IDENTIFICATION

PRODUCT CODE:	MAINDEC-9A-D4DC-D
PRODUCT NAME:	TC59 (7 Track) DATA RELIABILITY TEST
DATE REVISED:	November 18, 1968
MAINTAINER:	Diagnostic Group
AUTHOR:	Keith F. Nelson/John Rodenhiser

1. ABSTRACT

The TC59 Data Reliability Test is primarily designed for the collection of statistical information pertaining to the data reliability of the tape drives that may be associated with the TC59 Magnetic Tape Control. The Program is also designed to be usable as an aid to the hardware debugging and maintenance of the TC59 Magnetic Tape Control and its associated magnetic tape drives. This program may also be used as an extended data reliability acceptance test.

2. REQUIREMENTS

2.1 Equipment

PDP-9
TC59 Magnetic Tape Control
1 to 8 TU20 or Similar Magnetic Tape Transports (7 track)

2.2 Storage

This program occupies all of the lower 4K. In addition one write buffer occupies memory addresses 1ØØØØ to 12467 and two read buffers occupy addresses 1247Ø to 15157 and 1516Ø to 1765Ø.

2.3 Preliminary Programs

The TC59 Instruction Test and Drive Function Timer programs should run in their entirety before attempting to run the Data Reliability Test.

3. LOADING PROCEDURE

Place the ABS binary tape in the Reader
Set ADDRESS to 17720
Press I/O RESET
Press READ IN

4. STARTING PROCEDURE

4.1 Starting Addresses

The TC59 Data Reliability Test has 3 starting addresses.

ØØ2ØØ Enter all parameter and test selections VIA Teletype Keyboard.

Ø3ØØØ Enter drive and test parameters via AC SWS, make 1 Write or Write/Read pass to EOT and HALT. (See paragraph 4.2 for drive and test parameters that may be selected.)

Ø2ØØØ Dump drive record and error counters on the teletype.

4.2.1 Control Switch Settings

When starting at address ØØ2ØØ there are no control switch settings, all parameters are loaded via the teletype keyboard.
When dumping error counters at address 2ØØØ there are no control switch settings.
When starting at address 3ØØØ, only 1 drive may be selected and the program will halt at EOT. Control switch settings are as follows:

AC

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	A		B		C	D		E		F		G		H		I	

SECTION	SWS	USAGE
A	Ø, 1, 2	DRIVE SELECTION (ONLY 1 DRIVE MAY BE SELECTED)
B	3, 4	WRITE ROUTINE EXIT MODE ØØ EXIT AT EOT Ø1 EXIT AT END OF RECORD LENGTH SEQUENCE* 1Ø or 11 EXIT AFTER EVERY RECORD
C	5	SELECT READ PASS Ø NO READ PASS 1 MAKE READ PASS
D	6,7	READ STOP MODE (RMO) ØØ NONSTOP Ø1 START STOP 1Ø or 11 RANDOM, NON STOP/START STOP DELAYS
E	8,9	RECORD LENGTH SEQUENCE (RLS)* ØØ 24 CHARACTER RECORDS (MIN) Ø1 4ØØ8 CHARACTER RECORDS (MAX) 1Ø 24 TO 4008 CHARACTER RECORDS (MIN TO MAX) 11 4ØØ8 TO 24 CHARACTER RECORDS (MAX TO MIN)
F	1Ø, 11	DENSITY SELECT ØØ 200 BPI Ø1 556 BPI 1Ø 8ØØ BPI

Minimum RLS = 256 records each 24 characters in length.
Maximum RLS = 256 records each 4ØØ8 characters in length.
Min. to Max RLS = A series of records with the first record 24 characters long and each successive record length incremented by 24 characters (12 characters if 556 BPI and 6 characters if 800 BPI) until the last record length of 4ØØ8 characters is reached.
Max. to Min. RLS = the reverse of Min. to Max. with the first record 4ØØ8 characters long and the last record 24 characters long.

4.2.1 Control Switch Settings (Continued)

G	12, 13	WRITE STOP MODE (WMO) ØØ NON STOP Ø1 START STOP 1Ø or 11 RANDOM, NON STOP/START STOP DELAYS
H	14	SELECT PARITY Ø EVEN 1 ODD
I	15, 16, 17	SELECT PATTERN (See Paragraphs 4.3.2.4 and 4.3.2.5)

4.2.2 Operational Switch Settings

AC switch a "1" or "up" means function selected.

SW	Function
1	Dump error counters at end of each Record Length Sequence
2	Delete Write with extended interrecord gap.
3	Print Write errors
4	Select Write statistical recovery
5	Print Read errors
7	Delete Read retrys
12	Increment Pattern selection
13	Complement Parity selection
14	Increment Density selection
15	Increment Record Length Sequence selection
16	Increment Write Mode selection
17	Increment Read Mode selection

4.3 Program and/or Operator Action

4.3.1 To start at ØЗØØØ

Set the AC Switches to select drive and test parameters per paragraph 4.1.

Set ADDRESS to ØЗØØØ
Press I/O RESET
Press START

The program will rewind the drive selected to Load Point, record test parameter selections and HALT at address ЗØ13.

Clear all AC Switches to Ø or set as desired per paragraph 5.1.1 thru 5.1.3

Press CONTINUE

The Program will exercise tape in the test sequence selected to EOT type out accumulated error information and HALT at address ЗØЗØ.

4.3.2 To Start at ØØ2ØØ

Set ADDRESS to ØØ2ØØ
Press I/O RESET
Press START

4.3.2.1 Drive Selection

The program will type

SELECT DRIVES

Any configuration of 1 to 8 drives may be selected and drive numbers may be typed in any sequence. After each drive typed in the program will type a comma (,). Typing in the same drive number twice will cause the initial selection of that drive to be deleted.

Typing in any key except Ø to 7 will cause a question mark (?) to be typed before the comma and that key will be ignored.

After selecting drives, a carriage return will end drive selection and the program proceed to test selection. If no drives were selected at the time the carriage return is typed, the process will start over again from the "SELECT DRIVES" type out.

Some variations of selecting drives could appear as follows:

SELECT DRIVES 3, 4, 5/
SELECT DRIVES 5, 4, 3/

In either case, drives 3, 4 and 5 are selected to be run

SELECT DRIVES
SELECT DRIVES

A carriage return was typed with no drives selected.

SELECT DRIVES 1, 9?, 1, 2

Drive 2 is the only drive selected, drive 1 was deleted (typed in twice) and the 9 was ignored.

4.3.2.2 Test Selection Typeout

At completion of Drive Selection the program will type:

SELECT TESTS

TST PAT PAR DEN RLS WMO RMO

TST = Test Sequence (Ø to 9)
PAT = Pattern selection (Ø to 7)
PAR = Parity Selection (Ø EVEN or 1 ODD)
DEN = Density (2 for 2ØØ, 5 for 556, 8 for 8ØØ)
RLS = Record Length Sequence
- Ø 24 character records (MINIMUM)
- 1 4ØØ8 character records (MAXIMUM)
- 2 24 to 4ØØ8 CHARACTER RECORDS (MINIMUM TO MAXIMUM)
- 3 4ØØ8 to 24 CHARACTER RECORDS (MAXIMUM TO MINIMUM)

WMO = Write Stop Mode*
- Ø NONSTOP
- 1 START/STOP
- 2 NONSTOP START/STOP RANDOM

* Determines if the next record should be written without waiting for a complete shutdown of the drive. In NON STOP Mode no waiting is done; in START/STOP Mode the program waits for the drive to shutdown between each record and in RANDOM Mode it is a combination of both.

RMO Read Stop Mode*
Ø NONSTOP
1 START/STOP
2 NONSTOP START/STOP RANDOM

4.3.2.3 Test Sequence Selections

The first selection made is test, type in the number of the test desired. Refer to 9.1 and 9.2 for complete test description and operational switch settings.

TEST	DESCRIPTION
Ø	Write to EOT on one drive, type accumulated write errors, repeat for each drive.
1	Write one record length sequence or 256 records, repeat for each drive, as each drive reaches EOT type accumulated write errors.
2	Write one record, repeat for each drive, as each drive reaches EOT type accumulated write errors.
3	Write to EOT, type accumulated write errors, rewind, repeat for each drive, then read to EOT, type accumulated read errors, repeat for each drive.
4	Write one record length sequence backspace, read, repeat for each drive, then as each drive reaches EOT type accumulated write and read error information.
5	Write one record, backspace, read, repeat for each drive, then as each drive reaches EOT type out accumulated error information.
6	Write one record length sequence, repeat for each drive, then backspace, repeat for each drive, read, repeat for each drive. As each drive reaches EOT type accumulated error information.
7	Write one record, repeat for each drive, backspace, repeat for each drive, read, repeat for each drive. 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 Ø (NON STOP), 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 a drive change between each record.

* Same as WRITE STOP Mode, see above.

-cont-

(i.e. WMO = Ø 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).

9

Test 9 is a read only test that maybe 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 selections follows TEST 3
b. TEST 9 selection follows TEST 6 with AC SW 1 = 1.
c. TEST 9 selection follows TEST 8 with AC SW 1 = 1.
d. TEST 9 selection follows TEST 5 SW 1 = 1 and only a single drive was selected.

For all other random data selections the random pattern would be changed before the write/read test was completed and test 9 would generate nothing but non-recoverable read errors.

4.3.2.4 Even Parity Pattern Selection

The next selection made is pattern. There are actually 16 unique pattern selections, 8 for each parity even or odd. The patterns that may be selected by even parity are:

PAT	PAR	DATA	DESCRIPTION
Ø	Even	Ø1Ø1Ø1	High Frequency outside skew
1	Even	773757 677375 767737 (etc.)	Sliding no bit (Ø) character pattern.
2	Even	252525	High frequency every other track.
3	Even	777677 767776	Half frequency outside tracks. High frequency all inside tracks.
4	Even	Ø1Ø2Ø3 Ø4Ø5Ø6 (etc.)	Incrementing character pattern no ØØ codes.
5	Even	777777 373737 575757 (etc.)	Three Ø bits each track every seventh word.
6	Even	777776 777775 777773 (etc.)	Sliding Ø through 18 data bits.
7	Even	RANDOM	Random data character pattern no ØØ codes.

4.3.2.5 Odd Parity Pattern Selections

The odd parity patterns that may be selected are:

PAT	PAR	DATA	DESCRIPTION
Ø	Odd	Ø1ØØØ1 ØØØ1ØØ	Half frequency outside skew.
1	Odd	ØØ4Ø2Ø 1ØØ4Ø2 Ø1ØØ4Ø (etc.)	Sliding 1 bit character pattern. (Isolated bit pattern.)
2	Odd	525252	High frequency every other track.
3	Odd	Ø7Ø7Ø7 6Ø6Ø6Ø 151515 424242 313131 Ø6Ø6Ø6 7Ø7Ø7Ø	Three zeros, three ones, three zeros, three ones, six zeros every track.
4	Odd	ØØØ1Ø2 Ø3Ø4Ø5 Ø6Ø71Ø	Incrementing character pattern ØØ codes included.
5	Odd	ØØØØØØ 4Ø4Ø4Ø 2Ø2Ø2Ø (etc.)	Each track 3 bits every seventh word.
6	Odd	777777	All ones pattern. High frequency all tracks.
7	Odd	RANDOM	Random data word pattern ØØ codes included.

4.3.2.6 Parity Selection (PAR)

The next selection made is parity (PAR):

Type in a Ø to select EVEN PARITY.
Type in a 1 to select ODD PARITY.

4.3.2.7 DENSITY SELECTIONS (DEN)

After parity has been selected, select density (DEN):

Type in a 2 for 2ØØ BPI.
Type in a 5 for 556 BPI.
Type in an 8 for 8ØØ BPI.

4.3.2.8 Record Length Sequence Selection (RLS)

After density, select record length sequence (RLS):

Type in a Ø for 24 character records.
Type in a 1 for 4ØØ8 character records.
Type in a 2 for 24 to 4ØØ8 character records length sequence MIN. to MAX.
Type in a 3 for 4ØØ8 to 24 character record length sequence MAX. to MIN.

4.3.2.9 Write Stop Mode Selections (WMO)

Then select Write Stop Mode (WMO):

Ø NONSTOP (no waiting between records for drive shutdown)
1 START/STOP (wait for drive to shutdown before next record is written)
2 RANDOM NONSTOP START/STOP DELAYS (random delays up to 128 millisec between records)

4.3.2.10 Read Stop Mode Selection (RMO)

Then select Read Stop Mode (RMO):

Ø NONSTOP)
1 START/STOP) same as WRITE, Ref. 4.3.2.9
2 RANDOM NONSTOP START/STOP DELAYS)

4.3.2.11 Final Test Select Approval (O.K.)

After selecting RMO, the program will pause. Examine the test sequence selected, and if everyhting is in order, type in a space. The program will type O.K. and enter the test parameters selected into a test table. If any key other than "SPACE" is typed, all parameter selections on that line will be discarded and test parameter selection will be restarted from test selection (TST).

After at least 1 test has been fully selected to the "OK" typeout, a carriage return instead of a test number will end the test selection and the program will proceed to execute all tests selected.

4.3.2.12 Illegal Select Characters

If, at any time during selection of test parameters, an invalid key is typed, all parameter selections up to that point on the line will be discarded, and parameter selection will be restarted from test selection (TST) on a new line.

A carriage return with no tests selected will cause the program to remain in the test selection routine.
Up to 64 tests may be selected at one time.
An example of test parameter selection appears below:

4.3.2.13 Test Selection Examples

SELECT TESTS

TST	PAT	PAR	DEN	RLS	WMO	RMO	
?	(Acarriage return was typed no tests selected.)						
Ø	7	Ø	8ØØ	3	Ø	Ø	O.K.
A?	(An Invalid test number was typed.)						
3	5	1	A?	(Invalid key for density.)			
?3	5	1	556	1	2	1	(Space wasn't typed after RMO).
3	5	1	556	1	2	1	O.K.
(Carriage Return)							

Only two tests were selected by the above sequence:

1. Write length of tape sequence (TEST Ø)
   Pattern 7 (Random Data) Even Parity
   8ØØ BPI
   MAX to MIN Record Length Sequence
   NONSTOP mode of write.

2. Write Length of Tape, rewind, read (TEST 3)
   Pattern 5 Odd parity (3 one bits each track every 7 words.)
   556 BPI
   4ØØ8 Character Records
   Write Random NONSTOP START/STOP
   Read START/STOP

5. Operating Procedure

5.1 Operational Switch Settings

The operational switch settings may be used to:

a. Alter error recovery procedures.
b. Cause error information to be typed as each error occurs.
c. Cause a test sequence to be re-run with a variation in Pattern, Mode, Density, Parity, Record Length Sequence, or Read or Write stop modes.'

5.1.1 Switches to alter error recovery

The function performed is with the switch in the 1 or UP position

SW	FUNCTION	USAGE
2	Delete write with Extended interrecord Gap*	Use of this switch will cause records with write errors to be left on tape. The read pass with data typeouts selected would then be an aid in determining write error origins.
4	Select write statistical recovery	Use of this switch will select the back-space 2 records, space forward 1 record, rewrite sequence. This sequence causes the same record to be rewritten on approximately the same area of tape that the write error occurred. This method keeps interrecord gap from getting larger. Data is written over same spot on tape to try and find bad tape.
7	Delete read retrys	This switch is included as an aid to scoping read circuits as it deletes the backspace, reread twice sequence.

5.1.2 Error Typeout Control Switches

All read and write errors are accummulated by drive, and as each drive reaches end of tape, the accumulated error information is typed on the teletype. For reliability or acceptance testing, it is not necessary for errors to be typed as they occur. Also, it is not desirable for typeouts to occur during scope loop operations.

However, the following switches have been included as an aid to hardware debugging.

The switch a 1or UP is functions selected

SW	FUNCTION
3	Type Write Error Status (Ref. 6.2.1)
5	Type all Read Status and Data Errors (Ref. 6.2.2)

* Delete error rewrites and read over incorrectly written block to find badly written data.

5.1.3 Switches to Alter Test Sequences

Normally, the program writes and reads to end of tape, and then starts the next test sequence that was typed in. To eliminate having to type in a long series of test selections to exercise various parameter selections and to eliminate waiting for end of tape to proceed to the next test sequence, the following switch options have been built into the Data Reliability test:

The switch a "1" or "UP" is function selected. Switch priority for the selection of new test parameters is: 12, 13, 14, 15, 16, 17

	SW	FUNCTION
	1	Dump error counters and proceed to next test sequence at the end of one record length sequence. (256 records for RLS = Ø or 1, one MIN to MAX sequence for 2, or one MAX to MIN sequence for 3).
PAT	12	Increment pattern selection and repeat last test sequence. Pattern selection is reset to its original selection after pattern 7 has been exercised.
PAR	13	Complement parity selection and repeat test sequence if new parity selection is different than the original test sequence.
DEN	14	Increment density selection to the next highest density and repeat test sequence selected. After 8ØØBPI has been exercised, density selection is reset to its original test sequence selection.
RLS	15	Increment RLS selection to the next sequence. After MAX to MIN has been exercised reset RLS selection to its original test sequence selection.
WMO	16	Increment WMO to the next stop mode. After random Start/Stop has been exercised, reset WMO to its original test selection.
RMO	17	Increment RMO to the next read stop mode. After read random start/stop has been exercised, reset RMO to its original test selection.

6. ERRORS

The normal mode (All AC SWS = Ø) of operation for this test is to simply accumulate the errors that occur and to dump the contents of the counters on the teleprinter as each drive reaches end of tape.

The only error typeout that can occur in this mode is if the tape system fails to write the same record 4 times in a row with extended interrecord gap.

6.1 Error Type out Options

The options to print write and read errors as they occur are on separate switches:

SW3 = 1 is print write errors as detected.
SW5 = 1 is print read errors as detected.

6.2 Error Typeout Formats

6.2.1 Write Error Typeouts

If SW3 = 1 and a write error status is detected by the program the following typeout will occur:

```
WRITE STATUS ERROR
  COMD      STATUS          RECORD      LENGTH
1Ø45ØØ      42Ø1ØØ          ØØØØ44      2Ø16 Min. to Max
```

This particular typeout indicates a parity error (42Ø1ØØ) occurred while writing record number 44_8 on Drive 1 at 556BPI (1Ø45ØØ)

If read pass is selected and a write error occurs, the program backspaces and rewrites with extended interrecord gap. If the write error persists for four rewrites, the following typeout will occur:

```
WRITE STATUS ERROR
  COMD      STATUS  RECORD
1Ø45ØØ      42Ø1ØØ  ØØØØ44  XIRG WRITTEN 4 TIMES
```

The program will attempt to write with extended gaps until end of tape is detected and this typeout will occur every fourth try that fails. Setting switch 2 to a 1 will delete all writes with extended gaps.

If AC SW1 is set to a 1, or program started at address 2ØØØ, error and record counters are typed on the teleprinter. The write dump portion of these typeouts could appear as follows:

```
  WRITE DUMP
DRV  PAT  PAR  DEN  MODE  RECRDS  LENGTH
1      7    1  800   SSTP  002954      2016 MAX TO MIN
WRITE ERRORS=ØØØØØ9
RECOVERED AT 1  ØØØØØ2
RECOVERED AT 2  ØØØØØ3
RECOVERED AT 5  ØØØØØ1
PERMANENT
        BADSPT  ØØØØØ3
```

Two thousand, nine hundred fifty four records were written on drive 1 start stop with record length sequence 3. Nine write status errors occurred. Of the original 9 errors, two were recovered on the first rewrite, 3 were recovered at two rewrites, one was recovered at five rewrites and the other 3 were not recovered after 7 rewrites and were counted as permanent badspots. The average record length was 2Ø16 characters.

Had SW1 been a Ø, and the drive had gone to end of tape, the typeout would indicate END OF TAPE instead of WRITE DUMP.

6.2.2 Read Error Typeouts

IF AC SW5 is a 1 and a read status error occurs, the following type could occur:

```
READ STATUS ERROR
  COMD STATUS RECORD LENGTH
 442600 420100 001745  777764
```

A parity error occured on Drive 4 while reading record number 1745_8 that was 28 PDP-9 words long.

If AC SW1 is set to a 1, and at least one record length sequence has been completely read, or program started at address 2ØØØ, read error and record counters are typed on the teleprinter as follows:

```
  READ DUMP
DRV  PAT  PAR  DEN  MODE  RECRDS  LENGTH
 0    4    0   800   NSTP  001994     2016 MIN TO MAX
*READ ERRORS =ØØØØØ7
NON RECOVERABLE=ØØØØØ2
DATA ERRORS=ØØØØØ3
DATA NO STATUS=ØØØØØ1
```

During the process of reading 1994 records at 800 B PI on drive Ø, seven read errors occured. Two of the errors still occured after 2 rereads and were counted as non recoverable, three of the error records had data errors. One record had data errors, but the status did not indicate anything was wrong with the record. Four of the read errors were recoverable.

