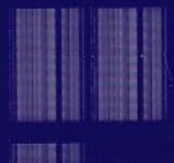


TM03, TU45

TM03/TU45 DATA RELIABAH-E497B-MC  
CZTURBO FICHE 1 OF 1

JUN 1980  
COPYRIGHT © 75.80  
MADE IN USA



.REM %

IDENTIFICATION

PRODUCT CODE: AC-E496B-MC  
PRODUCT TITLE: CZTURBO TM03/TU45 DATA RELIB  
DATE CREATED: 25 MAY 1978  
UPDATE INFORMATION: DATE 29 FEB 1980 AUTHOR VIJAY ANANDWALA  
MAINTAINER: COMPUTER SPECIAL SYSTEMS  
AUTHOR: CSS DIAGNOSTICS

THE INFORMATION IN THIS DOCUMENT IS SUBJECT TO CHANGE WITHOUT NOTICE AND SHOULD NOT BE CONSTRUED AS A COMMITMENT BY DIGITAL EQUIPMENT CORPORATION. DIGITAL EQUIPMENT CORPORATION ASSUMES NO RESPONSIBILITY FOR ANY ERRORS THAT MAY APPEAR IN THIS MANUAL.

THE SOFTWARE DESCRIBED IN THIS DOCUMENT IS FURNISHED TO THE PURCHASER UNDER A LICENSE FOR USE ON A SINGLE COMPUTER SYSTEM AND CAN BE COPIED (WITH INCLUSION OF DIGITAL'S COPYRIGHT NOTICE) ONLY FOR USE IN SUCH SYSTEM, EXCEPT AS MAY OTHERWISE BE PROVIDED IN WRITING BY DIGITAL.

DIGITAL EQUIPMENT CORPORATION ASSUMES NO RESPONSIBILITY FOR THE USE OR RELIABILITY OF ITS SOFTWARE ON EQUIPMENT THAT IS NOT SUPPLIED BY DIGITAL.

COPYRIGHT (©) 1975, 1980 BY DIGITAL EQUIPMENT CORPORATION

TABLE OF CONTENTS

PARAGRAPH	SUBJECT	PAGE
1.	ABSTRACT	3
2.	REQUIREMENTS	3
3.	LOADING PROCEDURE	3
4.	STARTING PROCEDURE	4
5.	DATA PATTERNS	11
6.	RANDOMIZATION	12
7.	DYNAMIC PARAMETERS	13
8.	CONSOLE SWITCH	14
9.	ERROR PRINTOUTS	19
10.	STATISTICS PRINTOUT	27
11.	AUTO SEQUENCE	28
12.	TESTING PROCEDURES	30
13.	LISTING	32

1. ABSTRACT

THIS PROGRAM IS DESIGNED TO BE USED BY AN EXPERIENCED ENGINEER /TECHNICIAN FOR EVALUATION AND DEBUGGING OF MAG TAPE DRIVES. THE PROGRAM IS CAPABLE OF EXERCISING THE TU45 MAGNETIC ON A MASSBUS THROUGH THE TM03 MAG TAPE CONTROLLER. ANY COMBINATION OF TM03'S & TU45'S UP TO A MAXIMUM OF EIGHT (8), MAY BE TESTED BY A SINGLE EXECUTION OF THE PROGRAM. THIS FLEXIBILITY IS POSSIBLE BECAUSE THE PROGRAM HAS NO FIXED PARAMETERS OR TESTING SEQUENCE. THE ENTIRE TEST PLAN, INCLUDING PARAMETERS AND OPERATING SEQUENCE, IS DETERMINED BY THE OPERATOR THROUGH RESPONSES TO TELETYPE REQUESTS AND SETTING OF CONSOLE SWITCHES.

THE PROGRAM PROVIDES FOR TESTING OF ALL TAPE DRIVE FUNCTIONS SUCH AS WRITING,READING,REWINDING,TAPE POSITIONING,EOT - BOT SENSING AND ASSUMES A GOOD RH AND TM03.

HOWEVER; THE RH AND TM03 ARE TESTED SOMEWHAT INTRINSICALLY DURING THE TEST CYCLE IN ORDER TO PROVIDE FULL INFORMATION ABOUT ANY ERROR CONDITIONS DETECTED.

DURING A TEST CYCLE, CHECKS ARE MADE FOR STATUS ERRORS,DATA ERRORS, POSITION ERRORS,WORD COUNT AND CURRENT MEMORY ADDRESS ERRORS WHEREVER APPLICABLE AS DETECTED BY THE RH OR TM03.

2. REQUIREMENTS (HARDWARE)

- A. ANY PDP-11 PROCESSER
- B. 8K OF CORE
- C. TELETYPE
- D. TM03 TAPE CONTROLLER
- E. 1 TO 8 MAG TAPE DRIVES
- F. MASSBUS CONTROLLER

3. LOADING PROCEDURE

USE STANDARD PROCEDURE FOR LOADING BINARY TAPES

4. STARTING PROCEDURE

THERE ARE FOUR (4) STARTING ADDRESSES THAT MAY BE USED:  
200(8), 204(8), 210(8), AND 240(8):

- A. 200(8): THIS ADDRESS MUST BE USED ON INITIAL START FROM LOAD AS ALL PARAMETERS ARE ENTERED FROM HERE. REQUESTS ARE PRINTED ON THE TELETYPE FOR ENTRY OF RH STARTING ADDRESS, VECTOR ADDRESS, DRIVE NUMBER(TM03 ADDRESS), SLAVE NUMBER, DENSITY, PARITY, FORMAT, RECORD COUNT, CHARACTER COUNT, PATTERN NUMBER, TAPE MARK AND STALL FOR READ, WRITE, AND TURNAROUND. ALL REPOSSES SHOULD BE MADE IN OCTAL AND WITHIN THE LIMITS OF THE PARAMETER. A QUESTION MARK (?) WILL BE TYPED IF ANY CHARACTER ENTERED IS NOT BETWEEN 0 THRU 7 (OCTAL). THE CHARACTER MAY BE RETYPED FOLLOWING THE QUESTION MARK. IF THE RESPONSE IS NOT WITHIN ITS LIMITS. A QUESTION MARK (?) IS TYPED AND THE ENTIRE RESPONSE MAY BE RENTERED. SOME RESPONSES REQUIRE MORE THAN ONE (1) CHARACTER, BUT NONE REQUIRES MORE THAN SIX (6). RESPONSES OF MORE THAN ONE CHARACTER NEED NOT HAVE LEADING ZEROS AND SHOULD BE TERMINATED BY A CARRIAGE RETURN IF LESS THAN THE MAXIMUM NUMBER OF CHARACTERS IS INPUT.
- B. 204(8): THIS ADDRESS SHOULD BE USED ANYTIME A RESTART OF THE PROGRAM IS NECESSARY AND THE PARAMETERS ENTERED AT THE INITIAL START OF 200(8) NEED NOT BE CHANGED. ALSO NOTE THAT ANY DATA PATTERN WHICH HAD BEEN GENERATED BY SETTING THE RANDOM DATA SWITCH (CONSOLE SWITCH EIGHT) WILL NOT BE OVERWRITTEN AND THEREFORE IS HELD IN CORE FOR USE UNTIL CONSOLE SWITCH EIGHT(8) IS AGAIN SET AND THAT ALL STATISTICS WILL BE RETAINED.
- C. 210(8): THIS ADDRESS IS THE SAME AS USING 204(8) IN THAT THE PREVIOUSLY SET PARAMETERS ARE USED; HOWEVER, THE DATA PATTERN IS RETURNED TO THE FIXED PATTERN ORIGINALLY CALLED FOR AT THE 200(8) START AND ALL STATISTICS ARE CLEARED TO ZERO.
- D. 240(8): THIS IS A SPECIAL ADDRESS WHICH WILL CAUSE THE PROGRAM TO EXECUTE A PREDETERMINED TEST PLAN ON ALL AVAILABLE DRIVES AND SLAVES. THE ONLY INPUT REQUIRED BY THE OPERATOR IS A RESPONSE TO REQUESTS FOR THE RH ADDRESS, VECTOR ADDRESS, CONTINUOUS OPERATION OF THE SEQUENCE, AND NRZ ONLY.
- E. 300(8): THIS ADDRESS IS TO BE USED AS A RESTART ONLY AND WILL PERFORM JUST AS IN 200(8) EXCEPT THAT THE PARAMETER INPUT LIST IS SHORTENED. THE SHORT PARAMETER LIST CONSISTS OF DRIVE NUMBER, SLAVE NUMBER, DENSITY, PARITY, FORMAT, RECORD COUNT, CHARACTER COUNT, PATTERN, TAPE MARK, AND

INTERCHANGE READ.  
\*\*NOTE SEE ALSO SECTION 8-CONSOLE SWITCH SETTINGS

THE FOLLOWING IS AN EXPLANATION OF THE INITIAL  
START (200 OCTAL) REQUESTS AND RESPONSES:

REGISTER START: THE RESPONSE REQUIRED FOR THIS REQUEST  
IS TO ENTER THE ADDRESS OF THE FIRST RH  
REGISTER (CS1) AS A SIX DIGIT UNIBUS ADDRESS.

VECTOR ADDRESS: THE RESPONSE FOR THIS REQUEST  
IS TO ENTER THE INTERRUPT VECTOR ADDRESS  
USED BY THE RH AS A THREE (3) DIGIT ADDRESS.

DRIVE NUMBER: THE DRIVE NUMBER (MASSBUS ADDRESS  
OF THE TM03) IS ENTERED AS ONE (1)  
OCTAL CHARACTER AND MUST BE WITHIN THE LIMITS  
OF 0 THROUGH 7.

SLAVE NUMBER: THE SLAVE NUMBER IS ENTERED AS ONE  
(1) OCTAL CHARACTER AND MUST BE  
WITHIN THE LIMITS OF 0 THROUGH 7.  
WHEN THE SLAVE NUMBER HAS BEEN  
ENTERED AND IS LEGAL, THE PROGRAM TESTS  
FOR THE PRESENCE OF A SLAVE OF THAT  
NUMBER. IF THE SLAVE IS AVAILABLE  
A PRINTOUT OF 7 CHANNEL, IF APPLICABLE,  
AND ITS SERIAL NUMBER (IN BCD)  
WILL BE MADE TO ASSIST THE OPERATOR  
IN SETTING OF DENSITY, PARITY, AND FORMAT.  
A CHECK IS MADE FOR THE PROPER SETTING  
OF THE DRIVE TYPE REGISTER; IF WRONG, A  
MESSAGE IS PRINTED FOR INFORMATION ONLY.  
IF THE SLAVE IS NOT AVAILABLE,  
A MESSAGE STATING SO WILL BE  
PRINTED AND A NEW SLAVE NUMBER  
REQUEST WILL BE ISSUED. WHEN A  
GOOD SLAVE NUMBER HAS BEEN ENTERED,  
REQUESTS FOR OPERATING DENSITY  
PARITY AND FORMAT ARE MADE FOR THAT  
SLAVE AND SHOULD BE RESPONDED TO  
ACCORDING TO THAT PARTICULAR SLAVE'S  
NEEDS. AS MANY AS EIGHT (8) SLAVE  
NUMBER REQUESTS MAY BE USED, HOW-  
EVER, AT LEAST ONE MUST BE USED.  
THE SLAVE NUMBERS AND THEIR RESPECTIVE  
DENSITY, PARITY AND FORMAT MAY BE ENTERED  
IN ANY ORDER. THE INFORMATION FOR  
EACH SLAVE ENTERED IS LOADED INTO A  
TABLE FOR REFERENCE IN TESTING.  
IF LESS THAN EIGHT(8) SLAVES ARE  
REQUIRED, THEN RESPONDING TO THE  
SLAVE NUMBER REQUEST WITH A CARRIAGE  
RETURN WILL TERMINATE THE SLAVE  
ENTRIES AND CONTINUE TO THE NEXT  
PARAMETER. IT SHOULD BE REMEMBERED

THAT AT LEAST ONE SLAVE NUMBER REQUEST  
MUST BE ENTERED. IF THE FIRST  
REQUEST IS RESPONDED TO BY A CARRIAGE  
RETURN, THEN THE REQUEST WILL BE REPEATED.

4.1 AUTOMATIC MODE OPERATION

IF THE PROGRAM IS LOADED AND RUN IN AUTOMATIC (CHAIN) MODE  
THE AUTO ACCEPT SEQUENCE TEST PLAN IS RUN. SEE SEC 11. BELOW;  
THE SOFTWARE SWR IS INVOKED WITH A SWITCH SETTING OF 100000 (HALT  
ON ERROR) IF LOADED VIA ACT11. NO OPERATOR INTERVENTION IS REQUIRED.

\*\*EXCEPTION: IF THIS PROGRAM IS LOADED VIA TMDP CHAIN MODE THE  
PROGRAM WILL TEST ALL SLAVES ON THE FIRST AVAILABLE  
DRIVE EXCEPT SLAVE 0.

DENSITY: THE DENSITY REQUEST IS RESPONDED TO BY ONE (1) OCTAL CHARACTER AND MUST BE WITHIN THE LIMITS OF 0 THRU 4. AS EACH SLAVE NUMBER IS ENTERED, A REQUEST FOR THE OPERATING DENSITY FOR THAT SLAVE IS TYPED. THE RESPONSE MEANINGS ARE AS FOLLOWING:

- A. 3 = 800BPI, NRZI
- B. 4 = 1600BPI, PE (9 CHANNEL ONLY)

PARITY: THE PARITY REQUEST IS RESPONDED TO BY ONE (1) OCTAL CHARACTER AND MUST BE EITHER 0 OR 1.

- A. 1 = EVEN PARITY
- B. 0 = ODD PARITY

FORMAT: THE FORMAT REQUEST IS RESPONDED TO BY TWO (2) CHARACTERS AND SHOULD BE AS FOLLOWS

- A. 14 = 9 CHANNEL NORMAL (TWO FRAMES PER WORD)
- B. 15 = CORE DUMP (FOUR FRAMES PER WORD)
- C. 16 = PDP-15 OR IBM COMPATABLE (TWO FRAMES PER WORD)  
(DATA IS BYTE SWAPPED ON TAPE)

RECORD COUNT: THIS REQUEST IS RESPONDED TO BY A SIX (6) CHARACTER OCTAL NUMBER FROM 1 TO 177777. REMEMBER LEADING ZEROS ARE NOT REQUIRED AND IF LESS THAN SIX CHARACTERS ARE ENTERED, A CARRIAGE RETURN WILL TERMINATE THE RESPONSE. THE RECORD COUNT IS USED IN CONJUNCTION WITH THE CHARACTER COUNT TO ESTABLISH A BLOCKING FACTOR FOR USE IN READ OR WRITE CYCLES.

CHARACTER COUNT: THIS RESPONSE IS ENTERED AS FOUR (4) OCTAL CHARACTERS WITHIN THE LIMITS OF 20 THRU 4000. AGAIN LEADING ZEROS ARE NOT REQUIRED AND A CARRIAGE RETURN TERMINATES A LESS THAN FOUR (4) CHARACTER RESPONSE. THE CHARACTER COUNT IN CONJUNCTION WITH THE RECORD COUNT IS USED TO ESTABLISH THE BLOCK SIZE (CHARACTERS PER RECORD, AND RECORDS PER BLOCK) USED IN READ AND WRITE CYCLES. THE SAME BLOCKING IS USED ON ALL AVAILABLE UNITS.



PATTERN NUMBER: THIS RESPONSE IS A TWO (2) CHARACTER OCTAL NUMBER WITHIN THE LIMITS OF 0 THRU 15(8). THE NUMBER ENTERED WILL CAUSE A SPECIFIC DATA PATTERN TO BE USED FOR ALL READING AND WRITING. THIS DATA PATTERN IS NOT CHANGED UNLESS RANDOM DATA IS REQUESTED BY SETTING CONSOLE SWITCH EIGHT (8) TO A ONE. RESETTING OF THE RANDOM DATA SWITCH DOES NOT CAUSE REVERSION TO THE FIXED PATTERN, BUT WILL HOLD THE LAST GENERATED PATTERN UNTIL A RESTART IS DONE FROM LOCATION 200(8), 210(8), OR 300(8). WHEN OPERATING IN NRZ MODE (DENSITY 0-3) THE PROGRAM CONSTRUCTS AND SAVES BOTH AN EXPECTED CRC CHARACTER AND AN LRC CHARACTER FOR COMPARISONS WITH THE HARDWARE GENERATED CHECK CHARACTER IN BOTH READ AND WRITE. THE SELECTION OF DATA PATTERN ZERO (0) HAS A SPECIAL USE. PATTERN NUMBER ZERO (0) WILL CAUSE TO BE READ IN AT THE HIGH SPEED PAPER TAPE READER ANY DATA PATTERN DESIRED. THE EXTERNAL INPUT DATA THROUGH THE READER IS DONE BY PREPARING A PAPER TAPE WITH A PROGRAM CALLED DTC. (CZTUTAO) ANY CONFIGURATION OF BITS AND CHARACTERS MAY BE USED AND A LIMIT OF 377(8) CHARACTERS IS IMPOSED. WHEN EXTERNAL DATA IS INPUT, THE ENTIRE WRITE BUFFER IN CORE IS FILLED WITH THE PATTERN SO THAT ANY SIZE RECORD MAY BE USED. DATA PATTERN PATTERN ZERO (0) EXTERNAL PAPER TAPE NEED ONLY BE READ ONCE AT INITIAL START OF 200(8), AND NEED NOT BE READ AGAIN UNLESS OVERWRITTEN BY RANDOM DATA. BE SURE TO LOAD THE READER BEFORE PRESSING START.

TAPE MARK: THE TAPE MARK REQUEST IS USED TO DETERMINE IF THE OPERATOR WISHES TO HAVE EACH DATA BLOCK SEPERATED BY A TAPE MARK. IF RESPONDED TO BY A ONE (1) THE TAPE MARK WILL BE WRITTEN AND WHEN READING WILL BE EXPECTED AT THE END OF DATA BLOCK. A ZERO (0) RESPONSE WILL DISALLOW TAPE MARK. PLEASE NOTE THAT THE TAPE MARK RECORD INCREASES THE BLOCK SIZE BY ONE (1) RECORD; IN OTHER WORDS, A BLOCK OF 100 RECORDS WILL HAVE THE TAPE MARK AS RECORD 101.

INTERCHANGE READ: THIS REQUEST IS RESPONDED TO BY A SINGLE CHARACTER INPUT OF EITHER ONE (1) OR ZERO (0). A RESPONSE OF ONE (1) WILL CAUSE ALL READING TO BE DONE IN THE INTERCHANGE MODE. A ZERO RESPONSE WILL CAUSE READING IN NORMAL MODE.

SINGLE PASS: THIS REQUEST IS RESPONDED TO BY EITHER A ONE (1) OR A ZERO (0). RESPONSE OF 1, WILL CAUSE THE TEST TO BE STOPPED AFTER THE LAST AVAILABLE DRIVE REACHES END OF TAPE. A RESPONSE OF 0, WILL ALLOW CONTINUOUS RUNNING THROUGH MULTIPLE PASSES. TO RESTART AT END OF PASS, PRESS CONTINUE, OR RESTART AT THE CONSOLE.

STALLS: THE STALL REQUESTS ARE RESPONDED TO BY A SIX (6) CHARACTER OCTAL NUMBER WITHIN THE LIMITS OF 1 THRU 177777. LEADING ZEROS ARE NOT REQUIRED AND AN ENTRY OF LESS THAN SIX (6) CHARACTERS SHOULD BE TERMINATED BY A CARRIAGE RETURN. EACH INCREMENT OF THE VALUE ADDS ABOUT 2.6 MICSEC TO THE DELAY.

READ: THE TIME DELAY BETWEEN EACH RECORD READ

WRITE: THE TIME DELAY BETWEEN EACH RECORD WRITTEN

TURN AROUND: TIME DELAY BETWEEN CHANGES OF TAPE DIRECTION (FORWARD, TO REVERSE, ETC.) AND BETWEEN BLOCKS.

FIXED PARAMETERS: IT SHOULD BE NOTED THAT ALL PARAMTERS EXCEPT FOR THE SLAVE DESCRIPTION VALUES (SLAVE NUMBER, DENSITY, PARITY, AND FORMAT) HAVE NOMINAL VALUES ALREADY STORED IN THE PROGRAM. COUNT, CHARACTER COUNT, TAPE MARK AND STALLS) IS TYPED. ITS PRESENT STORED VALUE IS ALSO PRINTED. IF THESE VALUES NEED NOT BE CHANGED, SIMPLY TYPE A CARRIAGE RETURN AS RESPONSE AND NO CHANGE WILL BE MADE. EACH START OF THE PROGRAM AT 200(8) WILL SHOW THE CURRENT VALUES OF THESE PARAMETERS AS PER THE LAST ENTRY. WHEN A FRESH LOAD OF THE PAPER TAPE IS DONE, THE PARAMETERS WILL REFLECT THE FIXED VALUES STORED IN THE PROGRAM.

- A. RECORD COUNT = 200
- B. CHARACTER COUNT = 4000
- C. PATTERN NUMBER = 1
- D. TM=1
- E. INTERCHANGE READ = 0
- F. SINGLE PASS = 0
- G. CRC CORRECTION = 0
- H. READ STALL = 10
- I. WRITE STALL = 10
- J. TURN AROUND STALL = 10

SAMPLE START AT 200(8):

THE FOLLOWING IS A SAMPLE OF THE  
PRINTED REQUESTS AND THEIR RESPONSES.  
RESPONSES ARE ENCLOSED IN PARENS FOR  
CLARITY ONLY AND (CR) MEANS CARRIAGE RETURN

LOAD ADDRESS 200(8), SET CONSOLE SWITCHES, PRESS START SWITCH:

TU45 TAPE DRIVE TEST

REGISTER START=172440(172440)  
VECTOR ADDRESS=224(CR)  
DRIVE NUMBER (4)  
SLAVE NUMBER=(5) SN: 5009  
DENSITY=(3)  
PARITY=(0)  
FORMAT=(14)  
SLAVE NUMBER=(2) 9 CHAN SN: 0022  
DENSITY=(3)  
PARITY=(1)  
FORMAT=(15)  
SLAVE NUMBER=(CR)  
RECORD COUNT=100 (500)(CR)  
CHARACTER COUNT=200 (38)?(7)(CR)  
PATTERN NUMBER=1 (22)  
?  
(6)(CR)  
TM=(0)  
INTERCHANGE READ=(1)  
SINGLE PASS=(0)  
  
ENTER STALLS  
READ=1 (CR)  
WRITE=1 (CR)  
TURN AROUND=1 (3000)(CR)

THE PROGRAM WILL NOW PERFORM THE TEST CYCLE SET IN  
THE CONSOLE SWITCHES ON SLAVE FIVE (5) THEN TWO (2),  
ONE BLOCK ON EACH UNIT PER CYCLE, USING DATA PATTERN  
NUMBER SIX (6) WITH A BLOCKING FACTOR OF 37 CHARACTERS  
PER RECORD AND 500 RECORDS PER BLOCK. THE DELAYS ARE SET  
FOR MINIMUM ON READ AND WRITE, AND APPROXIMATELY .75  
SECONDS ON TURN AROUND.

NO TAPE MARKS WILL BE WRITTEN AND ALL READING  
WILL BE DONE IN INTERCHANGE MODE (MAINT MODE 0001).

5. DATA PATTERNS

THERE ARE FIFTEEN DATA PATTERN GENERATORS STORED IN CORE AND ANY ONE OF THESE MAY BE SELECTED. THE ONE UNIQUE CASE IS PATTERN ZERO(0); SELECTION OF PATTERN ZERO(0) REQUIRES THAT A PREVIOUSLY PREPARED PAPER TAPE BE ENTERED AT THE HIGH SPEED READER. THIS TAPE CONTAINS A DATA PATTERN OF NO MORE THAN 377 OCTAL CHARACTERS. THE FIRST CHARACTER READ IN IS THE NUMBER OF ACTUAL DATA CHARACTERS THAT ARE CONTAINED ON THE TAPE. EACH DATA CHARACTER MAY BE ANY COMBINATION OF BITS AND WILL BE LOADED INTO CORE AS THEY APPEAR ON THE TAPE. NO MATTER HOW MANY CHARACTERS ARE ON TAPE, THE ENTIRE WRITE BUFFER (4000 CHARACTERS) WILL BE FILLED WITH THE PATTERN ENTERED SO THAT ANY SIZE RECORD CAN BE USED. (SEE DTC CZTUTA0)  
THE PROGRAM GENERATES A CYLIC REDUNDENCY CHECK CHARACTER (CRC) AND A LONGITUDINAL REDUNDENCY CHECK CHARACTER (LRC) FOR COMPARISONS AGAINST THE CRC AND LRC GENERATED BY THE HARDWARE IN NRZI READS OR WRITES.

THE FOLLOWING IS A LIST OF THE DATA PATTERNS AVAILABLE:

DATA0: EXTERNAL INPUT THRU HIGH SPEED READER (SEE DTC)  
DATA1: ALL ONE BITS IN ALL CHARACTERS  
DATA2: ALL ZERO BITS IN ALL CHARACTERS  
DATA3: A ONE BIT WALKING FROM RIGHT TO LEFT IN A FIELD OF ZEROS  
DATA4: A ZERO BIT WALKING FROM RIGHT TO LEFT IN A FIELD OF ONES.  
DATA5: ALTERNATING ONE AND ZERO BITS IN EACH CHARACTER  
DATA6: ALTERNATING ZERO AND ONE BITS IN EACH CHARACTER  
DATA7: SAME AS DATA5 BUT WITH EVERY OTHER CHARACTER COMPLEMENTED  
DATA10: WALKING ONE/ALL ONE IN ALTERNATING CHARACTERS  
DATA11: INCREMENTING CHARACTERS (000-377)  
DATA12: DECREMENTING CHARACTERS (377-000)  
DATA13: ALTERNATING CHARACTERS OF ALL ZERO AND ALL ONE BITS  
DATA14: WALKING ZERO/ALL ZERO IN ALTERNATING CHARACTERS  
DATA15: AUTO SEQUENCE PATTERN 0,0,-1,-1,-1,0,0

6. RANDOMIZATION

THERE ARE THREE (3) VALUES THAT MAY BE GENERATED RANDOMLY; DATA, CHARACTER COUNT, AND RECORD COUNT. THESE ARE NORMALLY SET TO SOME FIXED VALUE BUT MAY BE RANDOMIZED BY SETTING THE APPROPRIATE CONSOLE SWITCHES.

- A. RANDOM DATA: (CONSOLE SWITCH 8)  
GENERATES AN ENTIRE BUFFER, CHARACTER BY CHARACTER, OF RANDOM DATA WHEN SWITCH 8 IS SET TO A ONE. ONCE SET, THE RESETTING OF SWITCH 8 CAUSES THE LAST GENERATED PATTERN TO BE RETAINED IN CORE. A RESTART AT LOCATION 200(8) OR 210(8) WILL CAUSE REVERSION OF THE DATA TO THE FIXED PATTERN REQUESTED INITIALLY. A RESTART AT LOCATION 204(8) WILL HOLD THE LAST GENERATED PATTERN IN CORE UNTIL SWITCH 8 IS AGAIN SET.  
ALTHOUGH THE DATA IS GENERATED AS RANDOM, THE PROGRESSION OF RANDOM CHARACTERS IS ALWAYS THE SAME FROM THE OUTSET OF RANDOMIZATION. THEREFORE IT IS POSSIBLE TO GENERATE ONE TAPE REEL OF RANDOM DATA ON ONE UNIT, RESTART THE PROGRAM TO RE-ESTABLISH THE OUTSET POINT, AND READ THE RANDOM TAPE REEL ON ANOTHER UNIT FOR COMPATABILITY TESTING. IN MULTIDRIVE SYSTEMS THE SAME BLOCK OF DATA, WHETHER RANDOM OR FIXED, IS WRITTEN OR READ ON EACH AVAILABLE UNIT IN THE ORDER THAT THEY WERE ENTERED, BEFORE BEING CHANGED.
- B. RANDOM CHARACTER COUNT: (CONSOLE SWITCH 7)  
GENERATES A DIFFERENT NUMBER OF CHARACTERS PER RECORD TO BE WRITTEN ON EACH BLOCK CYCLE. THE SAME NUMBER OF CHARACTERS PER RECORD IS WRITTEN OR READ ON EACH AVAILABLE UNIT BEFORE BEING CHANGED. RESETTING SWITCH 7 HOLDS THE LAST VALUE GENERATED.
- C. RANDOM RECORD COUNT: (CONSOLE SWITCH 6)  
GENERATES A DIFFERENT NUMBER OF RECORDS FOR EACH BLOCK OF DATA WRITTEN OR READ ON EACH BLOCK CYCLE. THE SAME NUMBER OF RECORDS IS WRITTEN OR READ ON EACH AVAILABLE UNIT BEFORE BEING CHANGED. RESETTING SWITCH 6 HOLDS LAST VALUE GENERATED.

