IDENTIFICATION

PRODUCT CODE: MAINDEC-08-DHTMD-A-D

PRODUCT NAME: TM8-E DATA RELIABILITY 9 TRACK

DATE CREATED: DECEMBER 4, 1972

MAINTAINER: DIAGNOSTIC GROUP

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TMREL9

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MAYNARD, MASS. 01754

NOTE

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

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)

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WARNING: ANY PROGRAM INTERRUPT THAT OCCURS FROM A DEVICE OTHER THAN THE TM8-E IS A FATAL ERROR AND WILL RESULT IN A PROGRAM HALT.

1. ABSTRACT

THE TM8-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 TM8-E DECMAGTAPE CONTROL. THE PROGRAM IS ALSO DESIGNED TO BE USEABLE AS AN AID IN THE CHECKOUT AND MAINTENANCE OF THE TM8-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

2.1 HARDWARE

PDP-8/E, 8/M, 8/F
TELETYPE OR COMPATIBLE DEVICE (TTY)
TM8-E DECMAGTAPE CONTROL
TU10 MASTER/SLAVE TRANSPORT SYSTEM WITH FROM ONE TO EIGHT 9 TRACK DRIVES.

2.2 MEMORY

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

2.3 PRELIMINARY PROGRAMS

ALL PROCESSOR/MEMORY DIAGNOSTICS
TM8-E CONTROL TEST PART 1
TM8-E CONTROL TEST PART 2
TM8-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.

5.2 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 SEQUENCE	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 COMPATABILITY 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 0177 0277 0337 0357 0367 0373 0375 0376	SLIDING NO BIT (0) CHARACTER PATTERN
2	0103	HIGH FREQUENCY EVERY OTHER TRACK
3	0273	HALF FREQUENCY OUTSIDE TRACKS HIGH FREQUENCY ALL INSIDE TRACKS
4	0001 0002 0003 0004	INCREMENTING CHARACTER PATTERN NO 00 CODES

5	0377 0177 0277 0337 0357 0367 0373 0375 0376	THREE 0 BITS EACH TRACK EVERY 7TH WORD
6	0377	ALL 1'S ALL TRACKS
7	RANDOM	RANDOM DATA PATTERN WITH NO 00 CODES

B. ODD PARITY DATA PATTERNS

PAT	DATA	DESCRIPTION
0	0004	HALF FREQUENCY OUTSIDE SKEW
1	0000 0200 0100 0040 0020 0010 0004 0002 0001	SLIDING 1 BIT CHAR- ACTER PATTERN (ISO- LATED BIT)
2	0274	HIGH FREQUENCY EVERY OTHER TRACK
3	0037 0076 0201 0174 0003 0370 0007 0360	THREE 0'S, THREE 1'S, THREE 0'S, THREE 2'S, SIX 0'S EVERY TRACK

4	0001 0002 0003 0004	INCREMENTING CHARACTER PATTERN 00 CODES INCLUDED
5	0000 0200 0100 0040 0020 0010 0004 0002 0001	EACH TRACK 3 BITS EVERY SEVENTH WORD
6	0377	ALL ONES HIGH FREQUENCY ALL TRACKS
7	RANDOM	RANDOM DATA WORD PATTERN 00 CODES INCLUDED

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.

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 TWICE 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.

8	NO FUNCTION
9	INCREMENT RLS SELECTION TO THE NEXT SEQUENCE, AFTER MAX. TO MIN. HAS BEEN EXERCISED RESET RLS SELECTION TO ITS ORIGINAL TEST SEQUENCE SELECTION.
10	INCREMENT WMO TO THE NEXT STOP MODE, AFTER RANDOM START/STOP HAS BEEN EXERCISED, RESET WMO TO ITS ORIGINAL TEST SELECTION.
11	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 ALTER 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   800 SSTP   02954 2016 MAX TO MIN
WRITE ERRORS=0009
RECOVERED AT 1 0002
RECOVERED AT 2 0003
RECOVERED AT 3 0001
PERMANENT BADSPT 0003
```

WITH THE FOLLOWING DEFINITIONS:

SYMBOL	DEFINITION
DRV	DRIVE NUMBER
PAT	SELECTED DATA PATTERN

PAR	SELECTED PARITY
DEN	SELECTED DENSITY
MODE	WRITE STOP MODE
RECORDS	NUMBER OF RECORDS WRITTEN
LENGTH	SELECTED RECORD LENGTH SEQUENCE (2016 SHOWN IS AVERAGE LENGTH)
WRITE ERRORS	TOTAL WRITE ERRORS
RECOVERED AT N	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   NNNNN   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 SR 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 EOT, THE FOLLOWING REPORT IS PRINTED,

```
READ PASS
END OF TAPE
DR  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  NNNNN   NNNN
```

REFER TO 7.2 FOR SYMBOL DEFINITIONS.

8. RESTRICTIONS

IF ANY DEVICE OTHER THAN THE TM8-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 TM8-E CURRENT ADDRESS REGISTER AS DATA TRANSFERS ARE TAKING PLACE.

9. PROGRAM DESCRIPTION

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 Ø 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 TM8-E.

1Ø. LISTING (ATTACHED

```
                    /TM8E 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    LDBR=6707

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

            6721    SKEF=6721
            6722    SKCB=6722
            6723    SKTD=6723
            6724    SKTR=6724
            6725    CLF=6725
            6712    CLT=6712
            6726    SDLE=6726
            6727    SBRM=6727
                    /
            0000    *0      /FIELD0 /PROGRAM FIELD  /SET UP FOR HIGH SPEED DUMP.
0000        0000    0       /       /               /CHANGED AS SHOWN FOR INTERRUPT
0001        5001    JMP 1   /RMF    /JMP I 2        /HANDLING.
0002        0002    2       /JMP I 3/POINTER        /SUCH A SYSTEM ENABLES THIS PROGRAM
0003        0003    3       /1      /               /TO RUN IN ANY EXISTING MEMORY FIELD.
```

```
                        /PERMANENT VALUES
0130  3400      WRBUF,  3400            /READ-WRITE BUFFER STARTING ADDRESS
0131  7650      MAXLEN, 7650            /MAXIMUM RECORD LENGTH
0132  0030      MINLEN, 30              /MINIMUM RECORD LENGTH
                        /
                        /PAGE POINTERS
0133  5675      XRANUM, RANGEN
0134  5345      XRWIND, REWIND
0135  5066      XCLRTB, CLRTBL
0136  5127      XGOBKW, GOBKWD
0137  4200      XRDIT,  READIT
0140  2444      XWRIT,  WRTSEQ
0141  3102      XTSINC, TESINC
0142  5400      XGENPT, GENPAT
0143  4462      XRDINC, RDINCR
0144  1000      XSVCTR, SVCTRS
0145  1007      XMVCTR, MVCTRS
0146  1142      XWATKY, WAITKY
0147  1071      XCHGDV, CHGDRV
0150  1236      XALEOT, ALLEOT
0151  1051      XRSFDV, RSFDRV
0152  1035      XCLRAL, CLRALL
0153  6051      XDCPRT, DECPRT
0154  5101      XTYPDT, TYPDAT
0155  6000      XTEXT,  TEXTX
0156  6155      XOTY,   OTY
0157  6033      XOCT1,  OCT1
0160  6040      XTSP3,  TSP3
0161  6164      XTIN,   TIN
0162  6122      XTSR,   TSR
0163  1300      XLEOT1, LBEOT1
0164  1314      XLEOT2, LBEOT2
0165  1327      XLBSAV, LBSAV
0166  1335      XLBINT, LBINT
0167  1344      XLBWAT, LBWAT
0170  1712      XLBSET, LBSET
                        /
                        PAUSE
```

```
                        /
                        /TM8E DATA RELIABILITY TEST - TAPE 2 (9 TRACK)
                        /PARAMETER AND TEST SELECTIONS VIA KEYBOARD
          0200          *200
0200      7410  RELIAB, SKP
0201      7120          STL
0202      4570          JMS I   XLBSET          /SET UP INTERRUPT SERVICE
0203      4555          JMS I XTEXT             /PRINT TEXT,
0204      6701          TEXT30          /"SELECT DRIVES"
0205      3022          DCA MSBITS      /CLEAR DRIVE SELECT
0206      4546          JMS I XWATKY    /WAIT FOR CHARACTER FROM KEYBOARD
0207      7041          CIA
0210      1360          TAD K0215
0211      7650          SNA CLA                 /IS CHARACTER   CAR RET
0212      5225          JMP REL1                /YES,
0213      1054          TAD CHARIN      /NO
0214      0365          AND K0370
0215      1366          TAD K7520
0216      7650          SNA CLA                 /IS CHARACTER A VALID DRIVE NUMBER
0217      5231          JMP VLDDRV      /YES, SAVE
0220      1363          TAD K0277       /NO, TYPE "?"
0221      4556          JMS I XOTY
0222      1361          TAD K025        /TYPE ","
0223      4556          JMS I XOTY
0224      5206          JMP RELIAB+6
0225      1022  REL1,   TAD MSBITS
0226      7450          SNA                     /ANY DRIVES SELECTED?
0227      5203          JMP RELIAB+3    /NO
0230      5256          JMP SLTSTS      /YES, SELECT TESTS
                        /
                        /HAVE VALID DRIVE SELECTED
0231      1361  VLDDRV, TAD K0254       /TYPE ","
0232      4556          JMS I XOTY
0233      1054          TAD CHARIN      /GET CHARACTER
0234      0106          AND K0007       /MASK TO FIND DRIVE NUMBER
0235      3023          DCA CDRIVE
0236      1023          TAD CDRIVE
0237      7040          CMA
0240      3047          DCA DELAY       /TEMP STORAGE FOR - DRIVE NUMBER
0241      7120          STL
0242      7010          RAR             /MOVE SELECT BIT RIGHT ONE PLACE
0243      2047          ISZ DELAY       /IS THIS DRIVE SELECTED
0244      5242          JMP .-2                 /NO
0245      3047          DCA DELAY
0246      1047          TAD DELAY
0247      0022          AND MSBITS
0250      7041          CIA
0251      7104          CLL RAL
0252      1047          TAD DELAY
0253      1022          TAD MSBITS      /COMBINE DRIVE SELECT BITS
0254      3022          DCA MSBITS
0255      5206          JMP RELIAB+6
```

```
                0020    *20
0020    0000    PASSWS, 0               /PARAMETER STORAGE
0021    0000            0               /PARAMETER STORAGE
0022    0000    MSBITS, 0               /MASTER DRIVE SELECT BITS
0023    0000    CDRIVE, 0               /CURRENT DRIVE
0024    0000    PATNUM, 0               /PATTERN NUMBER SELECTED
0025    0000    PARBT1, 0               /PARITY SELECTION
0026    0000    DRVDEN, 0               /DRIVE AND DENSITY SELECTED
0027    0000    RLTROL, 0               /RECORD LENGTH CONTROL
0030    0000    MODBIT, 0               /WRITE STOP MODE
0031    0000    READMO, 0               /READ STOP MODE
0032    0000    RECSYS, 0               /READ PASS IS SELECTED
0033    0000    EXITMO, 0               /EXIT MODE
0034    0000    STRLEN, 0               /STARTING BLOCK LENGTH
0035    0000    COMAND, 0               /COMMAND, DRIVE, PAR, DEN
0036    0000    BLKINC, 0               /BLOCK LENGTH INCREMENTER
0037    0000    WRPASS, 0               /WRITE RECOVERY COUNT
0040    0000    NUMTST, 0               /NUMBER OF TESTS SELECTED
0041    0000    TBLCNT, 0               /NUMBER OF TESTS EXECUTED
0042    0000    EXETST, 0               /TESTS BEING EXECUTED
0043    0000    SWTEST, 0               /CLEARED IF PARAMETER INPUT IS THRU SWITCHES
0044    0000    EOSFLG, 0               /CLEARED AT END OF RLS
0045    0000    SVRECR, 0               /TEMP STORAGE
0046    0000            0
0047    0000    DELAY,  0               /DELAY COUNTER
0050    0000    DELAY1, 0               /DELAY COUNTER
0051    0000    RDPASS, 0               /COUNT READ PASSES
0052    0000    STATRD, 0               /SAVE MAGTAPE STATUS WORD
0053    0000    STATRE, 0
0054    0000    CHARIN, 0               /CHARACTER INPUT FROM KEYBOARD
```

```
                        /WRITE ERROR AND RECORD CONTROL REGISTERS
0055  0000    WRCHEK, 0                       /WRITE CHECK ERRORS
0056  0000    RECV1,  0
0057  0000    RECV2,  0
0060  0000    RECV3,  0
0061  0000    RECV4,  0
0062  0000    RECV5,  0
0063  0000    RECV6,  0
0064  0000    RECV7,  0
0065  0000    PERMBS, 0                       /PERMANENT BAD SPOT ON TAPE
0066  0000    RECORD, 0                       /RECORD COUNT
0067  0000            0                       /RECORD COUNT OVERFLOW
0070  0000    LASRCR, 0                       /LAST RECORD
0071  0000            0
0072  0000    WRTEOT, 0                       /
0073  0000    WRTLEN, 0                       /WRITE BLOCK LENGTH
0074  0000    WRRECR, 0                       /SAVE STARTING RECORD
0075  0000            0
                        /READ ERROR AND RECORD CONTROL REGISTERS
0076  0000    READLN, 0                       /READ BLOCK LENGTH
0077  0000    RNOSTA, 0
0100  0000    CMPERR, 0
0101  0000    NRREAD, 0                       /NON REC READ
0102  0000    RDERRS, 0                       /COUNT READ ERRORS
0103  0000    RDEOT,  0
0104  0003    K0003,  3
0105  0004    K0004,  4
0106  0007    K0007,  7
0107  0010    K0010,  10
0110  0017    K0017,  17
0111  0020    K0020,  20
0112  0030    K0030,  30
0113  0040    K0040,  40
0114  0060    K0060,  60
0115  0100    K0100,  100
0116  0177    K0177,  177
0117  0200    K0200,  200
0120  0240    K0240,  240
0121  0300    K0300,  300
0122  0400    K0400,  400
0123  7443    K7443,  7443
0124  7751    K7751,  7751
0125  7770    K7770,  7770
0126  7771    K7771,  7771
0127  7775    K7775,  7775
```

```
                    /
                    /SELECT TESTS
0256  4555    SLTSTS, JMS I XTEXT
0257  6715            TEXT31
0260  3040            DCA NUMTST
0261  7610            SKP CLA
0262  7477            TSTTBL-1
0263  1262            TAD .-1
0264  3016            DCA 16
0265  4561            JMS I xTIN
0266  4546            JMS I XWAITKY     /WAIT FOR KEY
0267  7041            CIA
0270  1360            TAD K0215
0271  7650            SNA CLA                   /IS CHARACTER A CAR RET
0272  5313            JMP TSTYQS+3      /YES, SEE IF TESTS SELECTED
0273  1054            TAD CHARIN        /NO
0274  0365            AND K0370
0275  1366            TAD K7520
0276  7650            SNA CLA                   /IS CHAR A VALID NUMBER 0-7?

