLA	/READ TO EOT YET?
2101	5341	JMP	T10RND	/YES, BYPASS READ
2102	1070	TAD	LASRCR	
2103	7041	CIA		
2104	1066	TAD	RECORD	
2105	7640	SEA	CLA	
2106	5314	JMP	.+6	
2107	1071	TAD	LASRCR+1	
2110	7041	CIA		
2111	1067	TAD	RECORD+1	
2112	7650	SNA	CLA	/READ TO LAST RECORD WRITTEN?
2113	5341	JMP	T10RND	/YES
2114	1070	TAD	LASRCR	/SAVE LAST RECORD
2115	3045	DCA	SVRECR	
2116	1071	TAD	LASRCR+1	
2117	3046	DCA	SVRECR+1	
2120	1031	TAD	READMO	/GET READ MODE
2121	7650	SNA	CLA	/NON STOP OR START STOP?
2122	5332	JMP	.+10	/NON-STOP
2123	1066	TAD	RECORD	/START STOP
2124	3070	DCA	LASRCR	
2125	1067	TAD	RECORD+1	
2126	3071	DCA	LASRCR+1	
2127	2070	ISZ	LASRCR	/SET EOS TO LAST RECORD READ+1
2130	7410	SKP		
2131	2071	ISZ	LASRCR+1	

2132	4537	JMS I XRDIT	/READ
2133	7200	CLA	
2134	1045	TAD SVRECR	
2135	3070	DCA LASRCR	/RESTORE LAST WRITTEN
2136	1046	TAD SVRECR+1	
2137	3071	DCA LASRCR+1	
2140	4544	JMS I XSVCTR	/SAVE COUNTERS
2141	4547	JMS I XCHGOV	/DONE ALL DRIVES
2142	5276	JMP T10RDP	/NO
2143	4545	JMS I XMVCTR	/GET CURRENT COUNTERS
2144	7200	CLA	
2145	1070	TAD LASRCR	
2146	7041	CIA	
2147	1066	TAD RECORD	
2150	7440	SEA	/AI
2151	5357	JMP .+6	
2152	1071	TAD LASRCR+1	
2153	7041	CIA	
2154	1067	TAD RECORD+1	
2155	7050	SNA CLA	
2156	5275	JMP T10RDP-1	/NOT AT EOS, READ AGAIN
2157	4547	JMS I XCHGOV	/TEST FOR ALL READ TO EOT
2160	5343	JMP T10RND+2	/NO
2161	4550	JMS I XALEOT	/ALL AT EOT?
2162	5214	JMP TS10L2	/NO
2163	5600	JMP I TEST10	/YES, EXIT

T10RND,

2200

\*2200 /READ PASS ONLY /RANDOM PATTERN SELECTION IS INVALID TEST11, 0

2201 JMS I XCLRAL /CLEAR COUNTERS  
2202 TAD K0400  
2203 DCA RECSYS  
2204 TAD K0200  
2205 DCA EXITMO  
2206 CLA CMA  
2207 DCA T11FLG  
2210 JMS I XWRIT  
2211 CLA  
2212 TAD EOSFLG  
2213 SZA  
2214 JMS I XTSINC  
2215 CLA  
2216 TAD RECORD  
2217 DCA T11INC  
2220 TAD RECORD+1  
2221 DCA T11INC+1  
2222 DCA RECORD  
2223 TAD PATNUM  
2224 CIA  
2225 TAD K0007  
2226 SZA  
2227 JMS I XGENPT  
2230 CLA CMA  
2231 DCA EOSFLG  
2232 JMS I XRSFDV  
2233 JMS I XMVCTR  
2234 TAD RDEOT  
2235 SZA  
2236 JMP ,+10  
2237 TAD RECORD  
2240 TAD T11INC  
2241 DCA LASRCR  
2242 TAD RECORD+1  
2243 TAD T11INC+1  
2244 DCA LASRCR+1  
2245 JMS I XSVCTR  
2246 JMS I XCHGDV  
2247 JMP T11LPI+3  
2250 JMS I XRSFDV  
2251 JMS I XMVCTR  
2252 TAD RDEOT  
2253 SZA  
2254 JMP T11END  
2255 TAD LASRCR  
2256 DCA SVRECR  
2257 TAD LASRCR+1  
2260 DCA SVRECR+1

/WRITE EXIT EVERY RECORD  
/SET TEST11 WRITE EXIT  
/SET UP RECORD LENGTHS  
/GET EOSFLAG  
/INCREMENT TO END?  
/NO  
/SAVE SEQUENCE LENGTH

/IF RANDOM PATTERN DON'T GENERATE  
/GENERATE PATTERN

/SET START OF SEQUENCE  
/GET COUNTERS FOR THIS DRIVE  
/IS THIS DRIVE AT EOT  
/YES  
/NO

/CURRENT RECORD + SEQUENCE LENGTH TO READ EXIT

/SAVE COUNTERS FOR THIS DRIV  
/DONE ALL DRIVES  
/NO

/THIS DRIVE AT EOT?  
/YES, DONT READ

/SAVE END OF RLS RECORDS

T11ROL,

T11LPI,

2261 1031 TAD READMO /NONSTOP OR START STOP?  
 2262 7650 SNA CLA /NON STOP  
 2263 5273 JMP .+10  
 2264 1066 TAD RECORD  
 2265 3070 DCA LASRCR  
 2266 1067 TAD RECORD+1  
 2267 3071 DCA LASRCR+1  
 2270 2070 ISZ LASRCR  
 2271 7410 SKP  
 2272 2071 ISZ LASRCR+1  
 2273 4537 JMS I XRDIT  
 2274 7200 CLA  
 2275 1045 TAD SVRECR  
 2276 3070 DCA LASRCR  
 2277 1046 TAD SVRECR+1  
 2300 3071 DCA LASRCR+1  
 2301 4544 JMS I XSVCTR  
 2302 4547 JMS I XCHGDV  
 2303 5251 JMP T11RDL  
 2304 4550 JMS I XALEOT  
 2305 7410 SKP  
 2306 5600 JMP I TEST11

T11END,

/GET COUNTERS AGAIN

2307 4551 JMS I XRSFOV  
 2310 4545 JMS I XMVCTR  
 2311 7200 CLA  
 2312 1066 TAD RECORD  
 2313 7041 CIA  
 2314 1070 TAD LASRCR  
 2315 7640 SZA CLA  
 2316 5324 JMP .+6  
 2317 1067 TAD RECORD+1  
 2320 7041 CIA  
 2321 1071 TAD LASRCR+1  
 2322 7650 SNA CLA  
 2323 3044 DCA EOSFLG  
 2324 4547 JMS I XCHGDV  
 2325 5310 JMP T11LP2  
 2326 7200 CLA  
 2327 1044 TAD EOSFLG  
 2330 7440 SZA  
 2331 5251 JMP T11RDL  
 2332 4550 JMS I XALEOT  
 2333 5230 JMP T11LP1  
 2334 5600 JMP I TEST11  
 2335 0000  
 2336 0000  
 2337 0000

T11INC, 0  
T11FLG, 0

/AT END OF RLS?  
 /YES  
 /CHECKED ALL DRIVES?  
 /AT END OF RLS?  
 /NO  
 /TEST EOS DUMP SWITCH  
 /EXIT

/DUMP ERROR COUNTERS ON ALL DRIVES

2340	4544
2341	4344
2342	7402
2343	5342
2344	0000
2345	4551
2346	4545
2347	1337
2350	7450
2351	5366
2352	4555
2353	6765
2354	4555
2355	7011
2356	7610
2357	4612
2360	4757
2361	1032
2362	7450
2363	5373
2364	4555
2365	7000
2366	4555
2367	7011
2370	7610
2371	4674
2372	4771
2373	4547
2374	5346
2375	5744

```

ERRDMP, JMS I XSVCTR
          JMS CTRDMP
          HLI
          JMP , -1
          CTRDMP, 0
          JMS I XRSFDV
          JMS I XMVCTRS
          TAD T11FLG
          SNA
          JMP COMEND-5
          JMS I XTEXT
          TEXT34
          JMS I XTEXT
          TEXT36
          CLA SKP
          WRDMP
          JMS I , -1
          TAD RECSYS
          SNA
          JMP COMEND
          JMS I XTEXT
          TEXT35
          JMS I XTEXT
          TEXT36
          CLA SKP
          READMP
          JMS I , -1
          COMEND, JMS I XCHGDV
                  JMP CTRDMP+2
                  JMP I CTRDMP
  
```

PAUSE

2400  
 \*2400  
 /IMSE DATA RELIABILITY TEST TAPE 4 (9 TRACK)  
 /GET SWS AND START TEST ROUTINE  
 /1 DRV OPERATION ONLY

2400	STRTES, STL		
2401	JMS I XLBSET		/SET UP INTERRUPT SERVICE,
2402	LAS		/GET FIRST WD SWS,
2403	AND KX7000		/MASK DRV NUMBER
2404	TAD K0303		
2405	DCA DRVDEN		
2406	RIF		
2407	TAD DRVDEN		
2410	DCA DRVDEN		
2411	JMS I XRWIND		/REWIND
2412	LAS		/GET SWS AGAIN
2413	DCA PASSWS		/FOR FIRST CONTROL WRD
2414	LAS		
2415	AND K0017		/PATTERN NUMBER TO
2416	DCA PAINUM		/GENERATE FIRST PATTERN
2417	DCA PARBT1		/PAR BIT IS IN PAINUM
2420	HLT		/WAIT FOR 2ND SW WORD
2421	LAS		/GET IT
2422	DCA PASSWS+1		/SAVE FOR EXECUTE
2423	JMS I XCLRTD		/CLR ERROR TABLES
2424	DCA SWTEST		/INDICATE SWITCH TEST
2425	HLT		/WAIT CLEAR SWS
2426	JMS I XGENPT		/GENERATE PATTERN
2427	JMS I XWRIT		/DO WRITE OPERATION
2430	TAD RECSYS		
2431	SNA CLA		/READ PASS SELECTED
2432	JMP ,+3		/NO
2433	JMS I XGOBKH		/MOVE BKWD TO FRST WRT
2434	JMS I XRDIT		/MAKE READ PASS
2435	RMSR		/GET STATUS
2436	AND K0010		
2437	SNA CLA		/AT EOT
2440	JMP STR1		/NO MAKE NEXT WRT PASS
2441	HLT		/HALT END OF TEST
2442	JMP STRTES+1		/RESTART FIRST WORD
2443	KX7000, 7000		