7. DYNAMIC PARAMETERS:

THE THREE (3) STALL VALUES ARE CONSIDERED TO BE DYNAMIC PARAMETERS AS THEY MAY BE CHANGED WHILE THE PROGRAM IS RUNNING BY TYPING A CONTROL B CHARACTER AT THE TELETYPE. AS SOON AS THE BUS IS RELEASED BY THE MAG TAPE OPERATION IN PROGRESS, THE PROGRAM WILL RESPOND TO THE CONTROL C INPUT BY TYPING A REQUEST FOR NEW STALL PARAMETERS. THE LAST VALUES THAT WERE ENTERED WILL BE PRINTED AS THE STORED VALUES AND MAY BE CHANGED BY ENTERING NEW VALUES OR LEFT UNCHANGED BY TYPING A CARRIAGE RETURN. THE YOZZLE STALL IS ALSO DYNAMIC AND CAN BE CHANGED BY TYPING A CONTROL B WHILE DOING A YOZZLE. A YOZZLE STALL REQUEST WILL BE PRINTED AND SHOULD BE RESPONDED TO WITH THE DESIRED VALUE.

8. CONSOLE SWITCH SETTINGS

CONTROL:

- 1) CONTROL G <^G>:  
SELECTS SOFTWARE SWR AND ALLOWS USER TO SELECT NEW SWITCHES.  
THE MACHINE WILL THEN TYPE: SWR=XXXXXXNEW=  
WHERE: XXXXXX IS THE OCTAL CONTENTS OF THE SOFTWARE SWR.  
AFTER THE 'NEW=' HAS BEEN TYPED THEN THE OPERATOR CAN DO ONE  
OF THE FOLLOWING AT THE TTY:  
A) TYPE A NUMBER TO BE LOADED INTO THE SOFTWARE SWR  
B) IF A <CR> IS THE FIRST KEY DEPRESSED THE SOFTWARE SWR  
CONTENTS WILL NOT BE CHANGED.
- 2) CONTROL A <^A>:  
ALTERNATES USAGE OF THE SWR BETWEEN THE HARDWARE SWR & SOFTWARE SWR.
- 3) CONTROL B <^B>:  
SEE SECTION 7 DYNAMIC PARAMETERS
- 4) CONTROL U <^U>:  
DELETES ALL CHARACTERS TYPED IN RESPONSE TO A REQUEST.

THE CONSOLE SWITCHES ARE USED TO SET UP THE TEST CYCLE  
DESIRED, TO GENERATE RANDOM VALUES, AND TO CONTROL ERROR  
RESPONSES. THE SWITCHES SHOULD BE SET IN THE DESIRED  
MANNER BEFORE PRESSING THE START SWITCH BECAUSE THEY  
ARE ALL DYNAMIC AND WILL RUN THE PROGRAM IN ANY  
CONFIGURATION. ALL SWITCHES SET TO ZERO(0) IS NORMAL.

- SW15: 1=STOP ON ERROR  
0=CONTINUE ON ERROR
- SW14: 1=PRINT READ/WRITE STATISTICS  
0=DO NOT PRINT STATS
- SW13: 1=DO NOT CHECK DATA ERRORS  
0=CHECK DATA ERRORS
- SW12: 1=DO NOT CHECK WRITE STATUS ERRORS (NOR CLEAR THEM IF THEY DO OCCUR)  
0=CHECK WRITE STATUS ERRORS
- SW11: 1=DO NOT CHECK READ STATUS ERRORS (NOR CLEAR THEM IF THEY DO OCCUR)  
0=CHECK READ STATUS ERRORS
- SW10: 1=DO NOT PRINT ANY ERRORS (EXCEPT CATASTROPHIC ERRORS)  
0=PRINT ALL ERRORS
- SW9: 1=REWIND ALL AVAILABLE TAPES  
0=DO NOT REWIND
- SW8: 1=GENERATE RANDOM DATA  
0=USED FIXED DATA

SW7: 1=GENERATE RANDOM CHARACTER COUNT  
0=USE FIXED CHARACTER COUNT

SW6: 1=GENERATE RANDOM RECORD COUNT  
0=USED FIXED RECORD COUNT

SW5: 1=YOZZLE ON CURRENT RECORD  
0=DO NOT YOZZLE ON RECORD

SW4: 1=DO WRITE/READ RETRIES  
0=DO NOT RETRY

SW3: 1=DO NOT READ FORWARD  
0=READ FORWARD

SW2: 1=DO NOT READ REVERSE  
0=READ REVERSE

SW1: 1=READ FORWARD FIRST  
0=READ REVERSE FIRST

SW0: 1=DO NOT WRITE  
0=WRITE



SWITCH EXPLANATION AND EXAMPLES:

SW0-3:

THESE SWITCHES ARE USED TO CONTROL THE SEQUENCE OF MAG TAPE OPERATIONS PERFORMED ON EACH AVAILABLE UNIT. THE BLOCK OF DATA DESCRIBED THROUGH THE RESPONSES TO TELETYPE REQUESTS AT INITIAL START WILL BE EITHER WRITTEN OR READ FROM EACH AVAILABLE UNIT IN THE ORDER THAT THEY WERE ENTERED. THE SEQUENCE OF OPERATIONS IS CALLED A CYCLE, AND WILL BE PERFORMED CONTINUOUSLY UNTIL STOPPED BY THE OPERATOR. WHEN END OF TAPE IS REACHED, THE UNIT WILL BE REWOUND AND FLAGGED AS UNAVAILABLE FOR TEST UNTIL ALL UNITS HAVE REACH EOT, AT WHICH TIME TESTING IS RESUMED ON ALL AVAILABLE UNITS.

EXAMPLES: 0-3

- A. SW0=0, SW1=0, SW2=1, SW3=1  
WRITE ONLY X RECORDS OF Y CHARACTERS
- B. SW0=0, SW1=0, SW2=1, SW3=0  
WRITE THEN BACKSPACE AND READ FORWARD X RECORDS
- C. SW0=0, SW1=0, SW2=0, SW3=1  
WRITE THEN READ REVERSE X RECORDS.
- D. SW0=0, SW1=0, SW2=0, SW3=0  
WRITE THEN READ REVERSE AND READ FORWARD X RECORDS
- E. SW0=0, SW1=1, SW2=0, SW3=0  
WRITE THEN BACKSPACE AND READ FORWARD THEN REVERSE
- F. SW0=1, SW1=0, SW2=1, SW3=0  
READ TAPE FORWARD X RECORDS
- G. SW0=1, SW1=0, SW2=0, SW3=1  
READ TAPE REVERSE X RECORDS
- H. SW0=1, SW1=0, SW2=0, SW3=0  
READ TAPE REVERSE THEN FORWARD
- I. SW0=1, SW1=1, SW2=0, SW3=0  
READ TAPE FORWARD THEN REVERSE

- SW4: SWITCH FOUR (4), WHEN SET TO A ONE (1), WILL CAUSE ANY DATA RELATED ERROR TO BE RETRIED. THE WRITE RETRY SCHEME CONSISTS OF REWRITING THE RECORD IN THE SAME SPOT ON TAPE FOUR (4) TIMES. IF ALL FOUR (4) REPEATS ARE SUCCESSFUL, THE RECORD IS CONSIDERED AS RECOVERED, AND A TAPE WRITE ERROR IS LOGGED. IF ANY OF THE FOUR (4) REPEATS IS UNSUCCESSFUL, A SKIP ERASE IS DONE, A SUSPECTED BAD TAPE SPOT IS LOGGED AT THIS BLOCK AND RECORD NUMBER, AND A SECOND RETRY OF FOUR REPEATS IS DONE. IF AFTER FOUR (4) RETRIES, THE RECORD CANNOT BE RECOVERED A NOTIFICATION IS PRINTED, AND TESTING IS RESUMED ON THE NEXT RECORD. IF 20(8) BAD TAPE SPOTS ARE FOUND, THE SLAVE WILL BE REWOUND AND REMOVED FROM TESTING WITH AN APPROPRIATE MESSAGE PRINTED. THE READ RETRY SCHEME CONSISTS OF REREADING THE RECORD UP TO EIGHT TIMES. IF ALL EIGHT REREADS ARE BAD, IT IS A HARD ERROR. IF ANY REREAD IS SUCCESSFUL, THIS IS A SOFT ERROR. IF THE ORIGINAL ERROR IS OF THE NON-RETRYABLE TYPE (IE: ILF,RMR,ILR,NEF,CBUSPE), THE RETRY SCHEME IS NOT ENTERED AND A MESSAGE IS PRINTED.
- SW5: SWITCH FIVE (5) WHEN SET DURING A READ FORWARD OR REVERSE WILL CAUSE THE TAPE TO CONTINUOUSLY READ THE CURRENT RECORD BY SPACING EITHER FORWARD OR REVERSE AND REREADING THAT RECORD. THIS TAPE MOVEMENT IS CALLED YOZZLING. THERE IS A SOFTWARE DELAY EXECUTED BETWEEN EACH SPACE/READ OF THE RECORD AND IT MAY BE VARIED BY TYPING CONTROL C ON THE TELETYPE DURING THE EXECUTION OF THE YOZZLE AND RESPONDING TO THE PRINTED REQUEST WITH A SIX (6) DIGIT VALUE. THE YOZZLE STALL IS PRESET TO A VALUE OF 3000 IN THE PROGRAM TO PREVENT EXCESSIVE TAPE WEAR, BUT MAY BE SET TO ANY VALUE THROUGH THE TELETYPE.
- SW6-8: THESE THREE (3) SWITCHES CONTROL THE RANDOMIZATION OF DATA AND BLOCK SIZE AND MAY BE SET AND RESET AT ANY TIME. THE ACTUAL CHANGE WILL TAKE PLACE BETWEEN BLOCK CYCLES.
- SW9: SWITCH NINE (9) WHEN SET WILL CAUSE ALL AVAILABLE TAPE UNITS TO BE REWOUND AT THE END OF THE CURRENT BLOCK CYCLE. TESTING WILL BE RESUMED AT A BLOCK COUNT OF ONE (1) WHEN ALL UNITS HAVE REACHED BOT.

SW10-13: THESE SWITCHES ARE USED TO CONTROL THE  
ERROR HANDLING TO BE DONE ON THE TAPE  
OPERATION DESCRIBED BY SWITCHES 0-3.

- A. SWITCH TEN (10) WHEN SET TO A ONE  
WILL DISALLOW ANY ERROR PRINTOUTS MADE  
ON THE OPERATION IN PROGRESS. CATASTROPHIC  
FAILURES AND INFORMATION PRINTOUTS WILL  
STILL OCCUR. IE: UNIT NOT AVAILABLE, ILLEGAL  
BOT, DROP OR PICK OVERFLOW, AND EOT REWIND.
- B. SWITCH ELEVEN (11) WHEN SET TO A ONE  
WILL DISALLOW THE CHECKING FOR STATUS  
ERRORS ON READ (FORWARD OR REVERSE) OPERATIONS.
- C. SWITCH TWELVE (12) WHEN SET TO A ONE  
WILL DISALLOW THE CHECKING FOR STATUS  
ERRORS ON WRITE OPERATIONS.
- D. SWITCH THIRTEEN (13) WHEN SET TO A ONE  
WILL DISALLOW THE CHECKING OF READ  
DATA. THIS SWITCH HAS NO EFFECT ON  
STATUS CHECKING.

\*\*\*NOTE THAT WHEN SW11 OR 12 ARE SET, NOT ONLY ARE ERRORS NOT CHECKED, BUT THEY ARE NOT CLEARED EITHER.  
\*\*\*THEREFOR USE CAUTION TO ASSURE THAT OPERATIONS ARE NOT UNEXECUTED DUE TO UNCLEARED ERRORS.  
\*\*\*\*DO NOT SET SW 11 OR 12 TO A ONE (1), DURING A RETRY SEQUENCE.

SW14: SWITCH FOURTEEN (14) WHEN SET TO A ONE (1) WILL  
PRINT THE ACCUMULATED READ/WRITE STATISTICS FOR THE SELECTED  
SLAVE UNDER TEST AT THE END OF THE CURRENT BLOCK  
CYCLE. THE STATISTICS PRINTED ARE THE NUMBER OF BITS  
DROPPED OR PICKED, THE NUMBER OF RETRIES, WRITE ERRORS,  
READ ERRORS, AND DATA ERRORS.

SW15: SWITCH FIFTEEN (15) WHEN SET TO A ONE,  
WILL CAUSE THE PROGRAM TO HALT ON ANY  
ERROR DETECTED BY THE OPERATION IN PROGRESS.  
IF BOTH SWITCH TEN (10) AND FIFTEEN (15)  
ARE SET, THE ACTUAL ERROR DETECTED WILL  
NOT BE PRINTED BUT WILL CAUSE A HALT.  
IF SWITCH TEN (10) IS RESET BEFORE PRESSING  
CONTINUE, THE ERROR WHICH CAUSED THE HALT  
WILL BE PRINTED BEFORE TESTING IS RESUMED.

9. ERROR PRINTOUTS

THERE ARE THREE TYPES OF ERROR PRINTOUTS MADE BY THE PROGRAM; OPERATION ERRORS, DATA ERRORS, AND CONDITION ERRORS. EACH ERROR MESSAGE PRINTED IS PRECEDED BY A TWO LINE HEADER WHICH CONTAINS THE DRIVE NUMBER, SLAVE NUMBER, DENSITY, PARITY, AND FORMAT ON THE FIRST LINE, AND THE BLOCK NUMBER, RECORD NUMBER, RECORD SIZE, AND ERROR TYPE ON THE SECOND.

A. OPERATION ERRORS:

THESE ARE ERRORS WHICH CAN OCCUR AS A DIRECT RESULT OF A TAPE OPERATION.

1. READ/WRITE STATUS ERRORS: THESE ARE DETECTED BY EITHER THE TMO3 ITSELF OR BY THE MASSBUS CONTROLLER. ALL STATUS ERRORS WILL BE REPORTED.
2. TAPE POSITION ERRORS: THESE ARE INDICATED BY AN INCORRECT SPACE OR REWIND OPERATION IN WHICH TAPE POSITION BECOMES UNRELIABLE.

B. DATA ERRORS:

DATA ERRORS WILL OCCUR WHEN TAPE IS BEING READ AND THE DATA FROM TAPE DOES NOT MATCH THE EXPECTED DATA. WHEN READING IN THE REVERSE DIRECTION, THE RECORD NUMBERS WILL BE COUNTED DOWN FROM LAST TO FIRST. THE CHARACTER NUMBERS IN REVERSE READS WILL ALSO BE COUNTED DOWN IN ORDER TO REFLECT TAPE POSITION RATHER THAN THE ORDER TRANSFERRED.

BECAUSE DATA RECORDS CAN BE UP TO FOUR THOUSAND CHARACTERS LONG, AN ERROR CONDITION WHICH WILL CAUSE THE ENTIRE RECORD TO READ INCORRECTLY COULD CAUSE A VERY LENGTHY PRINTOUT. THEREFORE, A COUNTER OF SUCCESSIVE BAD CHARACTERS IS EMPLOYED. IF TEN (10) CHARACTERS IN SUCCESSION ARE BAD, A NOTIFICATION IS PRINTED (BAD RECORD) AND THE NEXT TWENTY FIVE (25) CHARACTERS ARE SKIPPED BEFORE CHECKING IS RESUMED. IF THE BAD RECORD CONDITION OCCURS THREE (3) TIMES IN ONE RECORD, THE REST OF THE RECORD IS SKIPPED, DOWN TO THE LAST TEN (10) CHARACTERS WHICH WILL BE CHECKED. THE SKIPPING AND RESUMPTION OF CHECKING WILL ONLY BE DONE ON RECORDS WHICH ARE LONG ENOUGH TO ALLOW IT.

C. CONDITION ERRORS: (CATASTROPHIC)

THESE PRINTOUTS REFLECT THE STATE OF THE TAPE SYSTEM  
EITHER BEFORE OR AFTER AN OPERATION

1. EOT: WHEN EOT (END OF TAPE) IS ENCOUNTERED DURING  
EITHER A READ OR WRITE, THE CYCLE IS COMPLETED  
ON THE SHORTENED BLOCK AFTER WHICH THE SLAVE  
WILL BE REWOUND AND FLAGGED AS UNAVAILABLE  
FOR TESTING UNTIL ALL SLAVES HAVE REACHED EOT AND  
ARE REWOUND. WHEN THE LAST AVAILABLE SLAVE  
HAS REACHED EOT AND BEEN REWOUND TO BOT,  
TESTING WILL BE RESUMED ON ALL SLAVES.
2. ILLEGAL BOT: WHEN A SLAVE ENCOUNTERS BOT DURING  
A READ, WRITE, OR SPACE OPERATION, AN ERROR  
IS PRINTED AND THE PROGRAM HALTED. THIS IS  
A CATASTROPHIC ERROR. TESTING MAY BE RESUMED  
BY PRESSING CONTINUE; BUT A RESTART IS  
SUGGESTED.
3. NO INTERRUPT RETURNED: EACH TAPE OPERATION SHOULD BE  
TERMINATED BY THE SETTING OF AN INTERRUPT IN  
THE CPU. IF NO INTERRUPT IS RETURNED WITHIN  
THE APPROPRIATE TIME, AN ERROR IS PRINTED.
4. NO MEDIUM ON-LINE: BEFORE AN OPERATION IS ATTEMPTED,  
THE TMO3 IS CHECKED FOR MOL. IF IT IS NOT  
SET, AN ERROR IS PRINTED, AND THE PROGRAM STOPPED.  
TESTING MAY BE RESUMED BY PRESSING CONTINUE.
5. NO BOT ON REWIND: AS EACH SLAVE IS REWOUND A CHECK  
IS MADE TO ASSURE THAT PROPER POSITION AT BOT  
IS ESTABLISHED. IF BOT IS NOT SET UPON COMPLETION OF  
A REWIND, AN ERROR IS PRINTED AND THE PROGRAM  
WILL HALT. PRESS CONTINUE TO RESUME TESTING.
6. POSITION ERROR: IF POSITION IS LOST DURING A RETRY,  
A MESSAGE IS PRINTED, THE TAPE REWOUND,  
AND REMOVED FROM TESTING UNTIL ALL ARE  
RESTARTED AT BLOCK ONE.
7. BAD TAPE OVERFLOW: IF 20(8) BAD TAPE SPOTS ARE FOUND,  
A MESSAGE IS PRINTED, THE TAPE REWOUND,  
AND REMOVED FROM TESTING UNTIL ALL ARE  
RESTARTED AT BLOCK ONE.
8. HARD READ ERROR: IF ANY HARD READ ERROR IS ENCOUNTERED  
DURING A RETRY, A MESSAGE IS PRINTED  
REGARDLESS OF THE SETTING OF SW10.
9. NON-RETRYABLE: IF ANY NON-RETRYABLE ERROR IS ENCOUNTERED, A  
MESSAGE IS PRINTED REGARDLESS OF THE SETTING OF SW10.

D. EXAMPLES:

GLOSSARY:

BN = CURRENT BLOCK NUMBER  
RN = CURRENT RECORD NUMBER  
RS = RECORD SIZE, IN FRAMES  
WE = WRITE STATUS ERROR  
RE = READ STATUS ERROR  
SE = SPACE ERROR  
TM = TAPE MARK  
F = FORWARD  
R = REVERSE  
CS1 = RH/TU45 CONTROL REGISTER  
WC = RH WORD COUNT  
BA = RH BUS ADDRESS  
FC = TU45 FRAME COUNT  
CS2 = RH CONTROLLER STATUS  
DS = TU45 DRIVE STATUS  
ER = TU45 ERROR REGISTER  
AS = ATTENTION SUMMARY  
CK = TU45 CHECK CHARACTER  
DB = RH DATA BUFFER  
MR = TU45 MAINTENANCE REGISTER  
DT = TU45 DRIVE TYPE  
SN = TU45 SERIAL NUMBER  
TC = TU45 TEST CONTROL  
\*F = DATA FORMAT  
\*P = PARITY  
\*D = DENSITY  
\*PATRN = DATA PATTERN NUMBER (R = RANDOM)

EXAMPLE 1: IN THIS EXAMPLE SLAVE 1 ON TM03 0 WAS OPERATING AT 1600 BPI IN ODD PARITY USING THE NINE CHANNEL NORMAL DATA FORMAT. A WRITE STATUS ERROR WAS DETECTED. THE BAD STATUS INDICATES THAT AN UNCORRECTABLE DATA ERROR (BIT 6 OF ER) AND A PE FORMAT ERROR (BIT 7 OF ER) OCCURED DURING THE WRITE OPERATION OF THE SIXTH (6) RECORD OF THE FIFTY (50) RECORDS IN BLOCK (2). THE SIZE OF THE RECORD WAS TWO HUNDRED (200) FRAMES. THE CHECK CHARACTER REFLECTS THE BAD TRACK.

DRIVE NO. 0 \*SLAVE NO. 1 \*D 4 \*P 0 \*F 14 \*PATRN 1  
\*BN 2 \*RN 6-50 \*RS = 200 \*WE  
CS1 144260  
CS2 100  
DS 150640  
ER 300  
WC 0  
CK 4

EXAMPLE 2: IN THIS EXAMPLE SLAVE 3 ON TM03 1 WAS OPERATING AT 800 BPI IN EVEN PARITY USING THE NINE CHANNEL NORMAL DATA FORMAT. A READ STATUS ERROR WAS DETECTED DURING THE REVERSE READ OF THE TENTH (10) RECORD OF THE 25 RECORDS IN THIS BLOCK (12). THE SIZE OF THE RECORD IS TWENTY (20) FRAMES. THE PRINTOUT INDICATES THE DETECTION OF A VERTICAL PARITY ERROR (VPE: BIT 6 OF ER) AND A CYCLIC REDUNDENCY ERROR (CRC: BIT 15 OF ER). THE CRC CHARACTER, AS RECEIVED, IS NOT AS EXPECTED AND IS PRINTED SHOWING BOTH THE ACTUAL (FIRST) AND THE EXPECTED (LAST).

DRIVE NO. 2 \*SLAVE NO. 3 \*D 3 \*P 1 \*F 14 \*PATRN 3  
\*BN 12 \*RN 10-25 \*RS 20 \*RE R  
CS1 144276  
CS2 100  
DS 150600  
ER 100100  
WC 0  
CRC 767-777

EXAMPLE 3: IN THIS EXAMPLE, THE HEADER IS THE SAME AS IN EXAMPLE TWO (2) EXCEPT THAT THE ERROR TYPE REFLECTS A READ ERROR IN THE FORWARD DIRECTION. IT IS NORMAL FOR THE SYSTEM TO DETECT AN ERROR IN THE FORWARD AND REVERSE DIRECTION AT THE SAME RECORD. REMEMBER THAT IN REVERSE OPERATIONS THE RECORD NUMBER IS COUNTED DOWN SO THAT RECORD NUMBER TEN (10) WILL SHOWN IN THE PROPER POSITION IN BOTH FORWARD AND REVERSE.

DRIVE NO. 2 \*SLAVE NO. 3 \*D 3 \*P 1 \*F 14 \*PATRN 2  
\*BN 12 \*RN 10-25 \*RS 20 \*RE F  
CS1 144270  
CS2 100  
DS 150600  
ER 100100  
WC 0  
CRC 767-777

EXAMPLE 4: IN EXAMPLES 2 AND 3 THE READ OPERATION RESULTED IN BAD STATUS, HOWEVER THE DATA ASSOCIATED WITH THE OPERATION WAS NOT BAD (OR WAS NOT CHECKED: SW 13=1). THIS EXAMPLE (4) SHOWS A PRINTOUT REFLECTING A READ STATUS ERROR ACCOMPANIED BY BAD DATA IN CHARACTERS FOUR (4) AND SIX (6).

DRIVE NO. 2 \*SLAVE NO. 3 \*D 3 \*P 1 \*F 14 \*PATRN 2  
\*BN 12 \*RN 10-25 \*RS 20 \*RE F  
CS1 144270  
CS2 100  
DS 150600  
ER 100100  
WC 0  
CRC 767-777  
CN 4  
G 11111111  
B 10111111  
CN 6  
G 11111111  
B 10111111



EXAMPLE 5: THIS EXAMPLE SHOWS A READ DATA ERROR  
WHICH OCCURRED, WITHOUT AN ACCOMPANING  
STATUS ERROR, WHICH RESULTED IN A BAD RECORD.

DRIVE NO. 3 \*SLAVE NO. 1 \*D 4 \*P 0 \*F 14 \*PATRN R  
\*BN 100 \*RN 66-200 \*RS 2000 \*DE F  
CN 0  
G 11111111  
B 00000000  
CN 1  
G 11111111  
B 00000000  
CN 2  
G 11111111  
B 00000000  
CN 3  
G 11111111  
B 00000000  
CN 4  
G 11111111  
B 00000000  
CN 5  
G 11111111  
B 00000000  
CN 6  
G 11111111  
B 00000000  
CN 7  
G 11111111  
B 00000000

BAD RECORD

EXAMPLE 6: THE FOLLOWING EXAMPLE SHOWS THE  
RESULT OF A SPACE OPERATION THAT  
SHOULD HAVE SPACED REVERSE OVER  
AN ENTIRE 100 RECORD BLOCK BUT  
WHICH TERMINATED AT THE END OF 40  
RECORDS. LEAVING A POSITION ERROR OF 40

DRIVE NO. 2 \*SLAVE NO. 6 \*D 2 \*P 0 \*F 14  
\*BN 3 \*RN 100-100 \*RS 1000 \*SE R  
ERR AMT 40

EXAMPLE 7: THIS EXAMPLE REFLECTS AN ERROR DETECTED WHILE WRITING A TAPE MARK (TM) AT THE END OF THE CURRENT DATA BLOCK PER OPTION RESPONSE TM=1. NOTE THAT THE TM RECORD NUMBER IS ONE GREATER THAN THE TOTAL NUMBER OF DATA RECORDS IN THE CURRENT BLOCK.

DRIVE NO. 1 \*SLAVE NO. 1 \*D 2 \*P 0 \*F 14  
\*BN 67 \*RN 101-100 \*RS 36 \*WE TM  
CS1 144226  
CS2 300  
DS 150604  
ER 1000  
WC 0

EXAMPLE 8: THIS EXAMPLE SHOWS TWO (2) PRINTOUTS REFLECTING A WRITE RETRY WHICH WAS NOT SUCCESSFUL THE FIRST TIME, BUT WHICH DID RECOVER ON THE SECOND. THE UNSUCCESSFUL RETRY IS LOGGED AS A SUSPECTED BAD TAPE SPOT BY ITS BLOCK AND RECORD NUMBER.

DRIVE NO. 0 \*SLAVE NO. 2 \*D 4 \*P 0 \*F 14 \*PATRN 6  
\*BN 2 \*RN 12-20 \*RS 667 \*WE  
CS1 144260  
CS2 100  
DS 150640  
ER 100  
WC 0  
\*\*\*ORIGINAL ERROR\*\*\*

DRIVE NO. 0 SLAVE NO. 2 \*D 4 \*P 0 \*F 14 \*PATRN 6  
\*BN 2 \*RN 12-20 \*RS 667 \*WE  
CS1 144260  
CS2 100  
DS 150640  
ER 100  
WC 0  
SUSPECT BAD TAPE  
RETRY: 0  
REPT: 0  
RECOVERED  
RETRY: 1

EXAMPLE 9: IF , DURING A WRITE RETRY THE BACKSPACE  
OR THE ERASE OPERATION RESULT IN AN ERROR,  
THE ERROR WILL BE PRINTED AND THE PROGRAM  
HALTED. THIS EXAMPLE SHOWS THE ERROR PRINT  
FOR A SPACE AND AN ERASE (2 EXAMPLES)

DRIVE NO. 1 \*SLAVE NO. 1 \*D 3 \*P 0 \*F 14  
BN 12 \*RN 8-64 \*RS 500 \*SE RTRY  
ERR AMT 1

DRIVE NO. 1 \*SLAVE NO. 1 \*D 3 \*P 0 \*F 14  
\*BN 12 \*RN 8-64 \*RS 500 \*ERASE  
CS1 144224  
CS2 100  
DS 150600  
ER 400  
WC 0

EXAMPLE 10: THIS EXAMPLE SHOWS THE PRINTOUT FROM  
A REWIND OPERATION WHICH DOES NOT HAVE  
BOT SET AT THE END.

DRIVE NO. 2 \*SLAVE NO. 3 \*D 3 \*P 0 \*F 14  
\*BN 66 \*RN 15-20 \*RS 1000  
NOT BOT ON REWIND: HALT

EXAMPLE 11: THIS EXAMPLE SHOWS THE PRINTOUT MADE WHEN  
THERE IS NO INTERRUPT RETURNED AT THE END  
OF AN OPERATION.