If AC SW1 had been a 0 and the read pass had gone to end of tape, the typeout would have been headed by:

```
READ PASS
END OF TAPE
```

* Read errors are defined as any errors which occur during read pass.
Non-recoverable errors are those errors that cannot be eliminated by re-reading the record a total of three times.
Data errors are errors caused by bad transfer of data.
Data no status are data errors not accompanied by a status error.

6.3 Error Recovery Procedures

6.3.1 Write Error Recovery Procedures

Write error recovery procedure varies according to:

a. Write Only Test
b. Read pass selected
c. SW4 = 1
d. SW2 = 1 and Read Pass selected.

If the test sequence being executed is a write only sequence, and SW4 = Ø, the write error is simply counted and the program proceeds to the next record.

If the test sequence being executed will make a read pass, and SWS 4 and 2 both = Ø, the recovery procedure is to backspace over the improperly written block and rewrite with extended interrecord gap.

If SW4 = 1 and a write error is detected, the program will execute a backspace 2 records, space forward 1 record, rewrite sequence. The sequence will be repeated up to 7 times if the write error persists. If a write error is generated by all 8 writes, the error is counted as a permanent badspot. If the write error is recovered before the seventh rewrite, one is added to the error pass recovery table for that drive and error pass. Each write error is counted twice if SW4 = 1, once as a write error and then either as a permanent badspot, or as recovered at 1 to 7 rewrites. If SW4 = 1 and read pass is selected, the backspace and write with extended interrord gap is not executed unless the write error is determined to be a permanent badspot. If SW2 = 1 and the read pass is selected, write with extended gap is deleted.

6.3.2 Read Error Recovery Procedures.

If a read error is detected by this program, it is counted as 1 error and the program executes a backspace, reread sequence. If the read error persists, the reread sequence is executed a second time. If the read error still occurs, it is counted as a non-recoverable read error.

If SW7 = 1, the program does not attempt to reread but simply continues on the next record in sequence.

Data errors in a record are only accumulated on the first read, unless they are not accompanied with a status error. Data errors with non error status must be considered non-recoverable.

9. DESCRIPTION

9.1 General

The TC59 Data Reliability Test 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 of course the write and read routines. The write routine is exited either after every record, every record length sequence (RLS) or at end of tape. The read routine is exited when the last record written on tape has been read. (Tests 8 and 9 manipulate the last record counter to cause the read routine to exit every record).

Other subroutines used, set up drive selection to the lowest drive number, change drive selection to the next higest drive and routines to get and save error and position tables for the drive currently selected.

These subroutines are tied together in different sequences to form the test selections Ø to 9.

9.2 Test Descriptions

9.2.1 Test Ø Description

Test Ø is a write only to end of tape test. Write errors are simply accumulated and their total dumped at end of tape. As each drive reaches end of tape, its record and error counters are typed out, a rewind is started and the program starts to write to end of tape on the next highest drive selected.

SW3 = 1 will cause each write error status to be typed as it occurs.

SW4 = 1 will cause statistical write error recovery to be executed.

SW1 = 1 will have no effect, the write routine is not exited until end of tape.

If a random data pattern is selected, (Pattern 7), the data pattern written will be changed every record.

9.2.2 Test 1 Description

Test 1 is also a write only test. However, the write routine exit is the end of every Record Length Sequence (RLS). If more than one drive is selected to be run, the program will change to the next highest drive number selected at the end of each record length sequence.

Write record and error counters are typed, by drive, as each drive reaches end of tape.

If random data is selected, the data pattern written will be changed every record.

SW3 = 1 will cause each write error status to be typed as it occurs.

SW4 = 1 will cause the statistical write recovery to be selected.

SW1 = 1 will cause error and record counters to be type when all drives have completed 1 Record Length Sequence (RLS).

9.2.3 Test 2 Description

Test 2 is also a write only test. However, the write routine exits is every record, and drive selection is changed between every record.

As in tests Ø and 1, random data selection will cause the data pattern written to be changed every record.

All switch selections valid for TEST 1 are valid for this TEST.

Write mode non stop (WMO = Ø) will not be an effective selection for this test since the write routine exit is every record.

9.2.4 Test 3 Description

Test 3 is the first of the read pass after write pass tests. This test first writes to end of tape on the lowest drive selected, starts rewinding it and then writes to end of tape on the next highest drive. After the pattern has been written to end of tape on all drives, the program reads to end of tape on each drive selected.

If a random data pattern is selected, only a single random data pattern is generated for the whole test.

Switches 2, 3, and 4 are valid selections for the write pass.

Switches 5 and 7 are valid for the readpass.

Switch 1 is ignored.

9.2.5 Test 4 Description

Test 4 is also a write sequence followed by a read sequence test. The program starts with the lowest drive number selected, writes one record length sequence, backspaces (or rewinds if the first sequence written) and then reads the record length sequence. At this point, the program selects the next highest drive and writes, backspaces (or rewinds) and then reads. Random data selection will cause a new pattern to be written and read on each drive.

As each drive reaches end of tape during a write sequence, write record and error counters are typed. As each drive reaches end of tape during a read sequence, read record and error counters typed.

SW3 = 1 will cause each write status error to by typed as it occurs.

SW4 = 1 will select statistical write recovery.

SW5 = 1 will cause all read status and data errors to be typed as they occur.

SW7 = 1 will delete read recovery.

SW2 = 1 will delete write recovery.

SW1 = 1 will cause all counters to be dumped after 1 RLS on every drives.

9.2.6 Test 5 Description

Test 5 operates similarly to test 4, except the write, backspace read sequence is for single record instead of a record length sequence. Drive change is made after every record has been read.

If a random data pattern is selected, each record written will be a different pattern.

Write record and error counters are typed as each drive reaches end of tape on a record. Read record and error counters are typed as each drive reaches end of tape on a read record.

All switch selections valid for test 4 are valid for this test.

9.2.7 Test 6 Description

Test 6 is similar in operation to test 5, in fact, identical if only a single drive is selected. However, if more than a single drive is selected, the test sequence is somewhat different.

One record length sequence is written on each drive selected, then all drives are backspaced (or reworund if the first RLS for BOT) to the beginning of the RLS, and then the record length sequence is read on each drive.

If random data is selected, the data pattern is not changed until all drives have completed the read operation.

Again, write record and error counters are typed as each drive reaches end of tape on a write pass and read record and error counters are typed as each drive reaches end of tape on a read pass.

All switch selection valid for test 4 are valid for this test.

9.2.8 Test 7 Description

Test 7 operates somewhat similar to test 6 except that a single record is written on each drive selected, each drive is backspaced, and then the record is read on each drive.

As in test 5, WMO and RMO of Ø or NON STOP will have no effect, since the write and read routine exits are every record.

Write and read record and error counters are typed individually by drive as each drive reaches end of tape on a write or read pass.

All switch options valid for test 4 are valid for this test.

9.2.9 Test 8 Description

Test 8 is somewhat similar in operation to test 6 in that a complete record length sequence is written on all drives selected before backspacing and reading.

If either Write Mode or Read Mode is NONSTOP the program completes a full RLS in that mode before changing drives. Selecting a stop mode, (2 or 3) will cause the program to change drives between every record.(i.e. if WMO = Ø and RMO = 1) then each RLS will be written non stop, but the read pass will be made start/stop with a drive change between every record.

If random data is selected, a new data pattern is not generated until all drives have read to the end of a record length sequence.

9.2.1Ø Test 9 Description

Test 9 is the read only test, included in this series of test mainly for the purpose of a drive compatability test.

If the RMO selected is "Ø" or nonstop, the program will read tape nonstop to the end of each RLS before changing drives.

If the RMO selected is either 1 or 2, the program will change drive selections between each record.

Test 9 can be operated without restrictions for all data pattern selections except random data. (Pattern 7 Even or Odd parity). (Assuming also of course that the parity, density and record length sequence parameters agree with the information recorded on tape).

Random data can be used in conjunction with Test 9 with the following instructions:

a. One of the test sequences that hold pattern selection for a complete RLS must have been previously selected and run with SW1 = 1. These test sequences include Test 6 and Test 8 if multiple drives, and Test 4 if single drives.

b. A Test 9 must be selected as the test following when typing in test selections.

c. Test 3 writes to end of tape on all drives selected, rewinds and then reads on all drives.

Test 9 may follow a test 3 selection without the use of SW1.

MAGTAPE IOT's

MNEMONIC	OCTAL	DESCRIPTION
MTSF	7Ø7341	Skip on error flag or magtape flag.
MTCR	7Ø7321	Skip on tape control ready
MTTR	7Ø73Ø1	Skip on transport ready.
MTAF	7Ø7322	Clear status and command registers and the EF and MTF if the tape control is ready. If the tape control is not ready clear EF and MTF only.
MTRC	7Ø7312	Inclusive OR command register into AC.
LCM	7Ø7324	Inclusive OR AC bits Ø-5, 9-11 into command register and jam transfer bits 6,7,8.
MTRS	7Ø7352	Read status register into AC.
MTGO	7Ø73Ø4	Set "GO" bit to execute command register.

COMMAND REGISTER

Ø	
1	Unit
2	
3	Parity
4	Core Dump
5	Ext Interrecord Gap
6	
7	Command
8	
9	Enable Flags
1Ø	
11	Density

COMMANDS

Ø	No operation
1	Rewind
2	Read
3	Read/Compare
4	Write
5	Write EOF
6	Space Forward
7	Space Reverse

DENSITY

Ø	2ØØ BPI
1	556 BPI
2	8ØØ BPI
3	8ØØ BPI(9 track)

STATUS REGISTER

Ø	Error flag (EF)
1	Tape rewinding
2	Beginning of tape (BOT)
3	Illegal command
4	Parity error (lateral or longitudinal)
5	End of file (EOF)
6	End of tape (EOT)
7	Read/Compare error
8	Record length incorrect (WC=Ø long, WC=1 short)
9	Data request late
1Ø	Bad tape
11	Magnetic tape flag (MTF)

```
                        .TITLE DAREL1
                        .ABS
                    /TC59 DATA RELIABILITY TEST (TAPE1)
                    /START AT 200
                    /SELECT DRIVES (TYPE IN DRIVE NUMBERS 0 TO 7)
                    /NUMBERS CAN BE TYPED IN ANY SEQUENCE
                    /TYPING SAME NUMBER TWICE DELETES DRIVE
                    /CARRIAGE RETURN ENDS SELECTION
                    /SELECT TESTS
                    /TST PAT PAR DEN RLS WMO RMO
                    /TEST 0 WRITE ON ONE DRIVE TO EOT REWIND START NEXT DRV
                    /TEST 1 WRITE ONE RLS OR 512 RECORDS CHANGE DRIVES
                    /TEST 2 WRITE ONE RECORD CHANGE DRIVES
                    /TEST 3 WRITE TO EOT RWD READ
                    /TEST 4 WRITE 1 RLS BACK SPACE READ CHANGE DRIVES
                    /TEST 5 WRITE 1 RECORD BACKSPACE READ CHANGE DRIVES
                    /TEST 6 WRITE 1 RLS CHG DRV BACKSPACE CHANGE READ CHANGE
                    /TEST 7 WRITE 1 RECORD CHANGE BACKSPACE CHG READ CHG
000100                          .LOC 100
000100  000000      MSBITS    0                   /DRIVE MASTER SELECT BITS
000101  000000      CDRIVE    0                   /CURRENT DRIVE
000102  000000      FDRIVE    0
000103  000000      PATNUM    0                   /PATTERN BEING EXERCISED
000104  000000      PARBT1    0                   /PARITY SELECTION
000105  000000      DRVDEN    0                   /DRIVE AND DENSITY
000106  000000      RLTROL    0                   /RECORD LENGTH CONTROL
000107  000000      MODBIT    0                   /WRITE STOP MODE
000110  000000      READMO    0                   /READ STOP MODE
000111  000000      RECSYS    0                   /INDICATES READ PASS BE MADE
000112  000000      EXITMO    0                   /EXIT EOT 1 BLOCK OR 1 RLS
000113  000000      STRLEN    0                   /STARTING BLOCK LENGTH
000114  000000      COMAND    0                   /COMMAND PARITY DEN DRIVE
000115  000000      RLKINC    0                   /BLOCK LENGTH INCREMENTER
000116  000000      WRPASS    0                   /WRITE RECOVERY COUNT
000117  000000      NUMTST    0                   /NUMBER OF TESTS SELECTED
000120  000000      TSTDEX    0                   /POINTER TO GET TEST
000121  000000      TBLCNT    0                   /NUMBER OF TESTS EXECUTED
000122  000000      EXETST    0                   /TEST BEING EXECUTED
000123  000000      EXECNT    0                   /NUMBER OF TIMES EXECUTED
000124  000000      SWTEST    0
000125  000000      EOSFLG    0                   /CLEARED AT END OF RLS
000126  000000      SVREGR    0                   /TEMP STORAGE
                    /
                        .EJECT
```

```
                                /WRITE ERROR AND RECORD CONTROL REGISTERS
00127       000000              WRCHEK    0
00130       000000              RECV1     0
00131       000000              RECV2     0
00132       000000              RECV3     0
00133       000000              RECV4     0
00134       000000              RECV5     0
00135       000000              RECV6     0
00136       000000              RECV7     0
00137       000000              PERMRS    0
00140       000000              RECORD    0
00141       000000              LASRCR    0
00142       000000              WRTEOT    0
00143       000000              WRTLFN    0
00144       000000              WRRECR    0
                                /READ ERROR AND RECORD CONTROL REGISTERS
00145       000000              READLN    0
00146       000000              COMPLN    0
00147       000000              READNX    0
00150       000000              COMPNX    0
00151       000000              CORECR    0
00152       000000              RNOSTA    0
00153       000000              CMPERR    0
00154       000000              NRREAD    0
00155       000000              RDERRS    0
00156       000000              RDEOT     0
                                /
                                          .EJECT
```

```
                        /TC59 DATA RELIABILITY TEST
                        /FIRST SELECT DRIVES
00200                           .LOC 200
00200   200452          RELIAB  LAC SELTX1
00201   105136                  JMS TYPET
00202   140100                  DZM MSRITS          /CLR DRVS SELECTED
00203   101076                  JMS WAITKY
00204   545676                  SAD (215            /CAR RET
00205   600216                  JMP .+11            /YES TEST FOR NO DRVS
00206   505677                  AND (370
00207   545700                  SAD (260            /VALID DRIVE NYMB
00210   600222                  JMP VLDDRV          /YES PUT IT IN TABLE
00211   760277                  LAW 277
00212   105152                  JMS TY1ASC          /TYPE QUES
00213   760254                  LAW 254
00214   105152                  JMS TY1ASC          /COMMA
00215   600203                  JMP RELIAB+3        /WAIT NEXT
00216   200100                  LAC MSRITS
00217   741200                  SNA                 /SELECT ANY DRIVES
00220   600200                  JMP RELIAB
00221   600241                  JMP SLTSTS          /DO TESTS
                        /
                                .EJECT
```

```
00222   760254      VLDDRV  LAW 254
00223   105152              JMS TY1ASC          /TYPE @
00224   201104              LAC CHARIN          /COMMA
00225   505701              AND (7
00226   040101              DAC CDRIVE          /S@VE DRV NUMBER
00227   740001              CMA                 /MAKE-FOR JSZ
00230   040102              DAC FDRIVE
00231   205702              LAC (400000
00232   440102              ISZ FDRIVE          /BIT POSITIONED
00233   600237              JMP .+4             /NO
00234   240100              XOR MSBITS                  /ADD OR DELETE DRIVE
00235   040100              DAC MSBITS
00236   600203              JMP RELIAB+3        /GET NEXT
00237   744020              RCR                 /MOVE BIT OVER 1
00240   600232              JMP .-6             /TRY AGAIN
        017700      TSTTBL=17700
00241   200463      SLTSTS  LAC SELTX2
00242   105136              JMS TYPET
00243   140117              DZM NUMTST          /CLR SELECTED
00244   205703              LAC (TSTTBL-1
00245   040016              DAC 16              /SET FOR INDIRECTS
00246   200515              LAC CRLFSP
00247   105136              JMS TYPET
00250   140017              DZM 17              /CLR ASSMBL WORD
00251   101076              JMS WAITKY          /WAIT FOR KEY
00252   545676              SAD (215            /C@R RET
00253   600267              JMP TSTYQS+3                /YES SEE IF ANY SELECTED
00254   505677              AND (370
00255   545700              SAD (260            /VALID NUMBER 0 TO 7
00256   600273              JMP VLDTST          /YES
00257   201104              LAC CHARIN
00260   545704              SAD (270
00261   600273              JMP VLDTST
00262   545705              SAD (271
00263   600273              JMP VLDTST
00264   760277      TSTYQS  LAW 277
00265   105152              JMS TY1ASC          /TYPE QUES
00266   600246              JMP SLTSTS+5        /TRY AGAIN
00267   200117              LAC NUMTST
00270   741200              SNA                 /SELECT ANY TESTS
00271   600264              JMP .-5             /NO
00272   600537              JMP EXECUT          /EXECUTE SELECTED
                    /
                            .EJECT
```

```
00273  201104  VLDTST  LAC CHARIN          /GET TEST NUMBER TYPED
00274  505706          AND (17             /MASK DIGIT
00275  744020          RCR
00276  742020          RTR                 /MOVE TO TEST POSITION
00277  742020          RTR
00300  040017          DAC 17              /SAVE IT
00301  200520          LAC SPA3TX          /SPACE 3
00302  105136          JMS TYPET
00303  101076          JMS WAITKY          /W@IT FOR PATTERN KEY
00304  505677          AND (370
00305  545700          SAD (260            /VALID PATTERN NUMBER
00306  741000          SKP                 /YES
00307  600264          JMP TSTYQS          /NOT VALID TYPE QUESTION
00310  201104          LAC CHARIN
00311  505701          AND (7              /MASK OCTAL
00312  340017          TAD 17              /COMBINE WITH TEST
00313  040017          DAC 17              /S@VE IT
00314  200520          LAC SPA3TX          /SPACE 3 MORE
00315  105136          JMS TYPET
00316  101076          JMS WAITKY          /WAIT FOR PARITY
00317  505707          AND (376
00320  545700          SAD (260            /=0 OR 1
00321  741000          SKP                 /YES
00322  600264          JMP TSTYQS          /NOT = 0 OR 1
00323  201104          LAC CHARIN
00324  505710          AND (1
00325  744010          RCL                 /POSITION PARITY
00326  742010          RTL                 /SELECT
00327  340017          TAD 17              /COMBINE WITH TEST
00330  040017          DAC 17              /AND P@TTERN SELECT
00331  200523          LAC SPA2TX
00332  105136          JMS TYPET           /SPACE 2
00333  101076          JMS WAITKY          /WAIT FOR DENSITY
00334  545711          SAD (262            /SELECT 200
00335  600347          JMP SEL200          /OK
00336  545712          SAD (265            /500
00337  600353          JMP SEL556          /OK
00340  545704          SAD (270            /MUST BE 800
00341  741000          SKP                 /OK
00342  600264          JMP TSTYQS                  /NOT VALID DENSITY
00343  200526          LAC ZEROTX
00344  105136          JMS TYPET           /TYPE 20S
00345  205713          LAC (200
00346  600356          JMP TADDEN          /800 BPI SELECTED
                       /
                       .EJECT
```

```
00347   200526   SEL200   LAC ZEROTX
00350   105136            JMS TYPET      /TYPE 20S
00351   750000            CLA
00352   600356            JMP TADDEN     /200 BPI SELECT
00353   200531   SEL556   LAC FIV6TX     /TYPE 56
00354   105136            JMS TYPET
00355   205714            LAC (100
00356   340017   TADDEN   TAD 17         /COMBINE DESNITY SELECT
00357   040017            DAC 17         /WITH TST PAT PAR
00360   101076            JMS WAITKY               /WAIT FOR RECORD LENGTH
00361   505715            AND (374
00362   545700            SAD (260       /MUST BE 0-1-2-3
00363   741000            SKP            /OK
00364   600264            JMP TSTYQS     /NOT V@LID
00365   201104            LAC CHARIN     /0=MINIMUM
00366   505716            AND (3         /MASCK SELECT
00367   545710            SAD (1         /SELECT MAX
00370   205717            LAC (400       /YES
00371   545720            SAD (2         /MIN TO MAX
00372   205721            LAC (1000      /YES
00373   545716            SAD (3         /OR MAX TO MIN
00374   205722            LAC (1400      /YES
00375   340017            TAD 17         /COMBINE RLS WITH
00376   040017            DAC 17         /TST PAT PAR DEN
00377   200520            LAC SPA3TX     /SPACES 3 FOR WMO
00400   105136            JMS TYPET
00401   101076            JMS WAITKY     /WAIT FOR KEY
00402   505715            AND (374
00403   545700            SAD (260       /MUST =
00404   741000            SKP            /0-1-OR 2
00405   600264            JMP TSTYQS     /NOT V@LID
00406   201104            LAC CHARIN
00407   505716            AND (3
00410   545716            SAD (3         /3 IS
00411   600264            JMP TSTYQS     /NOT VALID
00412   744010            RCL
00413   742010            RTL            /POSITION
00414   740010            RAL
00415   340017            TAD 17         /COMBINE WITH WMO
00416   040017            DAC 17         /TST PAT PAR DEN RLS
00417   200520            LAC SPA3TX
00420   105136            JMS TYPET      /SPACE 3 MORE
00421   101076            JMS WAITKY     /WAIT FOR READ MODE
00422   505715            AND (374
00423   545700            SAD (260       /MUST =0 1 OR 2
00424   741000            SKP            /OK SO FAR
00425   600264            JMP TSTYQS     /NOT VALID
00426   201104            LAC CHARIN
00427   505716            AND (3
00430   545716            SAD (3         /CANNOT=
00431   600264            JMP TSTYQS     /3 EITHER
                 /
                          .EJECT
```

```
00432   545710                  SAD (1              /1 IS
00433   205723                  LAC (2000           /NONSTOP
00434   545720                  SAD (2              /2 IS
00435   205724                  LAC (4000           /RANDOM
00436   340017                  TAD 17              /COMBINE WITH RMO
00437   040017                  DAC 17              /TST PAT PAR DFN RLS WMO
00440   101076                  JMS WAITKY          /SPACE KEY
00441   545725                  SAD (240            /INDIC@TES ALL OK
00442   741000                  SKP                 /WITH THE OUTSIDE
00443   600246                  JMP SLTSTS+5        /NOT OK
00444   200017                  LAC 17
00445   060016                  DAC* 16             /STORE TEST SELECTION
00446   440117                  ISZ NUMTST          /+1 TESTS COUNTED
00447   200534                  LAC OKTEXT
00450   105136                  JMS TYPET           /TYPE OK
00451   600246                  JMP SLTSTS+5        /GET NEXT TEST
00452   000453          SELTX1  .+1
00453   064241                  .ASCII    <15><12><12>'SELECT DRIVES '<177>
00454   251612
00455   462130
00456   352100
00457   422451
00460   153212
00461   515017
00462   700000
00463   000464          SELTX2  .+1
00464   064241                  .ASCII    <15><12><12>'SELECT TESTS '<15>
00465   251612
00466   462130
00467   352100
00470   522132
00471   352246
00472   200320
00473   000000
00474   052512                  .ASCII    <12>'TST PAT PAR DFN RLS WMO RMO'<177>
00475   352100
00476   502032
00477   420240
00500   406444
00501   042212
00502   471012
00503   246246
00504   202571
00505   547500
00506   512331
00507   777400
                        /
                        .EJECT
```

```
00510   000511          TSTEXT  .+1
00511   064241                  .ASCII  <15><12><12>'TEST '<177>
00512   252212
00513   516504
00514   077400
00515   000516          CRLFSP  .+1
00516   064244                  .ASCII  <15><12><40><177>
00517   077400
00520   000521          SPA3TX  .+1
00521   201004                  .ASCII  <40><40><40><177>
00522   077400
00523   000524          SPA2TX  .+1
00524   201017                  .ASCII  <40><40><177>
00525   700000
00526   000527          ZEROTX  .+1
00527   301404                  .ASCII  '00  '<177>
00530   020376
00531   000532          FIV6TX  .+1
00532   325544                  .ASCII  '56  '<177>
00533   020376
00534   000535          OKTEXT  .+1
00535   475351                  .ASCII  'O.K.'<177>
00536   327376

                        /TC59 DATA RELIABILITY TEST TAPE 2
                        /EXECUTE TESTS SELECTED AND DRIVE CONTROL ROUTINES
                        /EXECUTE TESTS CURRENTLY SELECTED
00537   205726          EXECUT  LAC (TSTTBL
00540   040120                  DAC TSTDEX              /SET UP
00541   140121                  DZM TBLCNT
00542   220120                  LAC* TSTDEX             /GET TEST CONTROL WRD
00543   742010                  RTL
00544   742010                  RTL
00545   740010                  RAL
00546   505706                  AND (17
00547   040122                  DAC EXETST              /SAVE TEST NUMBER
                        /SET UP RUN MODES OUT OF CONTROL BITS
00550   220120                  LAC* TSTDEX
00551   505701                  AND (7
00552   040103                  DAC PATNUM              /SAVE PATTERN
00553   220120                  LAC* TSTDEX
00554   505727                  AND (10
00555   040104                  DAC PARBT1              /PARITY
00556   220120                  LAC* TSTDEX
00557   505730                  AND (300
00560   040105                  DAC DRVDEN              /DENSITY
00561   220120                  LAC* TSTDEX
00562   505722                  AND (1400               /RECORD LENGTH
00563   040106                  DAC RLTROL                      /CONTROL BITS
00564   220120                  LAC* TSTDEX
00565   505731                  AND (60
00566   040107                  DAC MODBIT              /WRITE STOP MODE
00567   220120                  LAC* TSTDEX
00570   505732                  AND (6000
00571   040110                  DAC READMO              /READ STOP MODE
00572   205733                  LAC (XCT TRLTST
```

```
00573   340122           TAD EXETST      /TO GET TO TEST SELECTED
00574   040611           DAC GOTST
00575   140123           DZM EXECNT      /ZERO TEST EXECUTE COUNT
00576   200510   TSRUNL  LAC TSTEXT
00577   105136           JMS TYPET       /TYPE TEST
00600   200122           LAC EXETST
00601   345700           TAD (260
00602   105152           JMS TY1ASC
00603   200121           LAC TBLCNT
00604   103655           JMS SPTCON      /TYPE TABLE POSITION
00605   200123           LAC EXECNT
00606   103655           JMS SPTCON      /AND TEST EXECUTE COUNT
00607   777777           LAW -1
00610   040124           DAC SWTEST
00611   401155   GOTST   XCT TBLTST      /DO TEST
00612   440123           ISZ EXECNT      /+1 EXECUTE COUNT
                 /
                         .EJECT
```

```
                                /GET SWS SEE IF READ MODE TO CHANGE
00613   750004                  LAS
00614   740020                  RAR
00615   740400                  SNL                     /CHANGE READ MODE
00616   600634                  JMP INCWMO              /NO
00617   777775                  LAW -3
00620   340122                  TAD EXETST
00621   741100                  SPA                     /WRITE ONLY TEST
00622   600634                  JMP INCWMO              /YES
00623   200110                  LAC READMO
00624   345723                  TAD (2000               /+1 READ MODE
00625   040110                  DAC READMO
00626   545732                  SAD (6000               /DONE RANDOM
00627   741000                  SKP                     /YES
00630   600576                  JMP TSRUNL              /RE EXECUTE NEXT RD MODE
00631   220120                  LAC* TSTDEX
00632   505732                  AND (6000               /RESET READ MODE
00633   040110                  DAC READMO              /TO ITS 0 PASS VALUE
                                /SEE IF WRITE MODE IS TO CHANGE
00634   750004                  INCWMO  LAS
00635   742020                  RTR
00636   740400                  SNL                     /CHNG WRT MODE
00637   600651                  JMP INCRLC              /NO CHECK RECRDLNTH
00640   200107                  LAC MODBIT
00641   345734                  TAD (20                 /+1 WRITE MODE
00642   040107                  DAC MODBIT
00643   545731                  SAD (60                 /DONE RANDOM
00644   741000                  SKP                     /YES
00645   600576                  JMP TSRUNL              /RE EXECUTE NEW W MODE
00646   220120                  LAC* TSTDEX
00647   505731                  AND (60
00650   040107                  DAC MODBIT              /RESET W MODE TO STRT
                                /SEE IF RECORD LENGTH IS TO CHANGE
00651   750004                  INCRLC  LAS
00652   505735                  AND (4
00653   741200                  SNA                     /CHANGE RECORD LENGTH
00654   600666                  JMP INCDEN              /NO TRY DENSITY
00655   200106                  LAC RLTROL
00656   345717                  TAD (400                /+1 RECORD LENTH CONTROL
00657   040106                  DAC RLTROL
00660   545723                  SAD (2000               /DONE @LL LENGTHS
00661   741000                  SKP                     /YES
00662   600576                  JMP TSRUNL              /RE EXECUTE NEW LENGTH
00663   220120                  LAC* TSTDEX
00664   505722                  AND (1400               /RESET TO 0 PASS
00665   040106                  DAC RLTROL              /RECORD LENGTHS
                                /
                                .EJECT
```

```
                                /SEE IF CHANGE DENSITY SELECTED
00666   750004   INCDEN  LAS
00667   505727          AND (10
00670   741200          SNA                     /CHANGE DENSITY
00671   600704          JMP CHGPAT              /NO TRY PATTERN
00672   200105          LAC DRVDEN
00673   345714          TAD (100                /+1 DENSITY
00674   505730          AND (300
00675   040105          DAC DRVDEN
00676   545730          SAD (300                /DONE 800
00677   741000          SKP                     /YES
00700   600576          JMP TSRUNL              /RE EXECUTE NEW DEN
00701   220120          LAC* TSTDEX
00702   505730          AND (300                /RESET TO
00703   040105          DAC DRVDEN              /0 PASS DENSITY
00704   750004   CHGPAT  LAS
00705   505736          AND (40
00706   741200          SNA                     /CHANGE PATTERNS
00707   600721          JMP CHRPAR              /NO TRY PARITY
00710   200103          LAC PATNUM
00711   345710          TAD (1
00712   040103          DAC PATNUM              /+1 PATTERN
00713   545727          SAD (10                 /DONE RANDOM
00714   741000          SKP                     /YES
00715   600576          JMP TSRUNL              /RE EXECUTE NEW PATTERN
00716   220120          LAC* TSTDEX
00717   505701          AND (7                  /RESET TO 0 PASS
00720   040103          DAC PATNUM              /PATTERN SELECTION
00721   750004   CHRPAR  LAS
00722   505734          AND (20
00723   741200          SNA                     /CHANGE PARITY
00724   600735          JMP RPTTST              /NO
00725   200104          LAC PARBT1
00726   245727          XOR (10                 /COMPLEMENT PARITY
00727   040104          DAC PARBT1
00730   220120          LAC* TSTDEX
00731   500010          AND 10
00732   540104          SAD PARBT1              /BACK TO ORIGINAL PARITY
00733   741000          SKP                     /YES
00734   600576          JMP TSRUNL              /RE EXECUTE NEW PARITY
00735   750004   RPTTST  LAS
00736   505714          AND (100
00737   740200          SZA                     /STAY ON THIS TEST
00740   600575          JMP TSRUNL-1            /YES START OVER
00741   440120          ISZ TSTDEX              /+1 TO GET NEXT TEST
00742   440121          ISZ TBLCNT              /+1 TABLE POSITION
00743   200121          LAC TBLCNT
00744   540117          SAD NUMTST              /DONE ALL SELECTED
00745   741000          SKP                     /YES
00746   600542          JMP EXECUT+3            /DO NEXT TEST
00747   750004          LAS
00750   505713          AND (200
00751   740200          SZ@                     /RECYCLE ALL SELECTED
00752   740040          HLT                     /HALT JOB DONE
00753   600537          JMP EXECUT              /RESTART FROM FIRST TEST
```