STR1,

2444	5244	/SET UP WRITE SEQUENCE
2445	7200	/GET INFO FROM JMS+1 AND JMS+2
2446	1066	WRITSEQ, JMP ,
2447	7640	TAD RECORD
2450	5324	SZA CLA /NO
2451	1067	JMP NOINCR /DOING RECORD 0
2452	7640	TAD RECORD+1
2453	5324	SZA CLA /AK FLAG * 0
2454	1043	JMP NOINCR /YES NOT BLK 0
2455	7640	TAD SWTEST
2456	5270	SZA CLA /TEST SWS
		JMP NOTSWS /NO
		/ENTER HERE IF PARAMETERS WERE SUPPLIED THRU THE AC SWITCHES
2457	7410	SKP
2460	1200	PARAMS
2461	4660	JMS I *1 /INITIALIZE
2462	1020	TAD PASSWS
2463	0122	AND K0400
2464	3032	DCA RECSYS
2465	1021	TAD PASSWS+1
2466	0121	AND K0300
2467	3033	DCA EXITMO /WRITE SEQUENCE EXIT MODE
		/ENTER HERE IF PARAMETERS WERE SUPPLIED THRU THE KEYBOARD
2470	1027	NOTSWS, TAD RLTR0L /GET RECORD LENGTH BITS
2471	0111	AND K0020
2472	7640	SZA CLA /MIN LENTH STRY IS SKP
2473	1131	TAD MAXLEN /MAX LENGTH SELECTED
2474	7450	SNA /MIN LENGTH SELECTED
2475	1132	TAD MINLEN
2476	7041	CMA IAC
2477	3034	DCA STRLEN
2500	3036	DCA BLKING
2501	1027	TAD RLTR0L /CLR LENGTH INCREMENTER
2502	0113	AND K0040
2503	7050	SNA CLA /CHNGING LENGTH
2504	5322	JMP NOINCR-2 /NO
2505	1026	TAD DRVDEN /DENSITY
2506	0104	AND K0003
2507	1347	TAD TADING
2510	3011	DCA *+1
2511	1350	TAD INCTBL /TO GET INCREMENTER
2512	3036	DCA BLKING /GET DENSITY INC *

2513	1034	TAD STRLEN	/GET STARTING LENGTH
2514	1131	TAD MAXLEN	
2515	7650	SNA CLA	/START LEN = MAX
2516	5322	JMP NOINCR-2	/YES LV BLKING +
2517	1036	TAD BLKING	
2520	7041	CMA IAC	/MAKE INCR -
2521	3036	DCA BLKING	/SO LENGTH GETS LNGR
2522	1034	TAD STRLEN	
2523	3073	DCA WRTLEN	/SET UP FIRST LENGTH
2524	1025	DCA WRTLEN	/MOVE PARITY BIT INTO POSITION
2525	7106	NOINCR, CLL RTL	
2526	7006	RTL	
2527	7004	RAL	/PAR + DRV + DENSITY
2530	1026	TAD DRVOEN	
2531	3035	DCA COMAND	
2532	1066	TAD RECORD	
2533	3074	DCA WRRECR	/SAVE STARTING RECORD
2534	1067	TAD RECORD+1	
2535	3075	DCA WRRECR+1	
2536	2755	ISZ I X11FLG	
2537	7410	SKP I WRTSEQ	
2540	5644	JMP I WRTSEQ	
2541	7001	IAC	
2542	3755	DCA I X11FLG	
2543	1125	TAD K7770	
2544	3037	DCA WRPASS	/SET 8 PASS COUNTER
2545	5746	JMP I ,+1	/WRT SEQUENCE
2546	2600	STRTOP	
2547	1350	TAD INCTBL	
2550	0010	INCTBL, 10	
2551	0004	4	/24 CHARACTER 200 BPI
2552	0002	2	/12 CHARACTER 556 BPI
2553	0002	2	/6 CHARACTER 800 BPI
2554	5644	WSEQXT, JMP I WRTSEQ	/IN CASE OF SWITCH GOOF
2555	2337	X11FLG, T11FLG	
2556	0303	K0303, 303	



```

2600
2600 1035
2601 6722
2602 5201
2603 6725
2604 6705
2605 6724
2606 5205
2607 6725
2610 1035
2611 6705
2612 1073
2613 6701
2614 1130
2615 6703
2616 1232
2617 3002
2620 1364
2621 6706
2622 1024
2623 1126
2624 7650
2625 4313

2626 6001
2627 7200
2630 5631
2631 7050
2632 2633

2633 4566
2634 6714
2635 7710
2636 5324
2637 1037
2640 1107
2641 7650
2642 5233
2643 1037
2644 7410
2645 2065
2646 1245
2647 3250
2650 2056
2651 1125
2652 3037
2653 1030
2654 7440
2655 5263

*2600
/PERFORM WRITE SEQUENCE OPERATION
STRIP, TAD COMAND /LOAD CM WHEN CONTROL READY,
SKCB
JMP , -1
CLF /CLEAR STATUS,
LCMR /LOAD CM,
SKTR /WAIT FOR TRANSPORT,
JMP , -1

NONSTP, CLF
TAD COMAND
LCMR /LOAD WC,
TAD WRTLEN
LWCR /LOAD CA,
TAD WRBUF
LCAR
TAD XTSTST /SET UP INTERRUPT LINK,
DCA 2 /LOAD FR (WRITE) AND GO,
TAD K4100
LFGR
TAD PATNUM
TAD K7771
SNA CLA /PATTERN 7 RANDOM
JMS STRPAY /YES SEE IF REGEN VALID
/PROGRAM STAYS IN THIS LOOP UNTIL INTERRUPT
ION
CLA
JMP I , +1
CAMON /CA MONITOR

XTSTST, TS1STP
/AT PROG INT COMES TO TSTSTP

TSTSTP, JMS I XLBINT
RMSR /READ STATUS
SPA CLA /EP = 1
JMP WRTERR /YES SEE IF EOT
TAD WRPASS
TAD K0010
SNA CLA /ERR REC PASS
JMP NSTSEL-3 /NO
TAD WRPASS
SKP
ISZ PERMBS /CONSTANT
TAD , -1 /ISZ PERMBS = WRITE PASS
DCA , +1 /TO +1 RECV1 TO RECV7
ISZ RECV1
TAD K7770
DCA WRPASS /RESET 8 PASS COUNTER
TAD MODBIT
SZA /AC = 0 IS NONSTOP
JMP STOPOP /START STOP SELECTED

```

```

2656 1037 NSTSEL, TAD WRPASS
2657 1107 TAD K0010
2660 7650 SNA CLA /ERROR PASS
2661 4541 JMS I XTSINC NO INCR BLOCK NUMBER
2662 5207 JMP NONSTP /GO AGAIN

2663 0117 STOPOP, AND K0200
2664 7640 SEA CLA /RANDOM STOP
2665 4273 JMS RANSTP /YES
2666 1037 TAD WRPASS
2667 1107 TAD K0010
2670 7650 SNA CLA /ERROR RECVR PASS
2671 4541 JMS I XTSINC /NO INCR BLOCK NUMBER
2672 5200 JMP STRTOP /GO AGAIN
/SELECTION IS RANDOM START STOP STALL
RANSTP, JMP
JMS I XRANUM /GET RANDOM NUMBER
AND K0177 /MASK 0 TO 127
CMA /MAKE #1 TO -128
DCA DELAY1 /SAVE IT
TAD K0004 /#4
TAD DELAY1 /# = RAN COUNT
SMA CLA /1 TO 4
JMP NSTSEL /IS GO NONSTOP
TAD K7443
DCA DELAY
ISZ DELAY /STALL 1 MILLISEC
JMP #-1 /DONE ALL SELECTED
ISZ DELAY1 /NO
JMP #-5 /EXIT RANDOM STALL
JMS I RANSTP /SEE IF APPROPRIATE TO REGENERATE RANDOM DATA
STRPAT, JMP
TAD RECSYS /READ PASS SELECTED
SEA CLA /YES DON'T REGEN
JMS I STRPAT
TAD WRPASS
TAD K0010
SNA CLA /ERROR PASS
JMS I XGENPT /NO REGENERATE PATTERN
JMP I STRPAT /FINISH WRITE OPERATION

```

```

2724 4563 /EF=1 DURING WRITE TEST EOT AND RECVR OPTION
2725 5763 WRTERR, JMS I XLEOT1
2726 1037 JMP I XENDTP /TYPE EOT INFO
2727 1107 TAD WRPASS
2730 7650 SNA CLA /FIRST ERROR PASS
2731 2055 ISZ WRCHEK /YES #1 WRT CHECK ERRS
2732 7604 LAS /TEST AC SW 2#1
2733 7006 RTL /TYPE ALL WRITE ERRORS
2734 7700 SMA CLA
2735 5345 JMP TESREC /NO
2736 4555 JMS I XTEXT /PRINT TEXT
2737 6200 TEXT1 /TYPE STANDARD DATA INFORMATION
2740 4554 JMS I XTYPDT
2741 4560 JMS I XTSP3
2742 1073 TAD WRTLEN
2743 7041 CIA
2744 4553 JMS I XDCPRT
2745 7604 LAS
2746 0122 AND K0400 /TEST AC SW 3#1
2747 7640 SZA CLA /STATISTICAL RECOVERY
2750 5765 JMP I XSTREC /YES TRY 7 MORE TIMES
2751 1032 TAD RECSYS
2752 7440 SZA /READ PASS SELECTED
2753 4766 JMS I XRCXRG /YES WRITE XIRG
2754 1125 TAD K7770
2755 3037 DCA WRPASS /RESET WRITE COUNT
2756 6714 RMSR
2757 0107 AND K0010
2760 7640 SZA CLA /EOT # 1
2761 5763 JMP I XENDTP /YES TYPE EOT INFO
2762 5253 JMP NSTSEL-3 /TEST STOP MODE
2763 4600 XENDTP, ENDTAP
2764 4100 K4100, 4100
2765 5275 XSTREC, STAREC
2766 3000 XRCXRG, XRGREC

```

3000

\*3000  
/WRITE RECOVERY UTILIZIN EXTENDED INTER RECORD GAP (XIRG)  
/USED AFTER 7 REWRITES AFTER EACH WRITE ERROR  
/IF STATISTICAL RECOVERY NOT SELECTED.  
/USED ONLY IF READ PASS IS SELECTED  
XRGREG, 0

3000	0000	CLA	
3001	7200	TAD K7774	
3002	1301	DCA WRPASS	/COUNT 4 REWRITES
3003	3037	LAS	
3004	7604	RAL	/TEST AC SW1=1
3005	7004	SPA CLA	
3006	7710	JMP XRGRCD	
3007	5246	JMS I XBACK1	
3010	4700	CLA	
3011	7200	TAD COMAND	/LOAD CM WHEN CONTROL READY,
3012	1035	SKCB	
3013	6722	JMP .-1	
3014	5213	CLF	
3015	6725	LCMR	
3016	6705	SKTR	
3017	6724	JMP .+1	
3020	5217	CLF	
3021	6725	TAD COMAND	
3022	1035	LCMR	
3023	6705	TAD WRTLEN	/LOAD WC,
3024	1073	LWCR	/LOAD CA,
3025	6701	TAD WRBUF	/SET UP INTERRUPT,
3026	1130	LCAR	/WRITE WITH XIRG,
3027	6703	TAD XRG1	
3030	1240	DCA 2	
3031	3002	TAD K4500	
3032	1277	LFGR	
3033	6706	ION	
3034	6001	CLA	
3035	7200	JMP I .+1	
3036	5637	CAMON	
3037	7050	XXRG1, XRG1	
3040	3041	/RETURN HERE AFTER PROGRAM INTERRUPT	
		XRG1,	/SAVE STATUS,
3041	4566	JMS I XLBINT	
3042	4565	JMS I XLBSAV	
3043	1052	TAD STATRD	

```

3044 7710 SPA CLA /HAVE EF?
3045 5251 JMP :+4 /YES
3046 1125 XRGRCO, TAD K7770
3047 3037 DCA WRPASS /RESET 7 COUNIER
3050 5600 JMP I XRGREC /EOT ONLY?
3051 4564 JMS I XLEOT2 /YES,
3052 5246 JMP XRGRCO /DONE 4 XIRG?
3053 2037 ISZ WRPASS /NO
3054 5204 JMP XRGREC+4 /TYPEOUT STATUS EVERY 4 XIRG
3055 4555 JMS I XTEXT /WRITE STATUS ERROR
3056 6200 TEXT1 /TYPE STANDARD DATA INFORMATION
3057 4554 JMS I XTYPDT
3060 4555 JMS I XTEXT /4TH EXTENDED RECORD GAP
3061 6442 TEXT14
3062 1052 TAD STATRD

3063 0107 AND K0010 /EOT=1
3064 7650 SNA CLA /NO
3065 5201 JMP XRGREC+1
3066 1026 TAD DRVDEN
3067 6725 CLF
3070 6705 LCMR
3071 1276 TAD K5100
3072 6706 LFGR /WRITE EOF,
3073 4567 JMS I XLBWAT /WAIT DONE,
3074 4565 JMS I XLBSAV /SAVE STATUS,
3075 5600 JMP I XRGREC
3076 5100 K5100,
3077 4500 K4500,
3100 4514 XBACK1,
3101 7774 K7774,