DRIVE NO. 7 \*SLAVE NO. 7 \*D 2 \*P 1 \*F 14  
\*BN 1 \*RN 25-26 \*RS 1200  
NO INTERRUPT

10. STATISTICS PRINTOUT

THE PROGRAM, THROUGH ITS ERROR CHECKING, IS ABLE TO GATHER CERTAIN STATISTICS ABOUT THE PERFORMANCE OF EACH UNIT UNDER TEST. THIS INFORMATION IS PRINTED OUT WHENEVER A UNIT IS REWOUND FROM END OF TAPE, OR BECAUSE IT IS TO BE REMOVED FROM TESTING DUE TO SOME CATASTROPHIC ERROR. (POSITION LOST, BAD TAPE OVERFLOW) THE STATISTICS MAY BE PRINTED AT ANY TIME BY SETTING SWITCH 14 TO A ONE (1). THIS PRESENTS A PICTURE OF PERFORMANCE UP TO THIS TIME. THE STATISTICS WILL BE CLEARED UPON REWIND OF THE UNIT; BUT NOT BY SETTING SW 14.

STATISTICS PRINT EXAMPLE (A HEADER WILL PRECEED THE STATS)

DROPS: 0 3 0 0 0 6 45 0  
PICKS: 1 0 0 0 0 0 0 2  
RETRY: 1  
WTERR: 2  
REFWD: 3  
SOFT: 2  
HARD: 1  
DEFWD: 0  
REREV: 4  
SOFT: 1  
HARD: 3  
DEREV: 0  
2 BAD TAPE SPOTS  
0 \*BN 1 \*RN 2  
1 \*BN 15 \*RN 100

\*\* NOTE \*\* DROPS AND PICKS REFLECT CORE BIT POSITIONS.  
THE FOLLOWING IS A TABLE OF CORE BITS TO TRACK NUMBER.

TRACK NO.	7	6	5	3	9	1	8	2
CORE BIT	7	6	5	4	3	2	1	0

DROPS: NUMBER OF DATA BITS DROPPED: PER CORE BIT(SEE NOTE ABOVE)  
PICKS: NUMBER OF DATA BITS PICKED UP: PER CORE BIT(SEE NOTE ABOVE)  
RETRY: NUMBER OF WRITE RETRIES  
WTERR: NUMBER OF WRITE ERRORS NOT ASSOCIATED WITH BAD TAPE  
REFWD: NUMBER OF READ FORWARD STATUS ERRORS  
REREV: NUMBER OF READ REVERSE STATUS ERRORS  
SOFT: NUMBER OF RECOVERED READ ERRORS  
HARD: NUMBER OF UNRECOVERED READ ERRORS  
DEFWD: NUMBER OF FORWARD DATA ERRORS WITH NO ASSOCIATED STATUS ERROR  
DEREV: NUMBER OF REVERSE DATA ERRORS WITH NO ASSOCIATED STATUS ERROR

11. AUTO SEQUENCE

THE AUTO SEQUENCE (START AT ADDRESS 240) WILL EXECUTE A PREDETERMINED TEST PLAN ON ALL AVAILABLE SLAVES ON EACH AVAILABLE TMO3. THE ONLY OPERATOR RESPONSE IS TO THE TYPED REQUESTS FOR THE RH ADDRESS, VECTOR, CONTINUOUS OR SINGLE CYCLE, AND NRZ ONLY. ALL SWITCHES REMAIN ACTIVE AND MAY BE USED NORMALLY; HOWEVER THE IDEA IS TO LEAVE ALL SWITCHES DOWN AND ALLOW FULL EXECUTION OF THE TEST PLAN FOR SYSTEM CHECKOUT.

SAMPLE START AT 240(8): AUTO SEQUENCE.

LOAD ADDRESS 240(8), SET SWITCHES TO ZERO, PRESS START:

TU45 AUTO SEQUENCE TEST  
ENTER CONDITIONS IN OCTAL

REGISTER START = 172400(172440)  
VECTOR ADDRESS = 224(CR)  
NRZ ONLY: (0)  
AUTO CONT: (1)

THIS EXAMPLE SHOWS AN AUTO SEQUENCE START WITH THE RH AT BUS ADDRESS 172440 AND A VECTOR OF 224. ALL AVAILABLE HARDWARE WILL BE TESTED CONTINUOUSLY IN BOTH NRZ AND PE MODE.

AS EACH TMO3 AND ITS SLAVES ARE FOUND, A DIVIDER LINE OF ASTERICKS WILL BE PRINTED FOLLOWED BY A PRINTOUT OF THE TMO3 AND ITS SLAVES BEING TESTED. AS EACH TMO3 AND ITS SLAVES ARE FINISHED, ANOTHER DIVIDER IS PRINTED BEFORE TESTING IS RESUMED ON THE NEXT AVAILABLE DRIVE.

WHEN ALL AVAILABLE HARDWARE HAS BEEN TESTED, A PRINTOUT OF END OF SEQUENCE WILL BE DONE AND THE PROGRAM WILL EITHER HALT (AUTO CONT = 0) OR RESTART WITH THE FIRST AVAILABLE UNIT (AUTO CONT = 1).

AUTO SEQUENCE TEST PLAN:

THE AUTO SEQUENCE WILL EXECUTE BOTH AN NRZ AND A PE CYCLE. EACH CYCLE WILL BE STARTED FROM BOT AND CONSIST OF VARIOUS DATA PATTERNS INTENDED TO BE WORST CASE FOR THAT PARTICULAR MODE.

1. NRZ CYCLE:

SIX (6) BLOCKS OF ONE HUNDRED (100) RECORDS OF FOUR THOUSAND (4000) CHARACTERS FOR EACH OF THE FOUR DATA PATTERNS.

PATTERN 1: ALL ONES DATA IN ALL BYTES  
PATTERN 10: WALKING ONE/ALL ONE  
PATTERN 14: WALKING ZERO/ALL ZERO  
RANDOM DATA: RANDOM

2. PE CYCLE: (IF NRZ ONLY = 0)

SIX BLOCKS OF ONE HUNDRED (100) RECORDS OF FOUR THOUSAND (4000) CHARACTERS EACH FOR EACH OF THREE DATA PATTERNS, THEN RANDOM DATA BLOCKS TO END OF TAPE.

PATTERN 10: WALKING ONE/ALL ONE  
PATTERN 14: WALKING ZERO/ALL ZERO  
PATTERN 15: THREE (3) 0 CHARACTERS, TWO (2) ALL CHARACTERS, THREE 0 CHARACTERS, THEN COMPLIMENT PATTERN. REPEATED FOR A FULL BUFFER  
RANDOM DATA: RANDOM

IN CHAIN MODE THIS SEQUENCE TEST PLAN WILL BE EXECUTED ONE TIME AND CONTROL WILL RETURN TO THE MONITOR. SPECIFY NUMBER OF PASSES DESIRED IN CHAIN COMMAND STRING.

12. TESTING PROCEDURES

AS PREVIOUSLY STATED THIS PROGRAM CONTAINS NO FIXED TESTS. THE ENTIRE TEST CYCLE TO BE EXECUTED IS DESCRIBED BY THE OPERATOR THROUGH RESPONSES TO TELETYPE REQUESTS FOR PARAMETERS AND CONSOLE SWITCH SETTINGS FOR OPERATION. THE OPERATION SELECTED WILL BE EXECUTED WITH THE PARAMETERS ENTERED CONTINUOUSLY ON EACH AVAILABLE UNIT, ONE BLOCK AT A TIME, UNTIL STOPPED BY THE OPERATOR. THE OPERATION MAY BE CHANGED DYNAMICALLY BY CHANGING THE CONSOLE SWITCHES AT ANY TIME. THE PROGRAM WILL ATTEMPT TO PERFORM ANY OPERATION SET AND THEREFORE CAUTION SHOULD BE TAKEN TO ASSURE THAT THE UNIT IS CAPABLE OF PERFORMING AS REQUESTED. FOR INSTANCE, ONE SHOULD NOT ATTEMPT TO PERFORM READ OPERATIONS ON A TAPE WHICH HAS NOT BEEN WRITTEN AS THE DATA, IF ANY, IS UNPREDICTABLE. HOWEVER, IF A TAPE HAS BEEN WRITTEN WITH THIS PROGRAM, IT CAN BE READ AS OFTEN AS DESIRED WITHOUT BEING REWRITTEN. THIS IS A GOOD PROCEDURE TO USE FOR TESTING TAPE COMPATIBILITY. SCOPING OF TAPE UNITS BECOMES SIMPLE; BY SETTING THE DESIRED OPERATION AND ITS PARAMETER, A UNIT MAY BE CONTINUOUSLY EXERCISED IN ANY MANNER DESIRED. BY USING THE VARIOUS ERROR CONTROL SWITCHES AND ENTERING THE NEEDED STALL, ANY FUNCTION CAN BE SCOPED RATHER EASILY. RELIABILITY TESTING CAN BE PERFORMED BY USE OF THE RANDOMIZATION CAPABILITY. PERHAPS A CYCLE OF RANDOM TESTING MIGHT BE SET UP AND ALLOWED TO RUN FOR SOME PERIOD OF TIME, THE STATISTICAL COLLECTION OF DROPS AND PICKS IS THEN SIGNIFICANT. INTERMITTANT PROBLEMS CAN BE FOUND BY SETTING THE DESIRED OPERATION IN MOTION AND DISALLOWING ERROR PRINTOUTS WHILE ALLOWING A HALT ON ERROR. THE ERROR THAT CAUSED THE HALT CAN BE PRINTED BY RESETTING CONSOLE SWITCH TEN AND PRESSING CONTINUE. IF SOME PARTICULAR DATA PATTERN SHOULD BE CAUSING DATA ERROR, USE OF THE YOZZLE SWITCH AND ITS ASSOCIATED STALL WILL ALLOW SCOPING OF THIS PARTICULAR RECORD.

AS YOU SEE, THERE ARE MYRIAD TESTING PROCEDURES WHICH COULD BE PERFORMED. THE PARAMETERS, TAPE OPERATIONS, ERROR EXAMINATION AND REPORTING ARE ALL AT YOUR DISCRETION.

TRY IT, YOU'LL LIKE IT.

2632  
2633  
2634  
2635  
2636  
2637  
2638  
2639

z

```
.LIST BIN,LOC,SEQ  
.TITLE TM03/TU45 DATA RELIABILITY PROGRAM  
:++B CZTURBO  
:21 FEB 1977  
:R. BARNES  
:REVISED (++) J.G.ADAMS MAY 1977  
:++B  
:++B
```

1) INCORRECT RECORD COUNT  
STORED WHEN EOT REACHED ON WRITE  
2) ADJUST STACK PTR ON BAD TAPE OVFLW

2640  
2641  
2642  
2643  
2644  
2645  
2646  
2647  
2648  
2649  
2650  
2651  
2652  
2653  
2654  
2655  
2656  
2657  
2658  
2659  
2660  
2661  
2662  
2663  
2664  
2665  
2666  
2667  
2668  
2669  
2670  
2671  
2672  
2673  
2674  
2675  
2676  
2677  
2678  
2679  
2680

```
.MCALL .SACT11,.$EOP,$SAVE,$RESTORE,$CHAIN  
.NLIST MC  
.LIST ME  
.ENABLE ABS,AMA  
  
:CONSOLE SWITCHES*****  
  
:SW15: 1=STOP ON ERROR  
:      0=CONTINUE ON ERROR  
:SW14: 1=PRINT READ/WRITE STATS  
:      0=DO NOT PRINT STATS  
:SW13: 1=DO NOT CHECK DATA  
:      0=CHECK DATA  
:SW12: 1=DO NOT CHECK WRITE ERRORS  
:      0=CHECK WRITE ERRORS  
:SW11: 1=DO NOT CHECK READ ERRORS  
:      0=CHECK READ ERRORS  
:SW10: 1=DO NOT PRINT ERRORS  
:      0=PRINT ERRORS  
:SW9:  1=REWIND TAPE  
:      0=DO NOT REWIND  
:SW8:  1=USE RANDOM DATA  
:      0=USE FIXED DATA PATTERN  
:SW7:  1=USE RANDOM CHARACTER COUNT  
:      0=USE FIXED CHAR COUNT  
:SW6:  1=USE RANDOM RECORD COUNT  
:      0=USE FIXED RECORD COUNT  
:SW5:  1=YOZZLE ON CURRENT RECORD  
:      0=DO NOT YOZZLE  
:SW4:  1=DO BOTH READ AND WRITE RETRIES  
:      0=INHIBIT RETRIES  
:SW3:  1=DO NOT READ FORWARD  
:      0=READ FORWARD  
:SW2:  1=DO NOT READ REVERSE  
:      0=READ REVERSE  
:SW1:  1=READ FORWARD FIRST  
:      0=READ REVERSE FIRST  
:SW0:  1=DO NOT WRITE  
:      0=WRITE  
  
:IF SWR <15::00> = 177777 OR NOT AVAILABLE USE SOFTWARE SWITCH REGISTER
```





```

2729                                     ;REGISTER EQUIVS*****
2730
2731         000000                       R0=%0
2732         000001                       R1=%1
2733         000002                       R2=%2
2734         000003                       R3=%3
2735         000004                       R4=%4
2736         000005                       R5=%5
2737         000006                       SP=%6
2738         000007                       PC=%7
2739         000240                       NCP=240
2740
2741                                     ;TRAP CATCHERS*****
2742
2750         000020                       .=20
2751 000020 023754                       .WORD TTOUT           ;SET IOT TRAP TO TTOUT ROUTINE
2752 000022 000340                       .WORD 340             ;PRIORITY LEVEL 7
2753
2754         000004                       TYPE=IOT             ;EQUATE TYPE TO AN IOT INSTRUCTION
2755         000034                       .=34
2756 000034 024126                       .WORD OCTP           ;SET TRAP TRAP TO OCTP ROUTINE
2757 000036 000340                       .WORD 340
2758         104400                       TYPOCT=TRAP        ;EQUATE TYPOCT TO TRAP INSTRUCTION
2759
(1)                                     ;ACT11 HOOK *****
(1)         000040                       $SVPC=.             ;SAVE CURRENT LOCATION CTR
(1)         000046                       .=46
(1) 000046 005022                       .WORD $ENDAD        ;SET LOCATION 46
(1)         000052                       .=52
(1) 000052 000000                       .WORD 0              ;SET LOCATION 52 = 0
(1)         000040                       .=$SVPC             ;RESTORE LOCATION CTR
2760
2761         000060                       ;TTY INTERRUPT VECTOR*****
2762 000060 021556                       .=60
2763 000062 000340                       .WORD TTINT         ;TTY INTERRUPT HANDLER ADDRESS
2764                                     .WORD 340           ;PRIORITY LEVEL 7
2765
2766         000176                       ;SOFTWARE SWITCH REGISTER*****
2767         000176                       ;INVOKED IF SWR <15::00> = 177777 OR NOT AVAILABLE
2768 000176 000000                       SWREG: .WORD 0
2769
2770         000200                       ;START ADDRESS*****
2771 000200 000137 003026                       .=200
2772         000137 003026                       JMP START           ;ENTER PARAMETERS VIA TTY
2773
2774         000204                       .=204
2775 000204 000137 003152                       JMP STARTC          ;USE FIXED PARAMETERS; HOLD DATA
2776
2777         000210                       .=210
2778 000210 005037 015064                       CLR RDFL
2779 000214 000137 003160                       JMP STARTA          ;USE FIXED PARAMETERS; NEW DATA
2780
2781                                     ;MAG TAPE INTERRUPT VECTOR*****
2782
2783         000224                       .=224

```

```
2784 000224 022006          MTINT          ;MAG TAPE INTERRUPT HANDLER ADDRESS
2785 000226 000340          340
2786
2787          ;AUTO SEQUENCE START*****
2788
2789          .=240
2790 000240 005237 000736    INC      ASEQF          ;SET AUTO SEQUENCE FLAG
2791 000244 000137 003136    JMP      STAUT         ;GO TO START OF AUTO SEQUENCE
```

```

2793                                     ;SHORT CONVERSATION RESTART*****
2794
2795         000300 000300                .=300
2796 000300 005237 014076                INC     SCVFL      ;SET SHORT CONVERSATION FLAG
2797 000304 000137 003026                JMP     START     ;ENTER SHORT PARAMETER LIST
2798
2799         000510                .=510
2800                                     ;TU45 REGISTER EQUIVS*****
2801
2802 000510 172440                C1:    172440
2803 000512 172442                WC:    172442
2804 000514 172444                BA:    172444
2805 000516 172446                FC:    172446
2806 000520 172450                CS:    172450
2807 000522 172452                DS:    172452
2808 000524 172454                ER:    172454
2809 000526 172456                AS:    172456
2810 000530 172460                CC:    172460
2811 000532 172462                DB:    172462
2812 000534 172464                MR:    172464
2813 000536 172466                DT:    172466
2814 000540 172470                SN:    172470
2815 000542 172472                TC:    172472
2816
2817                                     ;CONSTANTS*****
2818
2819 000544 172440                REGS:  172440      ;STARTING REGISTER ADDRESS (CS1)
2820 000546 000224                VECT:  224        ;VECTOR ADDRESS (RH INTERRUPT)
2821 000550 000000                DVN:   0          ;DRIVE NUMBER
2822 000552 000000                UDES:  0          ;UNIT DESCRIPTION (PARITY,DENSITY,UNIT,FORMAT)
2823 000554 000200                RCNT:  200       ;RECORD COUNTER
2824 000556 174000                FMCNT: 174000    ;NUMBER OF CHAR (4 - 4000) OCTAL IN TWOS COMPLEMENT
2825 000560 000001                PATRN: 1          ;DATA PATTERN SELECTOR (0 - 15) OCTAL
2826 000562 000002                RDCMD: 2         ;READ COMMAND
2827 000564 000001                TMEX:  1         ;TAPE MARK FLAG: 1=TM 0=NO TM
2828 000566 000000                CRCC:  0         ;CRC CORRECTION FLAG (YES=1,NO=0)
2829 000570 000000                INTRF: 0         ;INTERCHANGE READ 1=YES 0=NO
2830 000572 000000                SPFLG: 0         ;SINGLE PASS 1=YES 0=NO
2831 000574 000010                RSTAL: 10        ;READ STALL
2832 000576 000010                WSTAL: 10        ;WRITE STALL
2833 000600 000010                TSTAL: 10        ;TURN AROUND STAL
2834 000602 002000                YSTAL: 2000     ;YOZZLE STAL
2835 000604 000010                RETRY: 10        ;READ RETRY NUMBER
2836 000606 177776                PSW:   177776    ;PROCESSOR STATUS
2837 000610 177570                SWR:   177570    ;CONSOLE SWITCHES
2838 000612 177560                TKS:   177560    ;TTY READ STATUS REGISTER
2839 000614 177562                TKB:   177562    ;TTY READ BUFFER
2840 000616 177564                TPS:   177564    ;TTY PUNCH STATUS REGISTER
2841 000620 177566                TPB:   177566    ;TTY PUNCH OUTPUT REGISTER
2842 000622 177550                PRS:   177550    ;H/S READER STATUS REGISTER
2843 000624 177552                PRB:   177552    ;H/S READER BUFFER
2844 000626 153624                RANBAS:153624    ;RANDOM NUMBER GENERATOR BASE
2845 000630 032561                RANSAV:032561   ;RANDOM NUMBER BUFFER
2846 000632 000200                RCSAV: 200       ;RECORD COUNT SAVE
2847 000634 174000                FCSAV: 174000   ;FRAME COUNT SAVE

```

```
2849
2850
2851
2852 000636 000000
2853 000640
2854 000640 000000
2855 000642 000000
2856 000644 000000
2857 000646 000000
2858 000650 000000
2859 000652 000000
2860 000654 000000
2861 000656 000000
2862 000660 000000
2863 000662 000000
2864 000664 000000
2865 000666 000000
2866 000670 000000
2867 000672 000000
2868 000674 000000
2869 000676 000000
2870 000700 000000
2871 000702 000000
2872 000704 000000
2873 000706 000000
2874 000710 000000
2875 000712 000000
2876 000714 000000
2877 000716 000000
2878 000720 000000
2879 000722 000000
2880 000724 000000
2881 000726 000000
2882 000730 000000
2883 000732 000000
2884 000734 000000
2885 000736
2886 000736 000000
2887 000740 000000
2888 000742 000000
2889 000744 000000

:FLAGS AND COUNTERS*****
TINF: 0 :TTY ENTRY FLAG
STFLG:
TOB: 0 :TTY OUTPUT BUFFER
TIB: 0 :TTY INPUT BUFFER
TEMP1: 0 :TEMP STORAGE
TEMP2: 0 :TEMP STORAGE
TEMP3: 0 :TEMP STORAGE
NRZOF: 0 :NRZ ONLY FLAG
EMADDR: 0 :ERROR MSG ADDRESS STORAGE
BLCNTR: 0 :BLOCK COUNTER
BBC: 0 :BAD RECORD COUNTER
EOTREC: 0 :EOT FLAG
RTRN: 0 :INTERRUPT RETURN STORAGE
HDRFL: 0 :HEADER FLAG
STAL: 0 :DELAY STORAGE
PFLG: 0 :PRINT FLAG
MTC1: 0 :MAG TAPE CONT REGISTER BUFFER
UNP: 0 :UNIT TABLE POINTER
TMFLG: 0 :TAPE MARK FLAG
RPCNT: 0 :REPEAT COUNTER
RTCNT: 0 :RETRY COUNTER
DERFL: 0 :DATA ERROR FLAG
SERFL: 0 :STATUS ERROR FLAG
BCNT: 0 :BIT COUNTER
RTYFL: 0 :RETRY FLAG
UPS: 0 :UNIT POINTER SAVE
BDPP: 0 :BITS DROPPED POINTER
BPKP: 0 :BITS PICKED POINTER
ERSAV: 0 :ERROR SAVE LOC
BTFLG: 0 :BAD TAPE FLAG
BTSTF: 0 :STATISTIC PRINT FLAG
BTPT: 0 :BAD TAPE POINTER
ERTFL: 0 :ERASE FLAG
ENDFLG:
ASEQF: 0 :AUTO SEQ FLAG
ADRVN: 0 :UTO SEQ DRIVE NUMBER
ABLCNT: 0 :AUTO BLOCK COUNTER
ASEQCF: 0 :AUTO SEQ CONTINUOUS FLAG
```

2891  
2892  
2893  
2894 000746 000000  
2895 000750 000000  
2896 000752 000000  
2897 000754 000000  
2898 000756 000000  
2899 000760 000000  
2900 000762 000000  
2901 000764 000000  
2902 000766 177777  
2903  
2904  
2905  
2906 000770 001210  
2907 000772 001230  
2908 000774 001250  
2909 000776 001270  
2910 001000 001310  
2911 001002 001330  
2912 001004 001350  
2913 001006 001370  
2914 001010 001410  
2915 001012 001430  
2916 001014 001450  
2917 001016 001470  
2918 001020 001510  
2919 001022 001530  
2920 001024 001550  
2921 001026 001570  
2922  
2923  
2924  
2925 001030 001610  
2926 001032 001714  
2927 001034 002020  
2928 001036 002124  
2929 001040 002230  
2930 001042 002334  
2931 001044 002440  
2932 001046 002544  
2933  
2934  
2935  
2936  
2937 001050  
2938 001050 000000  
2939 001052 000000  
2940 001054 000000  
2941 001056 000000  
2942 001060 000000  
2943 001062 000000  
2944 001064 000000  
2945 001066 000000  
2946

:UNIT ORDER AND DESCRIPTION TABLE \*\*\*\*\*  
UN1: 0 :THIS TABLE IS LOADED  
UN2: 0 :WITH UNIT NUMBERS AND  
UN3: 0 :THEIR DESCRIPTIONS IN  
UN4: 0 :THE ORDER THAT THEY  
UN5: 0 :WILL BE TESTED  
UN6: 0  
UN7: 0  
UN8: 0  
UNX: -1

:UNIT DROPS AND PICKS POINTERS\*\*\*\*\*  
PIK1: BP00  
PIK2: BP10  
PIK3: BP20  
PIK4: BP30  
PIK5: BP40  
PIK6: BP50  
PIK7: BP60  
PIK8: BP70  
DRP1: BD00  
DRP2: BD10  
DRP3: BD20  
DRP4: BD30  
DRP5: BD40  
DRP6: BD50  
DRP7: BD60  
DRP8: BD70