.EJECT

```
                        /SAVE DRIVE RECORD AND ERROR CNTRS
00754   600754  SVCTRS  JMP .
00755   100772          JMS CTRDEX          /SET INDICES
00756   220010          LAC* 10
00757   060011          DAC* 11             /SAVE DRIVE COUNTERS
00760   440012          ISZ 12
00761   600756          JMP .-3
00762   620754          JMP* SVCTRS         /EXIT
                        /RESET DRIVE COUNTERS BACK INTO PROGRAM
00763   600763  MVCTRS  JMP .
00764   100772          JMS CTRDEX          /SET INDICES
00765   220011          LAC* 11
00766   060010          DAC* 10             /RESTORE DRIVE COUNTS
00767   440012          ISZ 12
00770   600765          JMP .-3
00771   620763          JMP* MVCTRS         /EXIT
                        /SET UP INDICES FOR MOVE AND SAVE CTRS
00772   600772  CTRDEX  JMP .
00773   205737          LAC (WRCHEK-1
00774   040010          DAC 10
00775   777750          LAW -30
00776   040012          DAC 12
00777   205740          LAC (DRVADR-1
01000   340101          TAD CDRIVE
01001   040017          DAC 17
01002   220017          LAC* 17
01003   040011          DAC 11
01004   620772          JMP* CTRDEX
                        /
                        .EJECT
```

```
01005   601005  CLRALL  JMP .
01006   101020          JMS RSFDRV          /RESET TO FIRST DRV
01007   103623          JMS REWIND          /REWIND IT
01010   103072          JMS CLRTRL          /CLEAR READ AND WRT CONT
01011   100754          JMS SVCTRS          /0S TO DRIVE
01012   101035          JMS CHGDRV                  /DONE ALL
01013   601007          JMP .-4             /NO
01014   777777          LAW -1
01015   040125          DAC FOSFLG
01016   142200          DZM T11FLG
01017   621005          JMP* CLRALL                 /EXIT
                        /
                        /RESET DRIVE SELECTION TO LOWEST DRIVE NUMBER
01020   601020  RSFDRV  JMP .
01021   140101          DZM CDRIVE          /START WITH 0
01022   205702          LAC (400000         /BIT FOR 0
01023   041075          DAC CDRVRT          /SAVE IT
01024   500100          AND MSRITS          /MASK WITH DRVS SELECTED
01025   744200          SZA!CLL             /DRIVE EXIST
01026   601033          JMP .+5             /YES
01027   440101          ISZ CDRIVE                  /+1 DRV NUMBER
01030   201075          LAC CDRVRT
01031   744020          RCR                 /MOVE BIT OVER 1
01032   601023          JMP RSFDRV+3        /TRY AGAIN
01033   101055          JMS SETFUN
01034   621020          JMP* RSFDRV
                        /
                        /SELECT NEXT DRIVE IN SEQUENCE
                        /+1 EXIT ADDRESS IF LAST DRIVE TESTED
01035   601035  CHGDRV  JMP .
01036   201075          LAC CDRVRT          /GET M@SK BIT
01037   744020          RCR                 /MOVE OVER 1
01040   440101          ISZ CDRIVE          /+1 DRIVE NUMBER
01041   505741          AND (776000         /MASK OF 8 BITS
01042   740200          SZA                 /END OF 8 DRIVES
01043   601047          JMP .+4             /NO SEE IF DRV EXISTS
01044   101020          JMS RSFDRV          /RESET TO FIRST SELECTED
01045   441035          ISZ CHGDRV          /+1 EXIT END OF DRIVES
01046   621035          JMP* CHGDRV         /EXIT
01047   041075          DAC CDRVRT          /S@VE CUR BIT
01050   500100          AND MSRITS          /MASK DRIVES SELECTED
01051   745200          SN@!CLL             /DRIVE EXIST
01052   601036          JMP CHGDRV+1        /NO SEE IF NEXT EXISTS
01053   101055          JMS SETFUN
01054   621035          JMP* CHGDRV         /EXIT WITHOUT SKIP
                        /
                        .EJECT
```

```
01055   601055  SETFUN  JMP .
01056   200105          LAC DRVDEN
01057   505730          AND (340                /MASK DENSITY BITS
01060   040105          DAC DRVDEN
01061   200101          LAC CDRIVE
01062   744020          RCR                     /MOVE DRIVE NUMBER TO 1 TO 2
01063   742020          RTR
01064   740020          RAR
01065   340105          TAD DRVDEN              /DRIVE + DENSITY
01066   040105          DAC DRVDEN
01067   200104          LAC PARBT1
01070   740200          SZA
01071   205742          LAC (4000
01072   340105          TAD DRVDEN              /PUT IN PARITY BIT
01073   040114          DAC COMAND
01074   621055          JMP* SETFUN
01075   000000  CORVRT   0
                /WAIT FOR KBD FLAG READ CHARACTER
01076   601076  WAITKY  JMP .
01077   700301          KSF
01100   601077          JMP .-1
01101   700312          KRB
01102   041104          DAC CHARIN
01103   621076          JMP* WAITKY
01104   000000  CHARIN   0
                /
                        .EJECT
```

```
                        /TEST FOR ALL DRIVES TO HAVE REACHED EOT
01105   601105  ALLEOT  JMP .
01106   200111          LAC RECSYS
01107   740200          SZA                     /READ PASS SELECTED
01110   601122          JMP TRDEOT              /YES USE RDEOT
01111   101020          JMS RSFDRV
01112   100763          JMS MVCTRS
01113   200142          LAC WRTEOT
01114   741200          SN@
01115   601133          JMP ALLEOS              /TEST EXIT EOS SELECTED
01116   101035          JMS CHGDRV
01117   601112          JMP ALLEOT+5
01120   441105          ISZ ALLEOT
01121   621105          JMP* ALLEOT
01122   101020  TRDEOT  JMS RSFDRV              /START FIRST DRV
01123   100763          JMS MVCTRS              /GET CTRS
01124   200156          LAC RDEOT               /GET READ TO EOT
01125   741200          SNA                     /THIS DRV AT EOT
01126   601133          JMP ALLEOS              /NO TEST EOS SW
01127   101035          JMS CHGDRV                      /TESTED ALL FOR EOT
01130   601123          JMP TRDEOT+1            /NO
01131   441105          ISZ ALLEOT              /ALL AT EOT SKP EXIT
01132   621105          JMP* ALLEOT
01133   750004  ALLEOS  LAS                     /GET SWS
01134   742010          RTL                     /EXIT END OF SEQUENCE
01135   740400          SNL                     /NO GO TO EOT
01136   621105          JMP* ALLEOT
01137   200125          LAC EOSFLG
01140   740200          SZA                     /WRITTEN TO EOS
01141   621105          JMP* ALLEOT             /NO EXIT
01142   441105          ISZ ALLEOT              /SKIP TO END OF TEST
01143   102004          JMS CTRDMP              /PRINT ERR CTRS
01144   621105          JMP* ALLEOT             /EXIT
                        /
                        .EJECT
```

```
                007400          DR0TAB=7400
                000040          DRINCR=40
                007440          DR1TAB=DR0TAB+DRINCR
                007500          DR2TAB=DR1TAB+DRINCR
                007540          DR3TAB=DR2TAB+DRINCR
                007600          DR4TAB=DR3TAB+DRINCR
                007640          DR5TAB=DR4TAB+DRINCR
                007700          DR6TAB=DR5TAB+DRINCR
                007740          DR7TAB=DR6TAB+DRINCR
01145           007400          DRVADR      DR0TAB
01146           007440                      DR1TAB
01147           007500                      DR2TAB
01150           007540                      DR3TAB
01151           007600                      DR4TAB
01152           007640                      DR5TAB
01153           007700                      DR6TAB
01154           007740                      DR7TAB
                                /TC59 DATA RELIABILITY TEST (TAPE 3)
                                /TEST RUN LOOPS
                                /TESTS 0 TO 7
                                /TABLE OF JMS TO TEST
01155           101167          TBLTST      JMS TEST0
01156           101203                      JMS TEST1
01157           101226                      JMS TEST2
01160           101251                      JMS TEST3
01161           101273                      JMS TEST4
01162           101321                      JMS TEST5
01163           101347                      JMS TEST6
01164           101411                      JMS TEST7
01165           101453                      JMS TEST10
01166           102075                      JMS TEST11
                                /
                                            .EJECT
```

```
                        /TEST Ø WRITE TO EOT
                        /REWIND GO TO NEXT DRIVE
01167   601167  TEST0   JMP .
01170   140112          DZM EXITMO          /SET EXIT END OF TAPE
01171   140111          DZM RECSYS          /NO READ PASS
01172   101005          JMS CLRALL          /CLEAR ERR CTRS REWIND
01173   103072          JMS CLRTRL
01174   103727          JMS GENPAT          /GENERATE DATA PATTERN
01175   103103          JMS WRITIT          /WRITE
01176   000000          Ø
01177   103623          JMS REWIND          /REWIND
01200   101035          JMS CHGDRV          /ANYMORE DRIVES
01201   601173          JMP TEST0+4         /YES
01202   621167          JMP* TEST0          /XIT TEST Ø
                        /TEST 1 WRITE 1 RECORD LENGTH SEQUENCE
                        /CHANGE DRIVES
01203   601203  TEST1   JMP .
01204   205743          LAC (27000
01205   040112          DAC EXITMO          /EXIT WRITE ROUTINE END OF RLS
01206   140111          DZM RECSYS          /CLEAR ERROR CTRS REWIND
01207   101005          JMS CLRALL          /CLEAR ERROR CTRS REWIND
01210   101020          JMS RSFDRV
01211   100763          JMS MVCTRS          /GET DRIVE COUNTERS
01212   200142          LAC WRTEOT          /THIS ONE AT EOT
01213   740200          SZA
01214   601221          JMP .+5             /DRIVE AT EOT SKIP WRITE
01215   103727          JMS GENPAT          /GENERATE NEW PATTERN
01216   103103          JMS WRITIT          /START WRITE
01217   000000          Ø
01220   100754          JMS SVCTRS          /SAVE CTRS THIS DRIVE
01221   101035          JMS CHGDRV          /DONE 1 RLS ALL DRIVES
01222   601211          JMP TEST1+6         /NO DO NEXT DRIVE
01223   101105          JMS ALLEOT
01224   601210          JMP TEST1+5
01225   621203          JMP* TEST1
                        /
                        .EJECT
```

```
                        /TEST 2 WRITE 1 RECORD SEQUENCE
                        /CHG DRIVES GO TO EOT
01226   601226  TEST2   JMP .
01227   205742          LAC (440000
01230   040112          DAC EXITMQ          /SET EXIT EVERY RECORD
01231   140111          DZM RECSYS          /NO READ PASS TO BE MADE
01232   101205          JMS CLRALL          /CLEAR DRV CTRS REWIND
01233   101220          JMS RSEDRV
01234   100763          JMS MVCTRS          /GET CTRS THIS DRIVE
01235   200142          LAC WRTEOT
01236   740200          SZA                 /AT EOT
01237   601244          JMP .+5             /YES SKIP WRITE
01240   103727          JMS GENPAT          /GENERATE PATTERN
01241   103103          JMS WRITIT          /WRITE 1 RECORD
01242   000000          0
01243   100754          JMS SVCTRS          /SAVE COUNTERS
01244   101235          JMS CHGDRV          /DONE ALL DRIVE
01245   601234          JMP TEST2+6         /NO
01246   101105          JMS ALLEOT          /TEST FOR ALL AT EOT
01247   601233          JMP TEST2+5         /NOT YET DO MORE WRITES
01250   621226          JMP* TEST2          /EXIT TEST 2
                        /TEST 3 WRITE TO EOT REWIND
                        /CHNG DRIVES READ
01251   601251  TEST3   JMP .
01252   140112          DZM EXITMQ          /EXIT AT EOT
01253   225744          LAC (150000
01254   040111          DAC RECSYS          /SET READ PASS SELECTED
01255   101205          JMS CLRALL          /CLEAR ALL AND REWIND
01256   103727          JMS GENPAT          /GENERATE PATTERN
01257   100763          JMS MVCTRS          /GET CTRS THIS DRIVE
01260   103103          JMS WRITIT          /WRITE PASS TO EOT
01261   000000          0
01262   103623          JMS REWIND          /REWIND THE DRIVE
01263   101235          JMS CHGDRV          /CHANGE
01264   601257          JMP TEST3+6         /NOT DONE ALL DO NEXT WRITE
01265   100763          JMS MVCTRS
01266   140140          DZM RECORD
01267   104322          JMS READIT          /MAKE READ PASS
01270   101435          JMS CHGDRV          /DONE ALL DRIVES
01271   601265          JMP .-4             /NO EXIT
01272   621251          JMP* TEST3
                        /
                                .EJECT
```

```
                        /TEST 4 WRITE 1 RLS
                        /BACKSPACE READ CHG DRIVES
01273   601273  TEST4   JMP .
01274   205743          LAC (20000
01275   040112          DAC EXITMO          /SET EXIT END OF RLS
01276   205744          LAC (10000
01277   040111          DAC RECSYS          /SET READ PASS WRITE RECVR
01300   101005          JMS CLRALL          /CLEAR ALL CTRS REWIND
01301   101020          JMS RSFDRV
01302   100763          JMS MVCTRS          /GET CTRS THIS DRIVE
01303   103727          JMS GENPAT          /GENERATE PATTERN
01304   200142          LAC WRTEOT
01305   740200          SZ@                 /THIS DRIVE AT EOT
01306   601314          JMP .+6             /YES
01307   103103          JMS WRITIT          /MAKE WRITE PASS
01310   000000          0
01311   105104          JMS GORKWD          /R@CK UP
01312   104322          JMS READIT          /MAKE READ PASS
01313   100754          JMS SVCTRS
01314   101035          JMS CHGDRV          /CHANGE DRIVES
01315   601302          JMP TEST4+7         /NOT DONE ALL DRIVES
01316   101105          JMS ALLEOT          /TEST FOR EOT
01317   601301          JMP TEST4+6         /NOT ALL THERE YET
01320   621273          JMP* TEST4          /EXIT
                        /TEST 5 WRITE 1 RECORD BACKSPACE READ
                        /THEN CHANGE DRIVES
01321   601321  TEST5   JMP .
01322   205742          LAC (40000
01323   040112          DAC EXITMO          /SET EXIT EVERY RECORD
01324   205744          LAC (10000
01325   040111          DAC RECSYS          /WRITE PASS MAKE READ RECVR
01326   101005          JMS CLRALL          /CLEAR CTRS REWIND
01327   101020          JMS RSFDRV
01330   103727          JMS GENPAT          /GENER@TE PATTERN
01331   100763          JMS MVCTRS          /MOVE THIS DRVS CTRS
01332   200142          LAC WRTEOT
01333   740200          SZA                 /THIS DRIVE AT EOT
01334   601342          JMP .+6             /YES SKIP WRITE
01335   103103          JMS WRITIT          /M@KE WRITE 1 RECORD
01336   000000          0
01337   105104          JMS GORKWD          /BACK SPACE
01340   104322          JMS READIT          /READ
01341   100754          JMS SVCTRS
01342   101035          JMS CHGDRV          /DONE ALL DRIVES
01343   601330          JMP TEST5+7         /NO
01344   101105          JMS ALLEOT          /TEST FOR ALL AT EOT
01345   601327          JMP TEST5+6         /NOT THERE
01346   621321          JMP* TEST5          /EXIT 5
                        /
                        .EJECT
```

```
                        /TEST 6 WRITE 1 RECORD LENGTH SEQUENCE
                        /CHANGE DRIVES REPEAT
                        /BACKSPACE CHANGE DRIVES REPEAT
                        /READ CHNG DRVS REPEAT
01347   601347  TEST6   JMP .
01350   205744          LAC (1^000
01351   040111          DAC RECSYS          /SET READ SELECTED
01352   205743          LAC (2^000
01353   040112          DAC EXITMO          /EXIT END OF RLS
01354   101005          JMS CLRALL          /CLEAR CTRS REWIND
01355   101020          JMS RSEDRV
01356   103727          JMS GENPAT          /GENERATE PATTERN
01357   100763          JMS MVCTRS          /GET CTRS THIS DRIVE
01360   200142          LAC WRTEOT
01361   740200          SZA                 /AT EOT
01362   601367          JMP .+5             /YES SKIP WRITE
01363   103103          JMS WRITIT
01364   000000          0
01365   100754          JMS SVCTRS          /SAVE CTRS
01366   101035          JMS CHGDRVS         /WRITTEN DIV ALL DRVS
01367   601357          JMP .-10  /NO
01370   100763          JMS MVCTRS          /GET CTRS AGAIN (NEW DRV)
01371   200156          LAC RDEOT
01372   741200          SNA                 /READ TO EOT IS SKP
01373   105104          JMS BCKWD           /BACK SPACE
01374   100754          JMS SVCTRS          /SAVE POSITION
01375   101035          JMS CHGDRV          /CHANGE DRVS
01376   601370          JMP .-6             /NOT ALL BACKSPACED
01377   100763          JMS MVCTRS          /NOT ALL BACKSPACED
01400   200156          LAC RDEOT
01401   741200          SNA                 /READ TO EOT
01402   104322          JMS READIT          /NO MAKE READ PASS
01403   100754          JMS SVCTRS          /SV CTRS AGAIN
01404   101035          JMS CHGDRV          /DONE ALL
01405   601377          JMP .-6             /NO MAKE READ PASS
01406   101105          JMS ALLEOT          /ALL DRVS AT EOT
01407   601355          JMP TEST6+6         /NO
01410   621347          JMP* TEST6          /EXIT 6
                        /
                        .EJECT
```

```
                        /TEST 7 WRITE 1 RECORD CHG DRVS
                        /BACKSPACE CHG DRVS
                        /READ CHG DRVS
01411   601411  TEST7   JMP .
01412   205742          LAC (40000
01413   040112          DAC EXITMO          /SET EXIT EVERY RECORD
01414   205744          LAC (10000
01415   040111          DAC RECSYS          /READ PASS SELECTED
01416   101005          JMS CLRALL          /CLR CTRS REWIND
01417   101020          JMS RSFDRV
01420   103727          JMS GENPAT          /GENER@TE PATTERN
01421   100763          JMS MVCTRS          /GET DRIVE COUNTERS
01422   200142          LAC WRTEOT
01423   740200          SZA                 /THIS DRIVE AT EOT
01424   601430          JMP .+4             /YES SKIP WRITE
01425   103103          JMS WRITIT          /NOT AT EOT YET WRITE
01426   000000          0
01427   100754          JMS SVCTRS          /S@VE CTRS THIS DRIVE
01430   101035          JMS CHGDRV          /DONE ALL
01431   601421          JMP TEST7+10        /DNO DO NEXT
01432   100763          JMS MVCTRS          /GET CTRS NEXT DRIVE
01433   200156          LAC RDEOT
01434   741200          SN@                 /READ TO EOT
01435   105104          JMS GORKWD          /NO BACKSPACE
01436   100754          JMS SVCTRS          /SAVE POSITION
01437   101035          JMS CHGDRV          /DONE ALL
01440   601432          JMP .-6             /NO
01441   100763          JMS MVCTRS          /GET CTRS NEXT DRIVE
01442   200156          LAC RDEOT
01443   741200          SN@                 /AT EOT
01444   104322          JMS READIT          /NO READ IT
01445   100754          JMS SVCTRS          /S@VE CTRS
01446   101035          JMS CHGDRV          /DONE READ ON ALL
01447   601441          JMP .-6             /NO
01450   101105          JMS ALLEOT          /TEST ALL DRVS AT EOT
01451   601417          JMP TEST7+6         /NOT ALL THERE YET
01452   621411          JMP* TEST7          /EXIT TEST 7
                        /
                        .EJECT
```

```
                        /TC59 DATA RELIABILITY TEST
                        /WRITE 1 RECORD CHG DRVS
                        /REPEAT UNTIL END RLS
                        /BACKSPACE CHG
                        /READ 1 RECORD CHANGE RPT TO END RLS
01453   601453  TEST10  JMP .
01454   200107          LAC MODBIT          /GET WRITE MODE
01455   740200          SZ@                 /NONSTOP
01456   205742          LAC (4#000                  /NO START STOPEXIT EVERY
01457   741200          SNA                 /START STOP
01460   205743          LAC (2#000          /NONSTOP XIT RLS
01461   040112          DAC EXITMO                  /SET EXIT EVRY RECORD
01462   205744          LAC (1#000
01463   040111          DAC RECSYS                  /MAKE READ RECOVERY
01464   101005          JMS CLRALL                  /CLR CTRS REWIND
01465   103727  TS10L2  JMS GENPAT
01466   101020          JMS RSFDRV
01467   100763          JMS MVCTRS
01470   200140          LAC RECORD
01471   040144          DAC WRRECR
01472   100754          JMS SVCTRS
01473   101035          JMS CHGDRV                  /RESET ALL DRVS
01474   601467          JMP .-5                     /NO SAVE LASRCR NXT DRV
01475   777777          LAW -1
01476   040125          DAC FOSFLG
01477   101020  TS10L1  JMS RSFDRV                  /SET TO 0 AT END RLS
01500   100763          JMS MVCTRS
01501   200142          LAC WRTEOT
01502   740200          SZA                 /DRV WRITTEN TO EOT
01503   601513          JMP .+10            /YES DON'T WRITE ANY MORE
01504   200144          LAC WRRECR
01505   040126          DAC SVRECR                  /SAVE START OF RLS
01506   103103          JMS WRITIT                  /WRITE 1 RECORD
01507   000000          0
01510   200126          LAC SVRECR                  /RESTORE START OF RLS
01511   040144          DAC WRRECR
01512   100754          JMS SVCTRS                  /SAVE CTRS THIS DRV
01513   101035          JMS CHGDRV                  /ANY DRVS LEFT
01514   601500          JMP TS10L1+1        /YES WRITE ON IT
01515   200125          LAC FOSFLG
01516   741200          SN@                 /DRIVES AT END RLS
01517   601526          JMP .+7             /YES BACK UP
01520   100763          JMS MVCTRS                  /MOVE CTRS
01521   200142          LAC WRTEOT                  /GET WRITTEN EOT FLG
01522   741200          SN@                 /DRIVE AT EOT
01523   601477          JMP TS10L1          /NO AT LEAST 1 ISN'T
01524   101035          JMS CHGDRV                  /IF SKPS ALL DRVS AT EOT
01525   601520          JMP .-5             /SEE IF NXT DRV AT EOT
01526   101020          JMS RSFDRV                  /START FIRST DRV AGAIN
01527   100763          JMS MVCTRS                  /GET CTRS
01530   200156          LAC RDEOT
01531   741200          SNA                 /DRV READ TO EOT
01532   105104          JMS GOBKWD                  /NO BACK SPACE
01533   100754          JMS SVCTRS
01534   101035          JMS CHGDRV                  /BACKED UP A L DRVS
```

```
01535   601527                  JMP .-6                 /NO DO THIS ONE
                                /
                                .EJECT
```

```
01536   101020          JMS RSFDRV          /RESET TO FIRST DRIVE
01537   100763  T10RDP  JMS MVCTRS          /GET DRV CTRS
01540   200156          LAC RDEOT
01541   740200          SZA         /READ TO EOT ON THIS ONE
01542   601561          JMP T10RND          /YES BYPASS READ
01543   200141          LAC LASRCR
01544   540140          SAD RECORD          /READ TO LAST RECORD WRITTEN
01545   601561          JMP T10RND          /YES
01546   040126          DAC SVRECR          /SAVE LAST RECORD
01547   200110          LAC READMO  /GET READ
01550   741200          SNA         /NONSTOP
01551   601555          JMP .+4     /YES
01552   200140          LAC RECORD
01553   040141          DAC LASRCR
                                            /SET EOS TO
01554   440141          ISZ LASRCR          /LAST READ +1
01555   104322          JMS READIT          /READ 1 RECORD
01556   200126          LAC SVRECR
01557   040141          DAC LASRCR          /RESTORE LAST WRITTEN
01560   100754          JMS SVCTRS          /SAVE COUNTER
01561   101035  T10RND  JMS CHGDRV          /DONE 1 ON ALL DRVS
01562   601537          JMP T10RDP          /NO DO 1 MORE ON NEXT
01563   100763          JMS MVCTRS          /GET CTRS CURREN DRV
01564   200141          LAC LASRCR
01565   540140          SAD RECORD          /READ TO EOS THIS DRV
01566   741000          SKP
01567   601536          JMP T10RDP-1    /NOT AT EOS READ AGAIN
01570   101035          JMS CHGDRV
01571   601563          JMP .-6
01572   101105          JMS ALLEOT          /TEST FOR ALL READ TO EOT
01573   601465          JMP TS10L2          /AT LEAST 1 ISN'T YET
01574   621453          JMP* TEST10         /ALL DRVS AT EOT EXIT TEST
                /
                        .EJECT
```

```
                                /DUMP ERROR COUNTERS ON ALL DRIVES
                                /FIRST SAVE COUNTERS CURRENTLY IN LOCATIONS
02000                                   .LOC 2000
02000     100754        FRRDMP          JMS SVCTRS
02001     102004                        JMS CTRDMP
02002     740040                        HLT
02003     602002                        JMP .-1
02004     602004        CTRDMP          JMP .
02005     101020                        JMS RSFDRV
02006     100763                        JMS MVCTRS
02007     202200                        LAC T11FLG
02010     741200                        SNA
02011     602022                        JMP COMEND-5
02012     202032                        LAC WRETEX
02013     105136                        JMS TYPET
02014     202054                        LAC EHORTX
02015     105136                        JMS TYPET
02016     103460                        JMS WRTDMP
02017     200111                        LAC RECSYS
02020     741200                        SNA
02021     602027                        JMP COMEND
02022     202043                        LAC RDETEX
02023     105136                        JMS TYPET
02024     202054                        LAC EHORTX
02025     105136                        JMS TYPET
02026     104720                        JMS READMP
02027     101035        COMEND          JMS CHGDRV
02030     602006                        JMP CTRDMP+2
02031     622004                        JMP* CTRDMP
                                        .EJECT
```

```
002032  002033          WRETEX  .+1
002033  064241                  .ASCII  <15><12><12>' WRITE DUMP '<15><12><177>
002034  220256
002035  512232
002036  442500
002037  422531
002040  550100
002041  064257
002042  700000
002043  002044          RDFTEX  .+1