```

```

3102 0000 /SEE IF RECORD LENGTH SHOULD BE CHANGED
3103 2066 TESING, 0
3104 7410 ISZ RECORD
3105 2067 SKP RECORD+1
3106 7300 CLA CLL
3107 1036 TAD BLKING
3110 7450 SNA
3111 5342 JMP TES2K
3112 1073 TAD WRTLEN
3113 3073 DCA WRTLEN
3114 1073 TAD WRTLEN
3115 7500 SNA
3116 5323 JMP .+5
3117 1132 TAD MINLEN
3120 7700 SNA CLA
3121 5335 JMP RESETL
3122 5327 JMP CWCKO
3123 1131 TAD MAXLEN
3124 7001 IAC
3125 7710 SPA CLA
3126 5335 JMP RESETL
3127 1033 TAD EXITMO
3130 0117 AND K0200
3131 7450 SNA
3132 5702 JMP I TESING
3133 5734 JMP I .+1
3134 2554 WSEQXT
3135 1034 TAD STRLEN
3136 3073 DCA WRTLEN
3137 3044 DCA EOSFLG
3140 1033 TAD EXITMO
3141 5331 JMP RESETL-4
3142 7200 CLA
3143 1066 TAD RECORD
3144 0350 AND K377
3145 7650 SNA CLA
3146 5337 JMP RESETL+2
3147 5327 JMP RESETL-6
3150 0377 K377. PAUSE

```

```

/GET INCREMENTIER
/LENGTH CHANGING?
/NO, GET OUT
/YES, INC + RECORD LENGTH
/SAVE

```

```

/COUNT LESS THAN MINIMUM
/YES, RESET

```

```

/COUNT MORE THAN MAXIMUM
/YES,RESET

```

```

/EXIT AT EOT ONLY
/EXIT AT END OF EVERY RECORD

```

```

/RESET LENGTH TO CURRENT START
/CLEAR EOS FLAG

```

```

/GET NEXT RECORD NUMBER

```

```

/RECORD NOT AN INCREMENT OF 256
/MULT OF 256 CLEAR EOS FLAG

```

/TAPE 5 (9 TRACK)

\*4200

/DATA RELIABILITY READ/COMPARE SEQUENCE  
READIT, 0

4200  
4201  
4202  
4203  
4204  
4205  
4206  
4207  
4210  
4211  
4212  
4213  
4214  
4215  
4216  
4217  
4220  
4221  
4222  
4223  
4224  
4225  
4226  
4227  
4230  
4231  
4232  
4233  
4234  
4235  
4236  
4237  
4240  
4241  
4242  
4243  
4244  
4245  
4246  
4247  
4250  
4251  
4252  
4253  
4254

CLA  
TAD RECORD  
SZA CLA  
JMP .+3  
TAD RECORD+1  
SZA CLA  
JMP .+3  
TAD STRLEN  
DCA READLN  
TAD K7775  
DCA ROPASS  
RDSTPD, SKCB  
JMP .-1  
CLA  
TAD COMAND  
CLF  
LCMR  
SKTR  
JMP .-1  
READGO, CLA  
CLF  
TAD  
LCMR  
TAD READLN  
LWCR  
TAD WRBUF  
LCAR  
TAD XRDRET  
DCA 2  
TAD K3100  
LFGR  
ION  
CLA  
JMP I .+1  
CAMON  
XRDRET, RDRET  
/AT PROGRAM INTERRUPT RETURN IS HERE  
RDRET, JMS I XLBINT  
JMS I XLBSAV  
TAD STATRD  
SPA  
JMP RDERRO  
AND K0010  
SZA CLA  
JMP I XRNDTP  
/CA MONITOR  
/ANY ERRORS?  
/YES  
/ANY ERRORS?  
/YES  
/HAVE ED07  
/YES, READ DUMP  
/SET UP INITIAL READ LENGTH  
/WAIT FOR CONTROL,  
/LOAD CM,  
/WAIT FOR TRANSPORT,  
/LOAD WC,  
/LOAD CA,  
/SET UP INTERRUPT,  
/READ/COMP = GO,  
/CA MONITOR  
/AT PROGRAM INTERRUPT RETURN IS HERE  
/CHECK CAUSE OF INTERRUPT,  
/SAVE STATUS,  
/ANY ERRORS?  
/YES  
/HAVE ED07  
/YES, READ DUMP

```

4255 1031 RTSSTP, TAD READMO /GET READ MODE BITS
4256 7440 SZA /NON STOP?
4257 5275 JMP ROSTPC
4260 4543 JMS I XRDINC INCR FOR NEXT BLOCK
4261 7200 CLA
4262 1066 TAD RECORD
4263 7041 CMA IAC
4264 1070 TAD LASRCR
4265 7440 SZA
4266 5273 JMP .+5
4267 1067 TAD RECORD+1
4270 7041 CIA
4271 1071 TAD LASRCR+1
4272 7440 SZA
4273 5224 JMP READGO
4274 5600 RDEXIT, JMP I READIT

/
ROSTPC, AND K0020 /MASK READ RANDOM STOP
SZA RNRDRS /TEST FOR START STOP OR RANDOM
JMS I XRDINC /RANDOM
CLA RECORD /NORMAL START STOP
CMA IAC
TAD LASRCR
SZA
JMP .+5
TAD RECORD+1
CIA
TAD LASRCR+1
SZA
JMP ROSTPD /GO AGAIN
JMP I READIT /GO AGAIN
/RANDOM READ START STOP
RNRDRS, 0

JMS I XCRANUM /GET RANDOM NUMBER
AND K0177 /MASK 0 TO 127
CMA /MAKE =1 TO =128
DCA DELAY1 /TO COUNT MILLISEC
TAD DELAY1
TAD K0004
SMA CLA
JMP RTSSTP+3
TAD K7443
DCA DELAY
ISZ DELAY
JMP .-1
ISZ DELAY1
JMP .-5
JMP I RNRDRS
/
K3100, 3100

```



/MAGTAP STATUS INDICATES SOME ERROR

4336	4564	JMS I	XLEOT2	/EOT?
4337	5763	JMP I	XRNDTP	/YES
4340	7604	LAS		
4341	0117	AND	K0200	/PRINT IMMEDIATE?
4342	7650	SNA CLA		
4343	5777	JMP I	(RDOERR	/NO
4344	1052	TAD	STATRD	/YES.
4345	7112	CLL RTR		
4346	7620	SNL CLA		
4347	5353	JMP	+4	
4350	4555	JMS I	XTEXT	/R/C ERROR, PRINT DATA ERROR
4351	6500	TEXT16		
4352	5355	JMP	+3	
4353	4555	JMS I	XTEXT	/NO R/C ERROR, PRINT STATUS ERROR
4354	6460	TEXT15		
4355	4554	JMS I	XTYPDT	/STANDARD STUFF
4356	4560	JMS I	XTSP3	
4357	1076	TAD	READLN	/THEN RECORD LENGTH
4360	7041	CIA		
4361	4553	JMS I	XDCPRT	
4362	5777	JMP I	(RDOERR	
4363	4664	XRNDTP,	RNDTAP	

```

4377 4400
      *4400
4400 1104 RDBERR, TAD K0003 /1ST PASS?
4401 1051 TAD RDPASS
4402 7640 SZA CLA
4403 5217 JMP I,+14 /NO, DO NOT UPDATE ERROR COUNTERS,
4404 1052 TAD STATRD /YES, R/C?
4405 7112 CLL RTR
4406 7420 SNL
4407 5216 JMP I,+7 /NO, NOT A DATA ERROR,
4410 0113 AND K0040 /YES, PARITY ERROR?
4411 7650 SNA CLA
4412 5215 JMP I,+3 /YES, UPDATE DATA ERROR,
4413 2100 ISZ CMPERR
4414 7410 SKP
4415 2077 ISZ RNSTA /NO, UPDATE DATA NO STATUS,
4416 2102 ISZ RDERRS /ALWAYS UPDATE READ ERROR ON 1ST PASS
4417 7200 CLA
4420 4543 JMS I XRDINC
4421 7604 LAS
4422 0115 AND K0100 /YES AC SW 5 = 1
4423 7450 SNA RPNAS3 /DELETE ERROR RECOVERY?
4424 5251 JMP RPNAS3
4425 7200 CLA /NO
4426 1127 TAD K7775 /RESET PASS COUNTER
4427 3051 DCA RDPASS
4430 1052 TAD STATRD
4431 0107 AND K0010
4432 7440 SZA /IS EOT=1
4433 5660 JMP I XRDTP2 /YES, PRINT EOT
4434 1066 TAD RECORD
4435 7041 CMA IAC
4436 1070 TAD LASRCR
4437 7640 SZA CLA
4440 5246 JMP I,+6 /TAD RECORD+1
4441 1067 TAD RECORD+1
4442 7041 CIA
4443 1071 TAD LASRCR+1
4444 7450 SNA
4445 5647 JMP I,+2
4446 5650 JMP I,+2
4447 4274 RDEXIT
4450 4214 RDSTPD
      /SEE IF ALL RE-READS HAVE BEEN MADE
      RPNAS3, ISZ RDPASS /DONE ALL RE-HEADS?
      JMP I,+3 /NO
      ISZ NRREAD /+1 NON REC READ
      JMP RPNAS3 /DO NEXT RECORD
      JMS I XSTBAK /PUT POINTERS BACK THIS ONE
      JMS BACK1 /BACK UP
      JMP I RPNAS3-1 /GO AGAIN
      XRDTP2, RNDTAP+1
      XSTBAK, SETBAK
  