:UNIT BAD TAPE POINTERS\*\*\*\*\*  
BTADDR: BT00  
BT01  
BT02  
BT03  
BT04  
BT05  
BT06  
BT07

:UNIT WRITE RETRY COUNTER\*\*\*\*\*  
:SET START OF STATISTICS TABLE  
STTBL:  
RTY1: 0  
RTY2: 0  
RTY3: 0  
RTY4: 0  
RTY5: 0  
RTY6: 0  
RTY7: 0  
RTY8: 0

```
2947                                     ;UNIT WRITE ERRORS*****
2948
2949 001070 000000 WTER1: 0
2950 001072 000000 WTER2: 0
2951 001074 000000 WTER3: 0
2952 001076 000000 WTER4: 0
2953 001100 000000 WTER5: 0
2954 001102 000000 WTER6: 0
2955 001104 000000 WTER7: 0
2956 001106 000000 WTER8: 0
2957
2958                                     ;UNIT READ FORWARD ERRORS*****
2959
2960 001110 000000 RDER1: 0
2961 001112 000000 RDER2: 0
2962 001114 000000 RDER3: 0
2963 001116 000000 RDER4: 0
2964 001120 000000 RDER5: 0
2965 001122 000000 RDER6: 0
2966 001124 000000 RDER7: 0
2967 001126 000000 RDER8: 0
2968
2969                                     ;UNIT DATA ERRORS FORWARD*****
2970
2971 001130 000000 DATER1: 0
2972 001132 000000 0
2973 001134 000000 0
2974 001136 000000 0
2975 001140 000000 0
2976 001142 000000 0
2977 001144 000000 0
2978 001146 000000 0
2979
2980                                     ;UNIT READ REVERSE ERRORS*****
2981
2982 001150 000000 RDERR1: 0
2983 001152 000000 0
2984 001154 000000 0
2985 001156 000000 0
2986 001160 000000 0
2987 001162 000000 0
2988 001164 000000 0
2989 001166 000000 0
2990
2991                                     ;UNIT DATA ERRORS REVERSE*****
2992
2993 001170 000000 DEREV1: 0
2994 001172 000000 0
2995 001174 000000 0
2996 001176 000000 0
2997 001200 000000 0
2998 001202 000000 0
2999 001204 000000 0
3000 001206 000000 0
```

```
3002 ;DROPS + PICKS PER CHANNEL PER UNIT*****
3003
3004 001210 000000 BP00: 0
3005 001230 001230 .=.+16
3006 001230 000000 BP10: 0
3007 001250 001250 .=.+16
3008 001250 000000 BP20: 0
3009 001270 001270 .=.+16
3010 001270 000000 BP30: 0
3011 001310 001310 .=.+16
3012 001310 000000 BP40: 0
3013 001330 001330 .=.+16
3014 001330 000000 BP50: 0
3015 001350 001350 .=.+16
3016 001350 000000 BP60: 0
3017 001370 001370 .=.+16
3018 001370 000000 BP70: 0
3019 001410 001410 .=.+16
3020 001410 000000 BD00: 0
3021 001430 001430 .=.+16
3022 001430 000000 BD10: 0
3023 001450 001450 .=.+16
3024 001450 000000 BD20: 0
3025 001470 001470 .=.+16
3026 001470 000000 BD30: 0
3027 001510 001510 .=.+16
3028 001510 000000 BD40: 0
3029 001530 001530 .=.+16
3030 001530 000000 BD50: 0
3031 001550 001550 .=.+16
3032 001550 000000 BD60: 0
3033 001570 001570 .=.+16
3034 001570 000000 BD70: 0
3035 001610 001610 .=.+16
3036
3037
```



```
3039
3040           ;UNIT BAD TAPE COUNTER:16 PER SLAVE*****
3041
3042 001610 000000 BT00: 0
3043           .=. +102
3044 001714 000000 BT01: 0
3045           .=. +102
3046 002020 000000 BT02: 0
3047           .=. +102
3048 002124 000000 BT03: 0
3049           .=. +102
3050 002230 000000 BT04: 0
3051           .=. +102
3052 002334 000000 BT05: 0
3053           .=. +102
3054 002440 000000 BT06: 0
3055           .=. +102
3056 002544 000000 BT07: 0
3057           .=. +102
3058
3059           ;UNIT END OF TAPE COUNTERS 1 PER SLAVE*****
3060
3061 002650 000000 EOTC0: 0
3062 002652 000000 0
3063 002654 000000 0
3064 002656 000000 0
3065 002660 000000 0
3066 002662 000000 0
3067 002664 000000 0
3068 002666 000000 0
3069
3070           ;UNIT READ FORWARD SOFT ERROR*****
3071
3072 002670 000000 RFSOFT: 0
3073 002672 000000 0
3074 002674 000000 0
3075 002676 000000 0
3076 002700 000000 0
3077 002702 000000 0
3078 002704 000000 0
3079 002706 000000 0
3080
3081           ;UNIT READ REVERSE SOFT ERROR*****
3082
3083 002710 000000 RRSOFT: 0
3084 002712 000000 0
3085 002714 000000 0
3086 002716 000000 0
3087 002720 000000 0
3088 002722 000000 0
3089 002724 000000 0
3090 002726 000000 0
3091
```

```
3093
3094 ;UNIT READ FORWARD HARD ERROR*****
3095
3096 002730 000000 RFHARD: 0
3097 002732 000000 0
3098 002734 000000 0
3099 002736 000000 0
3100 002740 000000 0
3101 002742 000000 0
3102 002744 000000 0
3103 002746 000000 0
3104
3105 ;UNIT READ REVERSE HARD ERROR*****
3106
3107 002750 000000 RRHARD: 0
3108 002752 000000 0
3109 002754 000000 0
3110 002756 000000 0
3111 002760 000000 0
3112 002762 000000 0
3113 002764 000000 0
3114 002766 000000 0
3115 ;SET END OF STATISTICS TABLE
3116 002770 ENDTBL:
3117
3118 ;DATA PATTERN GENERATORS*****
3119
3120 002770 002770 DATBL: . ;ENTRY TABLE
3121 002772 014336 DATA0: DAT0 ;EXTERNAL INPUT FROM H/S READER(SEE CZTUTAO)
3122 002774 014476 DATA1: DAT1 ;ALL ONES
3123 002776 014516 DATA2: DAT2 ;ALL ZEROS
3124 003000 014522 DATA3: DAT3 ;WALKING ONE
3125 003002 014546 DATA4: DAT4 ;WALKING ZERO
3126 003004 014556 DATA5: DAT5 ;ALTERNATING ONE/ZERO
3127 003006 014564 DATA6: DAT6 ;ALTERNATING ZERO/ONE
3128 003010 014572 DATA7: DAT7 ;ALTERNATING ONE/ZERO IN ALTERNATING CHARACTERS
3129 003012 014620 DATA10: DAT10 ;WALKING ONE/ALL ONE IN ALTERNATING CHARACTERS
3130 003014 014650 DATA11: DAT11 ;ALL BITS 0-377
3131 003016 014670 DATA12: DAT12 ;ALL BITS 377-0
3132 003020 014712 DATA13: DAT13 ;ALTERNATING CHARACTERS 0 AND 377
3133 003022 014722 DATA14: DAT14 ;WALKING ZERO/ALL ZERO IN ALTERNATING CHARACTERS
3134 003024 014752 DATA15: DAT15 ;AUTO SEQUENCE PATTERN 0,0,-1,-1,-1,0,0
3135
```

```

3137 .EVEN
3138 :*****
3139 :PROGRAM START AND SEQUENCE FORMATTER:
3140 :
3141 :THIS ROUTINE IS USED TO PERFORM ALL HOUSEKEEPING,
3142 :DECIDE WHICH TRANSPORT TO TEST AND ITS AVAILABILITY,
3143 :LOAD THE WRITE BUFFER WITH THE SELECTED DATA PATTERN,
3144 :GENERATE ANY RANDOM NUMBER AND THEN EXECUTE
3145 :THE TEST CYCLE REQUESTED BY THE SWITCH SETTING.
3146 :AT THE END OF THE TEST CYCLE THE NEXT UNIT IS SELECTED
3147 :AND CHECKED FOR AVAILABILITY AND THE TEST CYCLE IS
3148 :EXECUTED ON IT.
3149 :THE READ WRITE STATS MAY BE PRINTED AT THE END OF
3150 :EACH TEST CYCLE VIA CONSOLE SWITCH FOURTEEN (14).
3151 :*****
3152
3153
3154 :START 200, & 300*****
3155 003026 012706 000500 START: MOV #500,SP ;SET STACK PTR
3156 003032 005037 000736 CLR ASEQF ;CLEAR AUTO SEQUENCE FLAG
3157 003036 005027 CLR (PC)+ ;CLEAR CHAIN INDICATOR
(1) 003040 000000 CHNFLG: .WORD 0 ;CHAIN MODE INDICATOR
(1) (1) 003042 022737 005022 000042 CMP #SENDAD,@#42 ;1/0 = CHAIN/NOT CHAIN MODE
(1) 003050 001404 BEQ 50$ ;BRANCH IF LOADED VIA ACT11 CHAIN MODE
(1) 003052 005737 000042 TST @#42 ;BRANCH IF IN DUMP MODE
(1) 003056 001413 BEQ 52$
(1) 003060 000406 BR 51$
(1) 003062 012737 000176 000610 50$: MOV #SWREG,SWR ;INVOKE SOFTWARE SWR
(1) 003070 012777 100000 175512 MOV #100000,@SWR ;WITH HALT ON ERROR SET
(1) 003076 005237 003040 51$: INC CHNFLG ;SET CHNFLG = CHAIN MODE
(1) 003102 000137 003126 JMP 3$ ;GO TO CHAIN ADDRESS
(1) 003106 52$:
3158 003106 122737 000006 000041 CMPB #6,@#41 ;BRANCH IF LOADED VIA TMDP
3159 003114 001010 BNE STAUT
3160 003116 012704 027356 MOV #MSG120,R4 ;ADVISE USER TO REMOVE TMDP FROM SLAVE
3161 003122 000004 TYPE
3162 003124 000404 BR STAUT
3163 003126 005237 000736 3$: INC ASEQF ;SET AUTO SEQUENCE FLAG
3164 003132 000137 022056 JMP ASEQO ;GO TO AUTO SEQUENCER
3165
3166 :START 240*****
3167 003136 012737 000001 000636 STAUT: MOV #1,TINF ;SET TTY ENTRY FLAG
3168 003144 005037 015064 CLR RDFL ;CLEAR RANDOM DATA FLAG
3169 003150 000405 BR STARTB
3170
3171 :START 204*****
3172 003152 005037 000636 STARTC: CLR TINF ;CLEAR TTY INPUT FLAG
3173 003156 000432 BR STARTD
3174
3175 :START 210*****
3176 003160 005037 000636 STARTA: CLR TINF ;CLEAR TTY ENTRY FLAG
3177 003164 012700 000640 STARTB: MOV #STFLG,R0 ;GET STARTING ADDRESS OF FLAGS
3178 003170 012701 000076 MOV #ENDFLG-STFLG,R1
3179 003174 105020 1$: CLRB (R0)+ ;CLEAR FLAGS AND COUNTERS
3180 003176 005301 DEC R1

```

3181	003200	001375			BNE	1\$	
3182	003202	012706	000500		MOV	#500,SP	;SET STACK POINTER
3183	003206	004737	004276		JSR	PC,RANSET	;GO RESET RANDOM BASE
3184	003212	012700	001050		MOV	#STTBL,R0	;GET STARTING ADDRESS OF STAT TABLE
3185	003216	012701	001720		MOV	#ENDTBL-STTBL,R1	;AND # OF BYTES IN TABLE
3186	003222	105020		2\$:	CLRB	(R0)+	;CLEAR STATISTIC COUNTERS
3187	003224	005301			DEC	R1	
3188	003226	001375			BNE	2\$	
3189	003230	012737	177777	014330	MOV	#-1,PATS	;PRESET PATTERN
3190	003236	012737	000001	000656	STARTE: MOV	#1,BLCNTR	;PRESET BLOCK COUNTER
3191	003244	013746	000004		STARTD: MOV	@#4,-(SP)	;SAVE ERROR TRAP VECTOR
3192	003250	013746	000006		MOV	@#6,-(SP)	
3193	003254	022737	000176	000610	CMP	#SWREG,SWR	;BRANCH IF SOFTWARE SWR
3194	003262	001413			BEQ	2\$	;ALREADY SELECTED
3195	003264	012737	003310	000004	MOV	#1\$,@#4	;SET TIMEOUT TRAP TO 1\$ BELOW
3196	003272	005037	000006		CLR	@#6	
3197	003276	022777	177777	175304	CMP	#177777,@SWR	;BRANCH IF SWR = 177777 TRAP
3198	003304	001402			BEQ	2\$	;IF NOT AVAIL (1\$) OTHERWISE
3199	003306	000404			BR	3\$	;GO TO 3\$
3200	003310	022626			1\$: CMP	(SP)+,(SP)+	;RESET STACK
3201	003312	012737	000176	000610	2\$: MOV	#SWREG,SWR	;SET SWR = SOFTWARE SWR
3202	003320	012637	000006		3\$: MOV	(SP)+,@#6	;RESTORE ERROR TRAP
3203	003324	012637	000004		MOV	(SP)+,@#4	
3204	003330	012706	000500		MOV	#500,SP	
3205	003334	004737	012226		JSR	PC,TINP	;GO GET PARAMETERS FROM TTY
3206	003340	012777	000040	175152	MOV	#40,@CS	;INITIALIZE
3207	003346	005000			STAUTO: CLR	R0	;POINT TO FIRST ENTRY
3208	003350	022760	177777	000746	1\$: CMP	#-1,UN1(R0)	;BRANCH IF LAST ENTRY
3209	003356	001406			BEQ	2\$	
3210	003360	042760	100000	000746	BIC	#100000,UN1(R0)	;CLEAR EOT FLAG
3211	003366	062700	000002		ADD	#2,R0	;POINT TO NEXT UNIT ENTRY
3212	003372	000766			BR	1\$	;CONTINUE CLEARING
3213	003374	013703	005054		2\$: MOV	REOTC,R3	
3214	003400	000303			SWAB	R3	
3215	003402	110337	005054		MOVB	R3,REOTC	;RESTORE EOT CNTR
3216	003406	012777	000100	175176	START1: MOV	#100,@TKS	;SET KEYBOARD IE BIT
3217	003414	013700	000676		MOV	UNP,R0	;R0 = UNIT TABLE POINTER
3218	003420	022760	177777	000746	STAR1A: CMP	#-1,UN1(R0)	;BRANCH IF LAST ENTRY
3219	003426	001404			BEQ	STAR1B	
3220	003430	016037	000746	000552	MOV	UN1(R0),UDES	;LOAD NEXT UNIT DESCRIPTION
3221	003436	000446			BR	START4	
3222	003440	005237	000656		STAR1B: INC	BLCNTR	;BUMP BLOCK COUNTER
3223	003444	005737	000736		TST	ASEQF	;SEE IF AUTO SEQ
3224	003450	001411			BEQ	STAR1C	;IF NOT: BR
3225	003452	023737	000656	000742	CMP	BLCNTR,ABL CNT	;SEE IF DONE SEQ
3226	003460	001005			BNE	STAR1C	;IF NOT: BR
3227	003462	005037	000656		CLR	BLCNTR	;RESET BLOCK CNTR
3228	003466	005037	000676		CLR	UNP	;RESET UNIT POINTER
3229	003472	000207			RTS	PC	;RETURN TO AUTO SEQ
3230	003474	005037	000676		STAR1C: CLR	UNP	
3231	003500	005000			CLR	R0	
3232	003502	016037	000746	000552	MOV	UN1(R0),UDES	;LOAD FIRST UNIT DESCRIPTION
3233	003510	032777	000200	175072	BIT	#200,@SWR	;SEE IF RANDOM RECORD SIZE
3234	003516	001402			BEQ	START2	;IF NOT: BR
3235	003520	004737	012142		JSR	PC,CCNTR	;GO GENERATE RANDOM RECORD SIZE
3236	003524	032777	000400	175056	START2: BIT	#400,@SWR	;SEE IF RANDOM DATA

3237	003532	001402			BEQ	START3	:IF NOT: BR
3238	003534	004737	015022		JSR	PC,DATR	:GO GENERATE RANDOM DATA
3239	003540	032777	000100	175042	START3: BIT	#100,@SWR	:SEE IF RANDOM RECORD COUNT
3240	003546	001402			BEQ	START4	:IF NOT: BR
3241	003550	004737	012202		JSR	PC,RCNTR	:GO GENERATE RANDOM RECORD COUNT
3242	003554	005760	000746		START4: TST	UN1(R0)	:SEE IF REACHED EOT
3243	003560	100002			BPL	STAR40	:IF NOT: BR
3244	003562	000137	004264		JMP	START7	:ELSE GO TO NEXT UNIT
3245	003566	013777	000550	174724	STAR40: MOV	DVN,@CS	:SET DRIVE NUMBER
3246	003574	013777	000552	174740	MOV	UDES,@TC	:SET UNIT NUMBER
3247	003602	105777	174714		TSTB	@DS	:SEE IF UNIT AVAIL
3248	003606	100412			BMI	STAR4A	:IF SO: BR
3249	003610	005337	000670		DEC	STAL	
3250	003614	001357			BNE	START4	:AWAIT TUR
3251	003616	004737	022672		JSR	PC,PAPRT	:PRINT HEADER
3252	003622	012704	026056		MOV	#MSG49,R4	
3253	003626	000004			TYPE		:TYPE MSG
3254	003630	000000			HALT		:STOP
3255	003632	000750			BR	START4	:RETRY
3256	003634	004737	014124		STAR4A: JSR	PC,DSUP	:GO SET UP WRITE DATA
3257	003640	004737	005426		JSR	PC,INIT	:INIT SLAVE
3258	003644	004737	005056		JSR	PC,RWIND	:REWIND
3259	003650	004737	005542		JSR	PC,WRITE	:WRITE
3260	003654	013737	000600	000670	MOV	TSTAL,STAL	:SET TURN AROUND DELAY
3261	003662	004737	012132		JSR	PC,STALL	:DELAY
3262	003666	004737	007432		JSR	PC,RSEQ	:GO TO READ SEQUENCER
3263	003672	013737	000600	000670	MOV	TSTAL,STAL	:SET TURN AROUND DELAY
3264	003700	004737	012132		JSR	PC,STALL	:DELAY
3265	003704	032777	040000	174676	BIT	#40000,@SWR	:SEE IF SHOULD PRINT STATISTICS
3266	003712	001541			BEQ	START5	:IF NOT: BR
3267	003714	012700	000001		MOV	#1,R0	:SET RECORD COUNTER TO 1
3268	003720	004737	022672		JSR	PC,PAPRT	:PRINT CYCLE NUMBER
3269	003724	004737	003734		JSR	PC,STP	:GO PRINT STATS
3270	003730	000137	004202		JMP	STPX	
3271	003734	004737	017160		STAR4: JSR	PC,DPPRT	:PRINT DROPS AND PICKS
3272	003740	012704	026270		MOV	#MSG65,R4	
3273	003744	000004			TYPE		:TYPE MSG
3274	003746	013704	000676		MOV	UNP,R4	
3275	003752	016403	001050		MOV	RTY1(R4),R3	
3276	003756	104400			TYPOCT		:PRINT RETRIES
3277	003760	012704	026441		MOV	#MSG73,R4	
3278	003764	000004			TYPE		:TYPE MSG
3279	003766	013704	000676		MOV	UNP,R4	
3280	003772	016403	001070		MOV	WTER1(R4),R3	
3281	003776	104400			TYPOCT		:PRINT WRITE ERRORS
3282	004000	012704	026430		MOV	#MSG72,R4	
3283	004004	000004			TYPE		:TYPE MSG
3284	004006	013704	000676		MOV	UNP,R4	
3285	004012	016403	001110		MOV	RDER1(R4),R3	
3286	004016	104400			TYPOCT		:PRINT READ FORWARD ERRORS
3287	004020	012704	027233		MOV	#MSG113,R4	
3288	004024	000004			TYPE		:TYPE MSG
3289	004026	013704	000676		MOV	UNP,R4	
3290	004032	016403	002670		MOV	RFSOFT(R4),R3	
3291	004036	104400			TYPOCT		:PRINT FORWARD SOFT ERRORS
3292	004040	012704	027244		MOV	#MSG114,R4	

3293	004044	000004			TYPE		:TYPE MSG
3294	004046	013704	000676		MOV	UNP,R4	
3295	004052	016403	002730		MOV	RFHARD(R4),R3	
3296	004056	104400			TYPOCT		:PRINT HARD FORWARE ERRORS
3297	004060	012704	026521		MOV	#MSG77,R4	
3298	004064	000004			TYPE		:TYPE MSG
3299	004066	013704	000676		MOV	UNP,R4	
3300	004072	016403	001130		MOV	DATER1(R4),R3	
3301	004076	104400			TYPOCT		:PRINT DATA ERROR FORWARD NUMBER
3302	004100	012704	026324		MOV	#MSG68,R4	
3303	004104	000004			TYPE		:TYPE MSG
3304	004106	013704	000676		MOV	UNP,R4	
3305	004112	016403	001150		MOV	RDERR1(R4),R3	
3306	004116	104400			TYPOCT		:PRINT REVESE ERROR NUMBER
3307	004120	012704	027233		MOV	#MSG113,R4	
3308	004124	000004			TYPE		:TYPE MSG
3309	004126	013704	000676		MOV	UNP,R4	
3310	004132	016403	002710		MOV	RRSOFT(R4),R3	
3311	004136	104400			TYPOCT		:PRINT REVERSE SOFT ERROR
3312	004140	012704	027244		MOV	#MSG114,R4	
3313	004144	000004			TYPE		:TYPE MSG
3314	004146	013704	000676		MOV	UNP,R4	
3315	004152	016403	002750		MOV	RRHARD(R4),R3	
3316	004156	104400			TYPOCT		
3317	004160	012704	026510		MOV	#MSG76,R4	
3318	004164	000004			TYPE		:TYPE MSG
3319	004166	013704	000676		MOV	UNP,R4	
3320	004172	016403	001170		MOV	DEREV1(R4),R3	
3321	004176	104400			TYPOCT		:PRINT DATA REVERSE ERROR NUMBER
3322	004200	000207			RTS	PC	:RETURN
3323	004202	005237	000730	STPX:	INC	BTSTF	:SET STAT ONLY PRINT
3324	004206	004737	007342		JSR	PC,BTPRT	:PRINT BAD TAPE STATS
3325	004212	005037	000730		CLR	BTSTF	:CLEAR FLAG
3326	004216	017700	174366	START5:	MOV	@SWR,R0	:LOAD SWR
3327	004222	042700	177762		BIC	#177762,R0	:MASK READ/WRITE SWITCHES
3328	004226	022700	000015		CMP	#15,R0	:SEE IF HAVE READ OR WRITE
3329	004232	001417			BEQ	START8	:IF NOT: BR
3330	004234	105777	174262	START6:	TSTB	@DS	:SEE IF HAVE UNIT READY
3331	004240	100411			BMI	START7	:IF SO: BR
3332	004242	005337	000670		DEC	STAL	
3333	004246	001372			BNE	START6	:DELAY FOR TUR
3334	004250	004737	022672		JSR	PC,PAPRT	:PRINT HEADER
3335	004254	012704	026056		MOV	#MSG49,R4	
3336	004260	000004			TYPE		:TYPE MSG
3337	004262	000000			HALT		:STOP
3338	004264	062737	000002	000676	START7:	ADD	#2,UNP
3339	004272	000137	003406		START8:	JMP	START1
3340							
3341							:RANDOM BASE RESET*****
3342							
3343	004276	012737	153624	000626	RANSET:	MOV	#153624,RANBAS
3344	004304	012737	032561	000630		MOV	#32561,RANSAV
3345	004312	013737	000632	000554		MOV	RCSAV,RCNT
3346	004320	013737	000634	000556		MOV	FCSAV,FMCNT
3347	004326	000207			RTS	PC	
3348							

```

3350
3351
3352
3353
3354
3355
3356
3357
3358
3359
3360
3361
3362 004330 013777 000552 174204 REOT:  MOV    UDES,@TC      ;LOAD TAPE CONTROL REGISTER
3363 004336 012777 000011 174144      MOV    #11,@C1      ;DRIVE CLEAR
3364 004344 105777 174152      1$:   TSTB   @DS         ;WAIT FOR DRY
3365 004350 100375                BPL    1$           ;
3366 004352 012777 000007 174130      MOV    #7,@C1      ;START REWIND
3367 004360 005737 000726      TST    BTFLG       ;SEE IF BAD TAPE OVERFLOW REWIND
3368 004364 001004                BNE    REOT1A      ;IF SO: BR
3369 004366 013700 000662      MOV    EOTREC,R0   ;
3370 004372 042700 100000      BIC    #100000,R0  ;SET RECORD NUMBER OF EOT
3371 004376 005037 000662      REOT1A: CLR   EOTREC   ;CLEAR EOT INDICATOR & REC COUNT
3372 004402 004737 022672      JSR    PC,PAPRT    ;PRINT HEADER
3373 004406 022737 000002 000726      CMP    #2,BTFLG   ;SEE IF POSITION ERROR
3374 004414 001003                BNE    REOT1B      ;IF NOT: BR
3375 004416 012704 027124      MOV    #MSG109,R4  ;SET POSITION ERROR MSG
3376 004422 000406                BR     REOT1F      ;
3377 004424 022737 000001 000726      REOT1B: CMP   #1,BTFLG ;SEE IF BAD TAPE OVERFLOW
3378 004432 001004                BNE    REOT1C      ;IF NOT: BR
3379 004434 012704 026752      MOV    #MSG106,R4  ;SET BAD TAPE OVERFLOW MSG
3380 004440 000004                REOT1F: TYPE      ;TYPE MSG
3381 004442 000412                BR     REOT1E      ;
3382 004444 012704 024756      REOT1C: MOV   #MSG20,R4 ;SET EOT MSG
3383 004450 000004                TYPE      ;TYPE MSG
3384 004452 013704 000676      MOV    UNP,R4      ;
3385 004456 005264 002650      INC    EOTC0(R4)   ;BUMP CNTR
3386 004462 016403 002650      MOV    EOTC0(R4),R3 ;
3387 004466 104400                TYPOCT     ;PRINT EOT CNTR
3388 004470 012704 026777      REOT1E: MOV   #MSG16A,R4 ;
3389 004474 000004                TYPE      ;TYPE MSG
3390 004476 005037 000726      CLR    BTFLG       ;CLEAR BAD TAPE FLAG
3391 004502 004737 003734      JSR    PC,STP      ;PRINT STATS
3392 004506 004737 007342      JSR    PC,BTPRT    ;PRINT BAD TAPE STATS
3393 004512 105777 174004      REOT2: TSTB   @DS         ;BRANCH IF DRY SET
3394 004516 100414                BMI    REOT2A      ;
3395 004520 005337 000670      DEC    STAL        ;
3396 004524 001372                BNE    REOT2       ;WAIT DRY
3397 004526 012737 024615 000654      MOV    #MSG6,EMADDR ;
3398 004534 004737 022672      JSR    PC,PAPRT    ;PRINT HEADER
3399 004540 012704 026232      MOV    #MSG60,R4   ;
3400 004544 000004                TYPE      ;TYPE MSG
3401 004546 000000                HALT       ;
3402 004550 105337 005054      REOT2A: DECB  REOTC     ;SEE IF LAST UNIT TO REACH EOT
3403 004554 001410                BEQ    REOT3       ;IF SO: BR
3404 004556 013700 000676      MOV    UNP,R0      ;
3405 004562 052760 100000 000746      BIS    #100000,UN1(R0) ;SET EOT FLAG

```

```

3406 004570 005726          TST      (SP)+      ;RESET STACK POINTER
3407 004572 000137 004264    JMP      START7     ;GO TO NEXT UNIT
3408 004576 000337 005054    REOT3:  SWAB      REOTC      ;
3409 004602 013700 005054    MOV      REOTC,R0   ;
3410 004606 000337 005054    SWAB      REOTC      ;
3411 004612 110037 005054    MOV      R0,REOTC   ;RESTORE EOT UNIT COUNTER
3412 004616 005037 000676    CLR      UNP        ;
3413 004622 013700 000676    MOV      UNP,R0     ;POINT TO FIRST UNIT
3414 004626 016037 000746 000552 REOT4:  MOV      UN1(R0),UDES ;LOAD UNIT DESCRIPTION
3415 004634 013777 000552 173700 MOV      UDES,@TC   ;LOAD COMMAND REGISTER
3416 004642 032777 020000 173652 REOT5:  BIT      #20000,@DS ;
3417 004650 001374          BNE      REOT5      ;AWAIT PIP RESET
3418 004652 032777 000002 173642 BIT      #2,@DS     ;SEE IF HAVE BOT
3419 004660 001012          BNE      REOT6      ;IF SO: BR
3420 004662 012700 000001    MOV      #1,R0      ;
3421 004666 004737 022672    JSR      PC,PAPRT   ;PRINT HEADER
3422 004672 012704 026023    MOV      #MSG48,R4 ;
3423 004676 000004          TYPE      ;TYPE MSG
3424 004700 000000    HALT
3425 004702 013700 000676    MOV      UNP,R0     ;
3426 004706 042760 100000 000746 REOT6:  BIC      #100000,UN1(R0) ;CLEAR EOT FLAG
3427 004714 062737 000002 000676 ADD      #2,UNP     ;
3428 004722 013700 000676    MOV      UNP,R0     ;POINT TO NEXT UNIT
3429 004726 022760 177777 000746 CMP      #-1,UN1(R0) ;BRANCH IF NOT LAST UNIT
3430 004734 001334          BNE      REOT4      ;
3431 004736 005037 000676    REOT7:  CLR      UNP        ;CLEAR UNIT POINTER
3432 004742 005037 000636    CLR      TINF       ;CLEAR TTY INPUT FLAG
3433 004746 005737 000736    TST      ASEQF      ;SEE IF AUTO SEQ
3434 004752 001402          BEQ      REOTX      ;IF NOT: BR
3435 004754 005726          TST      (SP)+      ;RESET STACK POINTER
3436 004756 000207          RTS      PC         ;RETURN TO AUTO SEQ
3437 004760 004737 004276 014330 REOTX:  JSR      PC,RANSET ;GO RESET RANDOM BASE
3438 004764 012737 177777 014330 MOV      #-1,PATS   ;PRESET PATTERN
3439 004772 005037 015064    CLR      RDFL       ;CLEAR RANDOM FLAG
3440 004776 005737 000572    TST      SPFLG      ;SEE IF SINGLE PASS
3441 005002 001422          BEQ      REOTXX     ;IF NOT: BR
3442 005004 012704 026633    TEND:  MOV      #MSG100,R4 ;
3443 005010 000004          TYPE      ;TYPE MSG
3444 005012 013700 000042    MOV      @#42,R0    ;GET ACT11 RETURN ADDRESS
(1) 005016 001405          BEQ      HERE      ;BRANCH IF NOT ACT11
(1) 005020 000005          RESET
(1) 005022 004710          SENDAD: JSR      PC,(R0) ;
(1) 005024 000240          NOP
(1) 005026 000240          NOP
(1) 005030 000240          NOP
(1) 005032 000240          HERE:  NOP
3445 005034 005737 003040    TST      CHNFLAG   ;BRANCH IF NOT CHAIN MODE
3446 005040 001402          BEQ      1$        ;
3447 005042 000137 022056    JMP      ASEQ0      ;RETURN TO AUTO SEQUENCER
3448 005046 000000          1$:   HALT
3449 005050 000137 003236    REOTXX: JMP      STARTE    ;RESTART AT BLOCK NUMBER ONE
3450 005054 000000          REOTC: 0           ;EOT UNIT COUNTER

```



```

3452
3453
3454
3455
3456
3457
3458
3459
3460
3461 005056 032777 001000 173524 RWND: BIT #1000,@SWR :SEE IF SHOULD REWIND
3462 005064 001001 BNE RWNDA :IF SO: BR
3463 005066 000207 RTS PC :ELSE EXIT
3464 005070 013737 000676 000716 RWNDA: MOV UNP,UPS :SAVE UNIT POINTER
3465 005076 005037 000676 CLR UNP :CLEAR POINTER
3466 005102 005037 000662 CLR EOTREC :CLEAR EDT FLAG
3467 005106 000337 005054 SWAB REOTC
3468 005112 013700 005054 MOV REOTC,R0
3469 005116 000337 005054 SWAB REOTC
3470 005122 110037 005054 MOV R0,REOTC :RESTORE EOT UNIT COUNTER
3471 005126 013700 000676 RWND0: MOV UNP,R0 :POINT TO UNIT ENTRY
3472 005132 022760 177777 000746 CMP #-1,UN1(R0) :BRANCH IF LAST ENTRY
3473 005140 001445 BEQ RWND2
3474 005142 005760 000746 TST UN1(R0) :SEE IF ALREADY REWINDING
3475 005146 100433 BMI RWND1A :IF SO: BR
3476 005150 016037 000746 000552 MOV UN1(R0),UDES :SET UNIT DESCRIPTION
3477 005156 013777 000552 173356 MOV UDES,@TC :LOAD COMMAND REGISTER
3478 005164 012777 000011 173316 MOV #11,@C1 :DRIVE CLEAR
3479 005172 012777 000007 173310 MOV #7,@C1 :START REWIND
3480 005200 105777 173316 1$: TSTB @DS
3481 005204 100414 BMI RWND1A :IF DRY: BR
3482 005206 005337 000670 DEC STAL
3483 005212 001372 BNE 1$ :AWAIT DRY
3484 005214 012737 024615 000654 MOV #MSG6,EMADDR
3485 005222 004737 022672 JSR PC,PAPRT :PRINT HEADER
3486 005226 012704 026353 MOV #MSG70,R4
3487 005232 000004 TYPE :TYPE MSG
3488 005234 000000 HALT
3489 005236 042760 100000 000746 RWND1A: BIC #100000,UN1(R0) :CLEAR EOT FLAG
3490 005244 062737 000002 000676 ADD #2,UNP :BUMP POINTER
3491 005252 000725 BR RWND0 :DO NEXT UNIT
3492 005254 005037 000676 RWND2: CLR UNP :CLEAR POINTER
3493 005260 013700 000676 RWND3: MOV UNP,R0 :POINT TO UNIT ENTRY
3494 005264 022760 177777 000746 CMP #-1,UN1(R0) :BRANCH IF LAST ENTRY
3495 005272 001441 BEQ RWNDX
3496 005274 016037 000746 000552 MOV UN1(R0),UDES :SET UNIT DESCRIPTION
3497 005302 013777 000552 173232 MOV UDES,@TC :LOAD COMMAND REGISTER
3498 005310 032777 020000 173204 1$: BIT #20000,@DS
3499 005316 001374 BNE 1$ :AWAIT PIP RESET
3500 005320 013777 000552 173214 MOV UDES,@TC :LOAD UNIT DESCRIPTION
3501 005326 032777 000002 173166 BIT #2,@DS :SEE IF HAVE BOT
3502 005334 001407 BEQ RWND6 :IF NOT: BR
3503 005336 062737 000002 000676 RWND5: ADD #2,UNP :BUMP POINTER
3504 005344 012777 000011 173136 MOV #11,@C1 :DRIVE CLEAR
3505 005352 000742 BR RWND3 :DO NEXT UNIT
3506 005354 012700 000001 RWND6: MOV #1,R0
3507 005360 004737 022672 JSR PC,PAPRT :PRINT HEADER