002044  064241                  .ASCII  <15><12><12>' READ DUMP '<15><12><177>
002045  220244
002046  426030
002047  420210
002050  526332
002051  020032
002052  053760
002053  000000
002054  002055          FHDRTX  .+1
002055  422452                  .ASCII  'DRV PAT PAR DEN MODE RECRDS LENGTH'
002056  620240
002057  406504
002060  050202
002061  511710
002062  442634
002063  202331
002064  742212
002065  202450
002066  541644
002067  422464
002070  046212
002071  472172
002072  444000
002073  064244                  .ASCII  <15><12><40><177>
002074  077400
                        /
                                .EJECT
```

```
                        /TEST 11 READ ONLY RANDOM PAT SELECTION INVALID
                        /EXCEPT FOR SPECIFIC CASES
                        /
02075   602075  TEST11  JMP .
02076   101005          JMS CLRALL              /CLR CTRS REWIND
02077   205742          LAC (40000
02100   040112          DAC EXITMO              /SET WRITE EXIT EVERY RECORD
02101   777777          LAW -1
02102   042200          DAC T11FLG              /SET TEST 11 WRITE EXIT
02103   103103          JMS WRITIT              /SET UP RECORD LENGTHS
02104   000000          0
02105   200125          LAC EOSFLG              /GET END OF RLS FLAG
02106   740200          SZA                     /INCREMENT TO END
02107   103327          JMS TESINC              /NO RETURN IS .-2
02110   200140          LAC RECORD
02111   042177          DAC T11INC              /SAVE SEQUENCE LENGTH
02112   140140          DZM RECORD
                        /IF RANDOM PAT DO NOT REGEN
02113   200103          LAC PATNUM
02114   545701          SAD (7
02115   741000          SKP
02116   103727          JMS GENPAT
02117   777777  T11LP1  LAW -1
02120   040125          DAC EOSFLG              /SET START OF SEQUENCE
02121   101020          JMS RSEDRV
02122   100763          JMS MVCTRS              /GET CTRS THIS DRV
02123   200156          LAC RDEOT
02124   740200          SZA                     /THIS DRV AT EOT
02125   602132          JMP .+5                 /YES
02126   200140          LAC RECORD              /CURRENT RECORD
02127   342177          TAD T11INC              /+ SEQUENCE LENGTH
02130   040141          DAC LASRCR              /FOR READ EXIT
02131   100754          JMS SVCTRS              /SAVE CTRS THIS DRIVE
02132   101035          JMS CHGDRV              /DONE ALL
02133   602122          JMP T11LP1+3            /NO SET UP NEXT DRIVE
02134   101020          JMS RSEDRV
02135   100763  T11RDL  JMS MVCTRS              /GET DRIVE CTRS
02136   200156          LAC RDEOT
02137   740200          SZA                     /THIS ONE AT EOT
02140   602155          JMP T11END              /YES DONT READ
02141   200141          LAC LASRCR
02142   040126          DAC SVRECR              /SAVE END OF RLS RECORDS
02143   200110          LAC READMO
02144   741200          SNA                     /SELECTION NON STOP
02145   602151          JMP .+4                 /YES GO TO END RLS
                        /
                        .EJECT
```

```
02146   200140          LAC RECORD                      /NEXT TO BE READ
02147   040141          DAC LASRCR
02150   440141          ISZ LASRCR                      /+1 EXIT READ AFTER 1 RECORD
02151   104322          JMS READIT                      /READ 1 OR TO END RLS
02152   200126          LAC SVRECR
02153   040141          DAC LASRCR                      /RESTORE END RECORD
02154   100754          JMS SVCTRS                      /SAVE CTRS THIS DRIVE
02155   101235  T11END  JMS CHGDRV                      /DONE ALL DRIVES
02156   602135          JMP T11RDL                      /NO
02157   101105          JMS ALLEOT
02160   741000          SKP
02161   622075          JMP* TEST11
02162   101020          JMS RSEDRV
02163   100763          JMS MVCTRS                      /GET CTRS AGAIN
02164   200140          LAC RECORD
02165   540141          SAD LASRCR                      /AT END RLS
02166   140125          DZM EOSFLG                      /YES
02167   101035          JMS CHGDRV                      /CHECKED ALL DRIVES
02170   602163          JMP .-5                 /NO ONE MAY BE AT EOT
02171   200125          LAC EOSFLG
02172   740200          SZA                     /AT END OF RLS
02173   602135          JMP T11RDL                      /NO READ SOME MORE
02174   101105          JMS ALLEOT                      /TEST EOS DUMP SW
02175   602117          JMP T11LP1                      /NOT EOS EXIT READ MORE
02176   622075          JMP* TEST11                     /EXIT TEST 11
02177   000000  T11INC  0
02200   000000  T11FLG
                /
                /TC59-TU20 DATA RELIABILITY TEST (TAPE 4)
                /START AT 3000 SWITCHES = COMMAND
                /
                /SWITCHES 15 TO 17  PATTERN SELECTION 0-7
                /SWITCHES14           PARITY 0 = EVEN  1 = ODD
                          /SWITCHES 12 AND 13 = MODE (WRITE) 6 AND 7 = MODE (READ)
                          /00 = NONSTOP
                          /01 = START STOP DRIVE SETTLE DOWN
                          /10 OR 11 RANDOM START STOP NONSTOP
                /SWITCHES 10 AND 11 = DENSITY
                /SWITCHES 8 AND 9 = RECORD LENGTH SEQUENCE
                          /00 = MINIMUM LENGTH (24 CHAR)
                          /01 = MAXIMUM LENGTH (4008 CHAR)
                          /10 = MIN TO MAX 24 TO 4008 CHAR
                          /11 = MAX TO MIN 4008 TO 24 CHAR
                /SWITCH 5=1 IS MAKE @ READ PASS
                /SWS3AND4=00 WRITE PASS TO EOT
                /=01 WRITE PASS 1 SEQUENCE OR 512 IF FIXED GEN
                /=10 WRITE EXIT EVERY RECORD
                /
                /SWITCHES 0 TO 2 = DRIVE NUMBER
                /RUN SWITCHES SW3 = TYPE ALL ERRORS @S THEY OCCUR (WRITE)
                          /SW4 = STATISTICAL RECOVERY PROCEDURE (WRITE)
                /SW5 = 1-TYPE ALL ERRORS AS THEY OCCUR  (READ)
                /SW6 = 1-STATISTICAL RECOVERY PROCEDURE (READ)
                /SW7 = 1-DELETE ALL READ RECOVERY ATTEMPTS
                /
```

```
                        /IOT DEFINITIONS
                        /
707352                  MTRS=707352
707312                  MTRC=707312
707341                  MTSF=707341
707321                  MTCR=707321
707301                  MTTR=707301
707326                  MTLC=707326
707304                  MTGO=707304
707322                  MTAF=707322
707324                  LCM=707324
                        /
                        /RECORD LENGTH AND BUFFER DEFINITIONS
002470                  MAXLEN=2470             /4008 CHARACTERS 1336 WORDS
000010                  MINLEN=10               /24 CHARACTERS 8 WORD
010000                  WRBUF=10000
000033                  CALOC=33
000032                  WCLOC=32
000515                  MSEC=515
100000                  ROTBIT=100000
012470                  RDBUF1=WRBUF+MAXLEN
015160                  RDBUF2=RDBUF1+MAXLEN
                        /
                                .EJECT
```

```
                                  /CAL TRAP
        ØØØ2Ø                                 .LOC 2Ø
        ØØØ2Ø        ØØØØ2Ø                   2Ø
        ØØØ21        74ØØ4Ø                   HLT
                                  /
                                  /START OF TEST 1 PASS GET SWS HALT EXC
        Ø3ØØØ                                 .LOC 3ØØØ
        Ø3ØØØ        75ØØØ4       STRTES      LAS
        Ø3ØØ1        5Ø5745                   AND (7ØØØØØ
        Ø3ØØ2        Ø4Ø1Ø5                   DAC DRVDEN                    /DRIVE NUM
        Ø3ØØ3        1Ø3623                   JMS REWIND                    /FOR REWIND
        Ø3ØØ4        75ØØØ4                   LAS
        Ø3ØØ5        Ø43Ø16                   DAC PASSWS                    /SWS TO BE EXECUTED
        Ø3ØØ6        5Ø57Ø6                   AND (17              /MASK PATTERN AND PAR
        Ø3ØØ7        Ø4Ø1Ø3                   DAC PATNUM                    /FOR FIRST GENERATI
        Ø3Ø1Ø        14Ø1Ø4                   DZM PARBT1                    /AND CLEAR OLD PARITY
        Ø3Ø11        1Ø3Ø72                   JMS CLRTRL                    /CLR RECORD AND ERR TBL
        Ø3Ø12        14Ø124                   DZM SWTEST
        Ø3Ø13        74ØØ4Ø                   HLT
        Ø3Ø14        1Ø3727                   JMS GENPAT
        Ø3Ø15        1Ø31Ø3                   JMS WRITIT
        Ø3Ø16        ØØØØØØ       PASSWS      Ø
        Ø3Ø17        2ØØ111                   LAC RECSYS
        Ø3Ø2Ø        7412ØØ                   SN@
        Ø3Ø21        6Ø3Ø24                   JMP .+3
        Ø3Ø22        1Ø51Ø4                   JMS GORKWD
        Ø3Ø23        1Ø4322                   JMS READIT
        Ø3Ø24        7Ø7352                   MTRS
        Ø3Ø25        5Ø5724                   AND (4ØØØ
        Ø3Ø26        7412ØØ                   SN@
        Ø3Ø27        6Ø3Ø14                   JMP PASSWS-2         /NEW RNDOM EVERY PASS
        Ø3Ø3Ø        74Ø44Ø                   HLT
        Ø3Ø31        6Ø3ØØØ                   JMP STRTES
                                  /
                                              .EJECT
```

```
                                /
                                /RANDOM NUMBER GENERATOR
                                /
03032   603032          RANGEN  JMP .
03033   203060                  LAC RANDEX
03034   545746                  SAD (RANTBL+10
03035   741000                  SKP
03036   603046                  JMP RANTAD-1
03037   205747                  LAC (RANTBL
03040   043060                  DAC RANDEX
03041   203057                  LAC RANCON
03042   745100                  SPA!CLL
03043   744002                  STL
03044   740010                  RAL
03045   043057                  DAC RANCON
03046   223060                  LAC* RANDEX
03047   343057          RANTAD  TAD RANCON
03050   063060                  DAC* RANDEX
03051   203071                  LAC RANSAV
03052   740020                  RAR
03053   363060                  TAD* RANDEX
03054   043071                  DAC RANSAV
03055   443060                  ISZ RANDEX
03056   623032                  JMP* RANGEN
                                /
03057   123456          RANCON  123456
03060   003071          RANDEX      RANTBL+10
03061   654321          RANTBL  654321
03062   361416                  361416
03063   055363                  055363
03064   546060                  546060
03065   243035                  243035
03066   762572                  762572
03067   453237                  453237
03070   150214                  150214
                                /
03071   000000          RANSAV  0
                                /
                                .EJECT
```

```
                        /CLEAR READ AND WRITE TABLES
03072   603072  CLRTBL  JMP .
03073   205737          LAC (WRCHEK-1           /CLEAR ALL
03074   040010          DAC 10                  /WRITE TABLES TO 0
03075   777750          LAW -30                 /AND READ TABLES
03076   040011          DAC 11                  /THERE ARE 13
03077   160010          DZM* 10
03100   440011          ISZ 11                  /DONE ALL
03101   603077          JMP .-2                 /NO
03102   623072          JMP* CLRTBL
                        /
                        /TC59 DATA RELIABILITY TEST
                        /WRITE PORTION
                        /
03103   603103  WRITIT  JMP .
03104   200140          LAC RECORD
03105   741200          SNA
03106   603111          JMP .+3
03107   443103          ISZ WRITIT
03110   603203          JMP NOINCR
03111   200124          LAC SWTEST
03112   740200          SZA
03113   603144          JMP NOTSWS
03114   223103          LAC* WRITIT             /GET TEST CONTROL WORD
03115   505701          AND (7                  /MASK PATTERN NUMBER
03116   040103          DAC PATNUM              /SAVE IT
03117   223103          LAC* WRITIT             /WORD AG
03120   505727          AND (10                 /MASK PAR SELECT
03121   040104          DAC PARBT1              /SAVE IT
03122   223103          LAC* WRITIT             /GET IT AGAIN
03123   505750          AND (700300             /DENSITY AND DRIVE
03124   040105          DAC DRVDEN              /SAVE IT
03125   223103          LAC* WRITIT             /GET WORD AGAIN
03126   505722          AND (1400               /RECORD LENGTH
03127   040106          DAC RLTROL              /CONTROL BITS
03130   223103          LAC* WRITIT             /GET WORD
03131   505731          AND (60                 /MASK START STOP
03132   040107          DAC MODBIT              /MODE BITS
03133   223103          LAC* WRITIT
03134   505732          AND (6000
03135   040110          DAC READMO
03136   223103          LAC* WRITIT
03137   505744          AND (14000
03140   040111          DAC RECSYS
03141   223103          LAC* WRITIT
03142   505751          AND (60000
03143   040112          DAC EXITMO
03144   443103  NOTSWS  ISZ WRITIT             /STEP ADDRESS FOR EXIT
                        /
                        .EJECT
```

```
                        /
                        /NOW SET UP RECORD LENGTH CONTROL
                        /
03145   200106          LAC RLTROL          /RECORD LENGTH
03146   505717          AND (400            /STARTING LENGTH BIT
03147   750200          SZA!CLA             /M@XIMUM LENGTH
03150   775310          LAW -MAXLEN         /YES MAXIMUM
03151   741200          SNA                 /OR MINIMUM LENGTH
03152   777770          LAW -MINLEN         /YES MINIMUM
03153   040113          DAC STRLEN          /S@VE STARTING LENGTH
03154   140115          DZM RLKINC          /CLEAR LENGTH INCREMENT
03155   200106          LAC RLTROL          /GET RECORD LENGTH CONTROL
03156   505721          AND (1000           /M@SK CHANGE LENGTH BIT
03157   741200          SN@                 /CHANGE RECORD LENGTH
03160   603201          JMP NOINCR-2        /NO
03161   200105          LAC DRVDEN          /GET DENSITY BIT
03162   742020          RTR;      RTR
03163   742020
03164   742020          RTR                 /MOVE THEM OVER TO BITS 16 AND 17
03165   505716          AND (3              /MASK FOR 00,01 OR 10
03166   345752          TAD (LAC INCTBL     /+ LAC TO GEN INCR
03167   043170          DAC .+1             /E OR EXECUTE
03170   203613          LAC INCTRL          /GET DENSITY INCR
03171   040115          DAC RLKINC          /S@VE IT AS A + NUM
03172   775310          LAW -MAXLEN
03173   540113          SAD STRLEN          /LENGTH START AT MAX
03174   603201          JMP NOINCR-2        /YES LEAVE INCR +
03175   200115          LAC RLKINC          /RECORD LENGTH START
03176   740001          CMA                 /IS MINIMUM
03177   040115          DAC RLKINC          /MAKE IT - SO
03200   440115          ISZ RLKINC          /BLOCK WILL GET LONGER
03201   200113          LAC STRLEN          /STARTING RECORD LENTH
03202   040143          DAC WRTLEN          /TO CURRENT BLOCK LENTH
                        /
                        .EJECT
```

```
                        /EITHER NO LENGTH INCREMENT OR ALREADY SET UP
03203   200104  NOINCR  LAC PARBT1                      /GET PARITY SELECTION
03204   744020          RCR                     /MOVE BIT OVER TO COMMAND PARITY BIT
03205   742020          RTR;    RTR;    RTR;    RAR
03206   742020
03207   742020
03210   740020
03211   340105          TAD DRVDEN              /COMBINE WITH DRV DENSITY
03212   040114          DAC COMAND              /SAVE IT
03213   200140          LAC RECORD
03214   040144          DAC WRRECR
03215   442200          ISZ T11FLG
03216   741000          SKP
03217   623103          JMP* WRITIT
03220   777770          LAW -10
03221   040116          DAC WRPASS
                        /
                        /START THE WRITE SEQUENCE FROM BOT
03222   205753  STRTOP  LAC (4400               /WRITE + ENI
03223   340114          TAD COMAND              /DRIVE DENSITY AND PARITY
03224   707321          MTCR
03225   603224          JMP .-1
03226   707326          MTLC                    /LOAD THE COMMAND
03227   740000          NOP
03230   707301          MTTR
03231   603230          JMP .-1
03232   200143  NONSTP  LAC WRTLEN                      /RECORD LENGTH
03233   040032          DAC WCLOC               /TO WORD COUNT REG
03234   205754          LAC (WRBUF-1            /BUFFER ADDRESS
03235   040033          DAC CALOC               /TO CA LOCATION
03236   707304          MTGO                    /GO DRIVE GO
03237   200103          LAC PATNUM
03240   545701          SAD (7                  /RANDOM PAT SELECTED
03241   103276          JMS STRPAT              /YES NEW PAT EVERY BLOCK
03242   103636          JMS WAITI               /WAIT FOR INTERRUPT
03243   741100          SPA                     /ANY ERROR FLAG
03244   603377          JMP ERROR               /YES SEE IF EOT
03245   777770          LAW -10
03246   540116          SAD WRPASS                      /RECOVERY PASS
03247   603256          JMP TSTSTP                      /NO SEE IF START STOP
03250   200116          LAC WRPASS
03251   345755          TAD (ISZ PERMBS         /LAST PASS K-
03252   043253          DAC .+1                 /TO +1 RECVR PASS
03253   440130          ISZ RECV1
03254   777770          LAW -10
03255   040116          DAC WRPASS
                        .EJECT
```

```
03256  200107        TSTSTP  LAC MODBIT                      /GET START STOP MODE FROM MO
03257  740200                SZ@                     /NON STOP
03260  603266                JMP STOPOP                      /NO START STOP
03261  777770                LAW -10
03262  540116                SAD WRPASS
03263  103327                JMS TESINC                      /CLEAR ALL MAGTAPE FLAGS
03264  707322                MTAF
03265  603232                JMP NONSTP                      /GO AGAIN
03266  505736        STOPOP  AND (40
03267  740200                SZA                     /START STOP RANDOM
03270  103306                JMS RANSTP                      /YES
03271  777770                LAW -10
03272  540116                SAD WRPASS
03273  103327                JMS TESINC
03274  103651                JMS WATRDY              /JUST START STOP
03275  603222                JMP STRTOP              /WAIT DRIVE READY GO AGAIN
                     /
                             .EJECT
```

```
                                /IF READ SELECTED DO NOT REGENERATE RANDOM
                                /RANDOM PAT SELECTED IF NOT ERR PASS REGEN
03276   603276          STRPAT  JMP .
03277   200111                  LAC RECSYS
03300   740200                  SZA
03301   623276                  JMP* STRPAT
03302   777770                  LAW -10
03303   540116                  SAD WRPASS              /SKIP IS ERROR PASS
03304   103727                  JMS GENPAT              /NOT ERROR PASS REGENERATE
03305   623276                  JMP* STRPAT
03306   603306          RANSTP  JMP .                   /STALL RANDOM TIME
03307   103032                  JMS RANGEN              /GET RANDOM NUMBER
03310   505756                  AND (177                /MASK FOR 0 TO 127
03311   740001                  CMA                     /MAKE -1 TO -128
03312   043325                  DAC MTIMER              /FOR COUNTIM MILLISEC
03313   345735                  TAD (4
03314   740100                  SMA                     /COUNT -1 TO -4
03315   603261                  JMP TSTSTP+3            /YES GO NONSTOP
03316   777763                  LAW -MSEC               /TO COUNT 1 MILLISEC
03317   043326                  DAC MTIMER+1
03320   443326          .-1     ISZ MTIMER+1            /TIME 1 MILLISEC
03321   603320                  JMP .-1
03322   443325                  ISZ MTIMER              /WAITED RANDOM TIME
03323   603316                  JMP .-5                 /NO
03324   623306                  JMP* RANSTP             /GO AGAIN
03325   000000          MTIMER  0
03326   000000                  0
                                /
                                .EJECT
```

```
                        /
                        /SEE IF RECORD LENGTH SHOULD BE CHANGED
                        /
03327   000000  TESINC  0                       /ENTER
03330   440140          ISZ RECORD
03331   200115          LAC BLKINC              /GET INCREMENTER
03332   741200          SNA                     /LENGTH CHAOGING
03333   603361          JMP TES2K               /NO GET OUT
03334   340143          TAD WRTLEN              /INCR + REC LENGTH
03335   040143          DAC WRTLEN              /SAVE IT
03336   345727          TAD (MINLEN
03337   740100          SMA                     /COUNT LESS THAN MIN
03340   603352          JMP RESETL              /YES RESET IT
03341   205757          LAC (MAXLEN+1           /+ MAX + 1
03342   340143          TAD WRTLEN                      /- CURRENT LENGTH
03343   741100          SPA
03344   603352          JMP RESETL
03345   200112          LAC EXITMO
03346   505742          AND (40000
03347   741200          SNA
03350   623327          JMP* TESINC
03351   623103          JMP* WRITIT
03352   200113  RESETL  LAC STRLEN              /RESET LENGTH TO
03353   040143          DAC WRTLEN              /CURRENT START
03354   140125          DZM EOSFLG
03355   200112          LAC EXITMO
03356   741200          SN@
03357   623327          JMP* TESINC
03360   623103          JMP* WRITIT
03361   200140  TES2K    LAC RECORD                     /GET NEXT RECORD NUMBER
03362   505760          AND (377
03363   740200          SZA
03364   603372          JMP .+6                 /RECORD NOT AN INC OF 256
03365   140125          DZM EOSFLG              /MULT OF 256 CLEAR EOS FLG
03366   200112          LAC EXITMO              /EXIT MODE
03367   740200          SZA                     /GO TO END OF TAPE
03370   623103          JMP* WRITIT             /NO EXIT WRITE SEQUENCE
03371   623327          JMP* TESINC             /EXIT AT EOT ONLY
03372   200112          LAC EXITMO              /GET EXIT MODE
03373   505742          AND (40000              /MASK EXIT EVERY
03374   740200          SZA                     /EXIT EVERY RECORD
03375   623103          JMP* WRITIT             /YES
03376   623327          JMP* TESINC             /NOT EXIT EVERY RECORD
                        /
                        .EJECT
```

```
                        /ERROR STATUS SEE IF EOT
                        /CHECK SWITCH OPTIONS
03377   505761  ERROR   AND (373600          /MASK ALL ERROR BITS
03400   741200          SNA                 /EXCEPT EOT
03401   603574          JMP ENDTAP          /ERR WAS EOT NO ERR
03402   777770          LAW -10
03403   540116          SAD WRPASS          /FIRST ERR
03404   440127          ISZ WRCHEK          /YES +1 NUM WRITE ERR
03405   750004          LAS
03406   505742          AND (43000
03407   741200          SNA                 /TYPE ALL ERR = 1
03410   603421          JMP TESREC          /NO SEE IF RECVR SELECTED
03411   205762          LAC (TEXT1
03412   105136          JMS TYPET           /TYPE WRITE STATUS ERROR
03413   707312          MTRC
03414   105216          JMS TYPEC           /TYPE COMMAND
03415   203650          LAC STATRD
03416   103655          JMS SPTCON          /SPACE 2 AND TYPE
03417   200140          LAC RECORD
03420   103655          JMS SPTCON          /SPACE 2 TYPE BLOCK NUMBER
                        /
03421   750004  TESREC  LAS
03422   505743          AND (20000          /RECOVER STATISTICALLY
03423   740200          SZA                 /SELECTED
03424   603443          JMP STAREC          /YES
03425   200111          LAC RECSYS
03426   740200          SZA
03427   105220          JMS XRGREC
03430   740000          NOP
03431   777770          LAW -10
03432   040116          DAC WRPASS
03433   203650          LAC STATRD
03434   505724          AND (4000
03435   740200          SZA                 /EOT
03436   603574          JMP ENDTAP                  /YES TYPE
03437   707321          MTCR                /IS CU READY
03440   603256          JMP TSTSTP                  /CONTROL NOT READY NO TYPEOUT
03441   103651          JMS WATRDY          /WAIT FOR DRIVE
03442   603271          JMP STOPOP+3        /START AGAIN
                        /
                        .EJECT
```

```
03443   440116          STAREC  ISZ WRPASS              /TRIED 7 REWRITES
03444   603447                  JMP .+3                 /NO
03445   440137                  ISZ PERMRS              /YES +1 PERM BAD SPOT
03446   603425                  JMP TESREC+4            /GO DO NEXT BLOCK
03447   103664                  JMS BACK2               /BACKUP 2 RECORDS
03450   707352                  MTRS
03451   505763                  AND (BOTBIT             /AT BOTTOM
03452   740200                  SZA
03453   603222                  JMP STRTOP
03454   103677                  JMS SPACF1              /NOT BOT COME FWD 1
03455   205724                  LAC (4000               /CHANGE SPACE
03456   707324                  LCM                     /BACK TO WRITE
03457   603256                  JMP TSTSTP              /CHECK NONSTOP MODE
03460   603460          WRTDMP  JMP .
03461   200105                  LAC DRVDEN
03462   742010                  RTL;    RTL
03463   742010
03464   105245                  JMS TY1OCT
03465   103711                  JMS SPACF3
03466   200103                  LAC PATNUM
03467   105245                  JMS TY1OCT
03470   103711                  JMS SPACF3
03471   200104                  LAC PARBT1