```

```

4462 0000 /SET UP POINTERS FOR NEXT RECORD
4463 7200 RDINCR, 0
4464 1076 CLA
4465 3332 TAD READLN
4466 2066 DCA SETBAK+2
4467 7410 ISZ RECORD /+1 TO NEXT RECORD
4470 2067 SKP RECORD+1
4471 1036 TAD BLKING
4472 7450 SNA /GET RECORD INCREMENT
4473 5662 JMP I RDINCR /IS LENGTH CHANGING?
/RECORD LENGTH IS CHANGING, COUNT IT /NO, EXIT
TAD READLN /LENGTH + OR * INCR
DCA READLN /SAVE LAST RECORD LENGTH
TAD READLN
SMA
JMP +5
TAD MINLEN /IS LENGTH LESS THAN MIN
SMA CLA /YES, RESET
JMP RESTRL
JMP I RDINCR /IS LENGTH MORE THAN MAX
TAD MAXLEN
IAC
SMA CLA /NO
JMP I RDINCR /YES, RESET LENGTH
RESTRL, DCA READLN
JMP I RDINCR
/BACKSPACE 1 RECORD
/OR GET BACK IN SYNC FOR NONSTOP RE-READ
BACKL, 0
SKTR /WAIT FOR TRANSPORT,
JMP -1
CLF
CLA CMA /SET UP WC TO *1,
LWCR /LOAD CM,
TAD DRVDEN
LCMR /SPC REV 1,
TAD K7100
LFGR /WAIT DONE,
JMS I XLBWAT
JMP I BACKL
5714

```

/SET RECORD POINTERS BACK  
SETBAK, 0

4530 0000  
4531 7610  
4532 0000  
4533 1332  
4534 3076  
4535 7240  
4536 1066  
4537 3066  
4540 1066  
4541 7001  
4542 7640  
4543 5730  
4544 1067  
4545 7440  
4546 5351  
4547 3066  
4550 5730  
4551 1355  
4552 3067  
4553 5730  
4554 7100  
4555 7777

CLA SKP

0

TAD -1

DCA READLN

CLA CMA

TAD RECORD

DCA RECORD

TAD RECORD

IAC

SZA CLA

JMP I SETBAK

TAD RECORD+1

SZA

JMP +3

DCA RECORD

JMP I SETBAK

TAD K7777

DCA RECORD+1

JMP I SETBAK

K7100, 7100

K7777, 7777

/GET LAST RECORD LENGTH

/-1 TO RECORD COUNT

4600  
 2066  
 7410  
 2067  
 4555  
 6221  
 4212  
 7240  
 3072  
 5611  
 2554  
 0000  
 7300  
 1030  
 7012  
 7012  
 4723  
 4555  
 6400  
 1055  
 4553  
 1126  
 3010  
 7410  
 0055  
 1227  
 3011  
 3012  
 2012  
 1411  
 3013  
 1013  
 7450  
 5251  
 4561  
 4555  
 6413  
 1012  
 4557  
 4560  
 1013  
 4553  
 2012  
 2010  
 5234  
 1065  
 7450  
 5263  
 4555  
 6425  
 1065  
 4553  
 5612

ISZ RECORD /WRITE PASS IS AT EOT  
 SKP ISZ RECORD+1  
 JMS I XTEXT  
 TEXT2  
 JMS WRDMP  
 CLA CMA  
 DCA WRITE  
 JMP I,+1  
 WSEQXT  
 0  
 CLA CLL  
 TAD MODBIT  
 RTR  
 RTR  
 JMS I XCMDMP  
 JMS I XTEXT  
 TEXT10  
 TAD WRCHEK  
 JMS I XDCPRT  
 TAD K7771  
 DCA 10  
 SKP  
 RECV1+1  
 TAD :=1  
 DCA 11  
 DCA 12  
 ISZ 12  
 TAD I 11  
 DCA 13  
 TAD 13  
 SNA  
 TYRALL  
 JMP TYRALL  
 JMS I XTIN  
 JMS I XTEXT  
 TEXT12  
 TAD 12  
 JMS I XOC11  
 JMS I XTSP3  
 TAD 13  
 JMS I XDCPRT  
 ISZ 12  
 ISZ 10  
 JMP TYRECV  
 TAD PERMBS  
 SNA  
 JMP,+5  
 JMS I XTEXT  
 TEXT13  
 TAD PERMBS  
 JMS I XDCPRT  
 JMP I WRDMP

WRDMP, /WRITE DUMP  
 /COMMON DUMP FOR READ AND WRITE

/READ PASS IS AT END OF TAPE  
RNDIAP, JMS I XRDINC

4664 4543  
4665 4553  
4666 6517  
4667 4555  
4670 6221  
4671 4274  
4672 5673  
4673 4274

JMS I XTEXT  
TEXT20  
JMS I XTEXT  
TEXT2  
JMS READMP  
JMP I ,+1  
RDEXIT

/READ DUMP  
READMP, 3

4674 0000  
4675 1031  
4676 7110  
4677 4723

TAD READMO  
CLL RAR  
JMS I XCMDMP

/COMMON DUMP FOR READ AND WRITE

4700 4555  
4701 6530  
4702 1102  
4703 4553  
4704 4555  
4705 6000  
4706 1101  
4707 4553  
4710 4555  
4711 6615  
4712 1100  
4713 4553  
4714 4555  
4715 6630  
4716 1077  
4717 4553  
4720 7240  
4721 3103  
4722 5674  
4723 5000

JMS I XTEXT  
TEXT21  
TAD RDERRS  
JMS I XDCPRT  
JMS I XTEXT  
TEXT22  
TAD NRHEAD  
JMS I XDCPRT  
JMS I XTEXT  
TEXT23  
TAD CMPERR  
JMS I XDCPRT  
JMS I XTEXT  
TEXT24  
TAD RNOSTA  
JMS I XDCPRT  
CLA CMA  
DCA RDEOT  
JMP I READMP

/READ ERROR #

/NON RECOVERED #

/DATA ERRORS #

/DATA NO STAT #

XCMDMP, COMDMP

5000  
5000 0000  
5001 7112  
5002 3047  
5003 1026  
5004 7006  
5005 7006  
5006 4557  
5007 4560  
5010 1024  
5011 4557  
5012 4560  
5013 1025  
5014 7012  
5015 7010  
5016 4557  
5017 1026  
5020 0104  
5021 1240  
5022 4243  
5023 1047  
5024 1241  
5025 4243  
5026 1066  
5027 4726  
5030 0067  
5031 1027  
5032 7012  
5033 7012  
5034 0104  
5035 1242  
5036 4243  
5037 5000  
5040 1256  
5041 1252  
5042 1262  
5043 0000  
5044 3245  
5045 0000  
5046 3250  
5047 4555  
5050 0000  
5051 5643

\*5000  
/COMMON DUMP FOR READ AND WRITE  
COMDMP, 0

CLL RTR  
DCA DELAY  
TAD DRVDEN  
RTL  
RTL  
JMS I XOCT1  
JMS I XTSP3  
TAD PATNUM  
JMS I XOCT1  
JMS I XTSP3  
TAD PARBT1  
RTR  
RAR

/PRINT DRIVE NUMBER

/PRINT PATTERN NUMBER

/PRINT PARITY

JMS I XOCT1  
TAD DRVDEN  
AND K003  
TAD COM1  
JMS COM4  
TAD DELAY  
TAD COM2  
JMS COM4  
TAD RECORD  
JMS I XUDPRT  
RECORD+1  
TAD RLTR0L  
RTR  
RTR  
AND K003  
TAD COM3  
JMS COM4  
JMP I COMDMP

COM1,  
COM2,  
COM3,  
COM4,  
0  
DCA .+1  
0  
DCA .+2  
JMS I XTEXT  
0  
JMP I COM4

/MODIFIED = TAD I (DENTYP, OR MODTYP, OR LTHBL)

/MODIFIED = APPROPRIATE TEXT - SEE BELOW

5052 6263  
5053 6272  
5054 6301  
5055 6301  
5056 6236  
5057 6245  
5060 6254  
5061 6254  
5062 6310  
5063 6320  
5064 6331  
5065 6346

MODTYP, TEXT7  
TEXT8  
TEXT9  
TEXT9  
TEXT9  
DENIYP, TEXT4  
TEXT5  
TEXT6  
TEXT6  
LTHIBL, TYPMIN  
TYPMAX  
TYPAV1  
TYPAV2  
PAUSE

/NON-STOP  
/START=STOP  
/RANDOM  
/RANDOM  
/TYPE 200 BPI  
/TYPE 556 BPI  
/TYPE 800 BPI  
/TYPE 800 BPI  
/TYPE MINIMUM LENGTH  
/TYPE MAXIMUM LENGTH  
/TYPE AVE 1 LENGTH  
/TYPE AVE 2 LENGTH



/TM8E DATA RELIABILITY TEST - TAPE 6 (9 TRACK)

/CLEAR READ AND WRITE TABLES  
CLRTBL, 0

5066 0000  
5067 7610  
5070 0054  
5071 1270  
5072 3010  
5073 1124  
5074 3011  
5075 3410  
5076 2011  
5077 5275  
5100 5666

CLA SKP  
WRCHK=1  
TAD :-1  
DCA 10  
TAD K7751  
DCA 11  
DCA I 10  
ISZ 11  
JMP :-2  
JMP I CLRTBL

/TYPE COMMAND, STATUS, RECORD NUMBER  
TYPDAT, 0

5101 0000  
5102 6715  
5103 4725  
5104 4560  
5105 6716  
5106 4725  
5107 4560  
5110 6714  
5111 4725  
5112 4560  
5113 6711  
5114 4725  
5115 4560  
5116 6713  
5117 4725  
5120 4560  
5121 1066  
5122 4726  
5123 0067  
5124 5701

RCMR  
JMS I XOCprt /PRINT COMMAND  
JMS I XTSP3  
RFSR  
JMS I XOCprt /PRINT FS  
JMS I XTSP3 /PRINT MS,  
RMSR  
JMS I XOCprt  
JMS I XTSP3  
RWCR  
JMS I XOCprt  
JMS I XTSP3  
RCAR  
JMS I XOCprt  
JMS I XTSP3  
TAD RECORD  
JMS I XUDprt /PRINT RECORD NUMBER  
RECORD+1  
JMP I TYPDAT

XOCprt, OCIPrt  
XUDprt, UDPRnt

5125 6011  
5126 5200

5127 0000  
5130 7200  
5131 1066  
5132 3070  
5133 1067  
5134 3071  
5135 1074  
5136 3066  
5137 1075  
5140 3067  
5141 1066  
5142 7640  
5143 5346  
5144 1067  
5145 7640  
5146 5351  
5147 4534  
5150 5727  
5151 6722  
5152 5351  
5153 6725  
5154 1070  
5155 7041  
5156 1066  
5157 6701  
5160 1035  
5161 6705  
5162 6724  
5163 5362  
5164 1370  
5165 6706  
5166 4567  
5167 5727  
5170 7100

/GO BACKWARD  
GOBKWD: 0

/GET LAST RECORD  
/SAVE LAST RECORD

/RESTORE TO FIRST

/BLOCK 0 FIRST  
/NO, BACKSPACE  
/YES, REWIND  
/EXIT

/LOAD WC (USE DIFFERENCE FOR BACK SPACE,);  
/LOAD CM WHEN CONTROL READY,  
/WAIT FOR TRANSPORT,  
/SPC REV,  
/WAIT DONE;