0277  5321            JMP VLDTST        /YES
0300  1054            TAD CHARIN        /NO
0301  7041            CIA
0302  1362            TAD K0270
0303  7450            SNA               /IS CHAR AN 8?
0304  5321            JMP VLDTST        /YES
0305  7001            IAC
0306  7650            SNA CLA                   /IS CHAR A 9?
0307  5321            JMP VLDTST        /YES
0310  1363    TSTYQS, TAD K0277         /CHARACTER WAS NOT 0-9
0311  4556            JMS I XOTY        /TYPE "?"
0312  5265            JMP SLTSTS+7      /TRY AGAIN
0313  7200            CLA
0314  1040            TAD NUMTST
0315  7450            SNA               /ANY TESTS SELECTED?
0316  5310            JMP TSTYQS        /NO
0317  5720            JMP I .+1         /YES, EXECUTE SELECTED
0320  0601            EXECUT
```

```
                        /
                        /HAVE VALID TEST NUMBER SELECTED
0321  7300    VLDTST, CLA CLL
0322  1054            TAD CHARIN      / GET VALID TEST NUMBER
0323  0110            AND K0017
0324  7010            RAR             /MOVE INTO POSITION
0325  7012            RTR
0326  7012            RTR
0327  3021            DCA PASSWS+1    /SAVE IT
0330  4560            JMS I XTSP3     /TYPE 3 SPACES
0331  4546            JMS I XWATKY    /WAIT FOR PATTERN KEY
0332  0365            AND K0370
0333  1366            TAD K7520
0334  7640            SZA CLA                 /IS KEY VALID FOR PATTERN?
0335  5310            JMP TSTYQS      /NO
0336  1054            TAD CHARIN      /YES
0337  0106            AND K0007       /MASK OCTAL
0340  3020            DCA PASSWS      /SAVE IT
0341  4560            JMS I XTSP3
0342  4546            JMS I XWATKY    /WAIT FOR PARITY KEY
0343  0364            AND K0376
0344  1366            TAD K7520
0345  7640            SZA CLA                 /IS KEY VALID FOR PARITY? (0 OR 1)
0346  5310            JMP TSTYQS      /NO
0347  1054            TAD CHARIN      /YES
0350  7004            RAL             /ROTATE INTO POSITION
0351  7006            RTL
0352  0107            AND K0010       /MASK PARITY BIT
0353  1020            TAD PASSWS      /COMBINE PARITY WITH PATTERN
0354  3020            DCA PASSWS      /SAVE IT
0355  4560            JMS I XTSP3
0356  5757            JMP I .+1
0357  0400            400
0360  0215    K0215,  215
0361  0254    K0254,  254
0362  0270    K0270,  270
0363  0277    K0277,  277
0364  0376    K0376,  376
0365  0370    K0370,  370
0366  7520    K7520,  7520
```

```
                0400    *400
0400    1104            TAD K0003       /DENSITY IS 800 BPI 9 TRACK
0401    1021            TAD PASSWS+1    /COMBINE DENSITY OF 800 WITH TEST
0402    3021            DCA PASSWS+1    /SAVE
0403    1311            TAD K270
0404    4556            JMS I XOTY
0405    1310            TAD K0260       /ECHO 2 ZEROS (00)
0406    4556            JMS I XOTY
0407    1310            TAD K0260
0410    4556            JMS I XOTY
0411    1120            TAD K0240
0412    4556            JMS I XOTY
0413    4546            JMS I XWATKY    /WAIT FOR RECORD LENGTH KEY
0414    0313            AND K0374
0415    1312            TAD KX7520
0416    7640            SZA CLA                 /IS KEY FOR RECORD LENGTH 0-1-2-3
0417    5707            JMP I XTSYQS    /NO, PRINT "?"
0420    1054            TAD CHARIN      /YES
0421    7006            RTL             /MOVE RECORD LENGTH INTO POSITION
0422    7006            RTL
0423    0114            AND K0060
0424    1020            TAD PASSWS      /COMBINE RECORD LENGTH WITH PAR AND PAT
0425    3020            DCA PASSWS      /SAVE IT

0426    4560            JMS I XTSP3
0427    4546            JMS I XWATKY    /WAIT FOR WRITE STOP MODE KEY
0430    0313            AND K0374
0431    1312            TAD KX7520
0432    7640            SZA CLA                 /IS KEY FOR WRITE STOP MODE 0-1-1-3
0433    5707            JMP I XTSYQS    /NO, PRINT "?"
0434    1054            TAD CHARIN
0435    0104            AND K0003
0436    1127            TAD K7775
0437    7650            SNA CLA                 /IS KEY AN INVALID 3?
0440    5707            JMP I XTSYQS    /YES, PRINT "?"
0441    1054            TAD CHARIN      /NO
0442    7006            RTL             /MOVE INTO POSITON
0443    7006            RTL
0444    7006            RTL
0445    0121            AND K0300
0446    1020            TAD PASSWS      /COMBINE WRITE STOP MODE WITH RECORD LENGTH, PAR, PA
0447    3020            DCA PASSWS      /SAVE IT
0450    4560            JMS I XTSP3
0451    4546            JMS I XWATKY    /WAIT FOR READ MODE KEY
0452    0313            AND K0374
0453    1312            TAD KX7520
0454    7640            SZA CLA                 /IS KEY FOR READ STOP MODE 0-1-2-3
0455    5707            JMP I XTSYQS    /NO, PRINT "?"
```

```
0456  1054            TAD CHARIN      /YES
0457  0104            AND K0003
0460  1127            TAD K7775
0461  7650            SNA CLA                 /IS KEY AN INVALID 3?
0462  5707            JMP I XTSYQS    /YES, PRINT "?"
0463  1054            TAD CHARIN
0464  7004            RAL             /MOVE INTO POSITION
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                /SAVE TEST PARAMETERS
0500  1021            TAD PASSWS+1
0501  3416            DCA I 16                /SAVE TEST PARAMETERS
0502  2040            ISZ NUMTST      /+1 TO TESTS COUNTED
0503  4555            JMS I XTEXT
0504  6750            TEXT32          /"O,K,"
0505  5706            JMP I .+1
0506  0265            SLTSTS+7
0507  0310    XTSYQS, TSTYQS
0510  0260    K0260,  260
0511  0270    K270,   270
0512  7520    KK7520, 7520
0513  0374    K0374,  374
              /TABLE OF TEST POINTERS
0514  0000    TESTX,  0
0515  7200            CLA
0516  1042            TAD 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    LBTEXT, 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  4561          JMS I   XTIN
0553  5736          JMP I   LBTEXT
```

```
        0600    *600
                /
0600    0514    XTESTX, TESTX
                /EXECUTE TESTS SELECTED BY KEYBOARD
0601    7610    EXECUT, CLA SKP
0602    7500            TSTTBL
0603    1202            TAD .-1
0604    3375            DCA TSTDEX
0605    3041            DCA TBLCNT
0606    1775            TAD I TSTDEX
0607    3020            DCA PASSWS
0610    2375            ISZ TSTDEX
0611    1775            TAD I TSTDEX
0612    3021            DCA PASSWS+1
0613    1021            TAD PASSWS+1
0614    7006            RTL
0615    7006            RTL
0616    7004            RAL
0617    0110            AND K0017
0620    3042            DCA EXETST      /SAVE TEST NUMBER
0621    7410            SKP
0622    1200            PARAMS
0623    4622            JMS I .+1
0624    3374            DCA EXECNT
0625    4555    TSRUNL, JMS I XTEXT
0626    6756            TEXT33          /TEST
0627    1042            TAD EXETST
0630    1120            TAD K0240
0631    1111            TAD K0020
0632    4556            JMS I XOTY      /PRINT TEST NUMBER
0633    4560            JMS I XTSP3
0634    1041            TAD TBLCNT
0635    4553            JMS I XDCPRT    /PRINT TABLE POSITION
0636    4560            JMS I XTSP3
0637    1374            TAD EXECNT
0640    4553            JMS I XDCPRT    /PRINT TEST EXECUTE COUNT
0641    7240            CLA CMA
0642    3043            DCA SWTEST
0643    4600    GOTST,  JMS I XTESTX
0644    2374            ISZ EXECNT
```

```
                        /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 INCWMO      /NO
0651  1127                      TAD K7775
0652  1042                      TAD EXETST
0653  7710                      SPA CLA
0654  5270                      JMP INCWMO
0655  1107                      TAD K0010
0656  1031                      TAD READMO
0657  3031                      DCA READMO      /+1 TO READ MODE
0660  1031                      TAD READMO
0661  7041                      CIA
0662  1112                      TAD K0030
0663  7640                      SZA 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                INCWMO, LAS
0671  7012                      RTR
0672  7620                      SNL CLA                 /CHANGE WRITE MODE IF AC SW 10=1
0673  5307                      JMP INCRLC      /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                      SZA 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                INCRLC, 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 RLTROL
0715  1111                      TAD K0020       /+1 TO RECORD LENGTH
0716  3027                      DCA RLTROL
0717  1027                      TAD RLTROL
0720  7041                      CIA
0721  1115                      TAD K0100
0722  7640                      SZA 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 RLTROL
```

```
                    /SEE IF PATTERN IS TO CHANGE
0727  7604    CHGPAT, LAS
0730  0113            AND K0040
0731  7650            SNA CLA                 /CHANGE PATTERN IF AC SW 7=1
0732  5343            JMP CHRPAR      /NO
0733  2024            ISZ PATNUM      /+1 TO PATTERN
0734  1024            TAD PATNUM
0735  0107            AND K0010
0736  7650            SNA CLA                 /DONE ALL PATTERNS?
0737  5225            JMP TSRUNL      /NO, EXECUTE THIS PATTERN
0740  1020            TAD PASSWS      /YES, REINITIALIZE PATTERN
0741  0106            AND K0007
0742  3024            DCA PATNUM
                    /SEE IF PARITY IS \O CHANGE
0743  7604    CHRPAR, LAS
0744  0111            AND K0020
0745  7650            SNA CLA                 /CHANGE PARITY IF AC SW 6=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                     /BACK TO ORIGINAL PARITY
0760  5225            JMP TSRUNL      /NO, EXECUTE THIS PARITY
                    /CHANGE TEST NUMBER
0761  2375    RPTTST, ISZ TSTDEX      /+1 TO TEST NUMBER
0762  2041            ISZ TBLCNT      /+1 TO TABLE COUNT
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
                        /SAVE DRIVE RECORD AND ERROR COUNTERS
1000    0000    SVCTRS, 0
1001    4216            JMS CTRDEX
1002    1410            TAD I 10
1003    3411            DCA I 11                /SAVE DRIVE COUNTERS
1004    2012            ISZ 12
1005    5202            JMP .-3
1006    5600            JMP I SVCTRS
                        /
                        /RESET DRIVE COUNTERS BACK INTO PROGRAM
1007    0000    MVCTRS, 0
1010    4216            JMS CTRDEX
1011    1411            TAD I 11
1012    3410            DCA I 10                /RESTORE DRIVE COUNTERS
1013    2012            ISZ 12
1014    5211            JMP .-3
1015    5607            JMP I MVCTRS
                        /
                        /SET UP INDEX REGISTERS FOR MOVE AND SAVE COUNTERS
1016    0000    CTRDEX, 0
1017    7610            CLA SKP
1020    0054            WRCHEK-1
1021    1220            TAD .-1
1022    3010            DCA 10
1023    1124            TAD K7751
1024    3012            DCA 12
1025    7610            CLA SKP
1026    7037            DRVADR-1
1027    1226            TAD .-1
1030    1023            TAD CDRIVE
1031    3017            DCA 17
1032    1417            TAD I 17
1033    3011            DCA 11
1034    5616            JMP I CTRDEX
                        /
                        /CLEAR ALL DRIVES
1035    0000    CLRALL, 0
1036    4551            JMS I XRSFDV    /RESET TO FIRST DRIVE
1037    4534            JMS I XRWIND    /REWIND
1040    4535            JMS I XCLRTB    /CLEAR READ AND WRITE TABLES
1041    4200            JMS SVCTRS      /SAVE COUNTERS
1042    4547            JMS I XCHGDV    /DONE ALL DRIVES?
1043    5237            JMP .-4                 /NO
1044    7240            CLA CMA
1045    3044            DCA EOSFLG
1046    3650            DCA I .+2
1047    5635            JMP I CLRALL
1050    2337            T11FLG
```

```
                        /
                        /RESET DRIVE SELECTION TO LOWEST DRIVE NUMBER
1051  3000      RSFDRV, 0
1052  7200              CLA
1053  3023              DCA 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              ISZ CDRIVE        /NO, +1 TO DRIVE NUMBER
1063  1270              TAD CDRVBT
1064  7110              CLL RAR                   /MOVE BIT OVER
1065  5255              JMP RSFDRV+4      /TRY AGAIN
1066  4315              JMS SETFUN
1067  5651              JMP I RSFDRV
1070  0000      CDRVBT, 0
                        /
                        /SELECT NEXT DRIVE
                        /+1 TO EXIT IF LAST DRIVE TESTED
1071  0000      CHGDRV, 0
1072  7200              CLA
1073  1270              TAD CDRVBT        /GET MASK BIT
1074  7110              CLL RAR                   /MOVE OVER 1
1075  2023              ISZ CDRIVE        /+1 TO DRIVE NUMBER
1076  0314              AND K7760         /MASK FOR 8 DRIVES POSSIBLE
1077  7440              SZA               /END OF 8 DRIVES
1100  5304              JMP .+4                   /NO, SEE IF DRIVE EXISTS
1101  4251              JMS RSFDRV        /+1 TO EXIT
1102  2271              ISZ CHGDRV
1103  5671              JMP I CHGDRV      /EXIT
1104  3270              DCA CDRVBT        /SAVE CURRENT BIT
1105  1270              TAD CDRVBT
1106  0022              AND MSBITS        /MASK DRIVES SELECTED
1107  7450              SNA                       /DOES DRIVE EXIST?
1110  5272              JMP CHGDRV+1      /NO, SEE IF NEXT EXISTS
1111  4315              JMS SETFUN
1112  5671              JMP I CHGDRV      /EXIT WITHOUT SKIP
1113  4000      K4000,  4000
1114  7760      K7760,  7760
```

```
                    /SET UP FUNDAMENTAL COMMAND
1115  0000  SETFUN, 0
1116  7200         CLA
1117  1026         TAD DRVDEN
1120  0104         AND K0003
1121  3026         DCA DRVDEN
1122  6224         RIF
1123  1026         TAD DRVDEN
1124  3026         DCA DRVDEN
1125  1023         TAD CDRIVE
1126  7100         CLL
1127  7012         RTR
1130  7012         RTR
1131  1026         TAD DRVDEN
1132  1121         TAD K0300
1133  3026         DCA DRVDEN
1134  1025         TAD PARBT1
1135  7640         SZA CLA
1136  1122         TAD K0400
1137  1026         TAD DRVDEN
1140  3035         DCA COMAND
1141  5715         JMP I SETFUN
                    /WAIT FOR KBD FLAG AND READ CHARACTER
1142  0000  WAITKY, 0
1143  6031         KSF
1144  5343         JMP .-1
1145  6036         KRB
1146  6046         TLS              /ECHO CHARACTER
1147  6041         TSF
1150  5347         JMP .-1
1151  3054         DCA CHARIN
1152  1054         TAD CHARIN
1153  5742         JMP I WAITKY
      1200  *1200
                    /INITIALIZE TEST PARAMETERS
                    /PATNUM-PARBT1-DRVDEN-RLTROL-MODBIT-READMO
1200  0000  PARAMS, 0
1201  7200         CLA
1202  1020         TAD PASSWS
1203  0106         AND K0007
1204  3024         DCA PATNUM       /PATTERN
1205  1020         TAD PASSWS
1206  0107         AND K0010
1207  3025         DCA PARBT1       /PARITY
1210  1020         TAD PASSWS
1211  0235         AND K7000
1212  3026         DCA DRVDEN
1213  1021         TAD PASSWS+1
1214  0104         AND K0003
1215  1026         TAD DRVDEN       /
1216  1121         TAD K0300
1217  3026         DCA DRVDEN       /DRIVE NUMBERS AND DENSITY
1220  6224         RIF
1221  1026         TAD DRVDEN
```

```
1222  3026          DCA DRVDEN
1223  1020          TAD PASSWS
1224  0114          AND K0060
1225  3027          DCA RLTROL      /RECORD LENGTH
1226  1020          TAD PASSWS
1227  0121          AND K0300
1230  3030          DCA MODBIT      /WRITE STOP MODE
```