03472   742020                  RTR;    RAR
03473   740220
03474   105245                  JMS TY1OCT
03475   200105                  LAC DRVDEN
03476   742020                  RTR;    RTR;    RTR
03477   742020
03500   742020
03501   505716                  AND (3
03502   345764                  TAD (LAC DENTYP
03503   043504                  DAC .+1
03504   203607                  LAC DENTYP
03505   105136                  JMS TYPET
                        /
                                .EJECT
```

```
03506   200107          LAC MODBIT
03507   742020          RTR;    RTR
03510   742020
03511   505716          AND (3
03512   345765          TAD (LAC TYMODE
03513   043514          DAC .+1
03514   205766          LAC (TYMODE
03515   105136          JMS TYPET
03516   200140          LAC RECORD
03517   105252          JMS TYDECI
03520   200106          LAC PLTROL
03521   742020          RTR;    RTR;    RTR;    RTR
03522   742020
03523   742020
03524   742020
03525   505716          AND (3
03526   345767          TAD (LAC LTHTBL
03527   043530          DAC .+1
03530   203617          LAC LTHTBL
03531   105136          JMS TYPET
03532   205770          LAC (TEXT10
03533   105136          JMS TYPET               /WRITE ERRORS =
03534   200127          LAC WRCHEK
03535   105252          JMS TYDECI
03536   777771          LAW -7
03537   040010          DAC 10
03540   205771          LAC (RECV1-1
03541   040011          DAC 11
03542   140012          DZM 12
03543   440012          ISZ 12

                        .EJECT
```

```
                                /
03544      220011       TYRECV     LAC* 11
03545      040013                  DAC 13
03546      741200                  SN@
03547      603561                  JMP TYRALL
03550      205772                  LAC (TEXT11
03551      105136                  JMS TYPET
03552      205773                  LAC (TEXT12
03553      105136                  JMS TYPET
03554      200012                  LAC 12
03555      105245                  JMS TY1OCT
03556      103711                  JMS SPACE3
03557      200013                  LAC 13
03560      105252                  JMS TYDECI
03561      440012       TYRALL     ISZ 12
03562      440010                  ISZ 10
03563      603544                  JMP TYRECV
03564      200137                  LAC PERMRS
03565      741200                  SNA
03566      623460                  JMP* WRTDMP
03567      205774                  LAC (TEXT13
03570      105136                  JMS TYPET
03571      200137                  LAC PERMRS
03572      105252                  JMS TYDECI
03573      623460                  JMP* WRTDMP
                                /
                                /WRITE PASS DRV IS AT END OF TAPE
03574      205775       ENDTAP     LAC (TEXT2
03575      440140                  ISZ RECORD          /TYPE EOT TEXT
03576      105136                  JMS TYPET
03577      103460                  JMS WRTDMP          /DUMP COUNTERS
03600      777777                  LAW -1
03601      040142                  DAC WRTEOT          /SET WRITE TO EOT
03602      623103                  JMP* WAITIT         /EXIT
                                /
                                .EJECT
```

```
                              /
 03603    005422    TYMODE    TEXT7     /NONST
 03604    005426              TEXT8     /STSTP
 03605    005432              TEXT9     /RNDOM
 03606    005432              TEXT9     /RNDOM
 03607    005406    DENTYP    TEXT4     /TYPE 200
 03610    005412              TEXT5     /TYPE 556
 03611    005416              TEXT6     /TYPE 800
 03612    005416              TEXT6     /DITTO 800
                              /
 03613    000010    INCTRL    10        /24 CHAR 200 BPI
 03614    000004              4         /12 CHAR 556 BPI
 03615    000002              2         /6  CHAR 800 BPI
 03616    000002              2         /INCASE SWITCH GOOF
                              /
 03617    005436    LTHTRL    TYPMIN
 03620    005444              TYPMAX
 03621    005452              TYPAV1    /TYPE AVERAGE 1
 03622    005462              TYPAV2    /TYPE AVERAGE 2
                              /
                              .EJECT
```

```
                        /REWIND TO LOAD POINT
                        /
03623   603623  REWIND  JMP .
03624   200105          LAC DRVDEN              /DRIVE NUMBER
03625   707321          MTCR
03626   603625          JMP .-1
03627   707326          MTLC                    /LOAD COMMAND
03630   707301          MTTR                    /DRIVE READY
03631   603630          JMP .-1                 /NO
03632   205721          LAC (1000               /REWIND
03633   707324          LCM                     /CHANGE NOT TO REWIND
03634   707304          MTGO                    /GO
03635   623623          JMP* REWIND             /EXIT
                        /
                        /
                        /WAIT FOR PROGRAM INTERRUPT
                        /
03636   603636  WAITI   JMP .
03637   205776          LAC (JMP IRECD
03640   040001          DAC 1
03641   700042          ION
03642   603642          JMP .
                        /
03643   707341  IRECD   MTSF
03644   740040          HLT
03645   707352          MTRS
03646   043650          DAC STATRD
03647   623636          JMP* WAITI
                        /
03650   000000  STATRD  0
                        /
                        /
                        /WAIT FOR CU AND DRIVE READY
                        /
03651   603651  WATRDY  JMP .
03652   707301          MTTR
03653   603652          JMP .-1
03654   623651          JMP* WATRDY
                        /
                        .EJECT
```

```
                                /SPACE 2 AND TYPE CONTENTS
                                /
03655   603655          SPTCON  JMP .
03656   043663                  DAC SPTSAV
03657   103720                  JMS SPACE2
03660   203663                  LAC SPTSAV
03661   105216                  JMS TYPEC
03662   623655                  JMP* SPTCON
03663   000000          SPTSAV  0
                                /
                                /
                                /BACKSPACE 2 RECORDS
                                /
03664   603664          BACK2   JMP .
03665   103651                  JMS WATRDY
03666   200114                  LAC COMAND
03667   345777                  TAD (7400
03670   707326                  MTLC
03671   777776                  LAW -2
03672   040032                  DAC WCLOC
03673   707304                  MTGO
03674   707341                  MTSF
03675   603674                  JMP .-1
03676   623664                  JMP* BACK2
                                /
                                /
                                /SPACE FORWARD 1 RECORD
                                /
03677   603677          SPACE1  JMP .
03700   205732                  LAC (6400
03701   707324                  LCM
03702   777777                  LAW -1
03703   040032                  DAC WCLOC
03704   707322                  MTAF
03705   707304                  MTGO
03706   707341                  MTSF
03707   603706                  JMP .-1
03710   623677                  JMP* SPACE1
                                /
                                /
                                /SPACE 3 PLACES
                                /
03711   603711          SPACE3  JMP .
03712   203715                  LAC .+3
03713   105136                  JMS TYPET
03714   623711                  JMP* SPACE3
03715   003716                  .+1
03716   201004                  .ASCII '    '<177>
03717   077400
                                /
                                .EJECT
```

```
                        /SPACE 2 PLACES
                        /
03720   603720          SPACE2  JMP .
03721   203724                  LAC .+3
03722   105136                  JMS TYPET
03723   623720                  JMP* SPACE2
03724   003725                  .+1
03725   201017                  .ASCII '  '<177>
03726   700000
                        /
                        /TAPE 5 TC59 DATA RELIABILITY
                        /PATTERN GENERATION ROUTINES
                        /TC59 DATA RELIABILITY TEST
                        /ENTRANCE IS JMS GENPAT
                        /PATNUM = 0 TO 7 PATTERN NUMBER
                        /PARBT1 = 0 EVEN PARITY  10 ODD PARITY
                        /PATNUM + PARBT1 GETS PATTERNS 0 TO 17
                        /
                        /
                        /GENERATE PATTERNS CONTROL ROUTINE
                        /PATTERN NUMBER + PARITY BIT + ADDRESS
                        /OF PATTERN TABLE
                        /
03727   603727          GENPAT  JMP .
03730   200103                  LAC PATNUM              /PATTERN NUMBER
03731   340104                  TAD PARBT1              /+ PARITY BIT
03732   346000                  TAD (PATTBL             /+ TABLE ADDRESS OF JMS
03733   345702                  TAD (XCT                /+ EXECUTE INSTRUCTION
03734   043735                  DAC .+1                 /TO EXECUTE JMS TO PATTERN
03735   403737                  XCT PATTBL              /GENERATE 1 OF 16 PATTERNS
03736   623727                  JMP* GENPAT             /EXIT
                        /
                        /FIRST 8 JMS TO EVEN PARITY PATTERNS
03737   103757          PATTBL  JMS GNEV00              /HIGH FREQUENCE OUTSIDE TRACKS
03740   103763                  JMS GNEV01              /SLIDING NO BIT
03741   103775                  JMS GNEV02              /HIGH FREQUENCE ODD TRACKS
03742   104001                  JMS GNEV03              /HIGH FREQUENCY INSIDE HALF OUT
03743   104006                  JMS GNEV04              /CHARACTER COUNT NO 00
03744   104012                  JMS GNEV05              /NO BIT EACH TRACK 3 FRAMES
03745   104024                  JMS GNEV06              /SLIDING 0 18 BITS
03746   104036                  JMS GNEV07              /RANDOM CHARACTER NO 00
                        /
                        /
                        /2ND 8 JMS TO ODD PARITY GENERATION
                        /
03747   104070                  JMS GNOD00              /HALF FREQUENCY OUTSIDE TRACKS
03750   104075                  JMS GNOD01              /SLIDING ONE BIT CHAR
03751   104107                  JMS GNOD02              /HIGH FREQUENCY EVEN TRACKS
03752   104113                  JMS GNOD03              /THREE ONES THREE 0 TRACK
03753   104125                  JMS GNOD04              /INC CHARACTER 00 INCLUDED
03754   104131                  JMS GNOD05              /THREE ONE BITS ALL TRKS
03755   104143                  JMS GNOD06              /ALL ONES HIGH FREQUENCY ALL TRACKS
03756   104147                  JMS GNOD07              /RANDOM WORD PATTERN
                        /
                        /PATTERN 0 EVEN PARITY HIGH FREQUENCY
```

```
                                    /OUTSIDE SKEW PATTERN
                                    /
03757       603757          GNEV00      JMP .
03760       104174                      JMS STRONE
03761       010101                      010101
03762       623757                      JMP* GNEV00
                                    /
                                        .EJECT
```

```
                                /PATTERN 1 EVEN PARITY
                                /SLIDING 0 BIT CHARACTER PATTERN
                                /
03763       603763              GNEV01      JMP .
03764       104224                          JMS ST7WRD
03765       773757                          773757
03766       677375                          677375
03767       767737                          767737
03770       576773                          576773
03771       757677                          757677
03772       375767                          375767
03773       737576                          737576
03774       623763                          JMP* GNEV01
                                /
                                /
                                /PATTERN 2 EVEN PARITY
                                /HIGH FREQUENCY PATTERN ODD TRACKS
                                /
03775       603775              GNEV02      JMP .
03776       104174                          JMS STRONE
03777       252525                          252525
04000       623775                          JMP* GNEV02
                                /
                                /
                                /PATTERN NO 3 EVEN PARITY
                                /HALF FREQUENCY OUTSIDE TRACKS
                                /HIGH FREQUENCY INSIDE TRACKS
                                /
04001       604001              GNEV03      JMP .
04002       104204                          JMS STR2WD
04003       777677                          777677
04004       767776                          767776
04005       624001                          JMP* GNEV03
                                /
                                            .EJECT
```

```
                                /
                                /PATTERN NUMBER 4 EVEN PARITY
                                /INCREMENTING CHARACTER PATTERN
                                /
04006       604006      GNEV04  JMP .
04007       206001              LAC (SNA
04010       104247              JMS GENINC
04011       624006              JMP* GNEV04
                                /
                                /
                                /PATTERN NO 5 EVEN PARITY
                                /3 0 BITS EACH TRACK EVERY 7TH WORD
                                /
04012       604012      GNEV05  JMP .
04013       104224              JMS ST7WRD
04014       777777              777777
04015       373737              373737
04016       575757              575757
04017       676767              676767
04020       737373              737373
04021       757575              757575
04022       767676              767676
04023       624012              JMP* GNEV05
                                /
                                .EJECT
```

```
                                /PATTERN NUMBER 6 EVEN PARITY
                                /SLIDING 0 BIT THROUGH 18 BITS
                                /
04024   604024          GNEV06  JMP .
04025   104314                  JMS SETSTR
04026   777776                  LAW -2
04027   060010                  DAC* 10
04030   744002                  SMA!SZL
04031   744000                  CLL
04032   740010                  RAL
04033   440011                  ISZ 11
04034   604027                  JMP GNEV06+3
04035   624024                  JMP* GNEV06
                                /
                                /PATTERN NUMBER 7 EVEN PARITY
                                /RANDOM DATA PATTERN
                                /THROW AWAY ALL WORD WITH 00 CODES
04036   604036          GNEV07  JMP .
04037   104314                  JMS SETSTR
04040   777770                  LAW -MINLEN
04041   040013                  DAC 13
04042   103032                  JMS RANGEN
04043   040012                  DAC 12
04044   506002                  AND (770000
04045   741200                  SNA
04046   604042                  JMP GNEV07+4
04047   200012                  LAC 12
04050   506003                  AND (7700
04051   741200                  SNA
04052   604042                  JMP GNEV07+4
04053   200012                  LAC 12
04054   506004                  AND (77
04055   741200                  SNA
04056   604042                  JMP GNEV07+4
04057   200012                  LAC 12
04060   060010                  DAC* 10
04061   440011                  ISZ 11
04062   741000                  SKP
04063   624036                  JMP* GNEV07
04064   440013                  ISZ 13
04065   604042                  JMP GNEV07+4
04066   104164                  JMS MOVEUP
04067   624036                  JMP* GNEV07
                                /
                                /FIRST OF ODD PARITY PATTERNS
                                /HALF FREQUENCY OUTSIDE TRACKS
                                /LOW FREQUENCY SKEW
04070   604070          GNOD00  JMP .
04071   104204                  JMS STR2WD
04072   010001                  010001
04073   000100                  000100
04074   624070                  JMP* GNOD00
                                /
                                .EJECT
```

```
                                /ODD PARITY PATTERN 1
                                /SLIDING ONE BIT CHARACTER PATTERN
                                /
04075   604075          GNOD01  JMP .
04076   104224                  JMS ST7WRD
04077   004020                  004020
04100   100402                  100402
04101   010040                  010040
04102   201004                  201004
04103   020100                  020100
04104   402010                  402010
04105   040201                  040201
04106   624075                  JMP* GNOD01
                                /
                                /
                                /ODD PARITY PATTERN NUMBER 2
                                /HIGH FREQUENCY EVEN NUMBERED TRACKS
                                /
04107   604107          GNOD02  JMP .
04110   104174                  JMS ST0NE
04111   525252                  525252
04112   624107                  JMP* GNOD02
                                /
                                /
                                /ODD PARITY PATTERN NUMBER 3
                                /3 ONES 3 ZEROS  3 ONES  6 ZEROS EVERY TRACK
                                /
04113   604113          GNOD03  JMP .
04114   104224                  JMS ST7WRD
04115   070707                  070707
04116   606060                  606060
04117   151515                  151515
04120   424242                  424242
04121   313131                  313131
04122   060606                  060606
04123   707070                  707070
04124   624113                  JMP* GNOD03
                                /
                                /
                                /ODD PARITY PATTERN NUMBER 4
                                /CHARACTER COUNT PATTERN WITH 00 CODES
                                /
04125   604125          GNOD04  JMP .
04126   206005                  LAC (SKP
04127   104247                  JMS GENINC
04130   624125                  JMP* GNOD04
                                /
                                .EJECT
```

```
                                /ODD PARITY PATTERN NUMBER 5
                                /EACH TRACK BY ITSELF FOR 3 FRAMES
 04131      604131              GNOD05    JMP .
 04132      104224                        JMS ST7WRD
 04133      000000                        0
 04134      404040                        404040
 04135      202020                        202020
 04136      101010                        101010
 04137      040404                        040404
 04140      020202                        020202
 04141      010101                        010101
 04142      624131                        JMP* GNOD05
                                /ODD PARITY PATTERN NUMBER 6
                                /HIGH FREQUENCY ALL TRACKS
 04143      604143              GNOD06    JMP .
 04144      104174                        JMS STRONE
 04145      777777                        777777
 04146      624143                        JMP* GNOD06
                                /ODD PARITY PATTERN NUMBER 7
                                /RANDOM WORDS INCLUDING 00 CODES
 04147      604147              GNOD07    JMP .
 04150      104314                        JMS SETSTR
 04151      777770                        LAW -MINLEN
 04152      040014                        DAC 14
 04153      103032                        JMS RANGEN
 04154      060010                        DAC* 10
 04155      440011                        ISZ 11
 04156      741000                        SKP
 04157      624147                        JMP* GNOD07
 04160      440014                       ISZ 14
 04161      604153                        JMP GNOD07+4
 04162      104164                        JMS MOVEUP
 04163      624147                        JMP* GNOD07
                                /
                                /MOVE THE FIRST SERIES OF RANDOM DATA WORDS
                                /IN WRITE BUFFER UNTIL BUFFER FULL
 04164      604164              MOVEUP    JMP .
 04165      205754                        LAC (WRBUF-1
 04166      040015                        DAC 15
 04167      220015                        LAC* 15
 04170      060010                        DAC* 10
 04171      440011                        ISZ 11
 04172      604167                        JMP .-3
 04173      624164                        JMP* MOVEUP
                                          .EJECT
```

```
                        /STORE WORD SUBROUTINES
                        /GENERATE PATTERNS IN WRITE BUFFER
                        /
04174   604174  STRONE  JMP .
04175   104314          JMS SETSTR          /SET UP INDEXES
04176   224174          LAC* STRONE         /GET WORD
04177   060010          DAC* 10             /STORE IT
04200   440011          ISZ 11              /FILLED BUFFER
04201   604177          JMP .-2             /NO FILL BUFFER
04202   444174          ISZ STRONE          /STEP EXIT
04203   624174          JMP* STRONE         /EXIT
                        /
                        /
                        /STORE A 2 WORD PATTERN IN WRITE BUFFER
                        /
04204   604204  STR2WD  JMP .
04205   104314          JMS SETSTR          /SET UP INDEXES
04206   224204          LAC* STR2WD         /GET FIRST WORD
04207   040012          DAC 12              /SAVE IT
04210   444204          ISZ STR2WD          /STEP ENTER
04211   200012  STR2LP  LAC 12              /FIRST WORD
04212   060010          DAC* 10             /STORE IT
04213   440011          ISZ 11              /FILLED BUFFER
04214   741000          SKP                 /NO
04215   604222          JMP .+5             /BUFFER FULL EXIT
04216   224204          LAC* STR2WD         /GET 2ND WORD
04217   060010          DAC* 10             /STORE IT
04220   440011          ISZ 11              /BUFFER FULL
04221   604211          JMP STR2LP          /NO DO FIRST AGAIT
04222   444204          ISZ STR2WD          /STEP EXIT
04223   624204          JMP* STR2WD         /EXIT
                        /
                        .EJECT
```

```
                        /STORE A 7 WORD PATTERN IN WRITE BUFFER
                        /
04224   604224  ST7WRD  JMP .
04225   104314          JMS SETSTR              /SET INDEXES
04226   777771          LAW -7                  /-7
04227   040012          DAC 12                  /FOR COUNTING
04230   777777          LAW -1                  /ADDRESS
04231   344224          TAD ST7WRD              /-1
04232   040013          DAC 13                  /FOR INDIRECTS
04233   220013  ST7LP   LAC* 13                 /GET NEXT WORD
04234   060010          DAC* 10                 /STORE IT
04235   440011          ISZ 11                  /BUFFER FULL
04236   741000          SKP                     /NO
04237   604243          JMP .+4                 /BUFFER FULL, EXIT
04240   440012          ISZ 12                  /DONE 7 WORDS
04241   604233          JMP ST7LP               /NO GET NEXT
04242   604226          JMP ST7WRD+2            /RESET FOR NEXT 7
04243   205701          LAC (7
04244   344224          TAD ST7WRD              /ENTER +7
04245   044224          DAC ST7WRD              /TO EXIT OVER DATA
04246   624224          JMP* ST7WRD             /GET OUT
                        /
                        /
                        /GENERATE AN INCREMENTING CHARACTER PATTERN
                        /IF AC = SKP ODD PARITY 00 CODES OK
                        /IF AC = SNA EVEN PARITY THROW 00 AWAY
                        /
04247   604247  GENINC  JMP .
04250   044307          DAC GENSKP              /STORE SKIP OR SNA
04251   546005          SAD (SKP                /IF AC = SKP
04252   750000          CL@                     /FIRST CHAR IS 00
04253   740200          SZA                     /IF AC = SNA
04254   205710          LAC (1                  /FIRST CHAR I 0 1
04255   044313          DAC NXCHAR              /FIRST CHARACTER
04256   104314          JMS SETSTR              /SET UP 10 AND 11
04257   204313  GENWRD  LAC NXCHAR              /GET NEXT CHARACTER
04260   744020          RCR                     /POSITION IT TO
04261   742020          RTR                     /UPPER 6 BITS
04262   742020          RTR                     /OF WORD
04263   742020          RTR
04264   040012          DAC 12                  /SAVE IT
04265   104303          JMS INCRIT              /GENERATE NEXT CHAR +1
04266   744010          RCL                     /MOVE IT INTO MIDDLE 6 BITS
04267   742010          RTL                     /OF THE WORD
04270   742010          RTL;      RAL
04271   740010
04272   340012          TAD 12                  /COMBINE 1 AND 2
04273   040012          DAC 12                  /SAVE IT
04274   104303          JMS INCRIT              /GENER@TE NEXT
04275   340012          TAD 12                  /COMBINE WITH 1 AND 2
04276   060010          DAC* 10                 /STORE IN BUFFER
04277   104303          JMS INCRIT              /FIRST CHAR NEXT WORD
04300   440011          ISZ 11                  /FILLED BUFFER
04301   604257          JMP GENWRD              /NO
04302   624247          JMP* GENINC             /BUFFER FULL EXIT
```