```

```

3508 005364 012704 026023      MOV      #MSG48,R4
3509 005370 000004      TYPE
3510 005372 000000      HALT
3511 005374 000760      BR      RWND5      ;DO NEXT UNIT
3512 005376 013737 000716 000676 RWNDX: MOV      UPS,UNP      ;RESTORE UNIT POINTER
3513 005404 013700 000676      MOV      UNP,R0
3514 005410 016037 000746 000552      MOV      UN1(R0),UDES ;RESET UNIT DESCRIPTION
3515 005416 013777 000552 173116      MOV      UDES,@TC
3516 005424 000207      RTS      PC      ;RETURN TO TEST
3517
3518
3519
3520
3521
3522
3523
3524
3525
3526 005426 013746 000552 173060 INIT: MOV      UDES,-(SP) ;GET UNIT DESCRIPTION
3527 005432 013777 000550 173060      MOV      DVN,@CS ;LOAD DRIVE #
3528 005440 011677 173076      MOV      (SP),@TC ;LOAD SLAVE # & SLAVE DESCRIPTION
3529 005444 042716 174377      BIC      #174377,(SP) ;CLEAR ALL BUT DENSITY BITS
3530 005450 022726 001400      CMP      #1400,(SP)+ ;BRANCH IF NOT NRZ
3531 005454 001005      BNE      1$
3532 005456 032777 000040 173036      BIT      #40,ADS ;BRANCH IF SLAVE IS IN PE MODE
3533 005464 001425      BEQ      4$ ;PES = 0
3534 005466 000404      BR      2$
3535 005470 032777 000040 173024 1$: BIT      #40,ADS ;BRANCH IF SLAVE IS IN PE MODE
3536 005476 001020      BNE      4$ ;PES = 1
3537 005500 012777 000011 173002 2$: MOV      #11,@C1 ;CLEAR DRIVE
3538 005506 105777 173010 20$: TSTB   ADS ;WAIT FOR READY
3539 005512 100375      BPL      20$
3540 005514 012777 000007 172766      MOV      #7,@C1 ;LOAD REWIND COMMAND
3541 005522 105777 172774 10$: TSTB   ADS ;WAIT FOR READY
3542 005526 100375      BPL      10$
3543 005530 032777 020000 172764 3$: BIT      #20000,ADS ;WAIT FOR PIP=0
3544 005536 001374      BNE      3$
3545 005540 000207      RTS      PC

```

```

:*****
:INITIALIZE SELECTED SALVE
:THIS ROUTINE REWINDS AND SETS THE PROPER DENSITY IF
:THE DENSITY REQUIRED FOR THE TEST IS DIFFERENT FROM
:THE DENSITY AT WHICH THE SLAVE IS SELECTED.
:*****

```

```

3547 :*****
3548 :WRITE ROUTINE:
3549 :
3550 :THIS ROUTINE IS USED TO WRITE ONTO TAPE THE BLOCK
3551 :OF DATA DESCRIBED BY THE OPERATOR AND SET UP
3552 :IN THE SEQUENCE FORMATTER. THE TAPE UNIT TO BE USED
3553 :HAS BEEN ASSIGNED BY THE SEQUENCE FORMATTER AND
3554 :ITS PARAMETERS SET IN A UNIT DESCRIPTION WORD.
3555 :AS EACH RECORD OF THE BLOCK IS WRITTEN, IT IS CHECKED
3556 :FOR STATUS ERRORS, WORD COUNT ZERO, AND CORRECT CURRENT
3557 :MEMORY ADDRESS. IF THE WRITE OPERATION RESULTS IN
3558 :ANY ERROR CONDITION, A WRITE RETRY OF THAT OPERATION
3559 :MAY BE DONE BY SETTING SWITCH FOUR (4) TO A ONE (1).
3560 :THE RETRY CONSISTS OF A BACKSPACE, ERASE FORWARD, AND
3561 :REWRITE OF THE RECORD. (SEE WRITE RETRY SUBROUTINE)
3562 :AFTER ALL DATA RECORDS IN THE BLOCK HAVE BEEN
3563 :WRITTEN, THE WRITE ROUTINE WILL EXECUTE A WRITE
3564 :TAPE MARK COMMAND IF THE TTY RESPONSE TM=1 WAS
3565 :MADE AT INITIAL START. THE TM IS COUNTED AS TOTAL
3566 :DATA RECORDS PLUS ONE (IE: IF 100 DATA RECORDS; TM=RECORD 101)
3567 :IF THE WRITE OPERATION (DATA OR TM) CAUSES THE SELECTED SLAVE
3568 :TO REACH END OF TAPE (EOT) AND THERE IS TO BE NO READING DONE,
3569 :(SW2 AND SW3 SET TO A 1) THEN THE SLAVE IS REWOUND AND
3570 :FLAGGED AS UNAVAILABLE FOR TESTING UNTIL ALL SLAVES HAVE
3571 :REACHED EOT AND BEEN REWOUND AT WHICH TIME TESTING IS
3572 :RESUMED ON ALL AVAILABLE SLAVES.
3573 :WRITE RETRY MAY BE ALLOWED VIA CONSOLE SWITCH FOUR (4).
3574 :ERROR CHECKING MAY BE DISALLOWED VIA CONSOLE SWITCH
3575 :TWELVE (12).
3576 :WRITING TO TAPE MAY BE DISALLOWED VIA CONSOLE SWITCH
3577 :ZERO (0).
3578 :*****
3579
3580 005542 032777 000001 173040 WRITE: BIT #1,@SWR ;SEE IF SHOULD WRITE
3581 005550 001402 BEQ WRTE
3582 005552 000137 006340 JMP WEX ;IF NOT: BR
3583 005556 013700 000554 WRTE: MOV RCNT,R0 ;R0=RECORD COUNT
3584 005562 012737 024610 000654 W0: MOV #MSG5,EMADDR ;SET ERROR MSG ADDRESS
3585 005570 013777 000556 172720 MOV FMCNT,@FC ;LOAD CHAR COUNT
3586 005576 012777 027452 172710 MOV #WDATA,@BA ;SET DATA ADDR
3587 005604 112737 000060 000674 MOVB #60,MTC1 ;SET WRITE OP COMMAND
3588 005612 012737 005624 000664 MOV #W1,RTRN ;SET RETURN ADDRESS
3589 005620 000137 021144 JMP TAPG ;GO EXECUTE COMMAND
3590 005624 032777 002000 172670 W1: BIT #2000,@DS ;SEE IF EOT
3591 005632 001414 BEQ W2 ;IF NOT AT EOT: BR
3592 005634 005737 000662 TST EOTREC ;BRANCH IF WRITTEN PAST EOT
3593 005640 100411 BMI W2
3594 005642 010037 000662 MOV R0,EOTREC ;SAVE RECORD COUNT
3595 005646 052737 100000 000662 BIS #100000,EOTREC ;++B SET EOT INDICATOR
3596 005654 005337 000662 DEC EOTREC ;++B ADJUST RECORD COUNT
3597 005660 012700 000002 MOV #2,R0 ;SET TO WRITE 1 LAST RECORD
3598 005664 032777 010000 172716 W2: BIT #10000,@SWR ;SEE IF SHOULD CHECK ERRORS
3599 005672 001002 BNE W3 ;IF NOT: BR
3600 005674 004737 017316 JSR PC,ERCHK ;GO CHECK ERRORS
3601 005700 013737 000576 000670 W3: MOV WSTAL,STAL ;SET DELAY
3602 005706 004737 012132 JSR PC,STALL ;DELAY

```

3603	005712	005737	000714		TST	RTYFL	:SEE IF RETRY TIME
3604	005716	001401			BEQ	W3A	:IF NOT: BR
3605	005720	000207			RTS	PC	:ELSE RETURN
3606	005722	005737	000710	W3A:	TST	SERFL	:SEE IF WRITE ERROR
3607	005726	001450			BEQ	W5	:IF NOT: BR
3608	005730	013704	000676		MOV	UNP,R4	
3609	005734	005264	001070		INC	WTER1(R4)	:BUMP WRITE ERROR
3610	005740	005037	000710		CLR	SERFL	:CLEAR STATUS ERROR FLAG
3611	005744	032777	000020	172636	BIT	#20,@SWR	:SEE IF RETRY
3612	005752	001436			BEQ	W5	:IF NOT: BR
3613	005754	013703	000724		MOV	ERSAV,R3	
3614	005760	042703	102700		BIC	#102700,R3	:MASK UNRECOVERABLE ERROR
3615	005764	001410			BEQ	W4	:IF SO: BR
3616	005766	004737	022672		JSR	PC,PAPRT	:PRINT HEADER
3617	005772	012704	026532		MOV	#MSG78,R4	
3618	005776	000004			TYPE		:TYPE MSG
3619	006000	004737	011252		JSR	PC,NRTP	:PRINT ER FOR NON-RETRYABLE
3620	006004	000421			BR	W5	
3621	006006	013704	000676	W4:	MOV	UNP,R4	
3622	006012	005264	001050		INC	RTY1(R4)	:BUMP RETRY CNTR
3623	006016	032777	002000	172564	BIT	#2000,@SWR	:SEE IF PRINT ERRORS
3624	006024	001003			BNE	W4A	:IF NOT: BR
3625	006026	012704	026246		MOV	#MSG64,R4	
3626	006032	000004			TYPE		:TYPE MSG
3627	006034	005037	000704	W4A:	CLR	RTCNT	:CLEAR RETRY NUMBER
3628	006040	005037	000702		CLR	RPCNT	:CLEAR REPEAT COUNTER
3629	006044	004737	006402		JSR	PC,WRTY	:GO RETRY WRITE ERROR
3630	006050	005037	000714	W5:	CLR	RTYFL	:CLEAR RETRY COUNTER
3631	006054	005300			DEC	RO	:SEE IF DONE ALL
3632	006056	001241			BNE	W0	:IF NOT: BR
3633	006060	005737	000564	W6:	TST	TMEX	:SEE IF TM
3634	006064	001525			BEQ	WEX	:IF NOT: BR
3635	006066	005237	000700		INC	TMFLG	:SET TM FLAG
3636	006072	012737	026153	000654	MOV	#MSG54,EMADDR	:POINT TO TM ERROR MSG
3637	006100	012737	000026	000674	MOV	#26,MTC1	:SET TM OP CODE
3638	006106	012777	000000	172402	MOV	#0,@FC	:LOAD FRAME COUNTER
3639	006114	012777	027452	172372	MOV	#WDATA,@BA	:LOAD BUS ADDRESS
3640	006122	012737	006134	000664	MOV	#WTMO,RTRN	:SAVE RETURN ADDRESS
3641	006130	000137	021144		JMP	TAPG	:WRITE TM
3642	006134	032777	010000	172446	WTMO:	BIT	#10000,@SWR
3643	006142	001076			BNE	WEX	:SEE IF SHOULD CHECK ERRORS
3644	006144	032777	000004	172350	BIT	#4,@DS	:SEE IF TM STATUS
3645	006152	001011			BNE	WTM1	:IF SO: BR
3646	006154	012737	027452	021064	MOV	#WDATA,CADER	:SET EXPT BUS ADDRESS
3647	006162	012737	000001	021072	MOV	#1,DRVER	:INDICATE ERROR
3648	006170	004737	020136		JSR	PC,ERPT	:PRINT TM ERROR
3649	006174	000404			BR	WTM2	
3650	006176	012703	027452	WTM1:	MOV	#WDATA,R3	:SET EXPT ADDRESS
3651	006202	004737	017412		JSR	PC,ER2	:GO CHECK FOR OTHER ERRORS
3652	006206	005737	000714	WTM2:	TST	RTYFL	:SEE IF RETRY
3653	006212	001401			BEQ	WTM3	:IF NOT: BR
3654	006214	000207			RTS	PC	:ELSE RETURN TO RETRY ROUTINE
3655	006216	005737	000710	WTM3:	TST	SERFL	:SEE IF WRITE ERROR
3656	006222	001446			BEQ	WEX	:IF NOT: BR
3657	006224	013704	000676		MOV	UNP,R4	
3658	006230	005264	001070		INC	WTER1(R4)	:BUMP WRITE ERROR

3659	006234	032777	000020	172346		BIT	#20,@SWR	:SEE IF SHOULD RETRY
3660	006242	001436				BEQ	WEX	:IF NOT: BR
3661	006244	013703	000724			MOV	ERSAV,R3	
3662	006250	042703	102700			BIC	#102700,R3	:MASK UNRECOVERABLE ERROR
3663	006254	001410				BEQ	WTM4	:IF SO: BR
3664	006256	004737	022672			JSR	PC,PAPRT	:PRINT HEADER
3665	006262	012704	026532			MOV	#MSG78,R4	
3666	006266	000004				TYPE		:TYPE MSG
3667	006270	004737	011252			JSR	PC,NRTP	:PRINT ER FOR NON-RETRYABLE
3668	006274	000421				BR	WEX	
3669	006276	005037	000702		WTM4:	CLR	RPCNT	:CLEAR REPEAT CNTR
3670	006302	013704	000676			MOV	UNP,R4	
3671	006306	005264	001050			INC	RTY1(R4)	:BUMP RETRY CNTR
3672	006312	005037	000704			CLR	RTCNT	:CLEAR RETRY CNTR
3673	006316	032777	002000	172264		BIT	#2000,@SWR	:SEE IF PRINT ERRORS
3674	006324	001003				BNE	WTM4A	:IF NOT: BR
3675	006326	012704	026246			MOV	#MSG64,R4	
3676	006332	000004				TYPE		:TYPE MSG
3677	006334	004737	006402		WTM4A:	JSR	PC,WRTY	:GO DO RETRY
3678	006340	005037	000714		WEX:	CLR	RTYFL	:CLEAR RETRY FLAG
3679	006344	005037	000700			CLR	TMFLG	:CLEAR TAPE MARK FLAG
3680	006350	005737	000662			TST	EOTREC	:BRANCH IF NOT AT EOT
3681	006354	100011				BPL	WRWX	
3682	006356	017703	172226		WRW:	MOV	@SWR,R3	
3683	006362	042703	177763			BIC	#177763,R3	
3684	006366	022703	000014			CMP	#14,R3	:SEE IF WRITE ONLY
3685	006372	001002				BNE	WRWX	:IF NOT: BR
3686	006374	000137	004330			JMP	REOT	:ELSE REWIND
3687	006400	000207			WRWX:	RTS	PC	:EXIT

```

3689
3690
3691
3692
3693
3694 006402 012737 000001 000714 WRTY:  MOV #1,RTYFL ;SET RETRY FLAG
3695 006410 004737 007004 WRTY0: JSR PC,WRTSB ;GO SPACE REVERSE FOR REPEAT
3696 006414 005737 000700 TST TMFLG ;SEE IF TAPE MARK TIME
3697 006420 001003 BNE WRTYTM ;IF SO: BR
3698 006422 004737 005562 JSR PC,W0 ;REWRITE RECORD
3699 006426 000402 BR WRTYR ;GO ON
3700 006430 004737 006072 WRTYTM: JSR PC,WTM ;GO WRITE TAPE MARK AGAIN
3701 006434 005737 000710 WRTYR: TST SERFL ;REWRITE GOOD
3702 006440 001024 BNE WRTY2 ;IF NOT: BR
3703 006442 005237 000702 INC RPCNT ;BUMP REPEAT COUNTER
3704 006446 022737 000003 000702 CMP #3,RPCNT ;SEE IF THREE GOOD REPEATS
3705 006454 001355 BNE WRTY0 ;IF NOT: REPEAT
3706 006456 032777 002000 172124 BIT #2000,@SWR ;SEE IF PRINT
3707 006464 001011 BNE WRTY1 ;IF NOT: BR
3708 006466 012704 026737 MOV #MSG105,R4
3709 006472 000004 TYPE ;TYPE MSG
3710 006474 012704 026270 MOV #MSG65,R4
3711 006500 000004 TYPE ;TYPE MSG
3712 006502 013703 000704 MOV RTCNT,R3
3713 006506 104400 TYPOCT ;PRINT RETRY NUMBER
3714 006510 000207 WRTY1: RTS PC ;RESUME TESTING
3715 006512 013703 000724 WRTY2: MOV ERSAV,R3 ;GET ER
3716 006516 005037 000650 CLR TEMP3 ;CLEAR RECOVERABLE ERROR INDICATOR
3717 006522 042703 102700 BIC #102700,R3 ;MASK RECOVERABLE BITS
3718 006526 001413 BEQ WRTY2A ;IF RECOVERABLE: BR
3719 006530 004737 022672 JSR PC,PAPRT ;PRINT HEADER
3720 006534 012704 026532 MOV #MSG78,R4
3721 006540 000004 TYPE ;TYPE MSG
3722 006542 004737 011252 JSR PC,NRTP ;PRINT ER
3723 006546 012737 000001 000650 MOV #1,TEMP3 ;SET FLAG
3724 006554 000407 BR WRTY2B
3725 006556 032777 002000 172024 WRTY2A: BIT #2000,@SWR ;SEE IF PRINT
3726 006564 001025 BNE WRTY3 ;IF NOT: BR
3727 006566 012704 027156 MOV #MSG110,R4
3728 006572 000004 TYPE ;TYPE MSG
3729 006574 012704 026270 WRTY2B: MOV #MSG65,R4 ;TYPE MSG
3730 006600 000004 TYPE ;TYPE MSG
3731 006602 013703 000704 MOV RTCNT,R3
3732 006606 104400 TYPOCT ;PRINT RETRY NUMBER
3733 006610 012704 027200 MOV #MSG111,R4
3734 006614 000004 TYPE ;TYPE MSG
3735 006616 013703 000702 MOV RPCNT,R3
3736 006622 104400 TYPOCT ;PRINT REPEAT NUMBER
3737 006624 005737 000650 TST TEMP3 ;SEE IF DID NON-RECOVERABLE
3738 006630 001403 BEQ WRTY3 ;IF NOT: BR
3739 006632 005037 000650 CLR TEMP3 ;CLEAR FLAG
3740 006636 000207 RTS PC ;EXIT
3741 006640 005737 000704 WRTY3: TST RTCNT ;SEE IF FIRST RETRY
3742 006644 001004 BNE WRTY3A ;IF NOT: BR
3743 006646 013704 000676 MOV UNP,R4
3744 006652 005364 001070 DEC WTER1(R4) ;DECREMENT WRITE ERROR CNTR

```

```

3745 006656 013704 000676          WRTY3A: MOV      UNP,R4          :GET UNIT NUMBER
3746 006662 016437 001030 000732  MOV      BTADDR(R4),BTPT :GET ADDRESS OF UNIT BAD TAPE CNTR
3747 006670 017704 172036          MOV      @BTPT,R4        :GET COUNTER
3748 006674 005724          TST      (R4)+           :SET POINTER OFFSET
3749 006676 010477 172030          MOV      R4,@BTPT
3750 006702 013703 000732          MOV      BTPT,R3
3751 006706 060304          ADD      R3,R4           :SET ABSOLUTE POINTER
3752 006710 013714 000656          MOV      BLCNTR,(R4)     :SET BLOCK NUMBER
3753 006714 062704 000040          ADD      #40,R4         :ADD RCNT OFFSET
3754 006720 013714 000554          MOV      RCNT,(R4)
3755 006724 160014          SUB      R0,(R4)        :SET RECORD NUMBER
3756 006726 005214          INC      (R4)           :CORRECT RECORD NUMBER
3757 006730 022777 000040 171774          CMP      #40,@BTPT      :SEE IF TOO MANY BAD SPOTS
3758 006736 001002          BNE      WRTY4          :IF NOT: BR
3759 006740 000137 007200          JMP      BTOV           :ELSE GO TO BAD TAPE OVERFLOW
3760 006744 005237 000704          WRTY4: INC      RTCNT       :BUMP RETRY COUNTER
3761 006750 022737 000004 000704          CMP      #4,RTCNT      :SEE IF DONE 4 RETRIES
3762 006756 001410          BEQ      WRTY5          :IF SO: BR
3763 006760 013704 000676          MOV      UNP,R4
3764 006764 005264 001050          INC      RTY1(R4)       :BUMP RETRY COUNTER
3765 006770 005237 000734          INC      ERTFL          :SET ERASE FLAG
3766 006774 000137 006410          JMP      WRTY0          :DO NEXT RETRY
3767 007000 000137 007416          WRTY5: JMP      BTUR           :ELSE GO TO BAD TAPE UNRECOVERABLE
3768
3769          :WRITE RETRY BACKSPACE-ERASE SUBROUTINE*****
3770
3771 007004 005037 000710          WRTSB: CLR      SERFL        :CLEAR FLAG
3772 007010 013737 000600 000670          MOV      TSTAL,STAL
3773 007016 004737 012132          JSR      PC,STALL       :DO TURN AROUND DELAY
3774 007022 012737 026301 000654          MOV      #MSG66,EMADDR :SET ERROR CODE
3775 007030 012777 177777 171460          MOV      #-1,@FC       :SET TO BACKSPACE 1 RECORD
3776 007036 012777 033460 171450          MOV      #RDATA,@BA    :SET BA
3777 007044 004737 012062          JSR      PC,BKRT       :GO BACKSPACE
3778 007050 005737 000710          TST      SERFL         :SEE IF ERROR
3779 007054 001406          BEQ      WRTSB1        :IF NOT: BR
3780 007056 012737 000002 000726          WRTSB0: MOV      #2,BTFLG     :SET FLAG
3781 007064 022626          CMP      (SP)+,(SP)+   :RESET STACK
3782 007066 000137 004330          JMP      REOT           :GO REWIND AND REMOVE FROM TESTING
3783 007072 005737 000734          WRTSB1: TST      ERTFL       :SEE IF SHOULD ERASE
3784 007076 001001          BNE      WRTSB2        :IF SO: BR
3785 007100 000207          RTS      PC             :RETURN
3786 007102 005037 000734          WRTSB2: CLR      ERTFL        :CLEAR ERASE FLAG
3787 007106 005037 000702          CLR      RPCNT         :CLEAR REPEAT CNTR
3788 007112 005037 000710          CLR      SERFL         :CLEAR FLAG
3789 007116 012737 026314 000654          MOV      #MSG67,EMADDR :SET ERROR CODE
3790 007124 005077 171366          CLR      @FC           :CLEAR FRAME COUNT
3791 007130 012737 000024 000674          MOV      #24,MTC1      :SET ERASE OP-CODE
3792 007136 012777 027452 171350          MOV      #WDATA,@BA    :SET BA
3793 007144 012737 007156 000664          MOV      #WRTSB3,RTRN  :SET RETURN ADDRESS
3794 007152 000137 021144          JMP      TAPG          :GO ERASE
3795 007156 012703 027452          WRTSB3: MOV      #WDATA,R3  :SET EXPT BA
3796 007162 004737 017412          JSR      PC,ER2        :GO CHECK ERRORS
3797 007166 005737 000710          TST      SERFL         :SEE IF ERROR
3798 007172 001737          BEQ      WRTSB1        :IF NOT: BR
3799 007174 000137 007056          JMP      WRTSB0
3800

```

```

3801                                     ;BAD TAPE OVERFLOW SUBROUTINE*****
3802
3803 007200 005037 000714      BTOV:  CLR    RTYFL      ;CLEAR RETRY FLAG
3804 007204 012737 000001 000726  MOV    #1,BTFLG    ;SET BAD TAPE OVERFLOW FLAG
3805 007212 005726                TST    (SP)+       ;++B ADJUST STACK PTR
3806 007214 000137 004330      JMP    REOT        ;GO REWIND AND REMOVE FROM TESTING
3807 007220 013701 000732      BTOV0: MOV    BTPT,R1 ;SET TABLE POINTER
3808 007224 005721                TST    (R1)+
3809 007226 005000                CLR    R0
3810 007230 010003      BTOV1: MOV    R0,R3
3811 007232 000241                CLC
3812 007234 006003                ROR    R3          ;R3=R3/2 FOR CORRECT NUMBER
3813 007236 104400                TYPOCT ;PRINT ENTRY NUMBER
3814 007240 012704 024705      MOV    #MSG13+1,R4
3815 007244 000004                TYPE   ;TYPE MSG
3816 007246 011103      MOV    (R1),R3
3817 007250 104400                TYPOCT ;PRINT BLOCK NUMBER
3818 007252 012704 024712      MOV    #MSG14,R4
3819 007256 000004                TYPE   ;TYPE MSG
3820 007260 062701 000040      ADD    #40,R1     ;SET POINTER OFFSET FOR RECOED NUMBER
3821 007264 012103      MOV    (R1)+,R3
3822 007266 104400                TYPOCT ;PRINT RECORD NUMBER
3823 007270 162701 000040      SUB    #40,R1     ;RESET POINTER FOR BLOCK NUMBER
3824 007274 005720                TST    (R0)+
3825 007276 020077 171430      CMP    R0,@BTPT  ;SEE IF DONE
3826 007302 001404                BEQ    BTOV2     ;IF SO: BR
3827 007304 012704 025237      MOV    #MSG28,R4
3828 007310 000004                TYPE   ;TYPE MSG
3829 007312 000746                BR     BTOV1    ;CONTINUE
3830 007314 005737 000730      BTOV2: TST    BTSTF ;SEE IF STAT ONLY PRINT
3831 007320 001007                BNE   BTOVX    ;IF SO: BR
3832 007322 012703 000041      MOV    #41,R3    ;SET SIZE OF TABLE
3833 007326 013704 000732      MOV    BTPT,R4  ;SET POINTER
3834 007332 005024      BTOV3: CLR    (R4)+ ;CLEAR TABLE
3835 007334 005303                DEC    R3        ;SEE IF DONE
3836 007336 001375                BNE   BTOV3    ;IF NOT: BR
3837 007340 000207      BTOVX: RTS     PC ;RETURN
3838