```
1231  1021            TAD PASSWS+1
1232  0112            AND K0030
1233  3031            DCA READMO      /READ STOP MODE
1234  5600            JMP I PARAMS
1235  7000    K7000,  7000
                /
                /TEST FOR ALL DRIVES TO HAVE REACHED EOT
1236  0000    ALLEOT, 0
1237  7200            CLA
1240  1032            TAD RECSYS
1241  7440            SZA             /READ PASS SELECTED?
1242  5254            JMP TRDEOT      /YES
1243  4551            JMS I XRSFDV
1244  4545            JMS I XMVCTR
1245  1072            TAD WRTEOT
1246  7450            SNA
1247  5265            JMP ALLEOS      /TEST EXIT EOS SELECTED
1250  4547            JMS I XCHGDV
1251  5244            JMP ALLEOT+6
1252  2236            ISZ ALLEOT
1253  5636            JMP I ALLEOT
1254  4551    TRDEOT, JMS I XRSFDV    /GET FIRST DRIVE
1255  4545            JMS I XMVCTR    /GET COUNTERS
1256  1103            TAD RDEOT       /GET READ TO EOT
1257  7450            SNA             /THIS DRIVE AT EOT?
1260  5265            JMP ALLEOS      /NO
1261  4547            JMS I XCHGDV    /ALL AT EOT?
1262  5255            JMP TRDEOT+1    /NO
1263  2236            ISZ ALLEOT      /YES
1264  5636            JMP I ALLEOT
1265  7604    ALLEOS, LAS
1266  7004            RAL             /TEST AC SW 0=1
1267  7620            SNL CLA                 /EXIT AT END OF SEQUENCE
1270  5636            JMP I ALLEOT    /NO, GO TO EOT
1271  1044            TAD EOSFLG
1272  7440            SZA             /WRITTEN TO EOS?
1273  5636            JMP I ALLEOT    /NO
1274  2236            ISZ ALLEOT      /SKIP TO END OF TEST
1275  4677            JMS I .+2       /PRINT ERROR COUNTERS
1276  5636            JMP I ALLEOT
1277  2344            CTRDMP
                      PAUSE
```

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

1300  0000      LBEOT1, 0
1301  6716              RFSR
1302  0312              AND K0037
1303  7640              SZA CLA
1304  5310              JMP .+4
1305  6714              RMSR
1306  0313              AND K3767
1307  7640              SZA CLA
1310  2300              ISZ LBEOT1
1311  5700              JMP I LBEOT1
1312  0037      K0037,  37
1313  3767      K3767,  3767

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

1314  0000      LBEOT2, 0
1315  7200              CLA
1316  1053              TAD STATRE
1317  0312              AND K0037
1320  7640              SZA CLA
1321  5325              JMP .+4
1322  1052              TAD STATRD
1323  0313              AND K3767
1324  7640              SZA CLA
1325  2314              ISZ LBEOT2
1326  5714              JMP I LBEOT2

                        /ROUTINE TO SAVE STATUS REGISTERS,

1327  0000      LBSAV,  0
1330  6714              RMSR
1331  3052              DCA STATRD
1332  6716              RFSR
1333  3053              DCA STATRE
1334  5727              JMP I LBSAV

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

1335  0000      LBINT,  0
1336  6721              SKEF
1337  7410              SKP
1340  5735              JMP I LBINT
1341  6723              SKTD
1342  7402              HLT                     /ILLEGAL INTERRUPT;
1343  5735              JMP I LBINT

                        /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
```

```
                    /TM8E DATA RELIABILITY TEST - TAPE 3 (9 TRACK)
          1400      *1400
                    /WRITE TO EOT
                    /REWIND GO TO NEXT DRIVE
  1400    0000      TEST0,  0
  1401    7200              CLA
  1402    3033              DCA EXITMO        /SET EXIT EOT
  1403    3032              DCA RECSYS        /NO READ PASS
  1404    4552              JMS I XCLRAL      /CLEAR ERROR COUNTERS
  1405    4535              JMS I XCLRTB      /CLEAR READ AND WRITE TABLE
  1406    4542              JMS I XGENPT      /GENERATE PATTERN
  1407    4540              JMS I XWRIT       /WRITE
  1410    4534              JMS I XRWIND      /REWIND
  1411    4547              JMS I XCHGDV      /ANY MORE DRIVES?
  1412    5205              JMP TEST0+5       /YES
  1413    5600              JMP I TEST0       /NO, EXIT
                    /
                    /WRITE 1 RECORD LENGTH SEQUENCE OR 250 RECORDS
                    /CHANGE DRIVES, GO TO EOT
  1414    0000      TEST1,  0
  1415    7200              CLA
  1416    1115              TAD K0100
  1417    3033              DCA EXITMO        /EXIT WRITE ROUTINE AT END OF RLS
  1420    3032              DCA RECSYS        /NO READ PASS
  1421    4552              JMS I XCLRAL      /CLEAR ERROR COUNTERS
  1422    4551              JMS I XRSFDV
  1423    4545              JMS I XMVCTR      /GET DRIVE COUNTERS
  1424    1072              TAD WRTEOT
  1425    7440              SZA               /IS THIS ONE AT EOT?
  1426    5232              JMP .+4                   /YES
  1427    4542              JMS I XGENPT      /GENERATE PATTERN
  1430    4540              JMS I XWRIT       /WRITE
  1431    4544              JMS I XSVCTR      /SAVE COUNTERS THIS DONE
  1432    4547              JMS I XCHGDV      /DONE 1 RLS ALL DRIVES?
  1433    5223              JMP TEST1+7       /NO, DO NEXT DRIVE
  1434    4550              JMS I XALEOT      /ALL DRIVES AT EOT?
  1435    5222              JMP TEST1+6       /NO
  1436    5614              JMP I TEST1       /YES, EXIT
```

```
                        /
                        /WRITE ONE RECORD
                        /CHANGE DRIVES, GO TO EOT
1437  0000      TEST2,  0
1440  7200              CLA
1441  1117              TAD K0200
1442  3033              DCA EXITMO        /EXIT WRITE ROUTINE AT EOT
1443  3032              DCA RECSYS        /NO READ PASS
1444  4552              JMS I XCLRAL
1445  4551              JMS I XRSFDV
1446  4545              JMS I XMVCTR
1447  1072              TAD WRTEOT
1450  7440              SZA               /IS THIS ONE AT EOT
1451  5255              JMP .+4                 /YES
1452  4542              JMS I XGENPT      /GENERATE PATTERN
1453  4540              JMS I XWRIT       /WRITE
1454  4544              JMS I XSVCTR      /SAVE COUNTERS THIS DRIVE
1455  4547              JMS I XCHGDV      /DONE ALL DRIVES
1456  5246              JMP TEST2+7       /NO, DO NEXT DRIVE
1457  4550              JMS I XALEOT      /ALL DRIVES AT EOT
1460  5245              JMP TEST2+6       /NO
1461  5637              JMP I TEST2       /YES, EXIT
                        /
                        /WRITE TO EOT, REWIND
                        /CHANGE DRIVES, READ
1462  0000      TEST3,  0
1463  7200              CLA
1464  3033              DCA EXITMO
1465  1122              TAD K0400
1466  3032              DCA RECSYS
1467  4552              JMS I XCLRAL
1470  4542              JMS I XGENPT      /GENERATE PATTERN
1471  4545              JMS I XMVCTR      /GET COUNTERS THIS DRIVE
1472  4540              JMS I XWRIT       /WRITE
1473  4534              JMS I XRWIND      /REWIND
1474  4547              JMS I XCHGDV      /DONE ALL DRIVES
1475  5271              JMP .-4                 /NO
1476  4545              JMS I XMVCTR      /GET COUNTERS THIS DRIVE
1477  7200              CLA
1500  3066              DCA RECORD
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
```

```
                        /
                        /WRITE 1 RLS
                        /BACKSPACE, READ, CHANGE   IVES
1506  0000  TEST4,  0
1507  7200          CLA
1510  1115          TAD K0100
1511  3033          DCA EXITMQ      /EXIT AT END OF RLS
1512  1122          TAD K0400
1513  3032          DCA RECSYS      /READ PASS WRITE RECOVER
1514  4552          JMS I XCLRAL    /CLEAR ALL COUNTERS
1515  4551          JMS I XRSFDV
1516  4545          JMS I XMVCTR    /GET COUNTERS FOR THIS DRIVE
1517  4542          JMS I XGENPT    /GENERATE PATTERN
1520  7200          CLA
1521  1072          TAD WRTEOT
1522  7440          SZA             /IS THIS DRIVE AT EOT?
1523  5330          JMP .+5                 /YES
1524  4540          JMS I XWRIT     /WRITE
1525  4536          JMS I XGOBKW    /BACK UP
1526  4537          JMS I XRDIT     /READ
1527  4544          JMS I XSVCTR    /SAVE COUNTERS
1530  4547          JMS I XCHGDV    /ANY MORE DRIVES?
1531  5316          JMP TEST4+10    /YES
1532  4550          JMS I XALEOT    /TEST FOR ALL DRIVES AT EOT
1533  5315          JMP TEST4+7     /NO
1534  5706          JMP I TEST4     /YES, EXIT
                        /
                        /WRITE 1 RECORD, BACKSPACE, READ
                        /THEN CHANGE DRIVES
1535  0000  TEST5,  0
1536  7200          CLA
1537  1117          TAD K0200
1540  3033          DCA EXITMQ
1541  1122          TAD K0400
1542  3032          DCA RECSYS      /WRITE PASS, READ RECOVER
1543  4552          JMS I XCLRAL    /CLEAR ALL COUNTERS
1544  4551          JMS I XRSFDV
1545  4542          JMS I XGENPT    /GENERATE PATTERN
1546  4545          JMS I XMVCTR
1547  7200          CLA
1550  1072          TAD WRTEOT
1551  7440          SZA             /IS THIS DRIVE AT EOT
1552  5357          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 XCHGDV    /DONE ALL DRIVES?
1560  5345          JMP TEST5+10    /NO
1561  4550          JMS I XALEOT    /ALL DRIVES AT EOT?
1562  5344          JMP TEST5+7     /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    TEST6,  0
1601    7200            CLA
1602    1115            TAD K0100
1603    3033            DCA EXITMO      /EXIT AT END OF RLS
1604    1122            TAD K0400
1605    3032            DCA RECSYS      /WRITE PASS READ RECOVER
1606    4552            JMS I XCLRAL    /CLEAR ALL COUNTERS
1607    4551            JMS I XRSFDV
1610    4542            JMS I XGENPT    /GENERATE PATTERN
1611    4545            JMS I XMVCTR    /GET COUNTERS
1612    7200            CLA
1613    1072            TAD WRTEOT
1614    7440            SZA             /AT EOT?
1615    5220            JMP .+3                 /YES
1616    4540            JMS I XWRIT     /WRITE
1617    4544            JMS I XSVCTR    /SAVE COUNTERS
1620    4547            JMS I XCHGDV    /DONE ALL DRIVES
1621    5211            JMP .-10                /NO
1622    4545            JMS I XMVCTR    /GET COUNTERS AGAIN (FOR BKSP)
1623    7200            CLA
1624    1103            TAD RDEOT
1625    7450            SNA             /READ TO EOT IS SKP
1626    4536            JMS I XGOBKW    /BACK UP
1627    4544            JMS I XSVCTR    /SAVE POSITION
1630    4547            JMS I XCHGDV    /DONE ALL DRIVES
1631    5222            JMP .-7                 /NO
1632    4545            JMS I XMVCTR    /GET COUNTERS AGAIN (FOR READ)
1633    7200            CLA
1634    1103            TAD RDEOT
1635    7450            SNA             /READ TO EOT
1636    4537            JMS I XRDIT     /NO, READ
1637    4544            JMS I XSVCTR    /SAVE COUNTERS
1640    4547            JMS I XCHGDV    /DONE ALL DRIVES
1641    5232            JMP .-7                 /NO
1642    4550            JMS I XALEOT    /ALL DRIVES AT EOT?
1643    5207            JMP TEST6+7     /NO
1644    5600            JMP I TEST6     /YES, EXIT
```

```
                        /
                        /WRITE 1 RECORD, CHANGE DRIVES, REPEAT
                        /BACKSPACE, CHANDRIVES, REPEAT
                        /READ, CHANGE DRIVES, REPEAT
1645  0000    TEST7,    0
1646  7200              CLA
1647  1117              TAD K0200
1650  3033              DCA EXITMQ        /EXIT AT EVERY RECORD
1651  1122              TAD K0400
1652  3032              DCA RECSYS        /WRITE PASS READ RECOVER
1653  4552              JMS I XCLRAL      /CLEAR ALL COUNTERS
1654  4551              JMS I XRSFDV
1655  4542              JMS I XGENPT      /GENERATE PATTERN
1656  4545              JMS I XMVCTR      /GET COUNTERS
1657  7200              CLA
1660  1072              TAD WRTEOT
1661  7440              SZA               /AT EOT?
1662  5265              JMP .+3                 /YES
1663  4540              JMS I XWRIT       /WRITE
1664  4544              JMS I XSVCTR      /SAVE COUNTERS
1665  4547              JMS I XCHGDV      /DONE ALL DRIVES
1666  5256              JMP .-10                /NO
1667  4545              JMS I XMVCTR      /GET COUNTERS AGAIN (FOR BKSP)
1670  7200              CLA
1671  1103              TAD RDEOT
1672  7450              SNA               /READ TO EOT IS SKP
1673  4536              JMS I XGOBKW      /BACK UP
1674  4544              JMS I XSVCTR      /SAVE POSITION
1675  4547              JMS I XCHGDV      /DONE ALL DRIVES
1676  5267              JMP .-7                 /NO
1677  4545              JMS I XMVCTR      /GET COUNTERS AGAIN (FOR READ)
1700  7200              CLA
1701  1103              TAD RDEOT
1702  7450              SNA               /READ TO EOT
1703  4537              JMS I XRDIT       /NO, READ
1704  4544              JMS I XSVCTR      /SAVE COUNTERS
1705  4547              JMS I XCHGDV      /DONE ALL DRIVES
1706  5277              JMP .-7                 /NO
1707  4550              JMS I XALEOT      /ALL DRIVES AT EOT?
1710  5254              JMP TEST7+7       /NO
1711  5645              JMP I TEST7       /YES, EXIT
```

```
1712  0000    LBSET,  0                       /SET UP INTERRUPT LINKS,
1713  6201            CDF 00                  /DF=0,
1714  1340            TAD Z1                  /RMF TO LOC1, FLD 0,
1715  3735            DCA I P1
1716  1341            TAD Z2                  /JMP I 3 TO LOC 2, FLD 0,
1717  3736            DCA I P2
1720  7001            IAC                     /1 TO LOC 3, FLD 0,
1721  3737            DCA I P3
1722  6224            RIF
1723  1313            TAD LBSET+1             /CHANGE TO PROG FLD,
1724  3325            DCA .+1
1725  6201            CDF/PROG FLD,
1726  1342            TAD Z3
1727  3001            DCA 1                   /JMP I 2 TO LOC 1, PF,
1730  7430            SZL
1731  5712            JMP I   LBSET
1732  4555            JMS I XTEXT             /TITLE TEXT,
1733  1743            TEXTLB
1734  5712            JMP I LBSET             /EXIT,
1735  0001    P1,     1
1736  0002    P2,     2
1737  0003    P3,     3
1740  6244    Z1,     RMF
1741  5403    Z2,     5403
1742  5402    Z3,     5402

1743  0000    TEXTLB, 0       /TM8E DATA RELIABILITY 9 TRK
1744  4561            JMS I XTIN
1745  4562            JMS I XTSR
1746  2415            2415
1747  7005            7005
1750  4004            4004
1751  0124            0124
1752  0140            0140
1753  2205            2205
1754  1411            1411
1755  0102            0102
1756  1114            1114
1757  1124            1124
1760  3140            3140
1761  7140            7140
1762  2422            2422
1763  1300            1300
1764  4561            JMS I   XTIN
1765  4561            JMS I   XTIN
1766  4777            JMS I   (LBTEXT
1767  5743            JMP I TEXTLB
```

```
 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
 2000  0000     TEST10, 0
 2001  7200             CLA
 2002  1030             TAD MODBIT      /GET WRITE MODE
 2003  7640             SZA CLA                 /IS MODE NONSTOP OR START STOP
 2004  5207             JMP .+3
 2005  1115             TAD K0100       /NON STOP
 2006  7410             SKP
 2007  1117             TAD K0200       /START STOP
 2010  3033             DCA EXITMO
 2011  1122             TAD K0400
 2012  3032             DCA RECSYS      /WRITE PASS, READ RECOVER
 2013  4552             JMS I XCLRAL    /CLEAR COUNTERS
 2014  4542     TS10L2, JMS I XGENPT    /GENERATE PATTERN
 2015  4551             JMS I XRSFDV
 2016  4545             JMS I XMVCTR
 2017  1066             TAD RECORD
 2020  3074             DCA WRRECR
 2021  1067             TAD RECORD+1
 2022  3075             DCA WRRECR+1
 2023  4544             JMS I XSVCTR
 2024  4547             JMS I XCHGDV    /RESET ALL DRIVES?
 2025  5216             JMP .-7                 /NO, SAVE LAS RCR NEXT DRIVE
 2026  7240             CLA CMA

 2027  3044             DCA EOSFLG
 2030  4551     TS10L1, JMS I XRSFDV    /SET TO 0 AT END OF RLS
 2031  4545             JMS I XMVCTR
 2032  7200             CLA
 2033  1072             TAD WRTEOT
 2034  7640             SZA CLA                 /HAS DRIVE WRITTEN TO EOT
 2035  5251             JMP TS10LS              /YES, DONT WRITE ANYMORE
 2036  1074             TAD WRRECR
 2037  3045             DCA SVRECR      /SAVE START OF RLS
 2040  1075             TAD WRRECR+1
 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 XCHGDV    /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 XMVCTR     /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 XCHGDV     /ALL DRIVES AT EOT
2064  5257         JMP .-5                  /NO
2065  4551         JMS I XRSFDV     /START 1ST DRIVE AGAIN
2066  4545         JMS I XMVCTR     /GET COUNTERS
2067  1103         TAD RDEOT
2070  7450         SNA              /DRIVE READ TO EOT
2071  4536         JMS I XGOBKW     /NO, BACK UP
2072  4544         JMS I XSVCTR
2073  4547         JMS I XCHGDV     /ALL DRIVES BACKED UP?
2074  5265         JMP .-7                  /NO
2075  4551         JMS I XRSFDV     /START 1ST DRIVE AGAIN
2076  4545  T10RDP, JMS I XMVCTR    /GET DRIVE COUNTERS
2077  1103         TAD RDEOT