//

.EJECT

```
04303   604303          INCRIT  JMP .
04304   204313                  LAC NXCHAR              /LAST CHARACTER
04305   345710                  TAD (1                  /+1
04306   506004                  AND (77                 /MASK 6 BITS
04307   741200          GENSKP  SN@!SKP                 /SNA EVEN PARITY - SKP ODD PARITY
04310   205710                  LAC (1                  /00 CODE ILLEGAL EVEN PARITY
04311   044313                  DAC NXCHAR              /S@VE FOR NEXT TIME
04312   624303                  JMP* INCRIT             /EXIT AC = CHAR
04313   000000          NXCHAR  0                       /TO SAVE CHARACTER
                        /
                        /
                        /SET UP 10 AND 11 STORE PATTERN
                        /
04314   604314          SETSTR  JMP .
04315   775710                  LAW -MAXLEN
04316   040011                  DAC 11                  /WORD COUNT TO 11
04317   205754                  LAC (WRBUF-1
04320   040010                  DAC 10                  /BUFFER-1 TO 10
04321   624314                  JMP* SETSTR             /EXIT
                        /
                        /TC59 DATA RELIABILITY (TAPE 6)
                        /READ PORTION TC59 D@TA RELIABILITY TEST
                        /AC SWS 6 AND 7 WERE TO INDICATE
                        /READ MODE AT START
                        /SWS = 00 IS NON STOP
                        /SWS = 01 IS START STOP
                        /SWS = 10 OR 11 IS START STOP NON STOP RANDOM
                        /
04322   604322          READIT  JMP .
04323   200140                  LAC RECORD
04324   740200                  S%@
04325   604331                  JMP .+4
04326   200113                  LAC STRLEN                      /SET UP INITIAL
04327   040145                  DAC READLN              /READ LENGTH
04330   040146                  DAC COMPLN              /AND COMPARE LENGTH
04331   777775                  LAW -3
04332   044631                  DAC RDPASS              /READ PASS COUNTER
04333   206006                  LAC (RDBUF1-1           /RECORD INITIALLY
04334   040147                  DAC READNX              /READ INTO BUFFER1
04335   206007                  LAC (RDBUF2-1           /EVERY OTHER RECORD
04336   040150                  DAC COMPNX              /ALTERNATES BUF1-BUF2
04337   707321          RDSTPD  MTCR
04340   604337                  JMP .-1                 /WAIT CU READY
04341   206010                  LAC (2400               /READ FNI
04342   340114                  TAD COMAND                      /+ DRIVE AND DENSITY
04343   707326                  MTLC                    /LOAD COMMAND
04344   777777                  LAW -1                  /SET TAPE STOPPED
04345   044632                  DAC RSTPFL              /DELETE NONSTOP COMPARE
04346   707301                  MTTR                    /WAIT DRIVE READY
04347   604346                  JMP .-1
04350   200147          READGO  LAC READNX                      /SET UP CA AND
04351   040033                  DAC CALOC               /WC FOR NEXT BLOCK
04352   200145                  LAC READLN              /TO BE READ IN
04353   040032                  DAC WCLOC
04354   707304                  MTGO                    /START OR CONTINUE
```

```
04355   444632          ISZ RSTPFL          /GOING NONSTOP
04356   104510  NSCOMP  JMS CODATA          /YES COMPARE LAST BLOCK
04357   103636          JMS WAITI           /WAIT FOR INTERRUPT
04360   741100          SPA                 /FF=1
04361   604435          JMP RDERRO          /YES SEE IF EOT
04362   750004          LAS
04363   740020          RAR
04364   740400          SNL
04365   604372          JMP RTSSTP
04366   203650          LAC STATRD
04367   505724          AND (4000
04370   740200          SZA
04371   604710          JMP RNDTAP
                /
                        .EJECT
```

```
04372   200110          RTSSTP  LAC READMO              /GET READ MODE BITS
04373   740200                  SZA                     /NON STOP
04374   604406                  JMP RDSTPC                      /NO
04375   144632                  DZM RSTPFL              /CLR STOPPED FLAG
04376   707322                  MT@F                    /AND MTF
04377   104633                  JMS RDINCR              /INCR FOR NEXT BLOCK
04400   200140                  LAC RECORD
04401   540141                  SAD LASRCR
04402   604404                  JMP RDEXIT
04403   604350                  JMP READGO              /GO AGAIN COMPARE THIS ONE
04404   104510          RDEXIT  JMS CODATA
04405   624322                  JMP* READIT
                        /
04406   505724          RDSTPC  AND (4000               /MASK READ RNDM STOP
04407   740200                  SZA                     /USE SETTLE DOWN
04410   604417                  JMP RNDRDS              /NO RANDOM
04411   104633                  JMS RDINCR              /FOR NEXT BLOCK
04412   104510                  JMS CODATA              /COMPARE THIS ONE
04413   200140                  LAC RECORD
04414   540141                  SAD LASRCR
04415   624322                  JMP* READIT
04416   604337                  JMP RDSTPD              /GO AGAIN
04417   103032          RNDRDS  JMS RANGEN              /GET RNDOM
04420   505756                  AND (177                /MASK 0 TO 127
04421   740001                  CMA                     /MAKE -1 TO -128
04422   043325                  DAC MTIMER              /TO COUNT MILLISEC
04423   345735                  TAD (4
04424   740100                  SM@                     /NUMBER 4 OR LESS
04425   604375                  JMP RTSSTP+3            /YES GO NONSTOP
04426   777763                  LAW -MSEC               /TO COUNT 1 MILLISEC
04427   043326                  DAC MTIMER+1
04430   443326                  ISZ MTIMER+1            /TIME 1 MILLISEC.
04431   604430                  JMP .-1
04432   443325                  ISZ MTIMER              /WAITED ALL
04433   604427                  JMP .-4                 /NO
04434   604411                  JMP RDSTPC+3            /COMPARE DATA START AGAIN
                        /
                                .EJECT
```

```
04435   505761          /MAG TAPE STATUS INDICATES ERR SEE IF EOT
04436   741200  RDERRO  AND (373600         /MASK OFF EOT
04437   604710          SNA                 /OTHERS =1
04440   750004          JMP RNDTAP          /NO MUST BE EOT
04441   505744          LAS                 /GET SWS
04442   741200          AND (17000
04443   604456          SNA                 /TYPE ALL READ ERRS
04444   206011          JMP RTSREC          /NO SEE IF RECOVR SELECTED
04445   105136          LAC (TEXT15
04446   707312          JMS TYPET           /RD STATUS ERROR
04447   105216          MTRC
04450   203650          JMS TYPEC           /TYPE COMMAND
04451   103655          LAC STATRD
04452   200140          JMS SPTCON          /AND STATUS
04453   103655          LAC RECORD
04454   200145          JMS SPTCON          /AND RECORD NUMBER
04455   103655          LAC READLN
                        JMS SPTCON          /AND LENGTH
                /

                        .EJECT
```

```
                                /+1 READ ERRS IF FIRST ERR PASS
04456   777775          RTSREC  LAW -3
04457   544631                  SAD RDPASS              /FIRST PASS ERR
04460   440155                  ISZ RDERRS              /YES +1 RD ERRS
04461   104633                  JMS RDINCR              /INCR SET UP COMPARE
04462   104510                  JMS CODATA              /COMPARE DATA
04463   750004                  LAS
04464   505723                  AND (2000
04465   741200                  SN@                     /DELETE ALL RECORDRY
04466   604501                  JMP RPASN3                      /NO TRY AGAIN
04467   777775          RPASS3  LAW -3
04470   044631                  DAC RDPASS              /RESET PASS COUNTER
04471   203650                  LAC STATRD
04472   505724                  AND (4000
04473   740200                  SZA                     /IS END OF TAPE=1
04474   604712                  JMP RNDTAP+2            /YES TYPE EOT
04475   200140                  LAC RECORD
04476   540141                  SAD LASRCR
04477   624322                  JMP* READIT
04500   604337                  JMP RDSTPD              /ALWAYS STOP TAPE ON E R
                                /SEE IF ALL REREADS HAVE BEEN MADE
04501   444631          RPASN3  ISZ RDPASS                      /DONE ALL REREADS
04502   604505                  JMP .+3                 /NO
04503   440154                  ISZ NRREAD              /+1 NON REC READ
04504   604467                  JMP RPASS3              /DO NEXT RECORD
04505   104666                  JMS SETBAK                      /PUT POINTERS BACK THIS ONE
04506   104674                  JMS BACK1               /BACK UP
04507   604337                  JMP RDSTPD              /GO AG@IN
                                /
                                .EJECT
```

```
                        /COMPARE WRITE BUFFER AGAINST DATA READ
04510   604510  CODATA  JMP .
04511   144626          DZM CERFLG+1        /0 ERROR COUNTER
04512   777777          LAW -1
04513   044625          DAC CERFLG          /SET HEADER NOT TYPED
04514   205754          LAC (WRBUF-1
04515   040010          DAC 10              /TO GET WORDS WRITTEN
04516   200150          LAC COMPNX
04517   040011          DAC 11              /TO GET WORDS READ
04520   200146          LAC COMPLN
04521   040012          DAC 12              /TO COUNT SAME
04522   220010  COLOOP  LAC* 10             /GET WORD WRITTEN
04523   044627          DAC COGOOD          /SAVE FOR TYPE OUT
04524   220011          LAC* 11             /GET WORD READ
04525   544627          SAD COGOOD          /ARE THEY=
04526   741000          SKP                 /YES
04527   604553          JMP COERRO          /COUNT OR TYPE ERRORS
04530   440012  COINCR  ISZ 12             /DONE ALL WORDS
04531   604522          JMP COLOOP          /NO COMPARE NEXT
04532   204626          LAC CERFLG+1        /GET ERROR COUNT
04533   741200          SNA                 /ANY ERRORS
04534   624510          JMP* CODAT@         /NO EXIT
04535   777775          LAW -3
04536   544631          SAD RDPASS          /FIRST PASS
04537   440153          ISZ CMPERR          /YES +1 COMPARE ERRORS
04540   203650          LAC STATRD          /GET STATUS THIS RECORD
04541   505761          AND (373600
04542   741200          SNA
04543   440152          ISZ RNOSTA                  /NO EE +1 COMPARE NO ERR
04544   204510          LAC CODATA          /GET ENTR ADDRSS
04545   506012          AND (17777          /MASK ADDRS BITS
04546   546013          SAD (NSCOMP+1       /ENTERED NONSTOP
04547   741000          SKP                 /YES
04550   624510          JMP* CODAT@         /NOT NONSTP ENTER EXIT
04551   104674          JMS BACK1           /BACKUP TAPE IS
04552   604463          JMP RPASS3-4        /1 RECORD PAST FAILED
                        /
                        .EJECT
```

```
                                /DATA DID NOT COMPARE SAVE INCR TEST FOR TYPE
04553   044630          COERRO  DAC COREAD              /SAVE WORD READ
04554   750004                  LAS                     /GET SWS
04555   444626                  ISZ CERFLG+1            /+1 ERRS THIS BLOCK
04556   505744                  AND (10000
04557   741200                  SNA                     /TYPE ALL READ ERROR
04560   604530                  JMP COINCR              /NO
04561   444625                  ISZ CERFLG              /HOR TYPED ALREADY
04562   604602                  JMP COTYDA              /YES TYPE DATA
04563   203650                  LAC STATRD
04564   741100                  SP@
04565   604600                  JMP COTYDA-2
04566   206014                  LAC (TEXT16                     /READ DATA E ROR
04567   105136                  JMS TYPET               /COMD STATUS RECORD LENGTH
04570   707312                  MTRC
04571   105216                  JMS TYPEC               /TYPE COMMAND
04572   203650                  LAC STATRD
04573   103655                  JMS SPTCON              /TYPE STATUS
04574   200151                  LAC CORECRD             /RECORD NUMBER
04575   103655                  JMS SPTCON
04576   200146                  LAC COMPLN              /AND RECORD LENTH
04577   103655                  JMS SPTCON
04600   206015                  LAC (TEXT17             /DATA ADDRESS
04601   105136                  JMS TYPET
04602   777774          COTYDA  LAW -4
04603   344625                  TAD CERFLG
04604   740100                  SM@                     /DONE 4 DATA TYPEOUTS
04605   604530                  JMP COINCR              /YES
04606   206016                  LAC (TEXT11             /C@R RET
04607   105136                  JMS TYPET               /LINE FEED LINE FEED
04610   204627                  LAC COGOOD
04611   105216                  JMS TYPEC               /TYPE DATA WRITTEN
04612   200010                  LAC 10
04613   103655                  JMS SPTCON              /AND BUFFER ADDRESS
04614   206017                  LAC (TEXT18                     /WRITTEN CARRET LF
04615   105136                  JMS TYPET
04616   204630                  LAC COREAD
04617   105216                  JMS TYPEC               /TYPE DATA READ
04620   200011                  LAC 11
04621   103655                  JMS SPTCON              /AND BUFFER ADDRESS
04622   206020                  LAC (TEXT19
04623   105136                  JMS TYPET               /READ CARRET LF
04624   604530                  JMP COINCR
                                /
                                .EJECT
```

```
04625   000000          CERFLG   0                       /HEADER NOT TYPED=LAW -1
04626   000000                   0                       /TO COUNT DATA ERROR
04627   000000          COGOOD   0                       /D@TA WORD WRITTEN
04630   000000          COREAD   0                       /INCO WORD READ
04631   000000          RDPASS   0                       /READ PASS COUNTER
04632   000000          RSTPFL   0                       /TAPE NOT MOVING AT GO
                        /SET UP POINTERS FOR NEXT RECORD
04633   604633          RDINCR   JMP .
04634   200147                   LAC READNX              /SHUFFLE
04635   040017                   DAC 17                  /BUFFER ADDRESSES
04636   200150                   LAC COMPNX                      /FOR READ AND
04637   040147                   DAC READNX              /COMPARE
04640   200017                   LAC 17
04641   040150                   DAC COMPNX
04642   200145                   LAC READLN              /READ LENGTH
04643   040146                   DAC COMPLN              /TO COMPARE LENGTH
04644   200140                   LAC RECORD              /RECORD
04645   040151                   DAC CORECRD             /TO COMPARE RECORD
04646   440140                   ISZ RECORD              /+1 FOR NEXT RECORD
04647   200115                   LAC RLKINC                      /GET LENGTH INCR
04650   741200                   SN@                     /LENGTH CHANGING
04651   624633                   JMP* RDINCR             /NO EXIT
                        /RECORD LENGTH IS CHANGING COUNT IT
04652   340145                   TAD READLN              /LENGTH + OR-INCR
04653   040145                   DAC READLN              /FOR NEXT RECORD
04654   345727                   TAD (MINLEN
04655   740100                   SMA                     /LENGTH LESS THAN MIN
04656   604663                   JMP RESTRL              /YES RESET TO MAX
04657   205757                   LAC (MAXLEN+1           /M@XIMUM +1
04660   340145                   TAD READLN              /-CURRENT
04661   740100                   SMA                     /EXCEED MAX RESET TO MIN
04662   624633                   JMP* RDINCR             /LENTH OK
04663   200113          RESTRL   LAC STRLEN              /STARTING LENTH
04664   040145                   DAC READLN              /BACK TO INITIAL
04665   624633                   JMP* RDINCR             /EXIT
                        /
                                 .EJECT
```

```
                                /SET RECORD POINTERS BACK BUFFERS LEFT ALONE
04666   604666          SETBAK  JMP .
04667   200146                  LAC COMPLN
04670   040145                  DAC READLN              /RESET READ LENGTH
04671   200151                  LAC CORECRD
04672   040140                  DAC RECORD              /AND RECORD NUMBER
04673   624666                  JMP* SETBAK
                                /
                                /BACK SPACE 1 RECORD SAME DRIVE
                                /OR GET BACK IN SYNC FOR NONSTOP REREAD
04674   604674          BACK1   JMP .
04675   707301                  MTTR
04676   604675                  JMP .-1                 /WAIT DRIVE READY
04677   205777                  LAC (7400               /BACKSPACE
04700   340105                  TAD DRVDEN              /+ DRIVE AND DENSITY
04701   707326                  MTLC                    /LOAD COMMAND
04702   777777                  LAW -1
04703   040032                  DAC WCLOC               /1 RECORD
04704   707304                  MTGO                    /START TAPE
04705   707341                  MTSF
04706   604705                  JMP .-1                 /WAIT FOR DONE
04707   624674                  JMP* BACK1              /EXIT
                                /
                                /DRIVE HAS REACHED EOT IN READ TYPE OUT
04710   104633          RNDTAP  JMS RDINCR
04711   104510                  JMS CODATA
04712   206021                  LAC (TEXT20
04713   105136                  JMS TYPET
04714   206022                  LAC (TEXT2
04715   105136                  JMS TYPET
04716   104720                  JMS READMP
04717   624322                  JMP* READIT