```



```
3840
3841
3842 ;BAD TAPE STATISTIC PRINT*****
3843 007342 012704 025237 BTPRT: MOV #MSG28,R4
3844 007346 000004 ;TYPE MSG
3845 007350 013704 000676 MOV UNP,R4
3846 007354 016437 001030 000732 MOV BTADDR(R4),BTPT ;SET TABLE POINTER
3847 007362 017703 171344 MOV @BTPT,R3
3848 007366 000241 CLC
3849 007370 006003 ROR R3 ;CORRECT NUMBER
3850 007372 104400 TYPOCT ;PRINT NUMBER OF BAD SPOTS
3851 007374 012704 027212 MOV #MSG112,R4
3852 007400 000004 ;TYPE MSG
3853 007402 005777 171324 TST @BTPT ;SEE IF ANY BAD SPOTS
3854 007406 001001 BNE BTPRT1 ;IF SO: BR
3855 007410 000207 RTS PC ;ELSE RETURN
3856 007412 000137 007220 BTPRT1: JMP BTOVO ;PRINT STATS
3857
3858 ;BAD TAPE UNRECOVERABLE SUBROUTINE*****
3859
3860 007416 004737 022672 BTUR: JSR PC,PAPRT ;PRINT HEADER
3861 007422 012704 027040 MOV #MSG107,R4
3862 007426 000004 ;TYPE MSG
3863 007430 000207 RTS PC ;RESUME TESTING
3864
```

```

3866
3867
3868
3869
3870
3871
3872
3873
3874
3875
3876
3877
3878
3879
3880
3881
3882 007432 012737 000002 000562 RSEQ: MOV #2,RDCMD
3883 007440 017704 171144 MOV @SWR,R4 ;READ SWITCHES
3884 007444 042704 177763 BIC #177763,R4 ;MASK READ BITS & SEE IF BOTH READS
3885 007450 001004 BNE RSR ;IF NOT: BR
3886 007452 032777 000002 171130 BIT #2,@SWR ;SEE IF READ REVERSE FIRST
3887 007460 001050 BNE RSFR ;IF NOT: BR
3888 007462 032777 000004 171120 RSR: BIT #4,@SWR ;SEE IF SHOULD READ REVERSE
3889 007470 001005 BNE RSF ;IF NOT: BR
3890 007472 012737 010000 000562 MOV #10000,RDCMD ;LOAD READ REVERSE COMMAND
3891 007500 004737 007744 JSR PC,READ ;GO READ REVERSE
3892 007504 032777 000010 171076 RSF: BIT #10,@SWR ;SEE IF SHOULD READ FORWARD
3893 007512 001025 BNE RSEX ;IF NOT: BR
3894 007514 032737 010000 000562 BIT #10000,RDCMD ;SEE IF HAVE READ REVERSE
3895 007522 001406 BEQ RSF0 ;IF NOT: BR
3896 007524 013737 000600 000670 MOV TSTAL,STAL
3897 007532 004737 012132 JSR PC,STALL ;DO READ STALL
3898 007536 000406 BR RSF1
3899 007540 032777 000001 171042 RSF0: BIT #1,@SWR ;SEE IF WRITE
3900 007546 001002 BNE RSF1 ;IF NOT: BR
3901 007550 004737 011706 JSR PC,BKSP ;GO BACKSPACE
3902 007554 012737 000002 000562 RSF1: MOV #2,RDCMD ;LOAD READ FORWARD COMMAND
3903 007562 004737 007744 JSR PC,READ ;GO READ
3904 007566 005737 000662 RSEX: TST EOTREC ;BRANCH IF NOT AT EOT
3905 007572 100002 BPL 1$
3906 007574 000137 004330 JMP REOT ;ELSE GO TO REWIND
3907 007600 000207 1$: RTS PC ;EXIT
3908
3909 007602 012737 010000 000562 RSFR: MOV #10000,RDCMD
3910 007610 032777 000010 170772 BIT #10,@SWR ;SEE IF SHOULD READ FORWARD
3911 007616 001013 BNE RSFR1 ;IF NOT: BR
3912 007620 032777 000001 170762 BIT #1,@SWR ;SEE IF WRITE
3913 007626 001002 BNE RSFR0 ;IF NOT: BR
3914 007630 004737 011706 JSR PC,BKSP ;GO BACKSPACE TO START
3915 007634 012737 000002 000562 RSFR0: MOV #2,RDCMD ;LOAD READ FORWARD COMMAND
3916 007642 004737 007744 JSR PC,READ ;GO READ FORWARD
3917 007646 032777 000004 170734 RSFR1: BIT #4,@SWR ;SEE IF SHOULD READ REVERSE
3918 007654 001344 BNE RSEX ;IF NOT: BR
3919 007656 032737 010000 000562 BIT #10000,RDCMD
3920 007664 001005 BNE RSFR2 ;IF READ REVERSE: BR
3921 007666 013737 000600 000670 MOV TSTAL,STAL ;DO READ STALL

```

```
3922 007674 004737 012132
3923 007700 012737 010000 000562 RSFR2: MOV PC,STALL
3924 007706 004737 007744 JSR #10000,RDCMD ;LOAD READ REVERSE
3925 007712 005737 000662 TST PC,READ ;GO READ REVERSE
3926 007716 100011 BPL EOTREC ;SEE IF AT END OF TAPE
3927 007720 163737 000554 000662 RSFRX ;IF NOT: BR
3928 007726 005437 000662 SUB RCNT,EOTREC
3929 007732 005237 000662 NEG EOTREC ;SET TO PROPER RECORD NUMBER
3930 007736 000137 004330 INC EOTREC
3931 007742 000207 RSFRX: JMP REOT ;ELSE GO TO REWIND
3932 RTS PC ;EXIT
```

3934  
3935  
3936  
3937  
3938  
3939  
3940  
3941  
3942  
3943  
3944  
3945  
3946  
3947  
3948  
3949  
3950  
3951  
3952  
3953  
3954  
3955  
3956  
3957  
3958  
3959  
3960  
3961  
3962  
3963  
3964  
3965  
3966  
3967  
3968  
3969  
3970  
3971  
3972  
3973  
3974  
3975  
3976  
3977  
3978  
3979  
3980  
3981  
3982  
3983  
3984  
3985  
3986  
3987  
3988  
3989

007744 013700 000554  
007750 005737 000662  
007754 100013  
007756 032737 010000 000562  
007764 001407  
007766 042737 100000 000662  
007774 013703 000662  
010000 160300  
010002 005200  
010004 012737 024615 000654  
010012 005037 000700  
010016 032737 010000 000562  
010024 001406  
010026 005737 000564  
010032 001403  
010034 005237 000700  
010040 005200  
010042 013777 000556 170446  
010050 012777 033460 170436  
010056 032737 010000 000562  
010064 001417  
010066 013703 000556  
010072 005103  
010074 032737 000020 000552  
010102 001402  
010104 000241  
010106 006003  
010110 060377 170400  
010114 012737 000076 000674  
010122 000403

```

:*****
:READ ROUTINE:
:
:THIS ROUTINE PERFORMS THE READ OPERATION DETERMINED
:BY THE READ SEQUENCE ROUTINE ONE RECORD AT A TIME.
:AT THE END OF EACH READ OPERATION THE STATUS REGISTER
:IS SCANNED FOR EITHER END OF TAPE OR BEGINNING OF TAPE.
:IF EOT WAS REACHED, CONTROL WILL BE PASSED TO
:THE EOT SUBROUTINE TO REWIND THE UNIT AND FLAG IT
:UNAVAILABLE UNTIL ALL UNITS HAVE REACHED EOT.
:IF BOT WAS REACHED AN ERROR IS PRINTED AND THE
:PROGRAM WILL HALT. TESTING MAY BE RESUMED BY PRESSING
:THE CONTINUE SWITCH.
:IF A TAPE MARK IS EXPECTED (TM=1) THEN THE
:READ ROUTINE EXPECTS THE FIRST RECORD OF A
:READ REVERSE TO BE A TM, AND THE LAST RECORD
:OF A READ FORWARD TO BE A TM. REMEMBER
:THAT THE TM ADDS ONE (1) TO THE TOTAL NUMBER
:OF RECORDS IN A BLOCK.
:CONSOLE SWITCHES ELEVEN (11) AND THIRTEEN (13) DETERMINE WHETHER
:OR NOT TO CHECK FOR STATUS ERRORS (11) OR DATA ERRORS (13),
:CONSOLE SWITCH FIVE (5) IS USED TO CAUSE A CONTINUOUS
:READ AND SPACE (FORWARD OR REVERSE) OF THE CURRENT
:RECORD ON TAPE (YOZZLE).
:*****

```

```

READ:  MOV    RCNT,R0      ;LOAD REC CNTR
      TST    EOTREC     ;SEE IF EOT
      BPL    RDA        ;IF NOT: BR
      BIT    #10000,RDCMD ;SEE IF READ FORWARD
      BEQ    RDA        ;IF SO: BR
      BIC    #100000,EOTREC ;CLEAR FLAG
      MOV    EOTREC,R3  ;GET MODIFIED RECORD COUNT
      SUB    R3,R0      ;SET RECORD AT
      INC    R0         ;SET TO PROPER NUMBER OF RECORDS
RDA:   MOV    #MSG6,EMADDR ;SET ERROR MSG ADDRESS
      CLR    TMFLG
      BIT    #10000,RDCMD
      BEQ    RDO        ;IF READ FORWARD: BR
      TST    TMEX       ;SEE IF TM
      BEQ    RDO        ;IF NOT: BR
      INC    TMFLG      ;SET TM FLAG
      INC    R0
RDO:   MOV    FMCNT,@FC   ;LOAD CHAR CNTR
      MOV    #RDATA,@BA  ;LOAD DATA ADDR
      BIT    #10000,RDCMD ;SEE IF READ REVERSE
      BEQ    RD1A       ;IF NOT: BR
      MOV    FMCNT,R3
      COM    R3
      BIT    #20,UDES    ;SEE IF CORE DUMP
      BEQ    RD1        ;IF NOT: BR
      CLC
      ROR    R3         ;R3 = FC/2
RD1:   ADD    R3,@BA     ;SET REVERSE BUS ADDRESS
      MOV    #76,MTC1   ;SET READ REVERSE
      BR    RD1B

```

3990	010124	012737	000070	000674	RD1A:	MOV	#70,MTC1	;SET READ FORWARD
3991	010132	012737	010144	000664	RD1B:	MOV	#RD2,RTRN	;SET INTERRUPT RETURN ADDRESS
3992	010140	000137	021144		RD1D:	JMP	TAPG	;GO EXECUTE TAPE COMMAND
3993	010144	032737	010000	000562	RD2:	BIT	#10000,RDCMD	;SEE IF READ REVERSE
3994	010152	001014				BNE	RD3	;IF SO: BR
3995	010154	032777	002000	170340		BIT	#2000,@DS	;SEE IF EOT
3996	010162	001410				BEQ	RD3	;IF NOT: BR
3997	010164	005737	000700			TST	TMFLG	;SEE IF TM
3998	010170	001005				BNE	RD3	;IF SO: BR
3999	010172	010037	000662			MOV	R0,EOTREC	
4000	010176	052737	100000	000662		BIS	#100000,EOTREC	;SET EOT FLAG
4001	010204	032777	000002	170310	RD3:	BIT	#2,@DS	;SEE IF AT LOAD POINT
4002	010212	001410				BEQ	RD4	;IF NOT: BR
4003	010214	004737	022672			JSR	PC,PAPRT	;PRINT CYCLE NUMBER
4004	010220	012704	025016			MOV	#MSG22,R4	
4005	010224	000004				TYPE		;TYPE MSG
4006	010226	000000				HALT		
4007	010230	000137	003160			JMP	STARTA	;RESTART
4008	010234	032777	004000	170346	RD4:	BIT	#4000,@SWR	;SEE IF SHOULD CHECK ERRORS
4009	010242	001121				BNE	RD5	;IF NOT: BR
4010	010244	005737	000700			TST	TMFLG	
4011	010250	001472				BEQ	RD4B	;IF NO TM EXPT: BR
4012	010252	032777	000004	170242		BIT	#4,@DS	
4013	010260	001024				BNE	RD4A	;IF TM RECVD: BR
4014	010262	012737	033460	021064		MOV	#RDATA,CADER	;SAVE EXPT BUS ADDRESS
4015	010270	012737	000002	021072		MOV	#2,DRVER	;SET TM STATUS ERROR FLAG
4016	010276	004737	020136			JSR	PC,ERPT	;GO PRINT TM ERROR
4017	010302	013704	000676			MOV	UNP,R4	
4018	010306	032737	010000	000562		BIT	#10000,RDCMD	;SEE IF READ REVERSE
4019	010314	001403				BEQ	1\$	;IF NOT: BR
4020	010316	005264	001150			INC	RDERR1(R4)	;BUMP READ REVERSE ERROR
4021	010322	000502				BR	RD6	
4022	010324	005264	001110		1\$:	INC	RDER1(R4)	;BUMP READ FORWARD ERROR
4023	010330	000477				BR	RD6	
4024	010332	012703	033460		RD4A:	MOV	#RDATA,R3	
4025	010336	032737	010000	000562		BIT	#10000,RDCMD	;SEE IF READ REVERSE
4026	010344	001007				BNE	RD4A0	;IF SO: BR
4027	010346	032737	002000	000552		BIT	#2000,UDES	;SEE IF IN PE
4028	010354	001025				BNE	RD4A2	;IF SO: BR
4029	010356	062703	000002			ADD	#2,R3	
4030	010362	000422				BR	RD4A2	
4031	010364	013704	000556		RD4A0:	MOV	FMCNT,R4	
4032	010370	005104				COM	R4	
4033	010372	032737	000020	000552		BIT	#20,UDES	;SEE IF CORE DUMP
4034	010400	001402				BEQ	RD4A1	;IF NOT: BR
4035	010402	000241				CLC		
4036	010404	006004				ROR	R4	;SET TO FC/2
4037	010406	060403			RD4A1:	ADD	R4,R3	;SET EXPT BUS ADDRESS
4038	010410	042703	000001			BIC	#1,R3	;MAKE EXPT ADDRESS EVEN
4039	010414	032737	002000	000552		BIT	#2000,UDES	;SEE IF IN PE
4040	010422	001002				BNE	RD4A2	;IF SO: BR
4041	010424	162703	000002			SUB	#2,R3	
4042	010430	004737	017412		RD4A2:	JSR	PC,ER2	
4043	010434	000402				BR	RD4C	
4044	010436	004737	017316		RD4B:	JSR	PC,ERCHK	;GO CHECK ERRORS
4045	010442	005737	000710		RD4C:	TST	SERFL	

4046	010446	001417			BEQ	RD5	;IF NO ERROR: BR
4047	010450	013704	000676		MOV	UNP,R4	
4048	010454	032737	010000	000562	BIT	#10000,RDCMD	;SEE IF READ REVERSE
4049	010462	001003			BNE	RD4D	;IF SO: BR
4050	010464	005264	001110		INC	RDER1(R4)	;BUMP READ FORWARD ERROR
4051	010470	000402			BR	RD4E	
4052	010472	005264	001150		RD4D: INC	RDERR1(R4)	;BUMP READ REVERSE ERROR
4053	010476	004737	010700		RD4E: JSR	PC,RDRTY	;GO RETRY
4054	010502	005037	000714		CLR	RTYFL	;CLEAR RETRY FLAG
4055	010506	032777	020000	170074	RD5: BIT	#20000,@SWR	;SEE IF SHOULD DO DATA CHECK
4056	010514	001005			BNE	RD6	;IF NOT: BR
4057	010516	005737	000700		TST	TMFLG	
4058	010522	001002			BNE	RD6	
4059	010524	004737	015446		JSR	PC,DCHK	;GO CHECK DATA
4060	010530	005037	000710		RD6: CLR	SERFL	;CLEAR STATUS ERROR FLAG
4061	010534	004737	014272		JSR	PC,DS3	;CLEAR BUFFER
4062	010540	032777	000040	170042	BIT	#40,@SWR	;SEE IF SHOULD YOZZLE
4063	010546	001402			BEQ	RD7	;IF NOT: BR
4064	010550	004737	011266		JSR	PC,YOZ	;ELSE GO YOZZLE
4065	010554	013737	000574	000670	RD7: MOV	RSTAL,STAL	;SET DELAY
4066	010562	004737	012132		JSR	PC,STALL	;STALL
4067	010566	032737	010000	000562	BIT	#10000,RDCMD	;SEE IF READ REVERSE
4068	010574	001403			BEQ	RD7A	;IF NOT: BR
4069	010576	005037	000700		CLR	TMFLG	;CLEAR TAPE MARK FLAG
4070	010602	000405			BR	RD10	
4071	010604	005737	000662		RD7A: TST	EOTREC	;SEE IF EOT FOUND
4072	010610	100002			BPL	RD10	;IF NOT: BR
4073	010612	012700	000001		MOV	#1,R0	;SET TO EOT
4074	010616	005300			RD10: DEC	R0	
4075	010620	001402			BEQ	RD11	;IF DONE ALL: BR
4076	010622	000137	010042		JMP	RDO	
4077	010626	032737	010000	000562	RD11: BIT	#10000,RDCMD	;SEE IF READ REVERSE
4078	010634	001016			BNE	RDEX	;IF SO: BR
4079	010636	005737	000662		TST	EOTREC	;SEE IF FOUND EOT
4080	010642	100413			BMI	RDEX	;IF SO: BR
4081	010644	005737	000564		TST	TMEX	;SEE IF TM EXPECTED
4082	010650	001410			BEQ	RDEX	;IF NOT: BR
4083	010652	005737	000700		TST	TMFLG	;SEE IF TM FOUND
4084	010656	001005			BNE	RDEX	;IF SO: BR
4085	010660	005237	000700		INC	TMFLG	;ELSE SET FLAG
4086	010664	005200			INC	R0	;SET RECORD COUNT TO ONE
4087	010666	000137	010042		JMP	RDO	;GO READ TM
4088	010672	005037	000700		RDEX: CLR	TMFLG	
4089	010676	000207			RDX: RTS	PC	;EXIT

```
4091 :*****
4092 :READ ERROR RETRY SUBROUTINE:
4093 :
4094 :THIS SUBROUTINE WILL RETRY ALL DATA RELATED
4095 :READ ERRORS UP TO EIGHT (8) TIMES. IF ALL
4096 :FOUR RETRIES ARE BAD, IT IS CONSIDERED
4097 :A HARD ERROR. IF ANY ARE GOOD, IT IS A
4098 :SOFT ERROR. RETRIES MAY BE INHIBITED
4099 :VIA SWITCH FOUR (SW4=0: INHIBIT RETRIES)
4100 :*****
4101
4102 010700 032777 000020 167702 RDRTY: BIT #20,@SWR ;SEE IF RETRY INHIBITED
4103 010706 001001 BNE RDRT0 ;IF NOT: BR
4104 010710 000207 RTS PC ;ELSE RETURN
4105 010712 013703 000724 RDRT0: MOV ERSAV,R3
4106 010716 042703 102700 BIC #102700,R3 ;MARK NON-RECOVERABLE ERROR BITS
4107 010722 001410 BEQ RDRT1 ;IF NOT: BR
4108 010724 004737 022672 JSR PC,PAPRT ;PRINT HEADER
4109 010730 012704 026573 MOV #MSG79,R4
4110 010734 000004 TYPE ;TYPE MSG
4111 010736 004737 011252 JSR PC,NRTP ;PRINT ER FOR NON-RETRYABLE ERROR
4112 010742 000207 RDRT1A: RTS PC ;RETURN
4113 010744 032777 002000 167636 RDRT1: BIT #2000,@SWR ;SEE IF PRINT INHIBITED
4114 010752 001003 BNE RDRT1B ;IF SO: BR
4115 010754 012704 026246 MOV #MSG64,R4
4116 010760 000004 TYPE ;TYPE MSG
4117 010762 005037 000704 RDRT1B: CLR RTCNT ;CLEAR RETRY COUNTER
4118 010766 005037 000710 RDRTG: CLR SERFL ;CLEAR STATUS ERROR FLAG
4119 010772 012737 000002 000714 MOV #2,RTYFL ;SET READ RETRY FLAG
4120 011000 004737 011266 JSR PC,YOZ ;GO TO YOZZLE TO RETRY READ
4121 011004 005737 000710 TST SERFL ;SEE IF RETRY ERROR
4122 011010 001031 BNE RDRT5 ;IF SO: BR
4123 011012 032777 002000 167570 BIT #2000,@SWR
4124 011020 001011 BNE RDRT2
4125 011022 012704 026737 MOV #MSG105,R4
4126 011026 000004 TYPE ;TYPE MSG
4127 011030 012704 026270 MOV #MSG65,R4
4128 011034 000004 TYPE ;TYPE MSG
4129 011036 013703 000704 MOV RTCNT,R3
4130 011042 104400 TYPOCT ;PRINT RETRY NUMBER
4131 011044 013704 000676 RDRT2: MOV UNP,R4
4132 011050 032737 010000 000562 BIT #10000,RDCMD ;SEE IF READ REVERSE
4133 011056 001003 BNE RDRT3 ;IF SO: BR
4134 011060 005264 002670 INC RFSOFT(R4) ;ELSO BUMP FORWARD SOFT ERROR COUNTER
4135 011064 000402 BR RDRT4
4136 011066 005264 002710 RDRT3: INC RRSOFT(R4) ;BUMP ERRORS SOFT CNTR
4137 011072 000207 RDRT4: RTS PC ;RETURN
4138 011074 013703 000724 RDRT5: MOV ERSAV,R3 ;GET ER
4139 011100 005037 000650 CLR TEMP3 ;CLEAR RECOVERABLE ERROR INDICATOR
4140 011104 042703 102700 BIC #102700,R3 ;MASK RECOVERABLE BITS
4141 011110 001413 BEQ RDRT5A ;IF RECOVERABLE: BR
4142 011112 004737 022672 JSR PC,PAPRT ;PRINT HEADER
4143 011116 012704 026573 MOV #MSG79,R4
4144 011122 000004 TYPE ;TYPE MSG
4145 011124 004737 011252 JSR PC,NRTP ;PRINT ER
4146 011130 012737 000001 000650 MOV #1,TEMP3 ;SET FLAG
```

```

4147 011136 000404
4148 011140 032777 002000 167442 RDRT5A: BR RDRT5B
4149 011146 001014 BNE #2000,@SWR ;SEE IF PRINT INHIBITED
4150 011150 012704 026270 RDRT5B: MOV RDRT6 ;IF SO: BR
4151 011154 000004 TYPE #MSG65,R4 ;TYPE MSG
4152 011156 013703 000704 MOV RTCNT,R3
4153 011162 104400 TYPOCT ;PRINT RETRY NUMBER
4154 011164 005737 000650 TST TEMP3 ;SEE IF DID NON-RECOVERABLE
4155 011170 001403 BEQ RDRT6 ;IF NOT: BR
4156 011172 005037 000650 CLR TEMP3 ;CLEAR FLAG
4157 011176 000207 RTS PC ;EXIT
4158 011200 005237 000704 RDRT6: INC RTCNT
4159 011204 023737 000704 000604 CMP RTCNT,RETRY ;SEE IF DONE 8 RETRIES
4160 011212 001265 BNE RDRTG ;IF NOT: BR
4161 011214 012704 027255 MOV #MSG115,R4
4162 011220 000004 TYPE ;TYPE MSG
4163 011222 013704 000676 MOV UNP,R4
4164 011226 032737 010000 000562 BIT #10000,RDCMD ;SEE IF READ REVERSE
4165 011234 001003 BNE RDRT7 ;IF SO: BR
4166 011236 005264 002730 INC RFHARD(R4) ;BUMP FORWARD HARD ERROR CNTR
4167 011242 000402 BR RDRTX
4168 011244 005264 002750 RDRT7: INC RRHARD(R4) ;BUMP REVERSE HARD ERROR CNTR
4169 011250 000207 RDRTX: RTS PC ;RETURN
4170
4171 011252 013703 000724 NRTP: MOV ERSAV,R3 ;GET ER REGISTER
4172 011256 104400 TYPOCT ;PRINT ER
4173 011260 004737 021110 JSR PC,FRPRT ;PRINT F OR R
4174 011264 000207 RTS PC ;RETURN
  
```



```

4176
4177
4178
4179
4180
4181
4182
4183
4184
4185
4186
4187
4188
4189 011266 013737 000602 000670 YOZ:  MOV    YSTAL,STAL
4190 011274 004737 012132          JSR    PC,STALL          ;DO YOZZLE STALL
4191 011300 012777 177777 167210 YOZO:  MOV    #-1,@FC          ;SET TO 1 RECORD SPACING
4192 011306 032737 010000 000562      BIT    #10000,RDCMD     ;SEE IF READ REVERSE
4193 011314 001404          BEQ    YOZA             ;IF NOT: BR
4194 011316 112737 000030 000674      MOVB   #30,MTC1        ;SET TO SPACE FORWARD
4195 011324 000403          BR     YOZB
4196 011326 112737 000032 000674 YOZA:  MOVB   #32,MTC1        ;SET TO SPACE REVERSE
4197 011334 012737 011354 000664 YOZB:  MOV    #YOZC,RTRN     ;SET RETURN ADDRESS
4198 011342 012737 177775 000670      MOV    #177775,STAL    ;SET TIME MULTIPLIER
4199 011350 000137 021144          JMP    TAPG            ;GO YOZZLE
4200 011354 005737 000700          YOZC:  TST    TMFLG         ;SEE IF TM
4201 011360 001404          BEQ    1$              ;IF NOT: BR
4202 011362 012737 040000 000670      MOV    #40000,STAL    ;SET TM STALL
4203 011370 000403          BR     2$
4204 011372 013737 000602 000670 1$:   MOV    YSTAL,STAL
4205 011400 004737 012132          JSR    PC,STALL        ;DO YOZZLE STALL
4206 011404 012777 033460 167102 2$:   MOV    #RDATA,@BA     ;SET BUS ADDRESS
4207 011412 032737 010000 000562      BIT    #10000,RDCMD     ;SEE IF READ REVERSE
4208 011420 001416          BEQ    YOZC1          ;IF NOT: BR
4209 011422 013703 000556          MOV    FMCNT,R3
4210 011426 005103          COM    R3
4211 011430 032737 000020 000552      BIT    #20,UDES        ;SEE IF CORE DUMP
4212 011436 001401          BEQ    YOZC0          ;IF NOT: BR
4213 011440 005203          ASR    R3              ;R3 = FC/2
4214 011442 060377 167046          YOZC0: ADD    R3,@BA         ;SET REVERSE BUS ADDRESS
4215 011446 012737 000076 000674      MOV    #76,MTC1        ;SET READ REVERSE
4216 011454 000403          BR     YOZC2
4217 011456 012737 000070 000674 YOZC1: MOV    #70,MTC1        ;SET READ FORWARD
4218 011464 013777 000556 167024 YOZC2: MOV    FMCNT,@FC     ;SET CHARACTER COUNT
4219 011472 012737 011504 000664      MOV    #YOZD,RTRN     ;SET RETURN ADDRESS
4220 011500 000137 021144          JMP    TAPG            ;GO READ
4221 011504 032777 004000 167076 YOZD:  BIT    #4000,@SWR     ;SEE IF SHOULD CHECK ERRORS
4222 011512 001050          BNE    YOZE           ;IF NOT: BR
4223 011514 005737 000700          TST    TMFLG         ;SEE IF TAPE MARK TIME
4224 011520 001443          BEQ    YOZD1          ;IF NOT: BR
4225 011522 032737 010000 000562      BIT    #10000,RDCMD     ;SEE IF READ REVERSE
4226 011530 001425          BEQ    YOZD0          ;IF NOT: BR
4227 011532 012703 033460          MOV    #RDATA,R3
4228 011536 013704 000556          MOV    FMCNT,R4
4229 011542 005104          COM    R4
4230 011544 032737 000020 000552      BIT    #20,UDES        ;SEE IF CORE DUMP
4231 011552 001401          BEQ    YOZD4          ;IF NOT: BR

```



```

4261
4262
4263
4264
4265
4266
4267
4268
4269
4270
4271
4272
4273
4274
4275
4276
4277
4278 011706 013737 000600 000670 BKSP: MOV TSTAL,STAL
4279 011714 004737 012132 JSR PC,STALL ;DO TURN AROUND STALL
4280 011720 012737 024645 000654 MOV #MSG10,EMADDR
4281 011726 012777 033460 166560 MOV #RDATA,@BA
4282 011734 005737 000564 TST TMEX ;SEE IF TM
4283 011740 001440 BEQ B0 ;IF NOT: BR
4284 011742 012777 177777 166546 MOV #-1,@FC
4285 011750 012737 000032 000674 MOV #32,MTC1
4286 011756 012737 011770 000664 MOV #BKTM,RTRN
4287 011764 000137 021144 JMP TAPG ;SPACE TO TM
4288 011770 032777 010000 166612 BKTM: BIT #10000,@SWR ;SEE IF SHOULD CHECK ERROR
4289 011776 001021 BNE B0 ;IF NOT: BR
4290 012000 012737 026162 000654 MOV #MSG55,EMADDR
4291 012006 032777 000004 166506 BIT #4,@DS ;SEE IF TM
4292 012014 001006 BNE BKTMO ;IF SO: BR
4293 012016 012737 033460 021064 MOV #RDATA,CADER
4294 012024 004737 020136 JSR PC,ERPT ;PRINT ERROR
4295 012030 000404 BR B0
4296 012032 012703 033460 BKTM0: MOV #RDATA,R3
4297 012036 004737 017412 JSR PC,ER2
4298 012042 013700 000554 B0: MOV RCNT,R0
4299 012046 005400 NEG R0 ;BUILD SPACE AMOUNT
4300 012050 012737 024645 000654 MOV #MSG10,EMADDR ;SET ERROR MESG ADDRESS
4301 012056 010077 166434 MOV R0,@FC
4302 012062 012737 000032 000674 BKRT: MOV #32,MTC1 ;SET SPACE REVERSE
4303 012070 012737 012106 000664 MOV #B1,RTRN ;SET RETURN ADDRESS
4304 012076 010037 000670 MOV R0,STAL ;SET INTERRUPT TIME MULTIPLIER
4305 012102 000137 021144 JMP TAPG ;GO DO SPACE
4306 012106 012703 033460 B1: MOV #RDATA,R3
4307 012112 004737 017412 JSR PC,ER2
4308 012116 013737 000600 000670 B2: MOV TSTAL,STAL ;DO STALL
4309 012124 004737 012132 JSR PC,STALL ;STALL
4310 012130 000207 RTS ;EXIT
4311