P7100, 7100  
/EXIT

CLA  
TAD RECORD  
DCA LASCRCR  
TAD RECORD+1  
DCA LASCRCR+1  
TAD WRRECR  
DCA RECORD  
TAD WRRECR+1  
DCA RECORD+1  
TAD RECORD  
SZA CLA  
JMP .+3  
TAD RECORD+1  
SZA CLA  
JMP .+3  
JMS I XRWIND  
JMP I GOBKWD  
SKGB  
JMP .-1  
CLF  
TAD LASCRCR  
CIA  
TAD RECORD  
LWCR  
TAD COMAND  
LCMR  
SKTR  
JMP .-1  
TAD P7100  
LFGR  
JMS I XLBWAT  
JMP I GOBKWD  
7100

/UNSGINED DECIMAL PRINT, DOUBLE PRECISION  
/CALLING SEQUENCE: JMS UDPRNT /SUBROUTINE CALLED WITH AC=LOW ORDER WORD  
/ HI ADDR /ADDRESS OF HIGH ORDER WORD  
/ RETURN /RETURN WITH AC AND L CLEAR

```

5200 *5200
0000 UDPRNT, 0
3254 DCA UDLOW
1600 TAD I UDPRNT /PICK UP ADDRESS OF HIGH-ORDER WORD
3261 DCA UDGET
1661 TAD I UDGET
3253 DCA UDHIGH
1247 TAD UDLOOP
3252 DCA UDCNT
1250 TAD UDADDR
3262 DCA UDPTR
2200 ISZ UDPRNT
1662 TAD I UDPTR
2262 ISZ UDPTR
3255 DCA UDHSUB
1662 TAD I UDPTR
2262 ISZ UDPTR
3256 DCA UDLSUB
7100 CLL
1256 TAD UDLSUB
1254 TAD UDLOW
3260 DCA UDTEML
7004 RAL
1255 TAD UDHSUB
1253 TAD UDHIGH
7420 SNL
5237 JMP UDOUT
2257 ISZ UDBOX
3253 DCA UDHIGH
1260 TAD UDTEML
3254 DCA UDLOW
5221 JMP UDDO
7200 CLA
1257 TAD UDBOX
1251 TAD UDTWO
4556 JMS I XOTY
3257 DCA UDBOX
2252 ISZ UDCNT
5213 JMP UDARND
5600 JMP I UDPRNT
7773 -5
5263 UDADDR, UDCON1
0260 UDTWO, 260
0000 UDCNT, 0
0000 UDHIGH, 0
0000 UDLOW, 0
0000 UDHSUB, 0
0000 UDLSUB, 0
0000 UDBOX, 0
0000 UDTEML, 0
5201 5200
5202 0000
5203 3254
5204 1600
5205 3261
5206 1661
5207 3253
5210 1247
5211 3252
5212 1250
5213 3262
5214 2200
5215 1662
5216 2262
5217 3255
5220 1662
5221 2262
5222 3256
5223 7100
5224 1256
5225 1254
5226 3260
5227 7004
5230 1255
5231 1253
5232 7420
5233 5237
5234 2257
5235 3253
5236 1260
5237 3254
5240 5221
5241 7200
5242 1257
5243 1251
5244 4556
5245 3257
5246 2252
5247 5213
5250 5600
5251 7773
5252 5263
5253 0260
5254 0000
5255 0000
5256 0000
5257 0000
5260 0000

```

```

/PICK UP ADDRESS OF HIGH-ORDER WORD
/PICK UP BOTH WORDS FOR USE IN SUBROUTINE
/INITIALIZE DIGIT COUNTER FOR "5"
/INITIALIZE TO TABLE OF POWERS OF TEN
/INDEX LINKAGE FOR CORRECT RETURN
/PICK UP CURRENT POWER OF TEN FOR
/USE IN SUBTRACTION
/DOUBLE PRECISION SUBTRACTION
/DID IT UNDERFLOW?
/NO, COUNT IS DONE
/YES, COUNT NOT DONE YET, INDEX DIGIT
/DEPOSIT REMAINING PORTIONS OF WORD
/GO BACK AND SUBTRACT AGAIN
/PICK UP RESULTING DIGIT
/ADD "260" TO IT
/INITIALIZE DIGIT TO "5"
/HAVE WE TYPED "5" DIGITS
/NO, DETERMINE NEXT DIGIT
/YES, SUBROUTINE DONE, RETURN
/COUNT OF "5" DIGITS
/INITIAL ADDRESS OF POWERS OF TEN
/ICODE FOR DIGITS
/STORAGE LOCATIONS

```

5261	0000	UDGET,	0	
5262	0000	UDPTR,	0	
5263	7775	UDCON1,	7775	'=10,000
5264	4360		4360	
5265	7777		7777	/=1,200
5266	6030		6030	
5267	7777		7777	/=100
5270	7634		7634	
5271	7777		7777	/=10
5272	7766		7766	
5273	7777		7777	/=1
5274	7777		7777	

```

5275 2037 /SWS SAY STATISTICAL RECOVERY
5276 5301 STAREC; IS2 WRPASS /DONE 7 REWRITES
5277 2065 JMP .+3 /NO
5300 5711 IS2 PERMBS /+1 PERM BAD SPOTS
5301 4312 JMP I BACK2-1 /RESTART
5302 6714 JMS BACK2 /BACKSPACE 2
5303 0342 RMSR
5304 7650 AND K1000 /AT BOT
5305 4332 SNA CLA /NO SPACE FWD1
5306 7200 JMS SPAFW1
5307 5710 CLA /GO AGAIN
5310 2653 JMP I .+1
5311 2751 NSISEL=3
TESREC+4
/BACKSPACE 2 RECORDS
BACK2; JMP ;
SKCB ; /WAIT FOR CONTROL;
JMP .-1
CLF
TAD K7776 /LOAD WC # -2
LWCR /LOAD CM;
TAD COMAND
LCMR
SKTR
JMP .-1 /WAIT TRANSPORT;
TAD 07100 /SPC REV 2;
LFGR /WAIT DONE;
JMS I XLBWAT
CLA
JMP I BACK2 /EXIT BACKSPACE 2
07100; 7100
/SPACE FORWARD 1 RECORD
SPAFW1; JMP ;
CLF /CLEAR STATUS;
CLA CMA /LOAD WC # -1;
LWCR /SPC FWD 1;
TAD K6100
LFGR /WAIT DONE;
JMS I XLBWAT /EXIT SPACE FWD
JMP I SPAFW1
K1000; 1000
K7776; 7776
K6100; 6100
/REWIND DRIVE TO LOAD POINT
/CALL WITH DRIVE SELECT IN AC
REWIND; 0
SKCB /WAIT FOR CONTROL;
JMP .-1
CLA
TAD DRVDEN /LOAD CM;
CLF
LCMR
SKTR /WAIT FOR TRANSPORT;

```

```

5332 5332
5333 6725
5334 7240
5335 6701
5336 1344
5337 6706
5340 4567
5341 5732
5342 1000
5343 7776
5344 6100
5345 0000
5346 6722
5347 5346
5350 7200
5351 1026
5352 6725
5353 6705
5354 6724

```

5355	5354	JMP	.=1	
5356	6714	RMSR		/BOT?
5357	7006	RTL		
5360	7710	SPA	CLA	
5361	5745	JMP	I	REWIND
5362	1370	TAD	K1100	/YES
5363	6706	LFGR		/REWIND = 60
5364	6723	SKTD		
5365	5364	JMP		.=1
5366	6725	CLE		
5367	5745	JMP	I	REWIND
5370	1100			K1100, 1100

```

5400 *5400
5401 GENPAT, JMP I XSTSTR
5402 JMS I XSTSTR /GET PATTERN NUMBER
5403 TAD PATNUM /+ JMP I
5404 TAD PARBT1 /TO BE EXECUTE
5405 TAD JMPTBL
5406 DCA ,+1
5407 JMP I JMPTBL+1
5408 JMP I ,+1 /TO GET TO PATTERNS
5409 JMPTBL,
5410 GNEVN0
5411 GNEVN1
5412 GNEVN2
5413 GNEVN3
5414 GNEVN4
5415 GNEVN5
5416 GNEVN6
5417 GNEVN7
5420 GNODD0
5421 GNODD1
5422 GNODD2
5423 GNODD3
5424 GNODD4
5425 GNODD5
5426 GNODD6
5427 GNODD7

```

```

5430 /EVEN PATTERN 0 HIGH FREQ SKEW
5431 GNEVN0, TAD ,+2
5432 JMP GNODD6+1

```

```

5433 /EVEN PATTERN 2 HIGH FREQ EVERY OTHER TRK
5434 GNEVN2, TAD ,+2
5435 JMP GNODD6+1

```

```

5436 /ODD PATTERN 2 COMPLEMENT OFF EVEN 2
5437 GNODD2, TAD ,+2
5440 JMP GNODD6+1

```

```

5441 /ODD AND EVEN PATTERN 6 ALL TRACKS
5442 GNEVN6, NOP
5443 GNODD6, CMA /SAME AS ODD

```

```

5444 AND K0377
5445 DCA 12
5446 TAD 12
5447 DCA I 10
5450 ISZ 11
5451 JMP , -3

```

```

5452 /EVEN PARITY PATTERN 3 HIGH REQ, INSIDE HALF OUTSIDE
5453 GNEVN3, TAD ,+2
5454 JMP GNODD6+1

```

```

5455 0273
5456 0274
5457 0274
5458 0274
5459 0274
5460 0274
5461 0274
5462 0274
5463 0274
5464 0274
5465 0274
5466 0274
5467 0274
5468 0274
5469 0274
5470 0274
5471 0274
5472 0274
5473 0274
5474 0274
5475 0274
5476 0274
5477 0274
5478 0274
5479 0274
5480 0274
5481 0274
5482 0274
5483 0274
5484 0274
5485 0274
5486 0274
5487 0274
5488 0274
5489 0274
5490 0274
5491 0274
5492 0274
5493 0274
5494 0274
5495 0274
5496 0274
5497 0274
5498 0274
5499 0274

```

5455 1257 /ODD PATTERN 4 INCREMENTING CHARACTER NO 00  
 5456 5243 GNEVN4, TAD ,+2 /GET SNA TO THROW 00  
 5457 0004 JMP GNODD6+1 /GENERATE PATTERN  
 0004 SKP

5460 1262 /ODD PATTERN 4 SAVE 00 CODES  
 5461 5265 GNEVN4, TAD ,+2 /GET SKP TO SAVE 00  
 5462 7450 JMP GNODD4+1 /DEPOSIT SKP OR SNA  
 5463 7410 SNA DCA INC0CH /00 TO 14 START  
 SKP DCA 14 /GET NEXT CHAR  
 /STORE IT

5464 1263 /DONE ALL WORDS  
 5465 3316 DCA INC0CH /NO GET NEXT  
 5466 3014 DCA 14 /EXIT  
 5467 4312 JMS GENING  
 5470 3410 DCA I 10  
 5471 2011 ISZ 11  
 5472 5267 JMP GNODD4+3  
 5473 5600 JMP I GENPAT

5474 4533 /EVEN RANDOM PATTERN 7  
 5475 0366 GNEVN7, JMS I XTRANUM  
 5476 7450 AND K0377  
 5477 5274 SNA  
 5500 3410 JMP GNEVN7  
 5501 2011 DCA I 10  
 5502 5274 ISZ 11  
 5503 5600 JMP GNEVN7  
 JMP I GENPAT