                                /
                                /DUMP READ ERROR COUNTERS
04720   604720          READMP  JMP .
04721   200105                  LAC DRVDEN
04722   742010                  RTL
04723   742010                  RTL
04724   105245                  JMS TY1OCT
04725   103711                  JMS SPACE3
04726   200103                  LAC PATNUM
04727   105245                  JMS TY1OCT
04730   103711                  JMS SPACE3
04731   200104                  LAC PARBT1
04732   742020                  RTR
04733   740020                  RAR
04734   105245                  JMS TY1OCT
04735   200105                  LAC DRVDEN
04736   742020                  RTR
04737   742020                  RTR
04740   742020                  RTR
04741   505716                  AND (3
                                /
                                .EJECT
```

```
04742   345764          TAD (LAC DENTYP
04743   044744          DAC .+1
04744   203607          LAC DENTYP
04745   105136          JMS TYPET
04746   200110          LAC READMO
04747   742020          RTR
04750   742020          RTR
04751   742020          RTR
04752   742020          RTR
04753   742020          RTR
04754   505716          AND (3
04755   345765          TAD (LAC TYMODE
04756   044757          DAC .+1
04757   203603          LAC TYMODE
04760   105136          JMS TYPET
04761   200140          LAC RECORD
04762   105252          JMS TYDECI
04763   200106          LAC RLTROL
04764   742020          RTR
04765   742020          RTR
04766   742020          RTR
04767   742020          RTR
04770   505716          AND (3
04771   345767          TAD (LAC LTHTRL
04772   044773          DAC .+1
04773   203617          LAC LTHTRL
04774   105136          JMS TYPET
04775   206026          LAC (TEXT21         /READ ERROR =
04776   105136          JMS TYPET
04777   200155          LAC RDERRS
05000   105252          JMS TYDECI
05001   206027          LAC (TEXT22         /NON RECOVERED =
05002   105136          JMS TYPET
05003   200154          LAC NRREAD
05004   105252          JMS TYDECI
05005   206030          LAC (TEXT23         /DATA ERRORS =
05006   105136          JMS TYPET
05007   200153          LAC CMPERR
05010   105252          JMS TYDECI
05011   206031          LAC (TEXT24         /DATA NO STAT =
05012   105136          JMS TYPET
05013   200152          LAC RNOSTA
05014   105252          JMS TYDECI
05015   777777          LAW -1
05016   040156          DAC RDFOT
05017   624720          JMP* READMP

                        .EJECT
```

```
                        /WRITE RECOVERY UTILIZING EXTENDED INTER RECORD
                        /USER EITHER AFTER 7 REWRITES OR
                        /AFTER EACH WRITE ERROR IF STATISTICAL
                        /RECOVERY NOT SELECTED
                        /USED ONLY IF READ PASS SELECTED
05020   605020  XRGREC  JMP .
05021   777774          LAW -4
05022   040116          DAC WRPASS          /TO COUNT 4 REWRITES
                                            /BACK UP TAPE 1
05023   750004          LAS
05024   505763          AND (100000
05025   740200          SZ@
05026   605047          JMP XRGRCD                  /WRITE WITH XIRG DELETED
05027   104674          JMS BACK1
05030   206032          LAC (14400          /WRITE XIRG
05031   340114          TAD COMAND                  /+ DRIVE DENSITY PARITY
05032   707321          MTCR
05033   605032          JMP .-1             /WAIT FOR CONTROL
05034   707326          MTLC
05035   200143          LAC WRTLEN          /SET UP WC AND
05036   040032          DAC WCLOC           /CURRENT ADDRESS
05037   205754          LAC (WRBUF-1
05040   040033          DAC CALOC
05041   707301          MTTR                /WAIT FOR DRIVE
05042   605041          JMP .-1
05043   707304          MTGO                /START WRITE XIRG
05044   103636          JMS WAITI           /WAIT FOR STATUS
05045   741100          SPA                 /ERROR
05046   605052          JMP .+4             /YES
05047   777770  XRGRCD  LAW -10
05050   040116          DAC WRPASS          /RESET 7 COUNTER
05051   625020          JMP* XRGREC         /EXIT WRITE XIRG
05052   505761          AND (373600         /MASK OFF EOT
05053   741200          SNA                 /SOME OTHER BIT
05054   605047          JMP XRGRCD                  /NOT EOT ONLY
05055   440116          ISZ WRPASS          /DONE 4 XIRG
05056   605023          JMP XRGREC+3        /NO DO 1 MORE
                        /
                        .EJECT
```

```
                                /
                                /TYPEOUT STATUS EVERY 4 XIRQ
05057   206033                          LAC (TEXT1
05060   105136                          JMS TYPET               /WRITE STATUS ERROR
05061   707312                          MTRC
05062   105216                          JMS TYPEC               /TYPE COMMAND
05063   203650                          LAC STATRD
05064   103655                          JMS SPTCON              /TYPE STATUS
05065   200140                          LAC RECORD
05066   103655                          JMS SPTCON              /TYPE RECORD NUMBER
05067   206034                          LAC (TEXT14             /4TH EXTENDED REC GAP
05070   105136                          JMS TYPET
05071   203650                          LAC STATRD
05072   505724                          AND (4000
05073   741200                          SNA                     /EOT=1
05074   605021                          JMP XRQREC+1            /NO TRY 4 MORE
05075   206035                          LAC (5400               /WRITE
05076   340105                          TAD DRVDEN              /END OF FILE
05077   707326                          MTLC
05100   740000                          NOP
05101   707304                          MTGO
05102   103636                          JMS WAITI /WAIT FOR DONE
05103   625020                          JMP* XRQREC             /EXIT .
                                /
                                .EJECT
```

```
05104   605104      GOBKWD  JMP .
05105   200140              LAC RECORD              /GET LAST WRITTEN
05106   040141              DAC LASRCR              /SAVE IT
05107   200144              LAC WRRECR              /RESTORE TO FIRST
05110   040140              DAC RECORD
05111   740200              SZ@             /BLOCK 0 FIRST.
05112   605115              JMP .+3         /NO BACKSPACE
05113   103623              JMS REWIND              /YES REWIND
05114   625104              JMP* GOBKWD             /EXIT
05115   777777              LAW -1
05116   340140              TAD RECORD              /TWOS COMPLEMENT
05117   740001              CM@             /FIRST RECORD
05120   340141              TAD LASRCR              /FROM LAST RECORD=DIFF
05121   740001              CM@
05122   040032              DAC WCLOC       /MAKE-FOR BACKUP
05123   440032              ISZ WCLOC       /2 COMP ALSO
05124   205777              LAC (7400       /BKSPAC
05125   340114              TAD COMAND              /+ DRIVE PAR DENS
05126   707321              MTCR
05127   605126              JMP .-1         /WAIT C4 READY
05130   707326              MTLC
05131   707301              MTTR
05132   605131              JMP .-1         /WAIT DRIVE READY
05133   707304              MTGO
05134   103636              JMS WAITI       /W@IT DONE
05135   625104              JMP* GOBKWD             /EXIT
                    /
                    /
                    /TC59 DATA RELIABILITY TEST TAPE 7
                    /TYPE OUT ROUTINES
                    /TYPET OUTPUT 5-7 PACKED ASCII CHARACTERS
                    /
05136   605136      TYPET   JMP .
05137   045213              DAC CMDPTR
05140   777777              LAW -1
05141   045214              DAC PAIRCT
                    /
05142   105160      TYPLUP  JMS GETCHR
05143   545756              SAD (177
05144   625136              JMP* TYPET
05145   741200              SN@
05146   605142              JMP TYPLUP
05147   345713              TAD (200
05150   105152              JMS TY1ASC
05151   605142              JMP TYPLUP
                    /
                    /
                    /OUTPUT 1 ASCII CHARACTER AC = CHAR
                    /
05152   605152      TY1ASC  JMP .
05153   700406              TLS
05154   700401              TSF
05155   605154              JMP .-1
05156   700402              TCF
05157   625152              JMP* TY1ASC
```

```
                                /
                                /
                                /UNPACK ROUTINE 5-7 ASCII
                                /
05160       605160      GETCHR  JMP .
05161       445214              ISZ PAIRCT
05162       605174              JMP NUCHAR
05163       225213      NUPAIR  LAC* CMDPTR
05164       045211              DAC LFHALF
05165       445213              ISZ CMDPTR
05166       225213              LAC* CMDPTR
05167       045212              DAC RTHALF
05170       445213              ISZ CMDPTR
05171       045214              DAC PAIRCT
05172       777773              LAW 17773
05173       045214              DAC PAIRCT
05174       777770      NUCHAR  LAW 17770
05175       045215              DAC TEMPER
05176       205212      GETBCK  LAC RTHALF
05177       740010              RAL
05200       445215              ISZ TEMPER
05201       605204              JMP GETMRE
05202       505756              AND (177
05203       625160              JMP* GETCHR
                                /
                                .EJECT
```

```
05204   045212      GETMRE   DAC RTHALF
05205   205211               LAC LFHALF
05206   740010               RAL
05207   045211               DAC LFHALF
05210   605176               JMP GETBCK
                    /
05211   000000      LFHALF   0
05212   000000      RTHALF   0
05213   000000      CMDPTR   0
05214   000000      PAIRCT   0
05215   000000      TEMPER   0
                    /
                    /
                    /TYPE CONTENTS OCTAL
                    /
05216   605216      TYPEC    JMP .
05217   045325               DAC TYPECT
05220   742020               RTR;      RTR;      RTR
05221   742020
05222   742020
05223   045326               DAC TYPECT+1
05224   742020               RTR;      RTR;      RTR
05225   742020
05226   742020
05227   105235               JMS TY2OCT
05230   205326               LAC TYPECT+1
05231   105235               JMS TY2OCT
05232   205325               LAC TYPECT
05233   105235               JMS TY2OCT
05234   625216               JMP* TYPEC
                    /
                             .EJECT
```

```
                                /TYPE 2 OCTAL CHARACTERS
                                /
05235   605235          TY2OCT  JMP .
05236   045327                  DAC TYPECT+2
05237   742020                  RTR;    RAR
05240   740020
05241   105245                  JMS TY1OCT
05242   205327                  LAC TYPECT+2
05243   105245                  JMS TY1OCT
05244   625235                  JMP* TY2OCT
                                /
                                /
                                /TYPE 1 OCTAL CHARACTER
                                /
05245   605245          TY1OCT  JMP .
05246   505701                  AND (7
05247   345700                  TAD (260
05250   105152                  JMS TY1ASC
05251   625245                  JMP* TY1OCT
                                /
                                /
                                /TYPE CONTENTS DECIMAL
                                /ENTER AC = 18
                                /BIT UNSIGNED NUMBER
                                /CONVERT TO 6 DECIMAL DIGITS AND OUTPUT
                                /
05252   605252          TYDECI  JMP .
05253   045316                  DAC TYDUOT
05254   777772                  LAW -6
05255   045215                  DAC TEMPER
05256   045325                  DAC TYPECT
05257   206036                  LAC (DCHAR6
05260   045326          TYDLUP  DAC TYPECT+1
05261   105275                  JMS TYVERT
05262   065326                  DAC* TYPECT+1
05263   777777                  LAW -1
05264   345326                  TAD TYPECT+1
05265   445215                  ISZ TEMPER
05266   605260                  JMP TYDLUP
05267   225326          TYDOUT  LAC* TYPECT+1
05270   105152                  JMS TY1ASC
05271   445326                  ISZ TYPECT+1
05272   445325                  ISZ TYPECT
05273   605267                  JMP TYDOUT
05274   625252                  JMP* TYDECI
                                /
                                .EJECT
```

```
                                /CONVERT 1 DECIMAL CHARACTER TO ASCII
                                /(TYQUOT) = 18-BIT UNSIGNED NUMBER
                                /
05275   605275          TYVERT  JMP .
05276   205316                  LAC TYQUOT
05277   145316                  DZM TYQUOT
05300   740100                  SMA
05301   605306                  JMP TVRTPL
05302   445316                  ISZ TYQUOT
05303   346037                  TAD (-12
05304   741100                  SPA
05305   605302                  JMP .-3
05306   346037          TVRTPL  TAD (-12
05307   741100                  SPA
05310   605313                  JMP .+3
05311   445316                  ISZ TYQUOT
05312   605306                  JMP TVRTPL
05313   346040                  TAD (12
05314   345700                  TAD (260
05315   625275                  JMP* TYVERT
                                /
05316   000000          TYQUOT  0
05317   000000          DCHAR1  0
05320   000000          DCHAR2  0
05321   000000          DCHAR3  0
05322   000000          DCHAR4  0
05323   000000          DCHAR5  0
05324   000000          DCHAR6  0
05325   000000          TYPECT  0
05326   000000                  0
05327   000000                  0
                                /
                                .EJECT
```

```
                                /TEXT 1
                                /WRITE STATUS ERROR
                                /COMD STATUS
                                /XXXXXX XXXXXX
                                /
05330   064241          TEXT1       .ASCII <15><12><12>'WRITE STATUS ERROR'
05331   253644
05332   446510
05333   520246
05334   522032
05335   452646
05336   202132
05337   251236
05340   510000
05341   000000
05342   064244                      .ASCII <15><12>' COMD   ST@TUS'
05343   041636
05344   466104
05345   020100
05346   516510
05347   152252
05350   514000
05351   000000
05352   064257                      .ASCII <15><12><177>
05353   700000
                                /
                                /
                                /TEXT 2
                                /END OF TAPE
                                /DRV PAT PAR DEN MODE RECRDS LENGTH
                                /
05354   064241          TEXT2       .ASCII <15><12><12>'END OF TAPE'
05355   242634
05356   421011
05357   743100
05360   522032
05361   042400
05362   064250                      .ASCII <15><12>'DRV PAT PAR DEN '
05363   451254
05364   202410
05365   152100
05366   502032
05367   220210
05370   426344
05371   000000
05372   466370                      .ASCII 'MODE RECRDS LENGTH'
05373   442500
05374   512130
05375   351210
05376   515011
05377   442634
05400   436511
05401   000000
05402   064244                      .ASCII <15><12><40><177>
05403   077400
```

```
                                /
                                /
                                /TEXT 3  3 SPACES
                                /
05404     201004                TEXT3     .ASCII <40><40><40><177>
05405     077400
                                /
                                /
                                /TFXT 4 200 FOR 200 BPI
                                /
05406     201006                TEXT4     .ASCII '  200'<177>
05407     230140
05410     774000
05411     000000
                                /
                                          .EJECT
```

```
                                /TEXT 5  556 FOR 556 BPI
                                /
05412   201006          TEXT5     .ASCII '  556'<177>
05413   532554
05414   774000
05415   000000
                                /
                                /
                                /TEXT6  800 FOR 800 BPI
                                /
05416   201007          TEXT6     .ASCII '  800'<177>
05417   030140
05420   774000
05421   000000
                                /
                                /
                                /TEXT 7  NSTP FOR NONSTOP MODE
                                /
05422   202352          TEXT7     .ASCII ' NSTP '<177>
05423   352240
05424   203760
05425   000000
                                /
                                /
                                /TEXT 8  SSTP FOR START STOP MODE
                                /
05426   202472          TEXT8     .ASCII ' SSTP '<177>
05427   352240
05430   203760
05431   000000
                                /
                                /
                                /TEXT 9 RNDM FOR RANDOM START STOP NONSTOP
                                /
05432   202451          TEXT9     .ASCII ' RNDM '<177>
05433   642232
05434   203760
05435   000000
                                /
                                /
                                /TYPE MINIMUM RECORD LENGTH IN CHARACTERS
                                /
05436   201004          TYPMIN    .ASCII '     24 MIN'<177>
05437   020100
05440   311504
05441   046622
05442   473760
05443   000000
                                /
                                /
                                /TYPE MAXIMUM RECORD LENGTH IN CHARACTERS
                                /
05444   201004          TYPMAX    .ASCII '   4008 MAX'<177>
05445   032140
05446   301604
```

```
05447       046602
05450       543760
05451       000000
```