2100  7640         SZA 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         SZA 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 READMQ       /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  T10RND,    JMS I XCHGDV    /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             SZA             /AT
2151  5357             JMP .+6
2152  1071             TAD LASRCR+1
2153  7041             CIA
2154  1067             TAD RECORD+1
2155  7650             SNA CLA
2156  5275             JMP T10RDP-1    /NOT AT EOS, READ AGAIN
2157  4547             JMS I XCHGDV    /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
```

```
                2200    *2200
                        /READ PASS ONLY
                        /RANDOM PATTERN SELECTION IS INVALID
2200    0000    TEST11, 0
2201    4552            JMS I XCLRAL    /CLEAR COUNTERS
2202    1122            TAD K0400
2203    3032            DCA RECSYS
2204    1117            TAD K0200
2205    3033            DCA EXITMO      /WRITE EXIT EVERY RECORD
2206    7240            CLA CMA
2207    3337            DCA T11FLG      /SET TEST11 WRITE EXIT
2210    4540            JMS I XWRIT     /SET UP RECORD LENGTHS
2211    7200            CLA
2212    1044            TAD EOSFLG      /GET EOSFLAG
2213    7440            SZA             /INCREMENT TO END?
2214    4541            JMS I XTSINC    /NO
2215    7200            CLA
2216    1066            TAD RECORD
2217    3335            DCA T11INC      /SAVE SEQUENCE LENGTH
2220    1067            TAD RECORD+1
2221    3336            DCA T11INC+1
2222    3066            DCA RECORD
2223    1024            TAD PATNUM
2224    7041            CIA
2225    1106            TAD K0007
2226    7440            SZA             /IF RANDOM PATTERN DON'T GENERATE
2227    4542            JMS I XGENPT    /GENERATE PATTERN
2230    7240    T11LP1, CLA CMA
2231    3044            DCA EOSFLG      /SET START OF SEQUENCE
2232    4551            JMS I XRSFDV
2233    4545            JMS I XMVCTR    /GET COUNTERS FOR THIS DRIVE
2234    1103            TAD RDEOT
2235    7440            SZA             /IS THIS DRIVE AT EOT
2236    5246            JMP .+10                /YES
2237    1066            TAD RECORD
2240    1335            TAD T11INC
2241    3070            DCA LASRCR      /CURRENT RECORD + SEQUENCE LENGTH TO READ EXIT
2242    1067            TAD RECORD+1
2243    1336            TAD T11INC+1
2244    3071            DCA LASRCR+1
2245    4544            JMS I XSVCTR    /SAVE COUNTERS FOR THIS DRIV
2246    4547            JMS I XCHGDV    /DONE ALL DRIVES
2247    5233            JMP T11LP1+3    /NO
2250    4551            JMS I XRSFDV
2251    4545    T11RDL, JMS I XMVCTR
2252    1103            TAD RDEOT
2253    7440            SZA             /THIS DRIVE AT EOT?
2254    5302            JMP T11END      /YES, DONT READ
2255    1070            TAD LASRCR
2256    3045            DCA SVRECR      /SAVE END OF RLS RECORDS
2257    1071            TAD LASRCR+1
2260    3046            DCA SVRECR+1
```

```
2261  1031            TAD READMQ
2262  7650            SNA CLA                 /NONSTOP OR START STOP?
2263  5273            JMP .+10                /NON STOP
2264  1066            TAD RECORD
2265  3070            DCA LASRCR
2266  1067            TAD RECORD+1
2267  3071            DCA LASRCR+1
2270  2070            ISZ LASRCR      /+1 TO EXIT READ AFTER 1 RECORD
2271  7410            SKP
2272  2071            ISZ LASRCR+1
2273  4537            JMS I XRDIT     /READ 1 RECORD OT TO END RLS
2274  7200            CLA
2275  1045            TAD SVRECR
2276  3070            DCA LASRCR      /RESTORE END RECORD
2277  1046            TAD SVRECR+1
2300  3071            DCA LASRCR+1
2301  4544            JMS I XSVCTR
2302  4547  T11END,   JMS I XCHGDV    /DONE ALL DRIVES?
2303  5251            JMP T11RDL      /NO
2304  4550            JMS I XALEOT    /ALL DRIVES AT EOT
2305  7410            SKP
2306  5600            JMP I TEST11

2307  4551            JMS I XRSFDV
2310  4545  T11LP2,   JMS I XMVCTR    /GET COUNTERS AGAIN
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         /AT END OF RLS?
2323  3044            DCA EOSFLG      /YES
2324  4547            JMS I XCHGDV    /CHECKED ALL DRIVES?
2325  5310            JMP T11LP2
2326  7200            CLA
2327  1044            TAD EOSFLG
2330  7440            SZA             /AT END OF RLS?
2331  5251            JMP T11RDL      /NO
2332  4550            JMS I XALEOT    /TEST EOS DUMP SWITCH
2333  5230            JMP T11LP1
2334  5600            JMP I TEST11    /EXIT
2335  0000  T11INC,   0
2336  0000            0
2337  0000  T11FLG,   0
```

```
                        /DUMP ERROR COUNTERS ON ALL DRIVES
2340  4544      ERRDMP, JMS I XSVCTR
2341  4344              JMS CTRDMP
2342  7402              HLT
2343  5342              JMP .-1
2344  0000      CTRDMP, 0
2345  4551              JMS I XRSFDV
2346  4545              JMS I XMVCTRS
2347  1337              TAD T11FLG
2350  7450              SNA
2351  5366              JMP COMEND-5
2352  4555              JMS I XTEXT
2353  6765              TEXT34
2354  4555              JMS I XTEXT
2355  7011              TEXT36
2356  7610              CLA SKP
2357  4612              WRTDMP
2360  4757              JMS I .-1
2361  1032              TAD RECSYS
2362  7450              SNA
2363  5373              JMP COMEND
2364  4555              JMS I XTEXT
2365  7000              TEXT35
2366  4555              JMS I XTEXT
2367  7011              TEXT36
2370  7610              CLA SKP
2371  4674              READMP
2372  4771              JMS I .-1
2373  4547      COMEND, JMS I XCHGDV
2374  5346              JMP CTRDMP+2
2375  5744              JMP I CTRDMP

                        PAUSE
```

```
                2400    *2400
                        /TM8E DATA RELIABILITY TEST TAPE 4 (9 TRACK)
                        /GET SWS AND START TEST ROUTINE
                        /1 DRV OPERATION ONLY

2400    7120    STRTES, STL
2401    4570            JMS I XLBSET            /SET UP INTERRUPT SERVICE,
2402    7604            LAS             /GET FIRST WD SWS,
2403    0243            AND KX7000      /MASK DRV NUMBER
2404    1356            TAD K0303
2405    3026            DCA DRVDEN
2406    6224            RIF
2407    1026            TAD DRVDEN
2410    3026            DCA DRVDEN
2411    4534            JMS I XRWIND    /REWIND
2412    7604            LAS             /GET SWS AGAIN
2413    3020            DCA PASSWS      /FOR FIRST CONTROL WRD
2414    7604            LAS
2415    0110            AND K0017       /PATTERN NUMBER TO
2416    3024            DCA PATNUM      /GENERATE FIRST PATTERN
2417    3025            DCA PARBT1      /PAR BIT IS IN PATNUM
2420    7402            HLT             /WAIT FOR 2ND SW WORD
2421    7604            LAS             /GET IT
2422    3021            DCA PASSWS+1    /SAVE FOR EXECUTE
2423    4535            JMS I XCLRTB    /CLR ERROR TABLES
2424    3043            DCA SWTEST      /INDICATE SWITCH TEST
2425    7402            HLT             /WAIT CLEAR SWS
2426    4542    STR1,   JMS I XGENPT    /GENERATE PATTERN
2427    4540            JMS I XWRIT     /DO WRITE OPERATION
2430    1032            TAD RECSYS
2431    7650            SNA CLA                 /READ PASS SELECTED
2432    5235            JMP .+3                 /NO
2433    4536            JMS I XGOBKW    /MOVE BKWD TO FRST WRT
2434    4537            JMS I XRDIT     /MAKE READ PASS
2435    6714            RMSR            /GET STATUS
2436    0107            AND K0010
2437    7650            SNA CLA                 /AT EOT
2440    5226            JMP STR1                /NO MAKE NEXT WRT PASS
2441    7402            HLT             /HALT END OF TEST
2442    5201            JMP STRTES+1    /RESTART FIRST WORD
2443    7000    KX7000, 7000
```

```
                        /SET UP WRITE SEQUENCE
                        /GET INFO FROM JMS+1 AND JMS+2
2444  5244              WRTSEQ, JMP .
2445  7200                      CLA
2446  1066                      TAD RECORD
2447  7640                      SZA CLA                 /DOING RECORD 0
2450  5324                      JMP NOINCR      /NO
2451  1067                      TAD RECORD+1
2452  7640                      SZA CLA                 /4K FLAG = 0
2453  5324                      JMP NOINCR      /YES NOT BLK 0
2454  1043                      TAD SWTEST
2455  7640                      SZA CLA                 /TEST SWS
2456  5270                      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      /READ PASS SELECT SWITCH
2465  1021                      TAD PASSWS+1
2466  0121                      AND K0300
2467  3033                      DCA EXITMQ      /WRITE SEQUENCE EXIT MODE
                        /ENTER HERE IF PARAMETERS WERE SUPPLIED THRU THE KEYBOARD
2470  1027              NOTSWS, TAD RLTROL      /GET RECORD LENGTH BITS
2471  0111                      AND K0020
2472  7640                      SZA CLA                 /MIN LENTH STRT IS SKP
2473  1131                      TAD MAXLEN      /MAX LENGTH SELECTED
2474  7450                      SNA
2475  1132                      TAD MINLEN      /MIN LENGTH SELECTED
2476  7041                      CMA IAC
2477  3034                      DCA STRLEN
2500  3036                      DCA BLKINC      /CLR LENGTH INCREMENTER
2501  1027                      TAD RLTROL
2502  0113                      AND K0040
2503  7650                      SNA CLA                 /CHNGING LENGTH
2504  5322                      JMP NOINCR-2    /NO
2505  1026                      TAD DRVDEN
2506  0104                      AND K0003       /DENSITY
2507  1347                      TAD TADINC
2510  3311                      DCA .+1                 /TO GET INCREMENTER
2511  1350                      TAD INCTBL      /GET DENSITY INC +
2512  3036                      DCA BLKINC
```

```
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 BLKINC +
2517  1036            TAD BLKINC
2520  7041            CMA IAC                 /MAKE INCR -
2521  3036            DCA BLKINC      /SO LENGTH GETS LNGR
2522  1034            TAD STRLEN
2523  3073            DCA WRTLEN      /SET UP FIRST LENGTH
2524  1025    NOINCR, TAD PARBT1      /MOVE PARITY BIT INTO POSITION
2525  7106            CLL RTL
2526  7006            RTL
2527  7004            RAL
2530  1026            TAD DRVDEN      /PAR + DRV + DENSITY
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
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       /WRIT SEQUENCE
2546  2600            STRTOP
2547  1350    TADINC, TAD INCTBL
2550  0010    INCTBL, 10              /24 CHARACTER 200 BPI
2551  0004            4               /12 CHARACTER 556 BPI
2552  0002            2               /6 CHARACTER 800 BPI
2553  0002            2               /IN CASE OF SWITCH GOOF
2554  5644    WSEQXT, JMP I WRTSEQ
2555  2337    X11FLG, T11FLG
2556  0303    K0303,  303
```

```
                2600    *2600
                        /PERFORM WRITE SEQUENCE OPERATION
2600  1035      STRTOP, TAD COMAND              /LOAD CM WHEN CONTROL READY,
2601  6722              SKCB
2602  5201              JMP .-1
2603  6725              CLF                     /CLEAR STATUS,
2604  6705              LCMR                    /LOAD CM,
2605  6724              SKTR                    /WAIT FOR TRANSPORT,
2606  5205              JMP .-1
2607  6725      NONSTP, CLF
2610  1035              TAD     COMAND
2611  6705              LCMR
2612  1073              TAD WRTLEN              /LOAD WC,
2613  6701              LWCR
2614  1130              TAD WRBUF               /LOAD CA,
2615  6703              LCAR
2616  1232              TAD XTSTST              /SET UP INTERRUPT LINK,
2617  3002              DCA 2
2620  1364              TAD K4100               /LOAD FR (WRITE) AND GO,
2621  6706              LFGR
2622  1024              TAD PATNUM
2623  1126              TAD K7771
2624  7650              SNA CLA                 /PATTERN 7 RANDOM
2625  4313              JMS STRPAT      /YES SEE IF REGEN VALID
                        /PROGRAM STAYS IN THIS LOOP UNTIL INTERRUPT
2626  6001              ION
2627  7200              CLA
2630  5631              JMP I .+1
2631  7050              CAMON           /CA MONITOR
2632  2633      XTSTST, TSTSTP
                        /AT PROG INT COMES TO TSTSTP

2633  4566      TSTSTP, JMS I XLBINT
2634  6714              RMSR            /READ STATUS
2635  7710              SPA CLA                 /EF = 1
2636  5324              JMP WRTERR      /YES SEE IF EOT
2637  1037              TAD WRPASS
2640  1107              TAD K0010
2641  7650              SNA CLA                 /ERR REC PASS
2642  5253              JMP NSTSEL-3    /NO
2643  1037              TAD WRPASS
2644  7410              SKP
2645  2065              ISZ PERMBS      /CONSTANT
2646  1245              TAD ..-1                /ISZ PERMBS = WRITE PASS
2647  3250              DCA .+1                 /TO +1 RECVR1 TO RECVR7
2650  2056              ISZ RECV1
2651  1125              TAD K7770
2652  3037              DCA WRPASS      /RESET 8 PASS COUNTER
2653  1030              TAD MODBIT
2654  7440              SZA             /AC = 0 IS NONSTOP
2655  5263              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            SZA 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
2673  5273    RANSTP, JMP .
2674  4533            JMS I XRANUM    /GET RANDOM NUMBER
2675  0116            AND K0177       /MASK 0 TO 127
2676  7040            CMA             /MAKE -1 TO -128
2677  3050            DCA DELAY1      /SAVE IT
2700  1105            TAD K0004       /-4
2701  1050            TAD DELAY1      /- = RAN COUNT
2702  7700            SMA CLA                 /1 TO 4
2703  5256            JMP NSTSEL      /IS GO NONSTOP
2704  1123            TAD K7443
2705  3047            DCA DELAY
2706  2047            ISZ DELAY       /STALL 1 MILLISEC
2707  5306            JMP .-1
2710  2050            ISZ DELAY1      /DONE ALL SELECTED
2711  5304            JMP .-5                 /NO
2712  5673            JMP I RANSTP    /EXIT RANDOM STALL
                /SEE IF APPROPRIATE TO REGENERATE RANDOM DATA
2713  5313    STRPAT, JMP .
2714  1032            TAD RECSYS
2715  7640            SZA CLA                 /READ PASS SELECTED
2716  5713            JMP I STRPAT    /YES DON'T REGEN
2717  1037            TAD WRPASS
2720  1107            TAD K0010
2721  7650            SNA CLA                 /ERROR PASS
2722  4542            JMS I XGENPT    /NO REGENERATE PATTERN
2723  5713            JMP I STRPAT    /FINISH WRITE OPERATION
```

```
                        /EF=1 DURING WRITE TEST EOT AND RECVR OPTION
2724  4563    WRTERR, JMS I XLEOT1
2725  5763            JMP I XENDTP    /TYPE EOT INFO
2726  1037            TAD WRPASS
2727  1107            TAD K0010
2730  7650            SNA CLA                 /FIRST ERROR PASS
2731  2055            ISZ WRCHEK      /YES #1 WRT CHECH ERRS
2732  7604            LAS
2733  7006            RTL             /TEST AC SW 2=1
2734  7700            SMA CLA                 /TYPE ALL WRITE ERRORS
2735  5345            JMP TESREC      /NO
2736  4555            JMS I XTEXT     /PRINT TEXT
2737  6200            TEXT1
2740  4554            JMS I XTYPDT    /TYPE STANDARD DATA INFORMATION
2741  4560            JMS I   XTSP3
2742  1073            TAD     WRTLEN
2743  7041            CIA
2744  4553            JMS I   XDCPRT
2745  7604    TESREC, LAS
2746  0122            AND K0400       /TEST AC SW 3=1
2747  7640            SZA CLA                 /STATISICAL 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 XING
2754  1125            TAD K7770
2755  3037            DCA WRPASS      /RESET WRITE COUNTR
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 UTILIZI  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
3000    0000    XRGREC, 0
3001    7200            CLA
3002    1301            TAD K7774
3003    3037            DCA WRPASS      /COUNT 4 REWRITES
3004    7604            LAS
3005    7004            RAL             /TEST AC SW1=1
3006    7710            SPA CLA
3007    5246            JMP XRGRCD
3010    4700            JMS I XBACK1
3011    7200            CLA
3012    1035            TAD COMAND              /LOAD CM WHEN CONTROL READY,
3013    6722            SKCB
3014    5213            JMP .-1
3015    6725            CLF
3016    6705            LCMR
3017    6724            SKTR
3020    5217            JMP     .-1
3021    6725            CLF
3022    1035            TAD     COMAND
3023    6705            LCMR
3024    1073            TAD WRTLEN              /LOAD WC,
3025    6701            LWCR
3026    1130            TAD WRBUF               /LOAD CA,
3027    6703            LCAR
3030    1240            TAD XXRG1               /SET UP INTERRUPT,
3031    3002            DCA 2
3032    1277            TAD K4500               /WRITE WITH XIRG,
3033    6706            LFGR
3034    6001            ION
3035    7200            CLA
3036    5637            JMP I .+1
3037    7050            CAMON
3040    3041    XXRG1,  XRG1
                        /RETURN HERE AFTER PROGRAM INTERRUPT
3041    4566    XRG1,   JMS I XLBINT
3042    4565            JMS I XLBSAV            /SAVE STATUS,
3043    1052            TAD STATRD
```