5504 4533 /ODD RANDOM PATTERN 7  
 5505 0366 GNEVN7, JMS I XTRANUM  
 5506 3410 AND K0377  
 5507 2011 DCA I 10  
 5510 5304 ISZ 11  
 5511 5600 JMP GNODD7  
 JMP I GENPAT



```

5512 5312 /INCREMENT 14 FOR NEXT CHARACTER
5513 7014 GENING, JMP
5514 7001 TAD 14 /GET LAST
5515 0366 IAC /+1
AND K0377 /MASK LMR 6

5516 7450 INC0CH, SNA SKP /SNA IF EVEN PAR
5517 7001 IAC /NEVER EXECUTED IF ODD
5520 3014 DCA 14 /SAVE CHAR
5521 1014 TAD 14 /PUT IN AC
5522 5712 JMP I GENING /EXIT
5523 4347 GNEVN1, JMS ST9WRD /EVEN PATTERN 1
5524 0377 0377 /SLIDING 0 RET
5525 0177 0177 /BY CHARACTER
5526 0277 0277
5527 0337 0337
5530 0357 0357
5531 0367 0367
5532 0373 0373
5533 0375 0375
5534 0376 0376

5535 4347 GNOOD1, JMS ST9WRD /ODD PATTERN 1
5536 0000 0000 /SLIDING 1 BIT
5537 0200 0200 /BY CHARACTER
5540 0100 0100
5541 0040 0040
5542 0020 0020
5543 0010 0010
5544 0004 0004
5545 0002 0002
5546 0001 0001

5547 5347 /STORE 9 WORD SUBROUTINE EVN AND ODD 1
5550 7240 ST9WRD, JMP
5551 1347 CLA CMA
TAD ST9WRD
5552 3012 DCA 12
5553 1367 TAD K7767 /TO COUNT 9
5554 3013 DCA 13
5555 1412 ST9A, TAD I 12 /GET NEXT WORD
5556 3410 DCA I 10 /STORE IN WRITE BUFFER
5557 2011 ISZ 11 /FILLED BUFFER
5560 7410 SKP /NO
5561 5600 ST9B, JMP I GENPAT /BUFFER FULL EXIT
5562 2013 ISZ 13 /DONE 9
5563 5355 JMP ST9A /NOT 9 YET GET NEXT
5564 5350 JMP ST9WRD+1 /START OVER FROM FIRST OF 9

5565 5624 / XSTSTR, SETSTR
5566 0377 K0377, 377
5567 7767 K7767, 7767

```

5600 \*5600

/ODD PATTERN 5 EACH TRACK 3 FRAMES EVERY 27  
GNODD5, JMS STHALF

5600	4234
5601	0000
5602	0200
5603	0100
5604	0040
5605	0020
5606	0010
5607	0004
5610	0002
5611	0001

/ODD PATTERN 3 3 ONES 3 ZEROS THREE ONES  
GNODD3, JMS STHALF

5612	4234
5613	0037
5614	0300
5615	0076
5616	0201
5617	0174
5620	0003
5621	0370
5622	0007
5623	0360

/INITIALIZE AUTO INDEX 10-11 FOR PATTERN STORAGE  
SETSTR: 0

5624	0000	CLA
5625	7200	TAD BLENTH
5626	1233	DCA 11
5627	3011	TAD WRBUF
5630	1130	DCA 10
5631	3010	JMP I SETSTR
5632	5624	

/WORD COUNT IN 11

/WRITE BUFFER =1 IN 10

BLENTH: =400

/READ=WRITE BUFFER LENGTH;

```

5634 5234 /GENERATE A THREE WORD PATTERN
5635 7240 STHALF, JMP
5636 1234 CLA CMA
5637 3012 TAD STHALF
5640 1274 /SAVE TABLE LIST
5641 3013 /9 COUNT
5642 1127 /3 COUNT
5643 3015
5644 1412 /GET DATA WORD
5645 3261 /SAVE FOR FUTURE USE
5646 1261
5647 3410 /DEPOSIT DATA WORD IN TABLE
5650 2011 /DONE?
5651 7410 /NO
5652 5660 SKP I EXITGN
5653 2015 JMP I EXITGN
5654 5246 /BUFFER FULL, EXIT
5655 2013 /DONE 3 WORDS?
5656 5242 /NO
5657 5235 JMP STHALF+1 /YES

```

```

5660 5561 EXITGN, ST9B
5661 0000 STHF1, 0

```

```

5662 4234 /EVEN PATTERN 5 EACH TRACK ON A 0 FOR 3 FRAMES
5663 0377 GNEVNS, JMS STHALF
5664 0177
5665 0277
5666 0337
5667 0357
5670 0367
5671 0373
5672 0375
5673 0376
5674 7767 KX7767, 7767

```

```

5675 5275 /RANDOM NUMBER GENERATOR
5676 7200 JMP
5677 1337 CLA
5700 1324 TAD RANTND /GET CURRENT TABLE ADDRESS
5701 7640 TAD RANDEX /END TABLE
5702 5312 SZA CLA /AT END OF TABLE
5703 1326 JMP RANTAD /NO
5704 3324 TAD RANTBL /RESET TABLE ADDRESS
5705 1325 DCA RANCON /GET ROTATING WORD
5706 7104 CLL RAL /I LEFT
5707 7430 SZL /SAD BT 11=1
5710 7001 IAC /YES
5711 3325 DCA RANCON /RESET ROTATING
5712 1325 TAD RANCON /GET CYCLIC
5713 1724 TAD I RANDEX /T NEXT TABLE
5714 3724 DCA I RANDEX /RESET IT
5715 1340 TAD RANSV /GET LAST RANDOM
5716 7010 RAR /USE LINK AND 11 BITS
5717 1724 TAD I RANDEX /T RANDOM BIAS
5720 2324 ISZ RANDEX /STEP FOR NEXT NUMBER
5721 3340 DCA RANSV /TO GENERATE NEXT
5722 1340 TAD RANSV
5723 5675 JMP I RANGEN /EXIT AC=RANDOM

```

```

5724 5737 /TABLE TO GENERATE RANDOM NUMBERS
5725 6543 RANDEX, RANTND /TO GET INDIRECT
5726 5727 RANCON, 6543 /CYCLIC
5727 6543 RANTBL, *1 /TO RESET RANDEX TO STRT
5730 3210 /TABLE
5731 0765 /OF 8
5732 5432 /NUMBERS
5733 2107
5734 7654
5735 4321
5736 1076
5737 2041 /TO DETERMINE END
5740 0000 /TO SAVE LAST RANDOM

```

PAUSE

/TM8E DATA RELIABILITY TEST - TAPE 7 (0 TRACK)  
 /PRINT TEXT MESSAGE REQUESTED BY LOCATION FOLLOWING "JMS I XTEXT"  
 \*6000

6000	TEXTX, 0
6001	CLA
6002	TAD I, #2 /GET TEXT POINTER
6003	DCA, #2 /SAVE
6004	SKP
6005	0000
6006	JMS I, #1 /JMS TO TEXT
6007	ISZ TEXTX /+1 TO RETURN AFTER TEXT POINTER
6010	JMP I TEXTX

/PRINT OCTAL NUMBER IN AC  
 OCTPRT, 0

6011	DCA VALUE	/PRINT 1ST CHARACTER
6012	TAD VALUE	
6013	RTL	
6014	RTL	
6015	JMS OCT1	
6016	TAD VALUE	
6017	RTR	
6020	RTR	
6021	RTR	
6022	JMS OCT2	
6023	TAD VALUE	/PRINT 2ND CHARACTER
6024	RTR	
6025	RTR	
6026	JMS OCT1	
6027	TAD VALUE	/PRINT 3RD CHARACTER
6030	JMS OCT1	
6031	JMS OCT1	/PRINT 4TH CHARACTER
6032	JMP I OCTPRT	

/OCT1, 0

6033	AND K007	/MASK OCTAL BIT
6034	TAD K262	/MAKE ASCII
6035	JMS I XOTY	/PRINT CHARACTER
6036	JMP I OCT1	
6037		

/TYPE 3 SPACES  
 TSP3, 0

6040	CLA	
6041	TAD K0240	
6042	JMS I XOTY	
6043	TAD K0240	
6044	JMS I XOTY	
6045	TAD K0240	
6046	JMS I XOTY	
6047	JMP I TSP3	
6050		

```

6051 0000
6052 3310
6053 3311
6054 1321
6055 3312
6056 1303
6057 3264
6060 7410
6061 3310
6062 7100
6063 1310
6064 1304
6065 7430
6066 2311
6067 7430
6070 5261
6071 7200
6072 1311
6073 1316
6074 4556
6075 7200
6076 3311
6077 2264
6100 2312
6101 5263
6102 5651
6103 1304
6104 6030
6105 7634
6106 7766
6107 7777
6110 0000
6111 0000
6112 0000
6113 0077
6114 0212
6115 0215
6116 0260
6117 0340
6120 7740
6121 7774

/CONVERT NUMBER IN AC TO DECIMAL AND PRINT
DECPRT, 0
DCA VALUE /SAVE INPUT
DCA DIGIT /CLEAR
TAD KX7774
DCA CNTRZB /SET COUNTER TO 4
TAD ADDRZA /SET TABLE PCINTER
DCA ARROW
SKP 7410 /SAVE
DCA VALUE
DCA VALUE /SUBTRACT POWER OF TEN
TAD TENPWR /DEVELOP BCD DIGIT
SEL ISZ DIGIT
SEL ISZ DIGIT /DEVELOP BCD DIGIT
JMP ARROW*3 /LOOP
CLA /HAVE DIGIT
TAD DIGIT
TAD K260
JMS I XOTY /PRINT
CLA
DCA DIGIT /CLEAR DIGIT
ISZ ARROW /UPDATE POINTER
ISZ CNTRZB /DONE?
JMP ARROW*1 /NO
JMP I DECPRT
ADDRZA, TAD TENPWR /ONE THOUSAND
TENPWR, -1750 /ONE HUNDRED
-144 /TEN
-12 /ONE
-1 /ONE
VALUE, 0
DIGIT, 0
CNTRZB, 0
K77, 77
K0212, 212
K215, 215
K260, 260
K0340, 340
K7740, 7740
KX7774, 7774

```

```

/TYPE A STRING OF CHARACTERS
/CHARACTERS MUST BE STORED IN INTERNAL STRIPPED ASCII, 2 CHARACTERS PER WORD,
TSR,

```

```

6122 0000
6123 7240
6124 1322
6125 3017
6126 1417
6127 3340
6130 1340
6131 7012
6132 7012
6133 7012
6134 4341
6135 1340
6136 4341
6137 5326
6140 3000
6141 0000
6142 0313
6143 7450
6144 5417
6145 1320
6146 7500
6147 5352
6150 1317
6151 7410
6152 1120
6153 4556
6154 5741

```

```

CLA CMA
TAD TSR
DCA 17
TAD I 17
DCA TSRI
TAD TSRI
RTR
RTR
RTR
JMS TSR2
TAD TSRI
JMS TSR2
JMP TSR+4

```

/GET CHARACTER

/PRINT LEFT CHARACTER

/PRINT RIGHT CHARACTER  
/GET NEXT PAIR

```

TSR1,
TSR2,

```

```

AND K77 /MASK CHARACTER
SNA /IS IT END OF MESSAGE
JMP I 17 /YES, EXIT
TAD K7742 /RE-COMBINE ASCII CODE WITH STRIPPED CODE
SMA /
JMP +3 /CHARACTER WAS <40, ADD 300
TAD K0340 /CHARACTER WAS >40, ADD 200
SKP
TAD K0240 /PRINT ASCII CHARACTER
JMS I XOTY
JMP I TSR2