.EJECT

```
                                /TYPE AVERAGE LENGTH MIN TO MAX
                                /
05452   201004          TYPAV1  .ASCII '   2016 MIN TO MAX'<177>
05453   031140
05454   305544
05455   046622
05456   471012
05457   447500
05460   466033
05461   077400
                                /
                                /
                                /TYPE AVERAGE MAX TO MIN
                                /
05462   201004          TYPAV2  .ASCII '   2016 MAX TO MIN'<177>
05463   031140
05464   305544
05465   046602
05466   541012
05467   447500
05470   466231
05471   677400
                                /
                                /
                                /TEXT 10  WRITE ERRORS =
                                /
05472   064252          TEXT10  .ASCII <15><12>'WRITE ERRORS='<177>
05473   751222
05474   522124
05475   042644
05476   512372
05477   251572
05500   774000
05501   000000
                                /
                                /
                                /TEXT 11 CAR RET LINEFEED
                                /
05502   064257          TEXT11  .ASCII <15><12><177>
05503   700000
                                /
                                /
                                /TEXT 12  RECOVERED AT
                                /
05504   512130          TEXT12  .ASCII 'RECOVERED AT '<177>
05505   347654
05506   426450
05507   542100
05510   406504
05511   077400
                                /
                                /
                                        .EJECT
```

```
                                /TEXT 13 PERMANENT BAD/SPT
                                /
05512     064252                TEXT13    .ASCII <15><12>'PERMANENT BADSPT '<177>
05513     042644
05514     466031
05515     642634
05516     521010
05517     240610
05520     516412
05521     420376
                                /
                                /
                                /TEXT 14  XIRG WRITTEN 4 TIMES
                                /
05522     202611                TEXT14    .ASCII ' XIRG WRITTEN 4 TIMES'<177>
05523     151216
05524     202572
05525     244650
05526     522131
05527     620150
05530     202511
05531     146612
05532     517760
05533     000000
                                /
                                /
                                /TEXT 15
                                /READ STATUS ERROR
                                /COMD STATUS RECORD LENGTH
                                /
05534     064241                TEXT15    .ASCII <15><12><12>'READ STATUS ERROR'
05535     251212
05536     406104
05537     051650
05540     406512
05541     551500
05542     426452
05543     247644
05544     064244                          .ASCII <15><12>' COMD STATUS RECORD LENGTH'<15><12><177>
05545     041636
05546     466104
05547     051650
05550     406512
05551     551500
05552     512130
05553     347644
05554     421011
05555     442634
05556     436511
05557     006424
05560     774000
05561     000000
                                /
                                /
                                /TEXT 16  READ DATA ERROR
```

```
                                /
05562   064241          TEXT16  .ASCII <15><12><12>'READ DATA ERROR'<15><12>
05563   251212
05564   406104
05565   042202
05566   522024
05567   042644
05570   512372
05571   206424
05572   202071                  .ASCII ' COMD   STATUS  RECORD  LENGTH'<15><12><177>
05573   746610
05574   201004
05575   051650
05576   406512
05577   551500
05600   202450
05601   541636
05602   512104
05603   020230
05604   426350
05605   752220
05606   064257
05607   700000
                                /
                                /
                                /TEXT 17  DATA ADDRESS
                                /
05610   064244          TEXT17  .ASCII <15><12>' DATA   ADDRS'<15><12><177>
05611   042202
05612   522024
05613   020100
05614   406110
05615   451246
05616   064257
05617   700000
                                /
                                /
                                /TEXT 18  DATA WRITTEN
                                /
05620   202572          TEXT18  .ASCII ' WRITTEN'<15><12><177>
05621   244650
05622   522131
05623   606424
05624   774000
05625   000000
                                /
                                /
                                /
                                /TEXT 19  DATA READ
                                /
05626   202450          TEXT19  .ASCII ' READ'<15><12><177>
05627   540610
05630   064257
05631   700000
                                /
```

```
                                        /
                                        /TEXT 20  READ PASS
                                        /
05632       064241                      TEXT20    .ASCII <15><12><12>'READ PASS'<177>
05633       251212
05634       406104
05635       050202
05636       516477
05637       700000
                                        /
                                        /
                                        /
                                                  .EJECT
```

```
                                /TEXT 21  READ ERRORS =
                                /
05640   064252                  TEXT21    .ASCII <15><12>'READ ERRORS = '<177>
05641   242602
05642   421010
05643   551244
05644   476452
05645   320172
05646   203760
05647   000000
                                /
                                /
                                /TEXT 22  NON RECOVERABLE =
                                /
05650   064251                  TEXT22    .ASCII <15><12>'NON RECOVERABLE='<177>
05651   647634
05652   202450
05653   541636
05654   532132
05655   240604
05656   462127
05657   577400
                                /
                                /
                                /TEXT 23  DATA ERRORS =
05660   064250                  TEXT23    .ASCII <15><12>'DATA ERRORS='<177>
05661   440650
05662   405010
05663   551244
05664   476452
05665   336776
                                /
                                /
                                /TEXT 24  DATA ERR WITH NO STATUS ERR
                                /
05666   064250                  TEXT24    .ASCII <15><12>'DATA NO STATUS='<177>
05667   440650
05670   405011
05671   647500
05672   516510
05673   152252
05674   515737
05675   700000
                               /
        000000                            .END
05676   000215    *LIT
05677   000370    *LIT
05700   000260    *LIT
05701   000007    *LIT
05702   400000    *LIT
05703   017677    *LIT
05704   000270    *LIT
05705   000271    *LIT
05706   000017    *LIT
05707   000376    *LIT
```

```
05710      000001     *LIT
05711      000262     *LIT
05712      000265     *LIT
05713      000200     *LIT
05714      000100     *LIT
05715      000374     *LIT
05716      000003     *LIT
05717      000400     *LIT
05720      000002     *LIT
05721      001000     *LIT
05722      001400     *LIT
05723      002000     *LIT
05724      004000     *LIT
05725      000240     *LIT
05726      017700     *LIT
05727      000010     *LIT
05730      000300     *LIT
05731      000060     *LIT
05732      006000     *LIT
05733      401155     *LIT
05734      000020     *LIT
05735      000004     *LIT
05736      000040     *LIT
05737      000126     *LIT
05740      001144     *LIT
05741      776000     *LIT
05742      040000     *LIT
05743      020000     *LIT
05744      010000     *LIT
05745      700000     *LIT
05746      003071     *LIT
05747      003061     *LIT
05750      700300     *LIT
05751      060000     *LIT
05752      203613     *LIT
05753      004400     *LIT
05754      007777     *LIT
05755      440137     *LIT
05756      000177     *LIT
05757      002471     *LIT
05760      000377     *LIT
05761      373600     *LIT
05762      005330     *LIT
05763      100000     *LIT
05764      203607     *LIT
05765      203603     *LIT
05766      003603     *LIT
05767      203617     *LIT
05770      005472     *LIT
05771      000127     *LIT
05772      005502     *LIT
05773      005504     *LIT
05774      005512     *LIT
05775      005354     *LIT
05776      603643     *LIT
```

```
05777      007400      *LIT
06000      003737      *LIT
06001      741200      *LIT
06002      770000      *LIT
06003      007700      *LIT
06004      000077      *LIT
06005      741000      *LIT
06006      012467      *LIT
06007      015157      *LIT
06010      002400      *LIT
06011      005534      *LIT
06012      017777      *LIT
06013      004357      *LIT
06014      005562      *LIT
06015      005610      *LIT
06016      005502      *LIT
06017      005620      *LIT
06020      005626      *LIT
06021      005632      *LIT
06022      005354      *LIT
06023      203607      *LIT
06024      203603      *LIT
06025      203617      *LIT
06026      005640      *LIT
06027      005650      *LIT
06030      005660      *LIT
06031      005666      *LIT
06032      014400      *LIT
06033      005330      *LIT
06034      005522      *LIT
06035      005400      *LIT
06036      005324      *LIT
06037      777766      *LIT
06040      000012      *LIT
```

NO ERROR LINES