```

```

:*****
:BACKSPACE SUBROUTINE:
:
:THIS SUBROUTINE IS USED TO PERFORM THE
:BACKSPACE OPERATION REQUIRED BY THE READ
:ROUTINE FOR READ FORWARD AFTER WRITING.
:IF A TAPE MARK IS EXPECTED (TM=1) THEN THE SPACE
:ROUTINE ASSUMES THAT THE TM WILL BE FIRST WHEN
:BACKSPACING. THEREFORE TWO OPERATIONS ARE REQUIRED
:TO SPACE OVER A BLOCK. FIRST SPACE OVER THE TM, THEN
:SPACE OVER THE DATA RECORDS.
:A CHECK FOR RECORD COUNT ZERO IS MADE AT THE
:END OF THE SPACE OPERATION TO ASSURE THAT PROPER
:TAPE POSITIONING WAS DONE.
:*****

```

4313  
4314  
4315  
4316  
4317  
4318  
4319  
4320  
4321  
4322  
4323  
4324  
4325  
4326  
4327  
4328  
4329  
4330  
4331  
4332  
4333  
4334

012132 005337 000670  
012136 001375  
012140 000207

STALL: DEC STAL  
BNE STALL ;DELAY  
RTS PC ;EXIT

```
*****  
:STALL ROUTINE:  
:  
:THIS ROUTINE IS USED TO PROVIDE SOFTWARE DELAYS  
:DURING READ, WRITE, TURN AROUND, AND YOZZLE.  
:THE DELAY TIMES MAY BE SET BY THE OPERATOR AT  
:INITIAL START FROM 200(8) OR MAY BE MODIFIED  
:AT ANY TIME BY ENTERING CNTRL C ON THE TTY AND  
:INSERTING NEW VALUES IN RESPONSE TO THE REQUEST.  
:THE READ STALL AND THE WRITE STALL ARE DELAYS  
:EXECUTED BETWEEN EACH RECORD OF THE DATA BLOCK.  
:THE TURN AROUND STALL IS EXECUTED EACH TIME  
:THE DIRECTION OF TAPE MOVEMENT IS CHANGED AND  
:ALSO EACH TIME THE TAPE OPERATION CHANGES FROM  
:WRITE TO READ OR READ TO WRITE. THE YOZZLE  
:STALL IS EXECUTED ONLY DURING THE YOZZLE ROUTINE.  
:*****
```

4336  
4337  
4338  
4339  
4340  
4341  
4342  
4343  
4344  
4345  
4346  
4347  
4348  
4349  
4350  
4351  
4352  
4353  
4354  
4355  
4356  
4357  
4358  
4359  
4360  
4361  
4362  
4363  
4364  
4365  
4366  
4367  
4368  
4369  
4370  
4371  
4372  
4373

012142	012701	177760		
012146	012702	175000		
012152	004737	023254		
012156	042737	000001	000630	
012164	013737	000630	000556	
012172	012737	177777	014330	
012200	000207			
012202	012702	000001		
012206	012701	000500		
012212	004737	023254		
012216	013737	000630	000554	
012224	000207			

CCNTR:

```
MOV    #-20,R1      ;SET HIGH LIMIT
MOV    #-3000,R2    ;SET LOW LIMIT
JSR    PC,RANG      ;GO GENERATE NUMBER
BIC    #1,RANSAV
MOV    RANSAV,FMCNT ;SET CHAR COUNT
MOV    #-1,PATS     ;PRESET DATA PATTERN
RTS    PC           ;EXIT
```

```
*****
;RANDOM CHARACTER COUNT GENERATOR:
;
;THIS ROUTINE ENTERED VIA CONSOLE SWITCH
;SEVEN (7) IS USED TO GENERATE A RANDOM
;CHARACTER COUNT FOR EACH DATA BLOCK.
;ALL RECORDS WITHIN A GIVEN BLOCK WILL BE
;THE SAME, BUT EACH BLOCK WILL VARY.
;THE LIMITS ARE TWENTY (20) TO FOUR THOUSAND
;(4000) OCTAL CHARACTERS PER RECORD.
*****
```

```
*****
;RANDOM RECORD COUNT GENERATOR:
;
;THIS ROUTINE ENTERED VIA CONSOLE SWITCH SIX (6)
;IS USED TO GENERATE A RANDOM NUMBER OF RECORDS
;FOR EACH BLOCK OF DATA.
;THE LIMITS ARE ONE (1) TO FIVE HUNDRED (500) OCTAL
;RECORDS PER BLOCK.
*****
```

RCNTR:

```
MOV    #1,R2        ;SET LOW LIMIT
MOV    #500,R1      ;SET HIGH LIMIT
JSR    PC,RANG      ;GO GENERATE NUMBER
MOV    RANSAV,RCNT ;SET RECORD COUNT
RTS    PC           ;EXIT
```

4375  
4376  
4377  
4378  
4379  
4380  
4381  
4382  
4383  
4384  
4385  
4386  
4387  
4388  
4389  
4390  
4391  
4392  
4393  
4394  
4395  
4396  
4397  
4398  
4399  
4400  
4401  
4402  
4403  
4404  
4405  
4406  
4407  
4408  
4409  
4410  
4411  
4412  
4413  
4414  
4415  
4416  
4417  
4418  
4419  
4420  
4421  
4422  
4423  
4424  
4425  
4426  
4427  
4428  
4429  
4430

012226	005737	000636
012232	001002	
012234	000137	013714
012240	005037	000676
012244	005037	005054
012250	012700	000010
012254	012701	000746
012260	005021	
012262	005300	
012264	001375	

```

TINP:  TST      TINF      ;SEE IF SHOULD INPUT FROM TTY
        BNE     1$      ;IF SO: BR
        JMP     TINP4    ;GET SWITCHES
1$:     CLR     UNP      ;CLEAR TABLE POINTER
        CLR     REOTC   ;CLEAR EOT UNIT COUNTER
        MOV     #10,R0  ;SET SIZE OF TABLE
        MOV     #UN1,R1 ;SET START OF TABLE
3$:     CLR     (R1)+   ;CLEAR TABLE
        DEC     R0      ;SEE IF DONE
        BNE     3$      ;IF NOT: BR
    
```

```

:*****
:TEST CONDITION ENTRY ROUTINE:
:
:THIS ROUTINE IS USED TO ALLOW THE OPERATOR
:TO ENTER, AT THE TTY, THE NECESSARY PARAMETERS
:TO RUN THE PROGRAM AS HE WISHES. THE
:ROUTINE IS ONLY ENTERED UPON INITIAL STARTING
:FROM LOCATION 200(8).
:THE MAIN PURPOSE OF THIS ROUTINE IS TO ESTABLISH
:A TABLE OF DEVICES TO BE TESTED. THIS TABLE
:CONSISTS OF AN ENTRY FOR EACH OF ONE (1) TO
:EIGHT (8) DEVICES. EACH ENTRY CONTAINS THE
:SLAVE NUMBER, DENSITY, PARITY, AND
:FORMAT. THE INFORMATION IS ENTERED
:IN RESPONSE TO PRINTED REQUESTS AT THE TTY.
:SLAVES MAY BE ENTERED IN ANY ORDER. EACH
:PARAMETER IS CHECKED FOR LEGALITY BEFORE BEING
:SET INTO THE TABLE.
:THE DRIVE NUMBER REQUEST WILL ALSO CHECK THE MASSBUS
:FOR THE PRESENCE OF THE REQUESTED DRIVE. IF IT IS NOT FOUND,
:A NON-EXIST DRIVE MESSAGE WILL BE PRINTED AND ANOTHER DRIVE
:REQUEST MADE. WHEN THE DRIVE IS FOUND, THE RESPONSE IS STORED
:AND CONTROL PASSED TO THE SLAVE SELECT ROUTINE.
:THE SLAVE SELECT ROUTINE ALSO CHECKS FOR THE PRESENCE OF THE
:SLAVE. IF IT IS NOT PRESENT, A MESSAGE IS PRINTED AND ANOTHER
:REQUEST IS ISSUED. WHEN THE SELECTED SLAVE IS FOUND TO BE
:PRESENT, A MESSAGE IS PRINTED IF IT IS A 7 CHANNEL DRIVE
:TO ASSIST IN SELECTING DENSITY, PARITY, AND FORMAT.
:UPON COMPLETION OF THE DEVICE TABLE, REQUESTS
:ARE PRINTED FOR ENTRY OF THE NUMBER OF CHARACTERS
:PER RECORD AND THE NUMBER OF RECORDS PER BLOCK. THE
:NEXT REQUEST IS FOR A PATTERN NUMBER TO BE USED
:FOR WRITING AND CHECKING OF READ DATA.
:FOLLOWING THE PATTERN REQUEST IS THE TAPE MARK OPTION.
:RESPONDING TO THE REQUEST (TM=) WITH A ONE (1)
:WILL CAUSE THE PROGRAM TO WRITE A TM AT THE
:END OF EACH DATA BLOCK AND TO EXPECT THE
:TM TO BE DETECTED IN EITHER READ FORWARD AND REVERSE
:OR DURING SPACE OPERATION. A RESPONSE OF ZERO (TM=0)
:DISALLOWS WRITING OF THE TM AND CAUSES THE READ
:AND SPACE ROUTINES TO EXPECT NO TM TO BE PRESENT.
:THE LAST REQUESTS ARE FOR ENTRY OF THE DESIRED
:WRITE, READ, AND TURN AROUND STALLS.
:*****
    
```

4431	012266	012704	025306		MOV	#MSG31,R4	
4432	012272	005737	000736		TST	ASEQF	:SEE IF AUTO SEQ
4433	012276	001402			BEQ	4\$	:IF NOT: BR
4434	012300	012704	025241		MOV	#MSG30,R4	:SET AUTO SEQ HDR
4435	012304	010446		4\$:	MOV	R4,-(SP)	:SAVE ADDRESS OF MESSAGE
4436	012306	000004			TYPE		:TYPE MSG
4437	012310	105036			CLRB	@(SP)+	:DO NOT TYPE TITLE ON RESTART
4438	012312	012704	025363		MOV	#MSG31A,R4	:TYPE INSTRUCTION
4439	012316	000004			TYPE		
4440	012320	105037	025363		CLRB	MSG31A	:DO NOT TYPE STARTUP INSTRUCTIONS ON RESTART
4441	012324	005737	014076		TST	SCVFL	:SEE IF SHORT CONVERSATION
4442	012330	001067			BNE	6\$	:IF SO: BR
4443	012332	012704	026452		MOV	#MSG74,R4	
4444	012336	000004			TYPE		:TYPE MSG
4445	012340	013703	000544		MOV	REGS,R3	
4446	012344	104400			TYPOCT		:PRINT CURRENT REG START
4447	012346	012705	000544		MOV	#REGS,R5	:SAVE ADDRESS LOCATION
4448	012352	012701	000007		MOV	#7,R1	:SET SIZE OF ENTRY
4449	012356	012702	176400		MOV	#176400,R2	:SET UPPER LIMIT
4450	012362	012703	172300		MOV	#172300,R3	:SET LOWER LIMIT
4451	012366	004737	023442		JSR	PC,TTR	:GO GET RESPONSE
4452	012372	012704	026475		MOV	#MSG75,R4	
4453	012376	000004			TYPE		:TYPE MSG
4454	012400	013703	000546		MOV	VECT,R3	
4455	012404	104400			TYPOCT		:PRINT CURRENT VECTOR
4456	012406	012705	000546		MOV	#VECT,R5	:SET SAVE LOCATION
4457	012412	012701	000004		MOV	#4,R1	:SET SIZE OF ENTRY
4458	012416	012702	000224		MOV	#224,R2	:SET UPPER LIMIT
4459	012422	012703	000150		MOV	#150,R3	:SET LOWER LIMIT
4460	012426	004737	023442		JSR	PC,TTR	:GO GET RESPONSE
4461	012432	013700	000546		MOV	VECT,R0	:GET VECTOR ADDRESS
4462	012436	012720	022006		MOV	#MTINT,(R0)+	:LOAD VECTOR WITH HANDLER ADDRESS
4463	012442	012710	000340		MOV	#340,(R0)	:LOAD PRIORITY LEVEL
4464	012446	013700	000544		MOV	REGS,R0	:GET STARTING REGISTER ADDRESS
4465	012452	012701	000016		MOV	#16,R1	:SET NUMBER OF REGISTERS
4466	012456	012702	000510		MOV	#C1,R2	:GET FIRST ADDRESS LOCATION
4467	012462	010022		5\$:	MOV	R0,(R2)+	:BUILD TABLE OF ADDRESSES
4468	012464	062700	000002		ADD	#2,R0	:BUMP ADDRESS
4469	012470	005301			DEC	R1	:SEE IF DONE
4470	012472	001373			BNE	5\$	:IF NOT: BR
4471	012474	005737	000736		TST	ASEQF	:SEE IF AUTO SEQ
4472	012500	001403			BEQ	6\$	:IF NOT: BR
4473	012502	005726			TST	(SP)+	:RESET STACK POINTER
4474	012504	000137	022024		JMP	ASEQ	:GO TO AUTO SEQUENCE
4475	012510	012777	000040	166002	6\$:	MOV	#40,@CS
4476	012516	012704	026117		MOV	#MSG52,R4	
4477	012522	000004			TYPE		:TYPE MSG
4478	012524	012705	000550		MOV	#DVN,R5	:GET ADDRESS
4479	012530	012701	000002		MOV	#2,R1	:SET SIZE OF RESPONSE
4480	012534	012702	000007		MOV	#7,R2	:SET UPPER LIMIT
4481	012540	012703	000000		MOV	#0,R3	:SET LOWER LIMIT
4482	012544	004737	023442		JSR	PC,TTR	:GO GET DRIVE NUMBER
4483	012550	013777	000550	165742	MOV	DVN,@CS	
4484	012556	005777	165726		TST	@C1	:ACCESS DRIVE
4485	012562	032777	010000	165730	BIT	#10000,@CS	:SEE IF NED
4486	012570	001411			BEQ	TINP0	:IF NOT: BR

4487	012572	012704	026407		MOV	#MSG71,R4	
4488	012576	000004			TYPE		:TYPE MSG
4489	012600	013704	000510		MOV	C1,R4	
4490	012604	005204			INC	R4	
4491	012606	152714	000100		BISB	#100,(R4)	:CLEAR TRE
4492	012612	000736			BR	6\$	:RETRY DVN
4493	012614	012704	025450	TINPO:	MOV	#MSG32,R4	
4494	012620	000004			TYPE		:TYPE MSG
4495	012622	005037	000646		CLR	TEMP2	:CLEAR BUFFER
4496	012626	012705	000646		MOV	#TEMP2,R5	:SET UNIT DESCRIPTION BUFFER ADDRESS
4497	012632	012701	000002		MOV	#2,R1	:SET NUMBER OF CHARACTERS TO INPUT
4498	012636	012702	000007		MOV	#7,R2	:SET MAXIMUM LIMIT
4499	012642	012703	000000		MOV	#0,R3	:SET MINIMUM LIMIT
4500	012646	004737	023442		JSR	PC,TTR	:GO GET UNIT NUMBER
4501	012652	005737	000644		TST	TEMP1	:SEE IF HAVE NEW PARAMETER
4502	012656	001012			BNE	TINPOB	:IF SO: BR
4503	012660	005737	000676		TST	UNP	:SEE IF FIRST ENTRY
4504	012664	001753			BEQ	TINPO	
4505	012666	013700	000676		MOV	UNP,R0	
4506	012672	012760	177777	000746	MOV	#-1,UN1(R0)	:SET END UNIT TABLE
4507	012700	000137	013300		JMP	TINP2C	:GO GET RECORD COUNT
4508	012704	013700	000676		TINPOB: MOV	UNP,R0	
4509	012710	042760	000007	000746	BIC	#7,UN1(R0)	:CLEAR UNIT NUMBER
4510	012716	004737	014110		JSR	PC,TPOS1	:GO LOAD UNIT NUMBER TO PROPER POSITION
4511	012722	012777	000040	165570	MOV	#40,@CS	
4512	012730	013777	000550	165562	MOV	DVN,@CS	
4513	012736	016077	000746	165576	MOV	UN1(R0),@TC	:LOAD UNIT NUMBER
4514	012744	032777	002000	165564	TINPOC: BIT	#2000,@DT	:SEE IF SLAVE PRESENT
4515	012752	001004			BNE	TINPOD	:IF SO: BR
4516	012754	012704	026175		MOV	#MSG57,R4	
4517	012760	000004			TYPE		:TYPE MSG
4518	012762	000714			BR	TINPO	:REDO
4519	012764	017703	165546		TINPOD: MOV	@DT,R3	:GET CONTENTS OF DT REG
4520	012770	042703	000007		BIC	#7,R3	:CLEAR DRIVE TYPE #
4521	012774	022703	142050		CMP	#142050,R3	:SEE IF 9TRK TM03,TU45
4522	013000	001410			BEQ	TINPOE	:IF SO: BR
4523	013002	012704	026072		MOV	#MSG50,R4	:ILLEGAL DRIVE TYPE
4524	013006	000004			TYPE		:TYPE MSG
4525	013010	017703	165522		MOV	@DT,R3	
4526	013014	042703	000007		BIC	#7,R3	:CLEAR SLAVE #
4527	013020	104400			TYPOCT		:PRINT DRIVE TYPE REGISTER
4528	013022	012704	024637		TINPOE: MOV	#MSG9,R4	
4529	013026	000004			TYPE		:TYPE MSG
4530	013030	017703	165504		MOV	@SN,R3	
4531	013034	004737	024442		JSR	PC,SNPT	:PRINT SERIAL NUMBER
4532	013040	012704	025471		TINP1: MOV	#MSG33,R4	
4533	013044	000004			TYPE		:TYPE MSG
4534	013046	005037	000646		CLR	TEMP2	:CLEAR BUFFER
4535	013052	012701	000002		MOV	#2,R1	:SET NUMBER OF CHARACTERS TO INPUT
4536	013056	012702	000004		MOV	#4,R2	:SET MAXIMUM LIMIT
4537	013062	012703	000003		MOV	#3,R3	:SET MINIMUM LIMIT
4538	013066	004737	023442		JSR	PC,TTR	:GO GET DENSITY
4539	013072	005737	000644		TST	TEMP1	:SEE IF HAVE NEW PARAMETER
4540	013076	001407			BEQ	TINP2	:IF NOT: BR
4541	013100	042737	003400	000552	BIC	#3400,UDES	:ELSE CLEAR OLD PARAMETER
4542	013106	012703	000010		MOV	#10,R3	:SET POSITION FACTOR



4543	013112	004737	014100		JSR	PC,TPOS		;GO LOAD DENSITY INTO PROPER POSITION
4544	013116	012704	025505		TINP2: MOV	#MSG34,R4		
4545	013122	000004			TYPE			;TYPE MSG
4546	013124	005037	000646		CLR	TEMP2		;CLR BUFFER
4547	013130	012701	000002		MOV	#2,R1		;SET NUMBER OF CHARACTERS TO INPUT
4548	013134	012702	000001		MOV	#1,R2		;SET MAXIMUM LIMIT
4549	013140	012703	000000		MOV	#0,R3		;SET MINIMUM LIMIT
4550	013144	004737	023442		JSR	PC,TTR		;GO INPUT PARITY
4551	013150	005737	000644		TST	TEMP1		;SEE IF HAVE NEW PARAMETER
4552	013154	001407			BEQ	TINP2A		;IF NOT: BR
4553	013156	042737	000010	000552	BIC	#10,UDES		;ELSE CLEAR OLD PARAMETER
4554	013164	012703	000003		MOV	#3,R3		;SET POSITION FACTOR
4555	013170	004737	014100		JSR	PC,TPOS		;GO LOAD PARITY TO PROPER POSITION
4556	013174	012704	026140		TINP2A: MOV	#MSG53,R4		
4557	013200	000004			TYPE			;TYPE MSG
4558	013202	005037	000646		CLR	TEMP2		
4559	013206	012701	000003		MOV	#3,R1		
4560	013212	012702	000017		MOV	#17,R2		
4561	013216	012703	000000		MOV	#0,R3		
4562	013222	004737	023442		JSR	PC,TTR		;GO GET FORMAT
4563	013226	005737	000644		TST	TEMP1		;SEE IF NEW PARAMETER
4564	013232	001407			BEQ	TINP2B		;IF NOT: BR
4565	013234	042737	000170	000552	BIC	#170,UDES		
4566	013242	012703	000004		MOV	#4,R3		
4567	013246	004737	014100		JSR	PC,TPOS		
4568	013252	005237	005054		TINP2B: INC	REOTC		;BUMP EOT UNIT COUNTER
4569	013256	022737	000016	000676	CMP	#16,UNP		;SEE IF DONE UNITS
4570	013264	001405			BEQ	TINP2C		;IF SO: BR
4571	013266	062737	000002	000676	ADD	#2,UNP		;POINT TO NEXT UNIT
4572	013274	000137	012614		JMP	TINP0		;ELSE LOOK FOR NEXT UNIT
4573	013300	005037	000676		TINP2C: CLR	UNP		;CLEAR UNIT POINTER
4574	013304	013700	005054		MOV	REOTC,R0		
4575	013310	000337	005054		SWAB	REOTC		
4576	013314	110037	005054		MOVB	R0,REOTC		;SET UNIT EOT COUNTER
4577	013320	012704	025520		TINP3: MOV	#MSG35,R4		
4578	013324	000004			TYPE			;TYPE MSG
4579	013326	013703	000554		MOV	RCNT,R3		
4580	013332	104400			TYPOCT			;PRINT RECORD COUNT
4581	013334	012705	000554		MOV	#RCNT,R5		;SET RECORD COUNT ADDRESS
4582	013340	012701	000007		MOV	#7,R1		;SET NUMBER OF CHARACTERS TO INPUT
4583	013344	012702	177777		MOV	#-1,R2		;SET MAXIMUM LIMIT
4584	013350	012703	000001		MOV	#1,R3		;SET MINIMUM LIMIT
4585	013354	004737	023442		JSR	PC,TTR		;GO GET RECORD COUNT
4586	013360	013737	000554	000632	MOV	RCNT,RCSAV		;SAVE RECORD COUNT
4587	013366	012704	025541		MOV	#MSG36,R4		
4588	013372	000004			TYPE			;TYPE MSG
4589	013374	005437	000556		NEG	FMCNT		
4590	013400	013703	000556		MOV	FMCNT,R3		
4591	013404	104400			TYPOCT			;PRINT CHAR COUNT
4592	013406	012705	000556		MOV	#FMCNT,R5		;SET CHARACTER COUNT ADDRESS
4593	013412	012701	000007		MOV	#7,R1		;SET NUMBER OF CHARACTERS TO INPUT
4594	013416	012702	004000		MOV	#4000,R2		;SET MAXIMUM LIMIT
4595	013422	012703	000004		MOV	#4,R3		;SET MINIMUM LIMIT
4596	013426	004737	023442		JSR	PC,TTR		;GO GET CHARACTER COUNT
4597	013432	005437	000556		NEG	FMCNT		;SET TO TWO'S COMPLIMENT
4598	013436	013737	000556	000634	MOV	FMCNT,FCSAV		;SAVE FRAME COUNT

4599	013444	012704	025560	MOV	#MSG37,R4	;PRINT PATTERN NUMBER REQUEST
4600	013450	000004		TYPE		;TYPE MSG
4601	013452	013703	000560	MOV	PATRN,R3	
4602	013456	104400		TYPOCT		;PRINT PATTERN
4603	013460	005037	014474	CLR	DOFL	;CLEAR EXTERNAL DATA FLAG
4604	013464	012705	000560	MOV	#PATRN,R5	;SET PATTERN NUMBER ADDRESS
4605	013470	012701	000003	MOV	#3,R1	;SET NUMBER OF CHARACTERS TO INPUT
4606	013474	012702	000015	MOV	#15,R2	;SET MAXIMUM LIMIT
4607	013500	012703	000000	MOV	#0,R3	;SET MINIMUM LIMIT
4608	013504	004737	023442	JSR	PC,TTR	;GO GET PATTERN NUMBER
4609	013510	012704	026335	MOV	#MSG69,R4	
4610	013514	000004		TYPE		;TYPE MSG
4611	013516	013703	000564	MOV	TMEX,R3	
4612	013522	104400		TYPOCT		;PRINT CURRENT TM FLAG SETTING
4613	013524	012705	000564	MOV	#TMEX,R5	;GET TM FLAG ADDRESS
4614	013530	012701	000002	MOV	#2,R1	;SET SIZE OF RESPONSE
4615	013534	012702	000001	MOV	#1,R2	;SET UPPER LIMIT
4616	013540	012703	000000	MOV	#0,R3	;SET LOWER LIMIT
4617	013544	004737	023442	JSR	PC,TTR	;TM 1=YES
4618	013550	012704	024771	MOV	#MSG21,R4	
4619	013554	000004		TYPE		;TYPE MSG
4620	013556	013703	000570	MOV	INTRF,R3	
4621	013562	104400		TYPOCT		;PRINT CURRENT SETTING
4622	013564	012705	000570	MOV	#INTRF,R5	;GET FLAG ADDRESS
4623	013570	012701	000002	MOV	#2,R1	;SET SIZE OF RESPONSE
4624	013574	012702	000001	MOV	#1,R2	;SET UPPER LIMIT
4625	013600	012703	000000	MOV	#0,R3	;SET LOWER LIMIT
4626	013604	004737	023442	JSR	PC,TTR	;GO GET RESPONSE
4627	013610	012704	025603	MOV	#MSG38,R4	
4628	013614	000004		TYPE		;TYPE MSG
4629	013616	013703	000572	MOV	SPFLG,R3	
4630	013622	104400		TYPOCT		;PRINT CURRENT SETTING
4631	013624	012705	000572	MOV	#SPFLG,R5	;SET ADDRESS OF FLAG
4632	013630	012701	000002	MOV	#2,R1	;SET SIZE OF RESPONSE
4633	013634	012702	000001	MOV	#1,R2	;SET UPPER LIMIT
4634	013640	012703	000000	MOV	#0,R3	;SET LOWER LIMIT
4635	013644	004737	023442	JSR	PC,TTR	;GO GET RESPONSE
4636	013650	012704	025623	TINP3A: MOV	#MSG39,R4	
4637	013654	000004		TYPE		;TYPE MSG
4638	013656	013703	000566	MOV	CRCC,R3	
4639	013662	104400		TYPOCT		
4640	013664	012705	000566	MOV	#CRCC,R5	
4641	013670	012701	000002	MOV	#2,R1	
4642	013674	012702	000001	MOV	#1,R2	
4643	013700	012703	000000	MOV	#0,R3	
4644	013704	004737	023442	JSR	PC,TTR	
4645	013710	004737	023306	JSR	PC,GTSWR	;GET SWITCHES
4646	013714	005737	014076	TINP4: TST	SCVFL	;BRANCH IF SHORT CONVERSATION
4647	013720	001063		BNE	TINPX	
4648	013722	005737	000636	1\$: TST	TINF	;BRANCH IF NO TTY INPUT
4649	013726	001460		BEQ	TINPX	
4650	013730	012704	025663	MOV	#MSG40,R4	
4651	013734	000004		TYPE		;TYPE MSG
4652	013736	013703	000574	MOV	RSTAL,R3	
4653	013742	104400		TYPOCT		;PRINT READ STALL
4654	013744	012705	000574	MOV	#RSTAL,R5	;SET READ STALL ADDRESS

4655	013750	012701	000007		MOV	#7,R1		;SET NUMBER OF CHARACTERS TO INPUT
4656	013754	012702	177777		MOV	#-1,R2		;SET MAXIMUM LIMIT
4657	013760	012703	000001		MOV	#1,R3		;SET MINIMUM LIMIT
4658	013764	004737	023442		JSR	PC,TTR		;GO GET READ STALL
4659	013770	012704	025712		MOV	#MSG41,R4		
4660	013774	000004			TYPE			;TYPE MSG
4661	013776	013703	000576		MOV	WSTAL,R3		
4662	014002	104400			TYPOCT			;PRINT READ STALL
4663	014004	012705	000576		MOV	#WSTAL,R5		;SET WRITE STALL ADDRESS
4664	014010	012701	000007		MOV	#7,R1		;SET NUMBER OF CHARACTERS TO INPUT
4665	014014	012702	177777		MOV	#-1,R2		;SET MAXIMUM LIMIT
4666	014020	012703	000001		MOV	#1,R3		;SET MINIMUM LIMIT
4667	014024	004737	023442		JSR	PC,TTR		;GO GET WRITE STALL
4668	014030	012704	025724		MOV	#MSG42,R4		
4669	014034	000004			TYPE			;TYPE MSG
4670	014036	013703	000600		MOV	TSTAL,R3		
4671	014042	104400			TYPOCT			;PRINT TA STALL
4672	014044	012705	000600		MOV	#TSTAL,R5		;SET TURN AROUND STALL ADDRESS
4673	014050	012701	000007		MOV	#7,R1		;SET NUMBER OF CHARACTERS TO INPUT
4674	014054	012702	177777		MOV	#-1,R2		;SET MAXIMUM LIMIT
4675	014060	012703	000001		MOV	#1,R3		;SET MINIMUM LIMIT
4676	014064	004737	023442		JSR	PC,TTR		;GO GET TURN AROUND STALL
4677	014070	005037	014076	TINPX:	CLR	SCVFL		;CLEAR SHORT CONVERSATION FLAG
4678	014074	000207			RTS	PC		;EXIT
4679	014076	000000		SCVFL:	0			;SHORT CONVERSATION FLAG
4680								
4681								;UNIT DESCRIPTION POSITIONING SUBROUTINE*****
4682								
4683	014100	006337	000646	TPOS:	ASL	TEMP2		;POSITION CHARACTER
4684	014104	005303			DEC	R3		;SEE IF DONE
4685	014106	001374			BNE	TPOS		;IF NOT: BR
4686	014110	013700	000676	TPOS1:	MOV	UNP,R0		;LOAD UNIT POINTER
4687	014114	053760	000646 000746		BIS	TEMP2,UN1(R0)		;LOAD CHARACTER INTO UN1(R0)
4688	014122	000207			RTS	PC		;EXIT
4689								