```

```

/TYPE THE ASCII CHARACTER IN AC
OTY,

```

```

6155 2000
6156 6046
6157 7300
6160 6041
6161 5360
6162 6042
6163 5755

```

```

TL5
CLA CLL
TSF
JMP -1
TCF
JMP I OTY

```

```

/TYPE CARRIAGE RETURN, LINE FEED
TIN,

```

```

6164 2000
6165 7200
6166 1315
6167 4556
6170 1314
6171 4556
6172 5764

```

```

CLA
TAD K215 /CR
JMS I XOTY
TAD K0212 /LF
JMS I XOTY
JMP I TIN

```

```

6200
*6200
/WRITE STATUS ERROR
/COMD FUNCIN STATUS REC D LENGTH
TEXT1, 0
  JMS I XTIN
  JMS I XTSR
  2722
  1124
  0540
  2324
  0124
  2523
  4005
  2222
  1722
  0000
  SKP
  TEXT25
  JMS I '1
  JMP I TEXT1

```

```

6201 0000
6201 4561
6202 4562
6203 2722
6204 1124
6205 0540
6206 2324
6207 0124
6210 2523
6211 4005
6212 2222
6213 1722
6214 0000
6215 7410
6216 6644
6217 4616
6220 5600

/END OF TAPE
/DRV PAT PAR D.LN MODE REGRDS LENGTH
TEXT2, 0
  JMS I XTIN
  JMS I XTSR
  0516
  0440
  1706
  4024
  0120
  0500
  SKP
  TEXT36
  JMS I '1
  JMP I TEXT2

```

```

6221 0000
6222 4561
6223 4562
6224 0516
6225 0440
6226 1706
6227 4024
6230 0120
6231 0500
6232 7410
6233 7011
6234 4633
6235 5621

```



```

6236 0000
6237 4562
6240 4040
6241 4062
6242 6060
6243 0000
6244 5636

/200 FOR 200 BPI
TEXT4, 0
JMS I XTZR
4040
4062
6060
0000
JMP I TEXT4

/556 FOR 556 BPI
TEXT5, 0
JMS I XTZR
4040
4065
6566
0000
JMP I TEXT5

/800 FOR 800 BPI
TEXT6, 0
JMS I XTZR
4040
4070
6060
0000
JMP I TEXT6

/NSIP FOR NONSTOP MODE
TEXT7, 0
JMS I XTZR
4016
2324
2040
0000
JMP I TEXT7

/SSTP FOR START STOP MODE
TEXT8, 0
JMS I XTZR
4023
2324
2040
0000
JMP I TEXT8

/RNDM FOR RANDOM START STOP MODE
TEXT9, 0
JMS I XTZR
4022
1604
1540
0000
JMP I TEXT9
6301 0000
6302 4562
6303 4022
6304 1604
6305 1540
6306 0000
6307 5701

```

6310	0000		
6311	4562	JMS I XTZR	
6312	4040	0	
6313	4062	4052	
6314	6440	6440	
6315	1511	1511	
6316	1600	1600	
6317	5710	JMP I TYPMIN	

6320	0000		
6321	4562	JMS I XTZR	
6322	4040	0	
6323	4064	4054	
6324	6060	6050	
6325	7040	7040	
6326	1501	1501	
6327	3000	3000	
6330	5720	JMP I TYPMAX	

6331	0000		
6332	4562	JMS I XTZR	
6333	4040	0	
6334	4062	4062	
6335	6061	6061	
6336	6640	6640	
6337	1511	1511	
6340	1640	1640	
6341	2417	2417	
6342	4015	4015	
6343	0130	0130	
6344	0000	0000	
6345	5731	JMP I TYPAV1	

6346	0000		
6347	4562	JMS I XTZR	
6350	4040	0	
6351	4062	4062	
6352	6061	6061	
6353	6640	6640	
6354	1501	1501	
6355	3040	3040	
6356	2417	2417	
6357	4015	4015	
6360	1116	1116	
6361	0000	0000	
6362	5746	JMP I TYPAV2	

```

6400
*6400
/
WRITE ERRORS =
TEXT10, 0
JMS I XTIN
JMS I XTSR
2722
1124
0540
0522
2217
2223
7500
JMP I TEXT10

```

```

/RECOVERED AT
TEXT12, 0
JMS I XTSR
2205
0317
2605
2205
0440
0124
4000
JMP I TEXT12

```

```

/PERMANENT BADSPT
TEXT13, 0
JMS I XTIN
JMS I XTSR
2005
2215
0116
0516
2440
0201
0423
2024
4000
JMP I TEXT13

```

```

6400 0000
6401 4561
6402 4562
6403 2722
6404 1124
6405 0540
6406 0522
6407 2217
6410 2223
6411 7500
6412 5600

```

```

6413 0000
6414 4562
6415 2205
6416 0317
6417 2605
6420 2205
6421 0440
6422 0124
6423 4000
6424 5613

```

```

6425 2000
6426 4561
6427 4562
6430 2005
6431 2215
6432 0116
6433 0516
6434 2440
6435 0201
6436 0423
6437 2024
6440 4000
6441 5625

```

```

6442 0000
6443 4562
6444 4030
6445 1122
6446 0740
6447 2722
6450 1124
6451 2405
6452 1640
6453 6440
6454 2411
6455 1505
6456 2300
6457 5642

/XIRG WRITTEN 4 TIMES
TEXT14, 2
JMS I XTZR
4030
1122
3740
2722
1124
2405
1640
6440
2411
1505
2300
JMP I TEXT14

```

```

6460 0000
6461 4561
6462 4562
6463 2205
6464 0104
6465 4023
6466 2401
6467 2425
6470 2340
6471 0522
6472 2217
6473 2200
6474 7410
6475 6644
6476 4675
6477 5660

/READ STATUS ERROR
/COMD FUNCIN STATUS RECORD LENGTH
TEXT15, 2
JMS I XIIN
JMS I YTSR
2205
0104
4023
2401
2425
2340
0522
2217
2200
SKP
TEXT25
JMS I .-1
JMP I TEXT15

```

/READ DATA ERROR  
/COMD FUNCIN STATUS RECORD LENGTH  
TEXT16, 0

6500 0000  
6501 4561  
6502 4562  
6503 2205  
6504 0104  
6505 4004  
6506 0124  
6507 0140  
6510 0522  
6511 2217  
6512 2200  
6513 7410  
6514 6644  
6515 4714  
6516 5700

JMS I XTIN  
JMS I XTSR  
2205  
0104  
4004  
0124  
0140  
0522  
2217  
2200  
SKP  
TEXT25  
JMS I .-1  
JMP I TEXT16

/READ PASS  
TEXT20, 0

6517 0000  
6520 4561  
6521 4562  
6522 2205  
6523 0104  
6524 4020  
6525 0123  
6526 2300  
6527 5717

JMS I XTIN  
JMS I XTSR  
2205  
0104  
4020  
0123  
2300  
JMP I TEXT20

/READ ERRORS =  
TEXT21, 0

6530 0000  
6531 4561  
6532 4562  
6533 2205  
6534 0104  
6535 4005  
6536 2222  
6537 1722  
6540 2375  
6541 0000  
6542 5730

JMS I XTIN  
JMS I XTSR  
2205  
0104  
4005  
2222  
1722  
2375  
0000  
JMP I TEXT21

```

6600
*6600
/ /NON RECOVERABLE #
TEXT22, 0
JMS I XTIN
JMS I XTSR
1617
1640
2205
2317
2605
2201
2214
0575
0000
JMP I TEXT22

```

```

/ /DATA ERRORS =
TEXT23, 0
JMS I XTIN
JMS I XTSR
0401
2401
4005
2222
1722
2375
0000
JMP I TEXT23

```

```

/ /DATA ERROR WITH NO STATUS ERROR
TEXT24, 0
JMS I XTIN
JMS I XTSR
2401
2401
4016
1740
2324
0124
2923
7500
JMP I TEXT24

```

```

6600 0000
6601 4561
6602 4562
6603 1617
6604 1640
6605 2205
6606 2317
6607 2605
6610 2201
6611 0214
6612 0575
6613 0000
6614 5600

```

```

6615 0000
6616 4561
6617 4562
6620 0401
6621 2401
6622 4005
6623 2222
6624 1722
6625 2375
6626 0000
6627 5615

```

```

6630 0000
6631 4561
6632 4562
6633 0401
6634 2401
6635 4016
6636 1740
6637 2324
6640 0124
6641 2923
6642 7500
6643 5630

```

/COMD FUNCIN STATUS WRDCNT CURADR RECORD LENGTH  
TEXT25, 0

6644	0000
6645	4561
6646	4562
6647	0317
6650	1504
6651	4006
6652	2516
6653	0324
6654	1640
6655	2324
6656	0124
6657	2923
6660	4027
6661	2204
6662	2316
6663	2440
6664	0325
6665	2201
6666	0422
6667	4022
6670	0503
6671	1722
6672	0423
6673	4014
6674	0516
6675	0724
6676	1000
6677	4561
6700	5644

JMS I	XTIN
JMS I	XISR
0317	
1504	
4006	
2516	
0324	
1640	
2324	
0124	
2923	
4027	
2204	
2316	
2440	
0325	
2201	
0422	
4022	
0503	
1722	
0423	
4014	
0516	
0724	
1000	
JMS I	XTIN
JMP I	TEXT25

```

6701 0000
6702 4561
6703 4562
6704 2305
6705 1405
6706 0324
6707 4004
6710 2211
6711 2605
6712 2340
6713 0000
6714 5701

/SELECT DRIVES
TEXT30, 0
JMS I XTIN
JMS I XTSR
2305
1405
0324
4004
2211
2605
2340
0000
JMP I TEXT30

```

```

6715 0000
6716 4561
6717 4562
6720 2305
6721 1405
6722 0324
6723 4024
6724 0523
6725 2423
6726 0000
6727 4561
6730 4562
6731 2423
6732 2440
6733 2001
6734 2440
6735 2001
6736 2240
6737 0405
6740 1640
6741 2214
6742 2340
6743 2715
6744 1740
6745 2215
6746 1700
6747 5715

/SELECT TESTS
/TST PAT PAR DEN RLS WMO RMO
TEXT31, 0
JMS I XTIN
JMS I XTSR
2305
1405
0324
4024
0523
2423
0000
JMS I XTIN
JMS I XTSR
2423
2440
2001
2440
2001
2240
0405
1640
2214
2340
2715
1740
2215
1700
JMP I TEXT31

```

```

6750 0000
6751 4562
6752 1756
6753 1356
6754 0000
6755 5750

/D.K.
TEXT32, 0
JMS I XTSR
1756
1356
0000
JMP I TEXT32