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

3063  0107            AND K0010
3064  7650            SNA CLA                 /EOT=1
3065  5201            JMP XRGREC+1    /NO
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,    5100
3077  4500  K4500,    4500
3100  4514  XBACK1,   BACK1
3101  7774  K7774,    7774
```

```
                        /
                        /SEE IF RECORD LENGTH SHOULD BE CHANGED
3102  0000    TESINC, 0
3103  2066            ISZ RECORD
3104  7410            SKP
3105  2067            ISZ RECORD+1
3106  7300            CLA CLL
3107  1036            TAD BLKINC      /GET INCREMENTER
3110  7450            SNA             /LENGTH CHANGING?
3111  5342            JMP TES2K       /NO, GET OUT
3112  1073            TAD WRTLEN      /YES, INC # RECORD LENGTH
3113  3073            DCA WRTLEN      /SAVE
3114  1073            TAD WRTLEN
3115  7500            SMA
3116  5323            JMP .+5
3117  1132            TAD MINLEN
3120  7700            SMA CLA                 /COUNT LESS THAN MINIMUM
3121  5335            JMP RESETL      /YES, RESET
3122  5327            JMP CWCOK
3123  1131            TAD MAXLEN
3124  7001            IAC
3125  7710            SPA CLA                 /COUNT MORE THAN MAXIMUM
3126  5335            JMP RESETL      /YES,RESET
3127  1033    CWCOK,  TAD EXITMO
3130  0117            AND K0200
3131  7450            SNA
3132  5702            JMP I TESINC    /EXIT AT EOT ONLY
3133  5734            JMP I .+1       /EXIT AT END OF EVERY RECORD
3134  2554            WSEOXT
3135  1034    RESETL, TAD STRLEN      /RESET LENGTH TO CURRENT START
3136  3073            DCA WRTLEN
3137  3044            DCA EOSFLG      /CLEAR EOS FLAG
3140  1033            TAD EXITMO
3141  5331            JMP RESETL-4
3142  7200    TES2K,  CLA             /GET NEXT RECORD NUMBER
3143  1066            TAD RECORD
3144  0350            AND K377
3145  7650            SNA CLA
3146  5337            JMP RESETL+2    /RECORD NOT AN INCREMENT OF 256
3147  5327            JMP RESETL-6    /MULT OF 256 CLEAR EOS FLAG
3150  0377    K377,   377
                      PAUSE
```

```
                    /TAPE 5 (9 TRACK)
          4200      *4200
                    /DATA RELIABILITY READ/COMPARE SEQUENCE
4200      0000      READIT, 0
4201      7200              CLA
4202      1066              TAD RECORD
4203      7640              SZA CLA
4204      5207              JMP .+3
4205      1067              TAD RECORD+1
4206      7640              SZA CLA
4207      5212              JMP .+3
4210      1034              TAD STRLEN
4211      3076              DCA READLN          /SET UP INITIAL READ LENGTH
4212      1127              TAD K7775
4213      3051              DCA RDPASS
4214      6722      RDSTPD, SKCB                  /WAIT FOR CONTROL,
4215      5214              JMP .-1
4216      7200              CLA
4217      1035              TAD COMAND          /LOAD CM,
4220      6725              CLF
4221      6705              LCMR
4222      6724              SKTR                /WAIT FOR TRANSPORT,
4223      5222              JMP .-1
4224      7200      READGO, CLA
4225      6725              CLF
4226      1035              TAD     COMAND
4227      6705              LCMR
4230      1076              TAD READLN          /LOAD WC,
4231      6701              LWCR
4232      1130              TAD WRBUF           /LOAD CA,
4233      6703              LCAR
4234      1244              TAD XRDRET          /SET UP INTERRUPT,
4235      3002              DCA 2
4236      1335              TAD K3100           /READ/COMP + GO,
4237      6706              LFGR
4240      6001              ION
4241      7200              CLA
4242      5643              JMP I .+1
4243      7050              CAMON         /CA MONITOR
4244      4245      XRDRET, RDRET
                    /AT PROGRAM INTERRUPT RETURN IS HERE
4245      4566      RDRET,  JMS I XLBINT          /CHECK CAUSE OF INTERRUPT,
4246      4565              JMS I XLBSAV        /SAVE STATUS,
4247      1052              TAD STATRD
4250      7510              SPA           /ANY ERRORS?
4251      5336              JMP RDERRO    /YES
4252      0107              AND K0010
4253      7640              SZA CLA             /HAVE EOT?
4254      5763              JMP I XRNDTP  /YES, READ DUMP
```

```
4255  1031    RTSSTP, TAD READMO      /GET READ MODE BITS
4256  7440            SZA             /NON STOP?
4257  5275            JMP RDSTPC       NO
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      /GO AGAIN COMPARE T!   ONE
4274  5600    RDEXIT, JMP I READIT
                /
4275  0111    RDSTPC, AND K0020       /MASK READ RANDOM STOP
4276  7440            SZA             /TEST FOR START STOP OR RANDOM
4277  4315            JMS RNDRDS      /RANDOM
4300  4543            JMS I XRDINC    /NORMAL START STOP
4301  7200            CLA
4302  1066            TAD RECORD
4303  7041            CMA IA
4304  1070            TAD LASRCR
4305  7440            SZA
4306  5313            JMP .+5
4307  1067            TAD RECORD+1
4310  7041            CIA
4311  1071            TAD LASRCR+1
4312  7440            SZA
4313  5214            JMP RDSTPD      /GO AGAIN
4314  5600            JMP I READIT
                /RANDOM READ START STOP
4315  0000    RNDRDS, 0
4316  4533            JMS I XRANUM    /GET RANDOM NUMBER
4317  0116            AND K0177       /MASK 0 TO 127
4320  7040            CMA             /MAKE -1 TO -128
4321  3050            DCA DELAY1      /TO COUNT MILLISEC
4322  1050            TAD DELAY1
4323  1105            TAD K0004
4324  7700            SMA CLA
4325  5260            JMP RTSSTP+3
4326  1123            TAD K7443
4327  3047            DCA DELAY
4330  2047            ISZ DELAY
4331  5330            JMP .-1
4332  2050            ISZ DELAY1
4333  5326            JMP .-5
4334  5715            JMP I RNDRDS
                /
4335  3100    K3100,  3100
```

```
                    /MAGTAP STATUS INDICATES SOME ERROR

4336  4564    RDERRO, 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

4400  1104    RDOERR, TAD     K0003
4401  1051            TAD     RDPASS          /1ST PASS?
4402  7640            SZA CLA
4403  5217            JMP     .+14            /NO, DO NOT UPDATE ERROR COUNTERS,
4404  1052            TAD     STATRD          /YES, R/C?
4405  7112            CLL RTR
4406  7420            SNL
4407  5216            JMP     .+7             /NO, NOT A DATA ERROR,
4410  0113            AND     K0040           /YES, PARITY ERROR?
4411  7650            SNA CLA
4412  5215            JMP     .+3
4413  2100            ISZ     CMPERR          /YES, UPDATE DATA ERROR,
4414  7410            SKP
4415  2077            ISZ     RNOSTA          /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       /TEST AC SW 5 = 1
4423  7450            SNA             /DELETE ERROR RECOVERY?
4424  5251            JMP RPASN3      /NO
4425  7200    RPASS3, CLA
4426  1127            TAD K7775
4427  3051            DCA RDPASS      /RESET PASS COUNTER
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 .+6
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
4451  2051    RPASN3, ISZ RDPASS      /DONE ALL RE-READS?
4452  5255            JMP .+3                 /NO
4453  2101            ISZ NRREAD      /+1 NON REC READ
4454  5225            JMP RPASS3      /DO NEXT RECORD
4455  4661            JMS I XSTBAK    /PUT POINTERS BACK THIS ONE
4456  4314            JMS BACK1       /BACK UP
4457  5650            JMP I RPASN3-1  /GO AGAIN
4460  4665    XRDTP2, RNDTAP+1
4461  4530    XSTBAK, SETBAK
```

```
                        /
                        /SET UP POINTERS FOR NEXT RECORD
4462  0000    RDINCR, 0
4463  7200            CLA
4464  1076            TAD READLN
4465  3332            DCA SETBAK+2
4466  2066            ISZ RECORD      /+1 TO NEXT RECORD
4467  7410            SKP
4470  2067            ISZ RECORD+1
4471  1036            TAD BLKINC      /GET RECORD INCREMENT
4472  7450            SNA             /IS LENGTH CHANGING?
4473  5662            JMP I RDINCR    /NO, EXIT
                      /RECORD LENGTH IS CHANGING, COUNT IT
4474  1076            TAD READLN      /LENGTH + OR - INCR
4475  3076            DCA READLN      /SAVE LAST RECORD LENGTH
4476  1076            TAD READLN
4477  7500            SMA
4500  5305            JMP .+5
4501  1132            TAD MINLEN
4502  7700            SMA CLA                 /IS LENGTH LESS THAN MIN
4503  5311            JMP RESTRL      /YES, RESET
4504  5662            JMP I RDINCR
4505  1131            TAD MAXLEN
4506  7001            IAC
4507  7700            SMA CLA                 /IS LENGTH MORE THAN MAX
4510  5662            JMP I RDINCR    /NO
4511  1034    RESTRL, TAD STRLEN      /YES, RESET LENGTH
4512  3076            DCA READLN
4513  5662            JMP I RDINCR
                        /
                        /BACKSPACE 1 RECORD
                        /OR GET BACK IN SYNC FOR NONSTOP RE-READ
4514  0000    BACK1,  0
4515  6724            SKTR                    /WAIT FOR TRANSPORT,
4516  5315            JMP .-1
4517  6725            CLF
4520  7240            CLA CMA                 /SET UP WC TO -1,
4521  6701            LWCR
4522  1026            TAD DRVDEN              /LOAD CM,
4523  6705            LCMR
4524  1354            TAD K7100               /SPC REV 1,
4525  6706            LFGR
4526  4567            JMS I XLBWAT            /WAIT DONE,
4527  5714            JMP I BACK1
```

```
                    /
                    /SET RECORD POINTERS BACK
4530  0000  SETBAK, 0
4531  7610          CLA SKP
4532  0000          0
4533  1332          TAD .-1                 /GET LAST RECORD LENGTH
4534  3076          DCA READLN
4535  7240          CLA CMA                 /-1 TO RECORD COUNT
4536  1066          TAD RECORD
4537  3066          DCA RECORD
4540  1066          TAD RECORD
4541  7001          IAC
4542  7640          SZA CLA
4543  5730          JMP I SETBAK
4544  1067          TAD RECORD+1
4545  7440          SZA
4546  5351          JMP .+3
4547  3066          DCA RECORD
4550  5730          JMP I SETBAK
4551  1355          TAD K7777
4552  3067          DCA RECORD+1
4553  5730          JMP I SETBAK
4554  7100  K7100,  7100
4555  7777  K7777,  7777
```

```
        4600    *4600
4600    2066    ENDIAP, ISZ RECORD      /WRITE PASS IS AT EOT
4601    7410            SKP
4602    2067            ISZ RECORD+1
4603    4555            JMS I XTEXT
4604    6221            TEXT2
4605    4212            JMS WRTDMP
4606    7240            CLA CMA
4607    3072            DCA WRTEOT
4610    5611            JMP I .+1
4611    2554            WSEQXT
4612    0000    WRTDMP, 0               /WRITE DUMP
4613    7300            CLA CLL
4614    1030            TAD MODBIT
4615    7012            RTR
4616    7012            RTR
4617    4723            JMS I XCMDMP    /COMMON DUMP FOR READ AND WRITE
4620    4555            JMS I XTEXT
4621    6400            TEXT10
4622    1055            TAD WRCHEK
4623    4553            JMS I XDCPRT
4624    1126            TAD K7771
4625    3010            DCA 10
4626    7410            SKP
4627    0055            RECV1-1
4630    1227            TAD .-1
4631    3011            DCA 11
4632    3012            DCA 12
4633    2012            ISZ 12
4634    1411    TYRECV, TAD I 11
4635    3013            DCA 13
4636    1013            TAD 13
4637    7450            SNA
4640    5251            JMP TYRALL
4641    4561            JMS I XTIN
4642    4555            JMS I XTEXT
4643    6413            TEXT12
4644    1012            TAD 12
4645    4557            JMS I XOCT1
4646    4560            JMS I XTSP3
4647    1013            TAD 13
4650    4553            JMS I XDCPRT
4651    2012    TYRALL, ISZ 12
4652    2010            ISZ 10
4653    5234            JMP TYRECV
4654    1065            TAD PERMBS
4655    7450            SNA
4656    5263            JMP .+5
4657    4555            JMS I XTEXT
4660    6425            TEXT13
4661    1065            TAD PERMBS
4662    4553            JMS I XDCPRT
4663    5612            JMP I WRTDMP
```