```



```

6756 0000
6757 4561
6760 4562
6761 2405
6762 2324
6763 4000
6764 5756

/TEST
TEXT33, 0
JMS I XTIN
JMS I XTJR
2405
2324
4000
JMP I TEXT33

/WRITE DUMP
TEXT34, 0
JMS I XTIN
JMS I XTJR
2722
1124
0540
0425
1520
0000
JMP I TEXT34
*7000

/READ DUMP
TEXT35, 0
JMS I XTIN
JMS I XTJR
2205
0104
4004
2515
2000
JMP I TEXT35
7000 0000
7001 4561
7002 4562
7003 2205
7004 0104
7005 4004
7006 2515
7007 2000
7010 5600

```

/DRV PAT PAR DEN MODE RECORDS LENGTH  
TEXT36, 0

7011	0000	
7012	4561	JMS I XTIN
7013	4562	JMS I XTSR
7014	0422	0422
7015	2640	2640
7016	2001	2001
7017	2440	2440
7020	2001	2001
7021	2240	2240
7022	0405	0405
7023	1640	1640
7024	1517	1517
7025	3405	3405
7026	4022	4022
7027	0503	0503
7030	1722	1722
7031	0423	0423
7032	4014	4014
7033	0516	0516
7034	0724	0724
7035	1000	1000
7036	4561	JMS I XTIN
7037	5611	JMP I EXT36

7100	DR0TAB=7100
7040	DRINCR=40
7140	DR1TAB=DR0TAB+DRINCR
7200	DR2TAB=DR1TAB+DRINCR
7240	DR3TAB=DR2TAB+DRINCR
7300	DR4TAB=DR3TAB+DRINCR
7340	DR5TAB=DR4TAB+DRINCR
7400	DR6TAB=DR5TAB+DRINCR
7440	DR7TAB=DR6TAB+DRINCR
7500	TSTIBL=DR7TAB+DRINCR

7040	DRVADR, DR0TAB
7041	DR1TAB
7042	DR2TAB
7043	DR3TAB
7044	DR4TAB
7045	DR5TAB
7046	DR6TAB
7047	DR7TAB

7050	6713	CAMON,	RCAR
7051	7700		SMA CLA
7052	5250		JMP .-2
7053	1130		TAD WRBUF
7054	6703		LCAR
7055	5250		JMP .-5

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ADDRZA	6103	ERRORP	2340	K0303	2556	LWCR	6701
ALLEOS	1265	EXECNT	0774	K0340	6117	MAXLEN	0131
ALLEOT	1236	EXECUT	0601	K0370	0365	MINLEN	0132
ARRON	0064	EXETST	0042	K0374	0513	MODBIT	0030
BACK1	4514	EXITGN	0660	K0376	0564	MODTYP	5052
BACK2	5312	EXITMC	0033	K0377	5966	MVBITS	0022
BLENTH	5633	GENINC	5512	K0400	0122	MVCTRS	1007
BKINC	0036	GENPAT	5420	K1000	5342	NOINCR	2524
BANON	7050	GNEVNO	5430	K1100	5370	NONSTP	2607
CCAR	6704	GNEVN1	5523	K215	6115	NOTSWS	2470
CCF	6201	GNEVN2	5433	K260	6116	NRREAD	0101
CDMP1	5040	GNEVN3	5452	K270	0511	NSTSEL	2656
CDMP2	5041	GNEVN4	5460	K3100	4335	NUMTST	0040
CDMP3	5042	GNEVN5	5662	K3767	1313	OCT1	6033
CDMP4	5043	GNEVN6	5441	K377	3150	OCTPRT	6011
CDRIVE	0023	GNEVN7	5474	K4000	1113	OTY	6155
CDRVRT	1070	GN0002	5455	K4100	2764	P1	1735
CHARIN	0054	GN0001	5535	K4500	3077	P2	1736
CHGDRV	1071	GN0002	5436	K5100	3076	P3	1737
CHGPAT	0727	GN0003	5612	K6100	5344	P7100	5170
CHRPAR	0743	GN0004	5464	K7000	1235	PARAMS	1200
CLF	6725	GN0005	5602	K7100	4554	PARBT1	0025
CLRALL	1035	GN0006	5442	K7443	0123	PASSWS	0020
CLRTBL	5066	GN0007	5524	K7520	2566	PATNUM	0024
CLT	6712	GOBKWD	5127	K77	6113	PERMBS	0065
COMPERR	0100	GOTST	0643	K7740	6120	Q7100	5331
CONTRZB	6112	INC2CH	5516	K7751	0124	RANCON	5725
COMAND	0035	INCRLC	0707	K7760	1114	RANDEX	5724
COMDMP	5000	INCTBL	2550	K7767	5567	RANGEN	5675
COMEND	2373	INCWMC	0670	K7770	0125	RANSAV	5740
CTRDEX	1016	JMPTBL	5407	K7771	0126	RANSTP	2673
CTRDMP	2344	K0003	0104	K7774	3101	RANTAD	5712
CWCOK	3127	K0004	0105	K7775	0127	RANTBL	5726
CWCR	6702	K0007	0106	K7776	5343	RANTNO	5737
DECPRT	6051	K0010	0107	K7777	4555	RCAR	6713
DELAY	0047	K0017	0110	KX7000	2443	RCMR	6715
DENTYP	0050	K0020	0111	KX7520	0512	RDBR	6717
DENTYP	5056	K0030	0112	KX7767	5674	RDEOT	0103
DIGIT	6111	K0037	1312	KX7774	6121	RDERR0	4336
DR0TAB	7100	K0040	0113	LASRCH	0070	RDERRS	0102
DR1TAB	7140	K2062	0114	LBEOT1	1300	RDEXIT	4274
DR2TAB	7200	K0100	0115	LBEOT2	1314	RDINCR	4462
DR3TAB	7240	K0177	0116	LBINT	1335	RDEERR	4400
DR4TAB	7300	K0200	0117	LBSAV	1327	RDPASS	0051
DR5TAB	7340	K0212	6114	LBSET	1712	RDRRET	4245
DR6TAB	7400	K2215	0360	LBTEXT1	0536	RDSTPC	4275
DR7TAB	7440	K0240	0120	LBWAT	1344	RDSTPD	4214
DRINCR	0040	K2254	0361	LCAR	6703	READGO	4224
DRVADR	7040	K0260	0510	LCMR	6705	READIT	4200
DRVDEN	0026	K0270	0362	LDBR	6707	READLN	0076
ENDTAP	4600	K0277	0363	LFGP	6706	READMO	0031
EOSFLG	0044	K0300	0121	LTHTBL	5062	READMP	4674

RECORD	0066	STRTES	2420	TEXT4	6236	WRPASS	0037
RECSYS	0032	STHTCP	2620	TEXT5	6245	WRRECR	0074
RECV1	0056	SVCTRS	1222	TEXT6	6254	WRDMP	4612
RECV2	0057	SVRECR	2045	TEXT7	6263	WRTEOT	0072
RECV3	0060	SWTEST	2043	TEXT8	6272	WRTERR	2724
RECV4	0061	T10RDP	2076	TEXT9	6301	WRTEEN	0073
RECV5	0062	T10RND	2141	TEXTLB	1743	WRTSEQ	2444
RECV6	0063	T11END	2322	TEXTX	6000	WSEQXT	2554
RECV7	0064	T11FLG	2337	TIN	6164	X11FLG	2555
RELI1	0225	T11INC	2335	TRDEOT	1254	XALEOT	0150
RELIAB	0200	T11LP1	2230	TS10L1	2030	XBACK1	3100
RESETL	3135	T11LP2	2310	TS10L2	2014	XCHGDV	0147
RESTR1	4511	T11RDL	2251	TS10L5	2051	XCLRAL	0152
REWIND	5345	TADJNC	2547	TSP3	6040	XCLRT8	0135
RFSR	6716	TBLCNT	0041	TSR	6122	XCMOMP	4723
RIF	6224	TBLTST	2523	TSR1	6140	XDCPRT	0153
RLTROL	0027	TENPWR	6104	TSR2	6141	XENDTP	2763
RYF	6244	TES2K	3142	TSRUNL	0025	XGENPT	0142
RMSR	6714	TESINC	3122	TSTDEX	0775	XCOBKW	0136
RNDTAP	4315	TESREC	2745	TSTSTP	2633	XLBINT	0166
RNDSTA	4064	TEST0	1400	TSTYBL	7000	XLBSAV	0165
RNSTA	0077	TEST1	1414	TSTYQS	0310	XLBSET	0170
RPASN3	4451	TEST10	2200	TYPAV1	6331	XLBMAT	0167
RPASS3	4425	TEST11	2220	TYPAV2	6346	XLEOT1	0163
RPTST	0761	TEST2	1437	TYPDAT	5101	XLEOT2	0164
RPFORV	1051	TEST3	1462	TYPMAX	6320	XMVCTR	0145
RTSSTP	4255	TEST4	1506	TYPMIN	6310	XOCPR	5125
RWCR	6711	TEST5	1535	TYRALL	4051	XOCT1	0157
SBRM	6727	TEST6	1600	TYRECV	4634	XOTY	0156
SOLE	6726	TEST7	1645	UDADDR	5250	XRANUM	0133
SETBAK	4530	TESTX	2514	UDARND	5213	XRCXRG	2766
SETFUN	1115	TEXT11	6220	UDBOX	5257	XRDINC	0143
SETSTR	5624	TEXT10	6420	UDCNT	5252	XRDIT	0137
SKCB	6722	TEXT12	6413	UDCON1	5263	XRDRET	4244
SKEF	6721	TEXT13	6425	UDDO	5221	XRDTP2	4460
SKTD	6723	TEXT14	6442	UDGET	5261	XRG1	3041
SKTR	6724	TEXT15	6460	UDHIGH	5253	XRGCD	3046
SLTSTS	0256	TEXT16	6520	UDHSUB	5255	XRGREC	3000
SPAFW1	5332	TEXT2	6221	UDLOOP	5247	XRNDTP	4363
ST9A	5555	TEXT20	6517	UDLOW	5254	XRSFDV	0151
ST9B	5561	TEXT21	6530	UDLSUB	5256	XRWIND	0134
ST9WRD	5547	TEXT22	6600	UDOUT	5237	XSTBAK	4461
STAREC	5275	TEXT23	6615	UDPRN1	5202	XSTREC	2765
STAIRO	0052	TEXT24	6632	UDPTR	5262	XSTSTR	5565
STAIRE	0053	TEXT25	6644	UDTEML	5260	XSVCTR	0144
STHALF	5634	TEXT32	6701	UDTWO	5251	XTESTX	0620
STHF	5642	TEXT31	6715	VALUE	6110	XTEXT	0155
STHF1	5661	TEXT32	6750	VLDORV	0231	XTIN	0161
STOPOP	2663	TEXT33	6756	VLDTST	7321	XTSINC	0141
STR1	2426	TEXT34	6765	WAITKY	1142	XTSP3	0160
STRLEN	2034	TEXT35	7000	WRBUF	0132	XTSR	0162
STRPAT	2713	TEXT36	7011	WRCHK	0055	XTSTST	2632

XTSYQS	0507
XTYPOT	0154
XUDPRT	5126
XWATKY	0146
XWRIT	0140
XXRG1	3040
Z1	1740
Z2	1741
Z3	1742

ERRORS DETECTED: 0

LINKS GENERATED: 0

RUN-TIME: 23 SECONDS

3K CORE USED