```
                        /
                        /READ PASS IS AT END OF TAPE
4664  4543    RNDIAP, JMS I XRDINC
4665  4553            JMS I XTEXT
4666  6517            TEXT20
4667  4555            JMS I XTEXT
4670  6221            TEXT2
4671  4274            JMS READMP
4672  5673            JMP I .+1
4673  4274            RDEXIT
                        /READ DUMP
4674  0000    READMP, 0
4675  1031            TAD READMO
4676  7110            CLL RAR
4677  4723            JMS I XCMDMP    /COMMON DUMP FOR REA AND WRITE

4700  4555            JMS I XTEXT
4701  6530            TEXT21          /READ ERROR =
4702  1102            TAD RDERRS
4703  4553            JMS I XDCPRT
4704  4555            JMS I XTEXT
4705  6600            TEXT22          /NON RECOVERED =
4706  1101            TAD NRREAD
4707  4553            JMS I XDCPRT
4710  4555            JMS I XTEXT
4711  6615            TEXT23          /DATA ERRORS =
4712  1100            TAD CMPERR
4713  4553            JMS I XDCPRT
4714  4555            JMS I XTEXT
4715  6630            TEXT24          /DATA NO STAT =
4716  1077            TAD RNOSTA
4717  4553            JMS I XDCPRT
4720  7240            CLA CMA
4721  3103            DCA RDEOT
4722  5674            JMP I READMP
4723  5000    XCMDMP, COMDMP
```

```
                5000    *5000
                        /COMMON DUMP FOR READ AND WRITE
5000    0000    COMDMP, 0
5001    7112            CLL RTR
5002    3047            DCA DELAY
5003    1026            TAD DRVDEN
5004    7006            RTL
5005    7006            RTL
5006    4557            JMS I XOCT1     /PRINT DRIVE NUMBER
5007    4560            JMS I XTSP3
5010    1024            TAD PATNUM
5011    4557            JMS I XOCT1     /PRINT PATTERN NUMBER
5012    4560            JMS I XTSP3
5013    1025            TAD PARBT1
5014    7012            RTR
5015    7010            RAR
5016    4557            JMS I XOCT1     /PRINT PARITY
5017    1026            TAD DRVDEN
5020    0104            AND K0003
5021    1240            TAD CDMP1
5022    4243            JMS CDMP4
5023    1047            TAD DELAY
5024    1241            TAD CDMP2
5025    4243            JMS CDMP4
5026    1066            TAD RECORD
5027    4726            JMS I XUDPRT
5030    0067            RECORD+1
5031    1027            TAD RLTROL
5032    7012            RTR
5033    7012            RTR
5034    0104            AND K0003
5035    1242            TAD CDMP3
5036    4243            JMS CDMP4
5037    5600            JMP I COMDMP
5040    1256    CDMP1,  TAD DENTYP
5041    1252    CDMP2,  TAD MODTYP
5042    1262    CDMP3,  TAD LTHTBL
5043    0000    CDMP4,  0
5044    3245            DCA .+1
5045    0000            0               /MODIFIED = TAD I (DENTYP, OR MODTYP, OR LTHBL)
5046    3250            DCA .+2
5047    4555            JMS I XTEXT
5050    0000            0               /MODIFIED = APPROPRIATE TEXT - SEE BELOW
5051    5643            JMP I COMP4
```

```
                        /
5052  6263    MODTYP, TEXT7           /NON-STOP
5053  6272            TEXT8           'START-STOP
5054  6301            TEXT9            RANDOM
5055  6301            TEXT9           /RANDOM
5056  6236    DENTYP, TEXT4           /TYPE 200 BPI
5057  6245            TEXT5           /TYPE 556 BPI
5060  6254            TEXT6           /TYPE 800 BPI
5061  6254            TEXT6           /TYPE 800 BPI
5062  6310    LTHTBL, TYPMIN          /TYPE MINIMUM LENGTH
5063  6320            TYPMAX          /TYPE MAXIMUM LENGTH
5064  6331            TYPAV1          /TYPE AVE 1 LENGTH
5065  6346            TYPAV2          /TYPE AVE 2 LENGTH
                      PAUSE
```

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

                    /
                    /
                    /CLEAR READ AND WRITE TABLES
5066  0000      CLRTBL, 0
5067  7610              CLA SKP
5070  0054              WRCHEK-1
5071  1270              TAD .-1
5072  3010              DCA 10
5073  1124              TAD K7751
5074  3011              DCA 11
5075  3410              DCA I 10
5076  2011              ISZ 11
5077  5275              JMP .-2
5100  5666              JMP I CLRTBL
                    /
                    /TYPE COMMAND, STATUS, RECORD NUMBER
5101  0000      TYPDAT, 0
5102  6715              RCMR
5103  4725              JMS I XOCPRT    /PRINT COMMAND
5104  4560              JMS I XTSP3
5105  6716              RFSR
5106  4725              JMS I XOCPRT    /PRINT FS
5107  4560              JMS I XTSP3
5110  6714              RMSR            /PRINT MS,
5111  4725              JMS I XOCPRT
5112  4560              JMS I XTSP3
5113  6711              RWCR
5114  4725              JMS I   XOCPRT
5115  4560              JMS I   XTSP3
5116  6713              RCAR
5117  4725              JMS I   XOCPRT
5120  4560              JMS I   XTSP3
5121  1066              TAD RECORD
5122  4726              JMS I XUDPRT    /PRINT RECORD NUMBER
5123  0067              RECORD+1
5124  5701              JMP I TYPDAT

5125  6011      XOCPRT, OCTPRT
5126  5200      XUDPRT, UDPRNT
```

```
                        /
                        /GO BACKWARD
5127  0000    GOBKWD, 0
5130  7200            CLA
5131  1066            TAD RECORD      /GET LAST RECORD
5132  3070            DCA LASRCR      /SAVE LAST RECORD
5133  1067            TAD RECORD+1
5134  3071            DCA LASRCR+1
5135  1074            TAD WRRECR
5136  3066            DCA RECORD      /RESTORE TO FIRST
5137  1075            TAD WRRECR+1
5140  3067            DCA RECORD+1
5141  1066            TAD RECORD
5142  7640            SZA CLA
5143  5346            JMP .+3
5144  1067            TAD RECORD+1
5145  7640            SZA CLA                 /BLOCK 0 FIRST
5146  5351            JMP .+3                 /NO, BACKSPACE
5147  4534            JMS I XRWIND    /YES, REWIND
5150  5727            JMP I GOBKWD    /EXIT
5151  6722            SKCB
5152  5351            JMP .-1
5153  6725            CLF
5154  1070            TAD LASRCR
5155  7041            CIA
5156  1066            TAD RECORD
5157  6701            LWCR                    /LOAD WC (USE DIFFERENCE FOR BACK SPACE,),
5160  1035            TAD COMAND
5161  6705            LCMR                    /LOAD CM WHEN CONTROL READY,
5162  6724            SKTR
5163  5362            JMP .-1                 /WAIT FOR TRANSPORT,
5164  1370            TAD P7100               /SPC REV,
5165  6706            LFGR
5166  4567            JMS I XLBWAT            /WAIT DONE,
5167  5727            JMP I GOBKWD    /EXIT
5170  7100    P7100,  7100
```

```
                    /UNSIGNED 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
5200      0000      UDPRNT, 0
5201      3254              DCA UDLOW
5202      1600              TAD I UDPRNT      /PICK UP ADDRESS OF HIGH-ORDER WORD
5203      3261              DCA UDGET
5204      1661              TAD I UDGET       /PICK UP BOTH WORDS FOR USE IN SUBROUTINE
5205      3253              DCA UDHIGH
5206      1247              TAD UDLOOP        /INITIALIZE DIGIT COUNTER FOR "5"
5207      3252              DCA UDCNT
5210      1250              TAD UDADDR        /INITIALIZE TO TABLE OF POWERS OF TEN
5211      3262              DCA UDPTR
5212      2200              ISZ UDPRNT        /INDEX LINKAGE FOR CORRECT RETURN
5213      1662      UDARND, TAD I UDPTR       /PICK UP CURRENT POWER OF TEN FOR
5214      2262              ISZ UDPTR         /USE IN SUBTRACTION
5215      3255              DCA UDHSUB
5216      1662              TAD I UDPTR
5217      2262              ISZ UDPTR
5220      3256              DCA UDLSUB
5221      7100      UDDO,   CLL               /DOUBLE PRECISION SUBTRACTION
5222      1256              TAD UDLSUB
5223      1254              TAD UDLOW
5224      3260              DCA UDTEML
5225      7004              RAL
5226      1255              TAD UDHSUB
5227      1253              TAD UDHIGH
5230      7420              SNL               /DID IT UNDERFLOW?
5231      5237              JMP UDOUT         /NO, COUNT IS DONE
5232      2257              ISZ UDBOX         /YES, COUNT NOT DONE YET, INDEX DIGIT
5233      3253              DCA UDHIGH        /DEPOSIT REMAINING PORTIONS OF WORD
5234      1260              TAD UDTEML
5235      3254              DCA UDLOW
5236      5221              JMP UDDO                  /GO BACK AND SUBTRACT AGAIN
5237      7200      UDOUT,  CLA
5240      1257              TAD UDBOX         /PICK UP RESULTING DIGIT
5241      1251              TAD UDTWO         /ADD "260" TO IT
5242      4556              JMS I XOTY
5243      3257              DCA UDBOX         /INITIALIZE DIGIT TO "0"
5244      2252              ISZ UDCNT         /HAVE WE TYPED "5" DIGITS
5245      5213              JMP UDARND        /NO, DETERMINE NEXT DIGIT
5246      5600              JMP I UDPRNT      /YES, SUBROUTINE DONE, RETURN
5247      7773      UDLOOP, -5                /COUNT OF "5" DIGITS
5250      5263      UDADDR, UDCON1            /INITIAL ADDRESS OF POWERS OF TEN
5251      0260      UDTWO,  260               /ICODE  FOR DIGITS
5252      0000      UDCNT,  0                 /STORAGE LOCATIONS
5253      0000      UDHIGH, 0
5254      0000      UDLOW,  0
5255      0000      UDHSUB, 0
5256      0000      UDLSUB, 0
5257      0000      UDBOX,  0
5260      0000      UDTEML, 0
```

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

```
                        /SWS SAY STATISTICAL RECOVERY
5275  2037      STAREC, ISZ WRPASS        /DONE 7 REWRITES
5276  5301              JMP .+3                   /NO
5277  2065              ISZ PERMBS        /+1 PERM BAD SPOTS
5300  5711              JMP I BACK2-1     /RESTART
5301  4312              JMS BACK2         /BACKSPACE 2
5302  6714              RMSR
5303  0342              AND K1000
5304  7650              SNA CLA                   /AT BOT
5305  4332              JMS SPAFW1        /NO SPACE FWD1
5306  7200              CLA
5307  5710              JMP I .+1         /GO AGAIN
5310  2653              NSTSEL-3
5311  2751              TESREC+4
                        /BACKSPACE 2 RECORDS
5312  5312      BACK2,  JMP .
5313  6722              SKCB                      /WAIT FOR CONTROL,
5314  5313              JMP .-1
5315  6725              CLF
5316  1343              TAD K7776                 /LOAD WC # -2
5317  6701              LWCR
5320  1035              TAD COMAND                /LOAD CM,
5321  6705              LCMR
5322  6724              SKTR
5323  5322              JMP .-1                   /WAIT TRANSPORT,
5324  1331              TAD Q7100                 /SPC REV 2,
5325  6706              LFGR
5326  4567              JMS I XLBWAT              /WAIT DONE,
5327  7200              CLA
5330  5712              JMP I BACK2       /EXIT BACKSPACE 2
5331  7100      Q7100,  7100
                        /
                        /SPACE FORWARD 1 RECORD
5332  5332      SPAFW1, JMP .
5333  6725              CLF                       /CLEAR STATUS,
5334  7240              CLA CMA                   /LOAD WC # -1,
5335  6701              LWCR
5336  1344              TAD K6100                 /SPC FWD 1,
5337  6706              LFGR
5340  4567              JMS I XLBWAT              /WAIT DONE,
5341  5732              JMP I SPAFW1      /EXIT SPACE FWD
5342  1000      K1000,  1000
5343  7776      K7776,  7776
5344  6100      K6100,  6100
                        /REWIND DRIVE TO LOAD POINT
                        /CALL WITH DRIVE SELECT IN AC
5345  0000      REWIND, 0
5346  6722              SKCB                      /WAIT FOR CONTROL,
5347  5346              JMP .-1
5350  7200              CLA
5351  1026              TAD DRVDEN                        /LOAD CM,
5352  6725              CLF
5353  6705              LCMR
5354  6724              SKTR                      /WAIT FOR TRANSPORT,
```

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

```
                5400    *5400
5400    5200    GENPAT, JMP .
5401    4765            JMS I XSTSTR
5402    1024            TAD PATNUM      /GET PATTERN NUMBER
5403    1025            TAD PARBT1
5404    1207            TAD JMPTBL      /+ JMP I
5405    3206            DCA .+1                 /TO BE EXECUTE
5406    5610            JMP I JMPTBL+1
5407    5610    JMPTBL, JMP I .+1       /TO GET TO PATTERNS
5410    5430            GNEVN0
5411    5523            GNEVN1
5412    5433            GNEVN2
5413    5452            GNEVN3
5414    5460            GNEVN4
5415    5662            GNEVN5
5416    5441            GNEVN6
5417    5474            GNEVN7
5420    5455            GNODD0
5421    5535            GNODD1
5422    5436            GNODD2
5423    5612            GNODD3
5424    5464            GNODD4
5425    5600            GNODD5
5426    5442            GNODD6
5427    5504            GNODD7
                /EVEN PATTERN 0 HIGH FREQ SKEW
5430    1232    GNEVN0, TAD .+2
5431    5243            JMP GNODD6+1
5432    0014            0014
                /EVEN PATTERN 2 HIGH FREQ EVRY OTHER TRK
5433    1235    GNEVN2, TAD .+2
5434    5243            JMP GNODD6+1
5435    0103            0103
                /ODD PATTERN 2 COMPLEMENT OFF EVEN 2
5436    1240    GNODD2, TAD .+2
5437    5243            JMP GNODD6+1
5440    0274            0274
                /ODD AND EVEN PATTERN 6 ALL TRACKS
5441    7000    GNEVN6, NOP             /SAME AS ODD
5442    7040    GNODD6, CMA
5443    0366            AND K0377
5444    3012            DCA 12
5445    1012            TAD 12
5446    3410            DCA I 10
5447    2011            ISZ 11
5450    5245            JMP .-3
5451    5600            JMP I GENPAT
                /EVEN PARITY PATTERN 3 HIGH REQ, INSIDE HALF OUTSIDE
5452    1254    GNEVN3, TAD .+2
5453    5243            JMP GNODD6+1
5454    0273            0273
```

```
                    /ODD PARITY PAT 0 HALF FREQ OUTSIDE TRACKS
5455  1257          GNODD0, TAD .+2
5456  5243                  JMP GNODD6+1
5457  0004                  0004

                    /EVEN PATTERN 4 INCREMENTING CHARACTER NO 00
5460  1262          GNEVN4, TAD .+2                 /GET SNA TO THROW 00
5461  5265                  JMP GNODD4+1    /GENERATE PATTERN
5462  7450                  SNA
5463  7410                  SKP
                    /ODD PATTERN 4 SAVE 00 CODES
5464  1263          GNODD4, TAD .-1                 /GET SKP TO SAVE 00
5465  3316                  DCA INC0CH      /DEPOSIT SKP OR SNA
5466  3014                  DCA 14          /00 TO 14 START
5467  4312                  JMS GENINC      /GET NEXT CHAR
5470  3410                  DCA I 10                /STORE IT
5471  2011                  ISZ 11          /DONE ALL WORDS
5472  5267                  JMP GNODD4+3    /NO GET NEXT
5473  5600                  JMP I GENPAT    /EXIT
                    /EVEN RANDOM PATTERN 7
5474  4533          GNEVN7, JMS I XRANUM
5475  0366                  AND K0377
5476  7450                  SNA
5477  5274                  JMP GNEVN7
5500  3410                  DCA I 10
5501  2011                  ISZ 11
5502  5274                  JMP GNEVN7
5503  5600                  JMP I GENPAT
                    /ODD RANDOM PATTERN 7
5504  4533          GNODD7, JMS I XRANUM
5505  0366                  AND K0377
5506  3410                  DCA I 10
5507  2011                  ISZ 11
5510  5304                  JMP GNODD7
5511  5600                  JMP I GENPAT
```

```
                        /INCREMENT 14 FOR NEXT CHARACTER
5512  5312    GENINC, JMP .
5513  1014            TAD 14          /GET LAST
5514  7001            IAC             /+1
5515  0366            AND K0377       /MASK LWR 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 GENINC    /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    GNODD1, 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
                        /STORE 9 WORD SUBROUTINE EVN AND ODD 1
5547  5347    ST9WRD, JMP .
5550  7240            CLA CMA
5551  1347            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 TRA. 3 FRAMES EVERY 27
5600    4234    GNODD5, JMS STHALF
5601    0000            0000
5602    0200            0200
5603    0100            0100
5604    0040            0040
5605    0020            0020
5606    0010            0010
5607    0004            0004
5610    0002            0002
5611    0001            0001

                        /ODD PATTERN 3 3 ONES 3 ZEROS THREE ONES
5612    4234    GNODD3, JMS STHALF
5613    0037            0037
5614    0300            0300
5615    0076            0076
5616    0201            0201
5617    0174            0174
5620    0003            0003
5621    0370            0370
5622    0007            0007
5623    0360            0360
                        /INITIALIZE AUTO INDEX 10-11 FOR PATTERN STORAGE
5624    0000    SETSTR, 0
5625    7200            CLA
5626    1233            TAD BLENTH
5627    3011            DCA 11          /WORD COUNT IN 11
5630    1130            TAD WRBUF
5631    3010            DCA 10          /WRITE BUFFER -1 IN 10
5632    5624            JMP I SETSTR

5633    7400    BLENTH, -400            /READ-WRITE BUFFER LENGTH,
```

```
                        /GENERATE A THREE WORD PATTERN
5634  5234      STHALF, JMP .
5635  7240              CLA CMA
5636  1234              TAD STHALF
5637  3012              DCA 12              /SAVE TABLE LIST
5640  1274              TAD KX7767          /9 COUNT
5641  3013              DCA 13
5642  1127      STHF,   TAD K7775           /3 COUNT
5643  3015              DCA 15
5644  1412              TAD I 12            /GET DATA WORD
5645  3261              DCA STHF1           /SAVE FOR FUTURE USE
5646  1261              TAD STHF1
5647  3410              DCA I 12            /DEPOSIT DATA WORD IN TABLE
5650  2011              ISZ 11              /DONE?
5651  7410              SKP                 /NO
5652  5660              JMP I EXITGN        /BUFFER FULL, EXIT
5653  2015              ISZ 15              /DONE 3 WORDS?
5654  5246              JMP .-6             /NO
5655  2013              ISZ 13              /DONE 9 WORDS?
5656  5242              JMP STHF            /NO
5657  5235              JMP STHALF+1        /YES

5660  5561      EXITGN, ST9B
5661  0000      STHF1,  0


                        /EVEN PATTERN 5 EACH TRACK ON A 0 FOR 3 FRAMES
5662  4234      GNEVN5, JMS STHALF
5663  0377              0377
5664  0177              0177
5665  0277              0277
5666  0337              0337
5667  0357              0357
5670  0367              0367
5671  0373              0373
5672  0375              0375
5673  0376              0376
5674  7767      KX7767, 7767
```

```
                        /RANDOM NUMBER GENERATOR
5675    5275    RANGEN, JMP .
5676    7200            CLA
5677    1337            TAD RANTND      /GET CURRENT TABLE ADDRESS
5700    1324            TAD RANDEX      /= END TABLE
5701    7640            SZA CLA                 /AT END OF TABLE
5702    5312            JMP RANTAD      /NO
5703    1326            TAD RANTBL
5704    3324            DCA RANDEX      /RESET TABLE ADDRESS
5705    1325            TAD RANCON      /GET ROTATING WORD
5706    7104            CLL RAL                 /1 LEFT
5707    7430            SZL             /SAD BT 11=1
5710    7001            IAC             /YES
5711    3325            DCA RANCON      /RESET ROTATING
5712    1325    RANTAD, TAD RANCON      /GET CYCLIC
5713    1724            TAD I RANDEX    /T NEXT TABLE
5714    3724            DCA I RANDEX    /RESET IT
5715    1340            TAD RANSAV      /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 RANSAV      /TO GENERATE NEXT
5722    1340            TAD RANSAV
5723    5675            JMP I RANGEN    /EXIT AC=RANDOM

                        /TABLE TO GENERATE RANDOM NUMBERS
5724    5737    RANDEX, RANTND          /TO GET INDIRECT
5725    6543    RANCON, 6543            /CYCLIC
5726    5727    RANTBL, .+1             /TO RESET RANDEX TO STRT
5727    6543            6543            /TABLE
5730    3210            3210            /OF 8
5731    0765            0765            /NUMBERS
5732    5432            5432
5733    2107            2107
5734    7654            7654
5735    4321            4321
5736    1076            1076
5737    2041    RANTND, .               /TO DETERMINE END
5740    0000    RANSAV, 0               /TO SAVE LAST RANDOM

                        PAUSE
```

```
                    /TM8E DATA RELIABILITY TEST      -       TAPE 7 (9 TRACK)
                    /
                    /PRINT TEXT MESSAGE REQUESTED BY LOCATION FOLLOWING "JMS I XTEXT"
          6000      *6000
                    /
6000      0000      TEXTX,  0
6001      7200              CLA
6002      1600              TAD I .-2       /GET TEXT POINTER
6003      3205              DCA .+2 /SAVE
6004      7410              SKP
6005      0000              0000
6006      4605              JMS I .-1       /JMS TO TEXT
6007      2200              ISZ TEXTX       /+1 TO RETURN AFTER TEXT POINTER
6010      5600              JMP I TEXTX
                    /
                    /PRINT OCTAL NUMBER IN AC
6011      0000      OCTPRT, 0
6012      3310              DCA VALUE
6013      1310              TAD VALUE
6014      7006              RTL
6015      7006              RTL
6016      4233              JMS OCT1        /PRINT 1ST CHARACTER
6017      1310              TAD VALUE
6020      7012              RTR
6021      7012              RTR
6022      7012              RTR
6023      4233              JMS OCT1        /PRINT 2ND CHARACTER
6024      1310              TAD VALUE
6025      7012              RTR
6026      7010              RAR
6027      4233              JMS OCT1        /PRINT 3RD CHARACTER
6030      1310              TAD VALUE
6031      4233              JMS OCT1        /PRINT 4TH CHARACTER
6032      5611              JMP I OCTPRT
                    /
6033      0000      OCT1,   0
6034      0106              AND K0007       /MASK OCTAL BIT
6035      1316              TAD K260        /MAKE ASCII
6036      4556              JMS I XOTY      /PRINT CHARACTER
6037      5633              JMP I OCT1

                    /
                    /TYPE 3 SPACES
6040      0000      TSP3,   0
6041      7200              CLA
6042      1120              TAD K0240
6043      4556              JMS I XOTY
6044      1120              TAD K0240
6045      4556              JMS I XOTY
6046      1120              TAD K0240
6047      4556              JMS I XOTY
6050      5640              JMP I TSP3
```

```
                        /CONVERT NUMBER IN AC TO DECIMAL AND PRINT
6051  0000      DECPRT, 0
6052  3310              DCA VALUE         /SAVE INPUT
6053  3311              DCA DIGIT         /CLEAR
6054  1321              TAD KX7774
6055  3312              DCA CNTRZB        /SET COUNTER TO 4
6056  1303              TAD ADDRZA
6057  3264              DCA ARROW         /SET TABLE POINTER
6060  7410              SKP
6061  3310              DCA VALUE         /SAVE
6062  7100              CLL
6063  1310              TAD VALUE
6064  1304      ARROW,  TAD TENPWR        /SUBTRACT POWER OF TEN
6065  7430              SZL
6066  2311              ISZ DIGIT         /DEVELOP BCD DIGIT
6067  7430              SZL
6070  5261              JMP ARROW-3       /LOOP
6071  7200              CLA       /HAVE DIGIT
6072  1311              TAD DIGIT
6073  1316              TAD K260
6074  4556              JMS I XOTY        /PRINT
6075  7200              CLA
6076  3311              DCA DIGIT         /CLEAR DIGIT
6077  2264              ISZ ARROW         /UPDATE POINTER
6100  2312              ISZ CNTRZB        /DONE?
6101  5263              JMP ARROW-1       /NO
6102  5651              JMP I DECPRT
6103  1304      ADDRZA, TAD TENPWR
6104  6030      TENPWR, -1750     /ONE THOUSAND
6105  7634              -144      /ONE HUNDRED
6106  7766              -12       /TEN
6107  7777              -1        /ONE
6110  0000      VALUE,  0
6111  0000      DIGIT,  0
6112  0000      CNTRZB, 0
6113  0077      K77,    77
6114  0212      K0212,  212
6115  0215      K215,   215
6116  0260      K260,   260
6117  0340      K0340,  340
6120  7740      K7740,  7740
6121  7774      KX7774, 7774
```

```
                    /
                    /TYPE A STRING OF CHARACTERS
                    /CHARACTERS MUST BE STORED IN INTERNAL STRIPPED ASCII, 2 CHARACTERS PER WORD,
6122  0000  TSR,   0
6123  7240        CLA CMA
6124  1322        TAD TSR
6125  3017        DCA 17
6126  1417        TAD I 17          /GET CHARACTER
6127  3340        DCA TSR1
6130  1340        TAD TSR1
6131  7012        RTR
6132  7012        RTR
6133  7012        RTR
6134  4341        JMS TSR2          /PRINT LEFT CHARACTER
6135  1340        TAD TSR1
6136  4341        JMS TSR2          /PRINT RIGHT CHARACTER
6137  5326        JMP TSR+4         /GET NEXT PAIR
6140  0000  TSR1,  0
6141  0000  TSR2,  0
6142  0313        AND K77 /MASK CHARACTER
6143  7450        SNA     /IS IT END OF MESSAGE
6144  5417        JMP I 17          /YES, EXIT
6145  1320        TAD K7740         /RE-COMBINE ASCII CODE WITH STRIPPED CODE
6146  7500        SMA     /
6147  5352        JMP .+3
6150  1317        TAD K0340         /CHARACTER WAS <40, ADD 300
6151  7410        SKP
6152  1120        TAD K0240         /CHARACTER WAS >40, ADD 200
6153  4556        JMS I XOTY        /PRINT ASCII CHARACTER
6154  5741        JMP I TSR2
                    /
                    /TYPE THE ASCII CHARACTER IN AC
6155  0000  OTY,   0
6156  6046        TLS
6157  7300        CLA CLL
6160  6041        TSF
6161  5360        JMP .-1
6162  6042        TCF
6163  5755        JMP I OTY
                    /
                    /TYPE CARRIAGE RETURN, LINE FEED
6164  0000  TIN,   0
6165  7200        CLA
6166  1315        TAD K215          /CR
6167  4556        JMS I XOTY
6170  1314        TAD K0212         /LF
6171  4556        JMS I XOTY
6172  5764        JMP I TIN
```

```
                6200    *6200
                        /WRITE STATUS ERROR
                        /COMD FUNCTN STATUS REC  D LENGTH
6200  0000      TEXT1,  0
6201  4561              JMS I XTIN
6202  4562              JMS I XTSR
6203  2722              2722
6204  1124              1124
6205  0540              0540
6206  2324              2324
6207  0124              0124
6210  2523              2523
6211  4005              4005
6212  2222              2222
6213  1722              1722
6214  0000              0000
6215  7410              SKP
6216  6644              TEXT25
6217  4616              JMS I .-1
6220  5600              JMP I TEXT1
                /
                        /END OF TAPE
                        /DRV PAT PAR D.N MODE RECRDS LENGTH
6221  0000      TEXT2,  0
6222  4561              JMS I XTIN
6223  4562              JMS I XTSR
6224  0516              0516
6225  0440              0440
6226  1706              1706
6227  4024              4024
6230  0120              0120
6231  0500              0500
6232  7410              SKP
6233  7011              TEXT36
6234  4633              JMS I .-1
6235  5621              JMP I TEXT2
```

```
                        /200 FOR 200 BPI
6236  0000      TEXT4,  0
6237  4562              JMS I XTSR
6240  4040              4040
6241  4062              4062
6242  6060              6060
6243  0000              0000
6244  5636              JMP I TEXT4
                        /
                        /556 FOR 556 BPI
6245  0000      TEXT5,  0
6246  4562              JMS I XTSR
6247  4040              4040
6250  4065              4065
6251  6566              6566
6252  0000              0000
6253  5645              JMP I TEXT5
                        /
                        /800 FOR 800 BPI
6254  0000      TEXT6,  0
6255  4562              JMS I XTSR
6256  4040              4040
6257  4070              4070
6260  6060              6060
6261  0000              0000
6262  5654              JMP I TEXT6
                        /
                        /NSTP FOR NONSTOP MODE
6263  0000      TEXT7,  0
6264  4562              JMS I XTSR
6265  4016              4016
6266  2324              2324
6267  2040              2040
6270  0000              0000
6271  5663              JMP I TEXT7
                        /
                        /SSTP FOR START STOP MODE
6272  0000      TEXT8,  0
6273  4562              JMS I XTSR
6274  4023              4023
6275  2324              2324
6276  2040              2040
6277  0000              0000
6300  5672              JMP I TEXT8
                        /
                        /RNDM FOR RANDOM START STOP MODE
6301  0000      TEXT9,  0
6302  4562              JMS I XTSR
6303  4022              4022
6304  1604              1604
6305  1540              1540
6306  0000              0000
6307  5701              JMP I TEXT9
```

```
                        /
                        /24 MIN
6310  0000      TYPMIN, 0
6311  4562              JMS I XTSR
6312  4040              4040
6313  4062              4062
6314  6440              6440
6315  1511              1511
6316  1600              1600
6317  5710              JMP I TYPMIN
                        /
                        /4008 MAX
6320  0000      TYPMAX, 0
6321  4562              JMS I XTSR
6322  4040              4040
6323  4064              4064
6324  6060              6060
6325  7040              7040
6326  1501              1501
6327  3000              3000
6330  5720              JMP I TYPMAX
                        /
                        /2016 MIN TO MAX
6331  0000      TYPAV1, 0
6332  4562              JMS I XTSR
6333  4040              4040
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
                        /
                        /2016 MAX TO MIN
6346  0000      TYPAV2, 0
6347  4562              JMS I XTSR
6350  4040              4040
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 =
6400    0000    TEXT10, 0
6401    4561            JMS I XTIN
6402    4562            JMS I XTSR
6403    2722            2722
6404    1124            1124
6405    0540            0540
6406    0522            0522
6407    2217            2217
6410    2223            2223
6411    7500            7500
6412    5600            JMP I TEXT10
                        /
                        /RECOVERED AT
6413    0000    TEXT12, 0
6414    4562            JMS I XTSR
6415    2205            2205
6416    0317            0317
6417    2605            2605
6420    2205            2205
6421    0440            0440
6422    0124            0124
6423    4000            4000
6424    5613            JMP I TEXT12
                        /
                        /PERMANENT BADSPT
6425    0000    TEXT13, 0
6426    4561            JMS I XTIN
6427    4562            JMS I XTSR
6430    2005            2005
6431    2215            2215
6432    0116            0116
6433    0516            0516
6434    2440            2440
6435    0201            0201
6436    0423            0423
6437    2024            2024
6440    4000            4000
6441    5625            JMP I TEXT13
```

```
                        /
                        /XIRG WRITTEN 4 TIMES
6442  0000      TEXT14, 0
6443  4562              JMS I XTSR
6444  4030              4030
6445  1122              1122
6446  0740              0740
6447  2722              2722
6450  1124              1124
6451  2405              2405
6452  1640              1640
6453  6440              6440
6454  2411              2411
6455  1505              1505
6456  2300              2300
6457  5642              JMP I TEXT14
                        /
                        /READ STATUS ERROR
                        /COMD FUNCTN STATUS RECORD LENGTH
6460  0000      TEXT15, 0
6461  4561              JMS I XTIN
6462  4562              JMS I XTSR
6463  2205              2205
6464  0104              0104
6465  4023              4023
6466  2401              2401
6467  2425              2425
6470  2340              2340
6471  0522              0522
6472  2217              2217
6473  2200              2200
6474  7410              SKP
6475  6644              TEXT25
6476  4675              JMS I .-1
6477  5660              JMP I TEXT15
```

```
                        /
                        /READ DATA ERROR
                        /COMD FUNCTN STATUS RECORD LENGTH
6500  0000      TEXT16, 0
6501  4561              JMS I XTIN
6502  4562              JMS I XTSR
6503  2205              2205
6504  0104              0104
6505  4004              4004
6506  0124              0124
6507  0140              0140
6510  0522              0522
6511  2217              2217
6512  2200              2200
6513  7410              SKP
6514  6644              TEXT25
6515  4714              JMS I .-1
6516  5700              JMP I TEXT16
                        /
                        /READ PASS
6517  0000      TEXT20, 0
6520  4561              JMS I XTIN
6521  4562              JMS I XTSR
6522  2205              2205
6523  0104              0104
6524  4020              4020
6525  0123              0123
6526  2300              2300
6527  5717              JMP I TEXT20
                        /
                        /READ ERRORS =
6530  0000      TEXT21, 0
6531  4561              JMS I XTIN
6532  4562              JMS I XTSR
6533  2205              2205
6534  0104              0104
6535  4005              4005
6536  2222              2222
6537  1722              1722
6540  2375              2375
6541  0000              0000
6542  5730              JMP I TEXT21
```

```
                6600    *6600
                        /
                        /NON RECOVERABLE =
6600  0000      TEXT22, 0
6601  4561              JMS I XTIN
6602  4562              JMS I XTSR
6603  1617              1617
6604  1640              1640
6605  2205              2205
6606  0317              2317
6607  2605              2605
6610  2201              2201
6611  0214              2214
6612  0575              0575
6613  0000              0000
6614  5600              JMP I TEXT22
                        /
                        /DATA ERRORS =
6615  0000      TEXT23, 0
6616  4561              JMS I XTIN
6617  4562              JMS I XTSR
6620  0401              0401
6621  2401              2401
6622  4005              4005
6623  2222              2222
6624  1722              1722
6625  2375              2375
6626  0000              0000
6627  5615              JMP I TEXT23
                        /
                        /DATA ERROR WITH NO STATUS ERROR
6630  0000      TEXT24, 0
6631  4561              JMS I XTIN
6632  4562              JMS I XTSR
6633  0401              0401
6634  2401              2401
6635  4016              4016
6636  1740              1740
6637  2324              2324
6640  0124              0124
6641  2523              2523
6642  7500              7500
6643  5630              JMP I TEXT24
                        /
```

```
                    /
                    /COMD FUNCTN STATUS WRDCNT CURADR RECORD LENGTH
6644  0000          TEXT25, 0
6645  4561                  JMS I XTIN
6646  4562                  JMS I XTSR
6647  0317                  0317
6650  1504                  1504
6651  4006                  4006
6652  2516                  2516
6653  0324                  0324
6654  1640                  1640
6655  2324                  2324
6656  0124                  0124
6657  2523                  2523
6660  4027                  4027
6661  2204                  2204
6662  0316                  0316
6663  2440                  2440
6664  0325                  0325
6665  2201                  2201
6666  0422                  0422
6667  4022                  4022
6670  0503                  0503
6671  1722                  1722
6672  0423                  0423
6673  4014                  4014
6674  0516                  0516
6675  0724                  0724
6676  1000                  1000
6677  4561                  JMS I XTIN
6700  5644                  JMP I TEXT25
```

```
                        /
                        /SELECT DRIVES
6701  0000              TEXT30, 0
6702  4561                      JMS I XTIN
6703  4562                      JMS I XTSR
6704  2305                      2305
6705  1405                      1405
6706  0324                      0324
6707  4004                      4004
6710  2211                      2211
6711  2605                      2605
6712  2340                      2340
6713  0000                      0000
6714  5701                      JMP I TEXT30
                        /
                        /SELECT TESTS
                        /TST PAT PAR DEN RLS WMO RMO
6715  0000              TEXT31, 0
6716  4561                      JMS I XTIN
6717  4562                      JMS I XTSR
6720  2305                      2305
6721  1405                      1405
6722  0324                      0324
6723  4024                      4024
6724  0523                      0523
6725  2423                      2423
6726  0000                      0000
6727  4561                      JMS I XTIN
6730  4562                      JMS I XTSR
6731  2423                      2423
6732  2440                      2440
6733  2001                      2001
6734  2440                      2440
6735  2001                      2001
6736  2240                      2240
6737  0405                      0405
6740  1640                      1640
6741  2214                      2214
6742  2340                      2340
6743  2715                      2715
6744  1740                      1740
6745  2215                      2215
6746  1700                      1700
6747  5715                      JMP I TEXT31
                        /
                        /O.K.
6750  0000              TEXT32, 0
6751  4562                      JMS I XTSR
6752  1756                      1756
6753  1356                      1356
6754  0000                      0000
6755  5750                      JMP I TEXT32
```

```
                        /
                        /TEST
6756  0000              TEXT33, 0
6757  4561                      JMS I XTIN
6760  4562                      JMS I XTSR
6761  2405                      2405
6762  2324                      2324
6763  4000                      4000
6764  5756                      JMP I TEXT33
                        /
                        /WRITE DUMP
6765  0000              TEXT34, 0
6766  4561                      JMS I XTIN
6767  4562                      JMS I XTSR
6770  2722                      2722
6771  1124                      1124
6772  0540                      0540
6773  0425                      0425
6774  1520                      1520
6775  0000                      0000
6776  5765                      JMP I TEXT34
      7000              *7000
                        /
                        /READ DUMP
7000  0000              TEXT35, 0
7001  4561                      JMS I XTIN
7002  4562                      JMS I XTSR
7003  2205                      2205
7004  0104                      0104
7005  4004                      4004
7006  2515                      2515
7007  2000                      2000
7010  5600                      JMP I TEXT35
```

```
                        /
                        /DRV PAT PAR DEN MODE RECORDS LENGTH
7011  0000      TEXT36, 0
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  0405              0405
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
      0040      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      TSTTBL=DR7TAB+DRINCR

7040  7100      DRVADR, DR0TAB
7041  7140              DR1TAB
7042  7200              DR2TAB
7043  7240              DR3TAB
7044  7300              DR4TAB
7045  7340              DR5TAB
7046  7400              DR6TAB
7047  7440              DR7TAB
```

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

```
0020  11110000  00000000  11111111  11111111  1 11111  11111111  11111111  11111111
0100  11111111  11111111  11111111  11111111  11111111  11111111  11111111  10000000

0200  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
0300  11111111  11111111  11111111  11111111  11111111  11111111  11111110  00000000

0400  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
0500  11111111  11111111  11111111  11111111  11111111  11110000  00000000  00000000

0600  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
0700  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111100


1000  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
1100  11111111  11111111  11111111  11111111  11111111  11110000  00000000  00000000

1200  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
1300  11111111  11111111  11111111  11111111  11111111  11100000  00000000  00000000

1400  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
1500  11111111  11111111  11111111  11111111  11111111  11111111  11110000  00000000

1600  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
1700  11111111  11111111  11111111  11111111  11111111  11111111  11111111  00000001


2000  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
2100  11111111  11111111  11111111  11111111  11111111  11111111  11110000  00000000

2200  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
2300  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111100

2400  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
2500  11111111  11111111  11111111  11111111  11111111  11111110  00000000  00000000

2600  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
2700  11111111  11111111  11111111  11111111  11111111  11111111  11111110  00000000


3000  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
3100  11111111  11111111  11111111  11111111  11111111  10000000  00000000  00000000

3200
3300

3400
3500

3600
3700
```

```
4000
4100

4200  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
4300  11111111  11111111  11111111  11111111  11111111  11111111  11110000  00000001

4400  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
4500  11111111  11111111  11111111  11111111  11111111  11111100  00000000  00000000

4600  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
4700  11111111  11111111  11110000  00000000  00000000  00000000  00000000  00000000


5000  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
5100  11111111  11111111  11111111  11111111  11111111  11111111  11111111  10000000

5200  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
5300  11111111  11111111  11111111  11111111  11111111  11111111  11111111  10000000

5400  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
5500  11111111  11111111  11111111  11111111  11111111  11111111  11111111  00000000

5600  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
5700  11111111  11111111  11111111  11111111  10000000  00000000  00000000  00000000


6000  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
6100  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11100000

6200  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
6300  11111111  11111111  11111111  11111111  11111111  11111111  11100000  00000000

6400  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
6500  11111111  11111111  11111111  11111111  11100000  00000000  00000000  00000000

6600  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
6700  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111110


7000  11111111  11111111  11111111  11111111  11111111  11111100  00000000  00000000
7100  00000000  00000000  00000000  00000000  00000000  00000000  00000000  00000000

7200
7300

7400
7500

7600
7700
```

```
ADDREA  6103    ERRDMP  2340    K0303   2556    LWCR    6701
ALLEOS  1265    EXECNT  0774    K0340   6117    MAXLEN  0131
ALLEOT  1236    EXECUT  0601    K0370   0365    MINLEN  0132
ARROW   6064    EXETST  0042    K0374   0513    MODBIT  0030
BACK1   4514    EXITGN  5660    K0376   0364    MODTYP  5052
BACK2   5312    EXITMO  0033    K0377   5566    MSBITS  0022
BLENTH  5633    GENINC  5512    K0400   0122    MVCTRS  1007
BLKINC  0036    GENPAT  5430    K1000   5342    NOINCR  2524
CAMON   7050    GNEVN0  5430    K1100   5370    NONSTP  2607
CCAR    6704    GNEVN1  5523    K215    6115    NOTSWS  2470
CDF     6201    GNEVN2  5433    K260    6116    NRREAD  0101
COMP1   5040    GNEVN3  5452    K270    0511    NSTSEL  2656
COMP2   5041    GNEVN4  5460    K3100   4335    NUMTST  0040
COMP3   5042    GNEVN5  5662    K3767   1313    OCT1    6033
COMP4   5043    GNEVN6  5441    K377    3150    OCTPRT  6011
CORIVE  0023    GNEVN7  5474    K4000   1113    OTY     6155
CORVBT  1070    GNODD0  5455    K4100   2764    P1      1735
CHARIN  0054    GNODD1  5535    K4500   3077    P2      1736
CHGDRV  1071    GNODD2  5436    K5100   3076    P3      1737
CHGPAT  0727    GNODD3  5612    K6100   5344    P7100   5170
CHRPAR  0743    GNODD4  5464    K7000   1235    PARAMS  1200
CLF     6725    GNODD5  5600    K7100   4554    PARBT1  0025
CLRALL  1035    GNODD6  5442    K7443   0123    PASSWS  0020
CLRTBL  5066    GNODD7  5534    K7520   2366    PATNUM  0024
CLT     6712    GOBKWD  5127    K77     6113    PERMBS  0065
CMPERR  0100    GOTST   0643    K7740   6120    Q7100   5331
CNTRZB  6112    INC0CH  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    RANTND  5737
DECPRT  6051    K0010   0107    K7777   4555    RCAR    6713
DELAY   0047    K0017   0110    KX7000  2443    RCMR    6715
DELAY1  0050    K0020   0111    KX7520  0512    RDBR    6717
DENTYP  5056    K0030   0112    KX7767  5674    RDEOT   0103
DIGIT   6111    K0037   1312    KX7774  6121    RDERRO  4336
DR0TAB  7100    K0040   0113    LASRCR  0070    RDERRS  0102
DR1TAB  7140    K0062   0114    LBEOT1  1300    RDEXIT  4274
DR2TAB  7200    K0100   0115    LBEOT2  1314    RDINCR  4462
DR3TAB  7240    K0177   0116    LBINT   1335    RDOERR  4400
DR4TAB  7300    K0200   0117    LBSAV   1327    RDPASS  0051
DR5TAB  7340    K0212   6114    LBSET   1712    RDRET   4245
DR6TAB  7400    K0215   0360    LBTEXI  0536    RDSTPC  4275
DR7TAB  7440    K0240   0120    LBWAT   1344    RDSTPD  4214
DRINCR  0040    K0254   0361    LCAR    6703    READGO  4224
DRVADR  7040    K0262   0510    LCMR    6705    READIT  4200
DRVDEN  0026    K0270   0362    LDBR    6707    READLN  0076
ENDTAP  4600    K0277   0363    LFGR    6706    READMO  0031
EOSFLG  0044    K0300   0121    LTHTBL  5062    READMP  4674
```

```
RECORD  0066        STRTES  2400        TEXT4   6236        WRPASS  0037
RECSYS  0032        STRTOP  2620        TEXT5   6245        WRRECR  0074
RECV1   0056        SVCTRS  1200        TEXT6   6254        WRTDMP  4612
RECV2   0057        SVRECR  2045        TEXT7   6263        WRTEOT  0072
RECV3   0060        SWTEST  2043        TEXT8   6272        WRTERR  2724
RECV4   0061        T10RDP  2076        TEXT9   6301        WRTLEN  0073
RECV5   0062        T10RND  2141        TEXTLB  1743        WRTSEQ  2444
RECV6   0063        T11END  2302        TEXTX   6000        WSEQXT  2554
RECV7   0064        T11FLG  2337        TIN     6164        X11FLG  2555
REL1    0225        T11INC  2335        TRDEOT  1254        XALEOT  0150
RELIAB  0200        T11LP1  2230        TS10L1  2030        XBACK1  3100
RESETL  3135        T11LP2  2310        TS10L2  2014        XCHGDV  0147
RESTRL  4511        T11RDL  2251        TS10LS  2051        XCLRAL  0152
REWIND  5345        TADINC  2547        TSP3    6040        XCLRTB  0135
RFSR    6716        TBLCNT  0041        TSR     6122        XCMDMP  4723
RIF     6224        TBLTST  2523        TSR1    6140        XDCPRT  0153
RLTROL  0027        TENPWR  6104        TSR2    6141        XENDTP  2763
RMF     6244        TES2K   3142        TSRUNL  0025        XGENPT  0142
RMSR    6714        TESINC  3132        TSTDEX  0775        XGOBKW  0136
RNDRDS  4315        TESREC  2745        TSTSTP  2033        XLBINT  0166
RNDTAP  4664        TEST0   1400        TSTTBL  7500        XLBSAV  0165
RNOSTA  0077        TEST1   1414        TSTYQS  0310        XLBSET  0170
RPASN3  4451        TEST10  2200        TYPAV1  6331        XLBWAT  0167
RPASS3  4425        TEST11  2220        TYPAV2  6346        XLEOT1  0163
RPTIST  0761        TEST2   1437        TYPDAT  5101        XLEOT2  0164
RSFDRV  1051        TEST3   1462        TYPMAX  6320        XMVCTR  0145
RTSSTP  4255        TEST4   1506        TYPMIN  6310        XOCPRT  5125
RWCR    6711        TEST5   1535        TYRALL  4051        XOCT1   0157
SBRM    6727        TEST6   1600        TYRECV  4034        XOTY    0156
SDLE    6726        TEST7   1645        UDADDR  5250        XRANUM  0133
SETBAK  4530        TESTX   2514        UDARND  5213        XRCXRG  2766
SETFUN  1115        TEXT1   6200        UDBOX   5257        XRDINC  0143
SETSTR  5624        TEXT10  6400        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        XRGRCD  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  6533        UDLSUB  5256        XRWIND  0134
ST9WRD  5547        TEXT22  6600        UDOUT   5237        XSTBAK  4461
STAREC  5275        TEXT23  6615        UDPRN1  5200        XSTREC  2765
STATRD  0052        TEXT24  6630        UDPTR   5262        XSTSTR  5565
STATRE  0053        TEXT25  6644        UDTEML  5260        XSVCTR  0144
STHALF  5634        TEXT32  6701        UDTWO   5251        XTESTX  0600
STHF    5642        TEXT31  6715        VALUE   6110        XTEXT   0155
STHF1   5661        TEXT32  6750        VLDDRV  0231        XTIN    0161
STOPOP  2663        TEXT33  6756        VLDTST  0321        XTSINC  0141
STR1    2426        TEXT34  6765        WAITKY  1142        XTSP3   0160
STRLEN  0034        TEXT35  7000        WRBUF   0132        XTSR    0162
STRPAT  2713        TEXT36  7011        WRCHEK  0055        XTSTST  2632
```

```
        XTSYQS  0507
        XTYPDT  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
```