4691  
4692  
4693  
4694  
4695  
4696  
4697  
4698  
4699  
4700  
4701  
4702  
4703  
4704  
4705  
4706  
4707  
4708  
4709  
4710  
4711  
4712  
4713  
4714  
4715  
4716  
4717  
4718  
4719  
4720  
4721  
4722  
4723  
4724  
4725  
4726  
4727  
4728  
4729  
4730  
4731  
4732  
4733  
4734  
4735  
4736  
4737  
4738  
4739  
4740  
4741  
4742  
4743  
4744  
4745  
4746

014124 005737 015064  
014130 001056  
014132 005737 000736  
014136 001412  
014140 005737 000560  
014144 100007  
014146 004737 015022  
014152 005037 015064  
014156 004737 015066  
014162 000207  
014164 023737 000560 014330  
014172 001^20  
014174 013,03 000552  
014200 042703 175767  
014204 023703 014332  
014210 001403  
014212 010337 014332  
014216 000403  
014220 005737 014334  
014224 001002  
014226 004737 015066  
014232 000207  
014234 005037 014334  
014240 012703 027452  
014244 013701 000560  
014250 010137 014330  
014254 062701 000001  
014260 006301  
014262 004771 002770  
014266 004737 015066  
014272 013702 000556  
014276 006202  
014300 012701 033460  
014304 005021  
014306 005202  
014310 001375  
014312 013737 000552 014332  
014320 042737 175767 014332

DSUP: TST RDFL  
BNE DS2A  
DS0: TST ASEQF  
BEQ DSOC  
TST PATRN  
BPL DSOC  
JSR PC,DATR  
CLR RDFL  
JSR PC,CRCLRC  
RTS PC  
DSOC: CMP PATRN,PATS  
BNE DSOA  
MOV UDES,R3  
BIC #175767,R3  
CMP PARS,R3  
BEQ DSOB  
MOV R3,PARS  
BR TWO  
DSOB: TST CLF  
BNE ONE  
TWO: JSR PC,CRCLRC  
ONE: RTS PC  
DSOA: CLR CLF  
MOV #WDATA,R3  
MOV PATRN,R1  
MOV R1,PATS  
ADD #1,R1  
ASL R1  
DS2A: JSR PC,@DATBL(R1)  
DS3: JSR PC,CRCLRC  
MOV FMCNT,R2  
ASR R2  
MOV #RDATA,R1  
DS4: CLR (R1)+  
INC R2  
BNE DS4  
MOV UDES,PARS  
BIC #175767,PARS

```

:*****
:DATA SETUP ROUTINE:
:
:THIS ROUTINE IS USED TO GENERATE INTO THE ENTIRE
:WRITE BUFFER (4000 OCTAL CHARACTERS) THE DATA PATTERN
:SELECTED BY THE OPERATOR. THERE ARE 15 (8) FIXED
:DATA PATTERNS AVAILABLE AND ONE SELECTION (DATA PATTERN 0)
:WHICH WILL READ ANY PATTERN PRESENTED AT THE
:HIGH SPEED PAPER TAPE READER. THIS TAPE MUST BE PREPARED
:BY USING THE PROGRAM CALLED DTC. (CZTUTAO)
:RANDOM DATA MAY ALSO BE USED VIA CONSOLE
:SWITCH EIGHT (8).
:THIS ROUTINE IS ALSO USED TO CLEAR OUT THE
:READ BUFFER (4000 OCTAL CHARACTERS) BEFORE EACH
:RECORD IS READ.
:*****
:SEE IF DID RANDOM DATA
:IF NOT: BR
:SEE IF AUTO SEQ
:IF NOT: BR
:SEE IF AUTO RANDOM
:IF NOT: BR
:ELSE GO GENERATE RANDOM DATA
:RESET RANDOM DATA FLAG
:GO GENERATE EXPT CRC/LRC
:RETURN
:SEE IF NEW PATTERN
:IF SO: BR
:GET UNIT DESCRIPTION
:MASK EVEN PARITY :DEN 2 BIT
:SEE IF SAME AS LAST TIME
:IF SO: BR
:SAVE PARITY
:EXPT CRC/LRC DONE?
:IF SO :BR
:GO GENERATE EXPT CRC/LRC
:CLEAR EXPT CRC/LRC CAL.DONE FLAG
:R3 = ADDRS OF WRITE BUFFER
:R1 = PATTERN SELECTOR
:BUMP POINTER
:MAKE PATTERN SELECTOR EVEN
:GO GENERATE PATTERN
:GO GENERATE EXPT CRC/LRC
:R2=BUFFER SIZE
:R2=FRAME CMT/2
:R1=READ DATA START
:CLEAR BUFFER
:SEE IF DONE ALL
:IF NOT: BR
:GET UNIT DESCRIPTION
:MASK PARITY :DEN 2 BIT

```

4747 014326 000207  
4748 014330 177777  
4749 014332 000000  
4750 014334 000000  
4751  
4752

PATS: RTS PC  
PARS: -1  
CLF: 0

:EXIT  
:PATTERN NUMBER SAVE

```

4754
4755                                     ;EXTERNAL DATA INPUT FROM H/S READER (256 CHARACTER MAXIMUM)
4756
4757 014336 005737 014474          DATO:  TST      DOFL      ;SEE IF SHOULD DO EXTERNAL INPUT
4758 014342 001351                BNE      DS2A     ;IF NOT: BR
4759 014344 012737 000001 014474  MOV      #1,DOFL ;SET EXTERNAL FLAG
4760 014352 005077 164244          CLR      @PRS     ;CLEAR READER STATUS
4761 014356 005037 000644          CLR      TEMP1   ;CLEAR FOR USE AS CHARACTER FLAG
4762 014362 052777 000001 164232  DATOA:  BIS      #1,@PRS ;START READER
4763 014370 105777 164226          DATOB:  TSTB    @PRS   ;SEE IF DONE
4764 014374 100375                BPL      DATOB   ;IF NOT : BR
4765 014376 005001                CLR      R1      ;CLEAR SAVE LOCATION
4766 014400 117701 164220          MOVB    @PRB,R1  ;SAVE CHARACTER
4767 014404 005737 000644          TST     TEMP1   ;SEE IF HAVE FOUND START CHARACTER
4768 014410 001011                BNE     DATOC   ;IF SO : BR
4769 014412 105701                TSTB   R1       ;SEE IF CHARACTER IS 0
4770 014414 001762                BEQ    DATOA    ;IF SO : BR
4771 014416 012737 000001 000644  MOV     #1,TEMP1 ;ELSE SET CHARACTER FOUND FLAG
4772 014424 010137 000646          MOV     R1,TEMP2 ;SAVE DATA SIZE
4773 014430 010102                MOV     R1,R2   ;SAVE DATA SIZE
4774 014432 000753                BR      DATOA   ;GO GET FIRST DATA CHAR
4775 014434 110123                DATOC:  MOVB    R1,(R3)+ ;LOAD BUFFER
4776 014436 005302                DEC     R2      ;SEE IF READ ALL
4777 014440 001350                BNE     DATOA   ;IF NOT : BR
4778 014442 012701 027452          DATOD:  MOV     #WDATA,R1 ;R1 = START OF WRITE BUFFER
4779 014446 013702 000646          MOV     TEMP2,R2 ;R2 = SIZE OF DATA FIELD
4780 014452 112123                DATOE:  MOVB    (R1)+,(R3)+ ;REPEAT LOAD OF DATA FIELD
4781 014454 022703 033460          CMP     #RDATA,R3 ;SEE IF DONE
4782 014460 003002                BGT     DATOF   ;IF NOT: BR
4783 014462 000137 014266          JMP     DS2A    ;EXIT
4784 014466 005302                DATOF:  DEC     R2 ;SEE IF AT END OF DATA FIELD
4785 014470 001370                BNE     DATOE   ;IF NOT : BR
4786 014472 000763                BR      DATOD   ;ELSE RESTART FILL
4787 014474 000000                DOFL:  0        ;EXTERNAL DATA FLAG=1 IF ALREADY DONE
4788

```

```

4790                                     :ALL ONES*****
4791
4792 014476 012701 177777  DAT1:  MOV    #-1,R1          ;R1=DATA
4793 014502 012702 002002  DAT1A: MOV    #2002,R2        ;R2=WORD COUNT +2
4794 014506 010123          1$:  MOV    R1,(R3)+        ;LOAD BUFFER
4795 014510 005302          DEC    R2          ;SEE IF DONE
4796 014512 001375          BNE   1$          ;IF NOT: BR
4797 014514 000207          RTS    PC
4798
4799                                     :ALL ZEROS*****
4800
4801 014516 005001  DAT2:  CLR    R1          ;R1=DATA
4802 014520 000770          BR     DAT1A        ;LOAD BUFFER
4803
4804                                     :WALKING ONE*****
4805
4806 014522 012701 000001  DAT3:  MOV    #1,R1          ;R1=DATA
4807 014526 000241          CLC
4808 014530 012702 004004  DAT3A: MOV    #4004,R2        ;R2=CHARACTER COUNT+4
4809 014534 110123          1$:  MOVB   R1,(R3)+        ;LOAD BUFFER
4810 014536 106101          ROLB  R1          ;SET NEXT CHARACTER
4811 014540 005302          DEC    R2          ;SEE IF DONE
4812 014542 001374          BNE   1$          ;IF NOT: BR
4813 014544 000207          RTS    PC
4814
4815                                     :WALKING ZERO*****
4816
4817 014546 012701 000376  DAT4:  MOV    #376,R1        ;R1=START OF DATA
4818 014552 000261          SEC
4819 014554 000765          BR     DAT3A        ;LOAD BUFFER
4820
4821                                     :ALTERNATING ONE/ZERO*****
4822
4823
4824 014556 012701 052525  DAT5:  MOV    #52525,R1       ;R1=DATA
4825 014562 000747          BR     DAT1A        ;LOAD BUFFER
4826
4827                                     :ALTERNATING ZERO/ONE*****
4828
4829 014564 012701 125252  DAT6:  MOV    #125252,R1      ;R1=DATA
4830 014570 000744          BR     DAT1A        ;LOAD BUFFER
4831
4832                                     :ONE/ZERO IN ALTERNATING WORDS*****
4833
4834 014572 012701 125252  DAT7:  MOV    #125252,R1      ;SET WORD 1
4835 014576 012702 052525  MOV    #52525,R2          ;SET WORD 2
4836 014602 012704 001002  MOV    #1002,R4          ;SET NUMBER OF ENTRIES
4837 014606 010123          1$:  MOV    R1,(R3)+        ;LOAD WORD 1
4838 014610 010223          MOV    R2,(R3)+        ;LOAD WORD 2
4839 014612 005304          DEC    R4          ;SEE IF DONE
4840 014614 001374          BNE   1$          ;IF NOT: BR
4841 014616 000207          RTS    PC
4842

```

```

4844                                     ;WALKING ONE/ALL ONE IN ALTERNATING CHARS****
4845
4846 014620 012702 002002  DAT10: MOV #2002,R2 ;SET BUFFER SIZE
4847 014624 012701 000001  MOV #1,R1 ;SET WALK BASE
4848 014630 000241
4849 014632 012713 177400  1$:  MOV #177400,(R3) ;LOAD ALL ONE BYTE
4850 014636 050123  BIS R1,(R3)+ ;LOAD WALK BYTE
4851 014640 106101  ROLB R1 ;WALK ONE
4852 014642 005302  DEC R2
4853 014644 001372  BNE 1$ ;DO FULL BUFFER
4854 014646 000207  RTS PC
4855
4856                                     ;ALL BITS 0-377*****
4857
4858 014650 005001  DAT11: CLR R1 ;R1=STARTING DATA
4859 014652 012702 004004  MOV #4004,R2 ;R2=CHARACTER COUNT+4
4860 014656 110123  1$:  MOVB R1,(R3)+ ;LOAD BUFFER
4861 014660 105201  INCB R1 ;BUMP DATA
4862 014662 005302  DEC R2 ;SEE IF DONE
4863 014664 001374  BNE 1$ ;IF NOT: BR
4864 014666 000207  RTS PC ;RETURN
4865
4866                                     ;ALL BITS 377-0*****
4867
4868 014670 012701 000377  DAT12: MOV #377,R1 ;R1=STARTING DATA
4869 014674 012702 004004  MOV #4004,R2 ;R2=CHARACTER COUNT+4
4870 014700 110123  1$:  MOVB R1,(R3)+ ;LOAD BUFFER
4871 014702 105301  DECB R1 ;BUMP DATA
4872 014704 005302  DEC R2 ;SEE IF DONE
4873 014706 001374  BNE 1$ ;IF NOT: BR
4874 014710 000207  RTS PC ;RETURN
4875
4876                                     ;ALTERNATING CHARACTERS 0 AND 377*****
4877
4878 014712 012701 000377  DAT13: MOV #377,R1 ;R1 = DATA
4879 014716 000137 014502  JMP DAT1A ;LOAD BUFFER
4880
4881                                     ;WALKING ZERO/ALL ZERO IN ALTERNATING CHARS*****
4882
4883 014722 012702 002002  DAT14: MOV #2002,R2 ;SET BUFFER SIZE
4884 014726 012701 000376  MOV #376,R1 ;SET WALK BASE
4885 014732 000261
4886 014734 010113  1$:  MOV R1,(R3) ;LOAD WALK BYTE
4887 014736 042723 177400  BIC #177400,(R3)+ ;CLEAR HIGH BYTE
4888 014742 106101  ROLB R1 ;WALK ZERO BIT
4889 014744 005302  DEC R2
4890 014746 001372  BNE 1$ ;FILL BUFFER
4891 014750 000207  RTS PC ;RETURN
4892

```



```

4897                                     ;AUTO SEQUENCE PATTERN*****
4898
4899 014752 012702 000200          DAT15: MOV    #200,R2          ;SET NUMBER OF ENTRIES
4900 014756 012701 015002          1$:  MOV    #APATS,R1        ;SET START OF PATTERN
4901 014762 012704 000010          MOV    #10,R4           ;SET SIZE OF PATTERN
4902 014766 012123                 2$:  MOV    (R1)+,(R3)+    ;FILL BUFFER
4903 014770 005304                 DEC    R4               ;SEE IF DONE PATTERN
4904 014772 001375                 BNE    2$              ;IF NOT: BR
4905 014774 005302                 DEC    R2               ;SEE IF DONE BUFER
4906 014776 001367                 BNE    1$              ;IF NOT: BR
4907 015000 000207                 RTS    PC               ;RETURN
4908
4909 015002 000000          APATS: 0
4910 015004 177400          177400
4911 015006 000377          377
4912 015010 000000          0
4913 015012 177777          -1
4914 015014 000377          377
4915 015016 177400          177400
4916 015020 177777          -1
4917
4918                                     ;RANDOM DATA GENERATOR SUBROUTINE*****
4919
4920 015022 013704 000556          DATR: MOV    FMCNT,R4      ;SET NUMBER OF FRAMES
4921 015026 012703 027452          MOV    #WDATA,R3       ;SET ADDRESS OF START OF BUFFER
4922 015032 012701 177777          MOV    #-1,R1          ;SET HIGH LIMIT
4923 015036 005002                 CLR    R2              ;SET LOW LIMIT
4924 015040 004737 023254          1$:  JSR    PC,RANG       ;GO GENERATE NUMBER
4925 015044 013723 000630          MOV    RANSV,(R3)+     ;LOAD BUFFER
4926 015050 005204                 INC    R4              ;SEE IF DONE WHOLE BUFFER
4927 015052 001372                 BNE    1$              ;IF NOT: BR
4928 015054 012737 000001 015064  MOV    #1,RDFL         ;SET RANDOM DATA FLAG
4929 015062 000207                 RTS    PC               ;EXIT
4930 015064 000000          RDFL: 0                ;RANDOM DATA SELECT FLAG

```

```

4932
4933
4934
4935
4936
4937
4938
4939
4940
4941 015066 032737 002000 000552 CRCLRC: BIT #2000, UDES
4942 015074 001105 BNE CL4 ;IF IN PE MODE: BR
4943 015076 012737 177777 014334 MOV #-1, CLF ;SET EXPT CRCLRC CAL.FLAG
4944 015104 013700 000556 MOV FMCNT, R0 ;SET RECORD SIZE
4945 015110 005400 NEG R0
4946 015112 012701 027452 MOV #WDATA, R1 ;SET START OF BUFFER
4947 015116 005037 015440 CLR XORS
4948 015122 111104 CLO: MOVB (R1), R4 ;GET CHARACTER
4949 015124 004737 015312 JSR PC, CLP ;GO GET PARITY OF CHARACTER
4950 015130 004737 015414 JSR PC, XOR ;XOR CHARACTER
4951 015134 000241 CLC
4952 015136 006004 ROR R4 ;ROTATE 1 RIGHT
4953 015140 103014 BCC CL2 ;IF NO CARRY: BR
4954 015142 052704 000400 BIS #400, R4 ;SET BIT NINE
4955 015146 000241 CLC
4956 015150 010405 CL1: MOV R4, R5 ;SAVE CHARACTER
4957 015152 042705 177703 BIC #177703, R5
4958 015156 005105 COM R5
4959 015160 042705 177703 BIC #177703, R5
4960 015164 042704 000074 BIC #74, R4
4961 015170 050504 BIS R5, R4 ;COMPLIMENT BITS 2,3,4,5
4962 015172 010437 015440 CL2: MOV R4, XORS
4963 015176 005300 DEC R0
4964 015200 001350 BNE CLO ;BRANCH IF NOT LAST CHAR
4965 015202 013704 015440 CLLAST: MOV XORS, R4
4966 015206 005137 015440 COM XORS
4967 015212 042737 177050 015440 BIC #177050, XORS
4968 015220 042704 177727 BIC #177727, R4 ;COMPLIMENT ALL BUT BITS 3&5
4969 015224 050437 015440 BIS R4, XORS
4970 015230 013737 015440 015442 MOV XORS, EXCRC ;SAVE EXPECTED CRC
4971 015236 013700 000556 MOV FMCNT, R0
4972 015242 005400 NEG R0
4973 015244 012701 027452 MOV #WDATA, R1 ;DO EXPT LRC
4974 015250 005037 015440 CLR XORS
4975 015254 111104 CL3: MOVB (R1), R4
4976 015256 004737 015312 JSR PC, CLP ;GET PARITY
4977 015262 004737 015414 JSR PC, XOR ;XOR CHARACTER
4978 015266 005300 DEC R0
4979 015270 001371 BNE CL3 ;DO ALL FOR LRC
4980 015272 013704 015442 MOV EXCRC, R4
4981 015276 004737 015414 JSR PC, XOR ;XOR CRC TO DATA
4982 015302 013737 015440 015444 MOV XORS, EXLRC ;SAVE EXPT LRC
4983 015310 000207 CL4: RTS PC ;RETURN
4984 015312 005704 CLP: TST R4 ;SEE IF 0 CHAR
4985 015314 001010 BNE CLPE ;IF NOT: BR
4986 015316 032737 000010 000552 BIT #10, UDES ;SEE IF EVEN PARITY
4987 015324 001404 BEQ CLPE ;IF NOT: BR

```



```

5021
5022
5023
5024
5025
5026
5027
5028
5029
5030
5031
5032
5033
5034
5035
5036 015446 005037 000660          DCHK: CLR      BBC          ;CLEAR BAD RECORD CNTR
5037 015452 005037 000706          CLR      DERFL        ;CLEAR DATA ERROR FLAG
5038 015456 013705 000556          MOV      FMCNT,R5     ;LOAD CHAR COUNT
5039 015462 032737 000020 000552  BIT      #20,UDES     ;SEE IF CORE DUMP
5040 015470 001401                    BEQ      DCHK0        ;IF NOT: BR
5041 015472 006205                    ASR      R5           ;R5 = FC/2
5042 015474 012701 027452          DCHK0: MOV      #WDATA,R1 ;SET WRITE DATA ADDR
5043 015500 012702 033460          MOV      #RDATA,R2   ;SET READ DATA ADDR
5044 015504 032737 000010 000552  BIT      #10,UDES     ;SEE IF EVEN PARITY
5045 015512 001430                    BEQ      DFOC0        ;IF NOT: BR
5046 015514 032737 000020 000552  BIT      #20,UDES     ;SEE IF CORE DUMP PARITY
5047 015522 001024                    BNE      DFOC0        ;IF SO: BR
5048 015524 032737 002000 000552  BIT      #2000,UDES   ;SEE IF PE MODE
5049 015532 001020                    BNE      DFOC0        ;IF SO: BR
5050 015534 105711                    DFOF:  TSTB     (R1)   ;SEE IF 0 CHAR
5051 015536 001404                    BEQ      DFOD         ;IF SO: BR
5052 015540 005201                    INC      R1           ;BUMP POINTER
5053 015542 005205                    DFOE:  INC      R5     ;SEE IF DONE
5054 015544 001373                    BNE      DFOF        ;IF NOT: BR
5055 015546 000406                    BR       DFOC         ;ELSE CONTINUE
5056 015550 112721 000020          DFOD:  MOVB     #20,(R1)+ ;SET 20 IN PLACE OF 0
5057 015554 012737 177777 014330  MOV      #-1,PATS    ;SET PATTERN GENERATE FLAG
5058 015562 000767                    BR       DFOE
5059 015564 013705 000556          DFOC:  MOV      FMCNT,R5 ;RESET CHAR CNT
5060 015570 012701 027452          MOV      #WDATA,R1   ;RESET DATA ADDRESS
5061 015574 032737 010000 000562  DFOC0: BIT      #10000,RDCMD ;SEE IF READ REVERSE
5062 015602 001462                    BEQ      DFO          ;IF NOT: BR
5063 015604 013704 000556          DFOB:  MOV      FMCNT,R4 ;GET FRAME COUNT
5064 015610 005404                    NEG      R4           ;SET TO WHOLE NUMBER
5065 015612 032737 000020 000552  BIT      #20,UDES     ;SEE IF CORE DUMP
5066 015620 001402                    BEQ      DFOB0       ;IF NOT: BR
5067 015622 000241                    CLC
5068 015624 006004                    ROR      R4           ;SET TO FC/2
5069 015626 060401                    DFOB0: ADD      R4,R1     ;POINT TO START OF WRITE DATA
5070 015630 060402                    ADD      R4,R2     ;POINT TO START OF READ DATA
5071 015632 032737 000001 000556  BIT      #1,FMCNT    ;SEE IF ODD FRAME COUNT
5072 015640 001401                    BEQ      DFOA        ;IF NOT: BR
5073 015642 105722                    TSTB     (R2)+       ;BUMP POINTER
5074 015644 032737 000020 000552  DFOA:  BIT      #20,UDES ;SEE IF CORE DUMP
5075 015652 001431                    BEQ      DFOA4       ;IF NOT: BR
5076 015654 000241                    CLC

```

5077	015656	132742	000001		BITB	#1, -(R2)	:SEE IF BIT 0 = 1
5078	015662	001401			BEQ	DF0A0	:IF NOT: BR
5079	015664	000261			SEC		
5080	015666	106012		DF0A0:	RORB	(R2)	
5081	015670	000241			CLC		
5082	015672	132712	000001		BITB	#1, (R2)	
5083	015676	001401			BEQ	DF0A1	
5084	015700	000261			SEC		
5085	015702	106012		DF0A1:	RORB	(R2)	:POSITION BITS FOR REVERSE CORE DUMP
5086	015704	000241			CLC		
5087	015706	132712	000001		BITB	#1, (R2)	
5088	015712	001401			BEQ	DF0A2	
5089	015714	000261			SEC		
5090	015716	106012		DF0A2:	RORB	(R2)	
5091	015720	000241			CLC		
5092	015722	132712	000001		BITB	#1, (R2)	
5093	015726	001401			BEQ	DF0A3	
5094	015730	000261			SEC		
5095	015732	106012		DF0A3:	RORB	(R2)	
5096	015734	005202			INC	R2	:RESET POINTER
5097	015736	124142		DF0A4:	CMPB	-(R1), -(R2)	:TEST DATA CHARACTER
5098	015740	001010			BNE	DF1	:IF NOT GOOD: BR
5099	015742	105037	000660		CLRB	BBC	:CLEAR BAD RECORD COUNTER
5100	015746	000411			BR	DF2	
5101	015750	122122		DF0:	CMPB	(R1)+, (R2)+	:CHECK DATA
5102	015752	001003			BNE	DF1	:IF BAD: BR
5103	015754	105037	000660		CLRB	BBC	:CLEAR BAD RECORD CNTR
5104	015760	000404			BR	DF2	
5105	015762	004737	016574	DF1:	JSR	PC, DRPKF	:GO GET DROPS AND PICKS
5106	015766	004737	016060		JSR	PC, DERR	:GO DO PRINT
5107	015772	005205		DF2:	INC	R5	:BUMP CHAR CNTR
5108	015774	001405			BEQ	DF3	:IF DONE ALL: BR
5109	015776	032737	010000 000562		BIT	#10000, RDCMD	:SEE IF READ REVERSE
5110	016004	001761			BEQ	DF0	:IF NOT: BR
5111	016006	000716			BR	DF0A	:ELSE CONTINUE READ REV
5112	016010	005037	000666	DF3:	CLR	HDRFL	:CLEAR HEADER FLAG
5113	016014	005737	000706		TST	DERFL	:SEE IF HAD DATA ERROR
5114	016020	001416			BEQ	DFX	:IF NOT: BR
5115	016022	005737	000710		TST	SERFL	
5116	016026	001013			BNE	DFX	:IF NOT DATA ERROR ONLY: BR
5117	016030	013704	000676		MOV	UNP, R4	
5118	016034	032737	010000 000562		BIT	#10000, RDCMD	:SEE IF READ REVERSE
5119	016042	001003			BNE	DF4	:IF SO: BR
5120	016044	005264	001130		INC	DATER1(R4)	:BUMP DATA ERROR FORWARD COUNTER
5121	016050	000402			BR	DFX	
5122	016052	005264	001170	DF4:	INC	DEREV1(R4)	:BUMP REVERSE DATA ERROR
5123	016056	000207		DFX:	RTS	PC	:EXIT
5124							

```

5126
5127
5128
5129
5130
5131
5132
5133
5134
5135
5136
5137
5138
5139
5140
5141
5142
5143
5144
5145
5146
5147
5148
5149
5150
5151
5152
5153
5154 016060 032777 002000 162522 DERR: BIT #2000,@SWR ;BRANCH IF NO ERROR
5155 016066 001067 BNE DERR4 ;PRINTOUT DESIRED
5156 016070 005237 000672 DERR0: INC PFLG ;SET PRINT FLAG
5157 016074 005737 000666 TST HDRFL ;SEE IF HAVE PRINTED HEADER
5158 016100 001007 BNE DERR0A ;IF SO: BR
5159 016102 004737 022672 JSR PC,PAPRT ;PRINT CYCLE NUMBER
5160 016106 012704 024564 MOV #MSG1,R4 ;LOAD ERROR MSG ADDR
5161 016112 000004 TYPE ;TYPE MSG
5162 016114 004737 021110 JSR PC,FRPRT ;PRINT F OR R
5163 016120 012704 024603 DERR0A: MOV #MSG4,R4
5164 016124 000004 TYPE ;TYPE MSG
5165 016126 010203 MOV R2,R3
5166 016130 162703 033460 SUB #RDATA,R3 ;POINT TO CHAR
5167 016134 005303 DEC R3
5168 016136 032737 010000 000562 BIT #10000,RDCMD ;SEE IF READ REVERSE
5169 016144 001402 BEQ DERR0B ;IF NOT: BR
5170 016146 010503 MOV R5,R3 ;GET CHAR NUMBER
5171 016150 005103 COM R3
5172 016152 104400 DERR0B: TYPOCT ;PRINT CHAR NUMBER
5173 016154 012704 024571 MOV #MSG2,R4
5174 016160 000004 TYPE ;TYPE MSG
5175 016162 032737 010000 000562 BIT #10000,RDCMD ;SEE IF READ REVERSE
5176 016170 001402 BEQ DERR0C ;IF NOT: BR
5177 016172 111103 MOVB (R1),R3 ;GET CHAR
5178 016174 000401 BR DERR0D
5179 016176 114103 DERR0C: MOVB -(R1),R3 ;LOAD EXPECTED DATA
5180 016200 004737 024342 DERR0D: JSR PC,DOUT ;GO PRINT CHAR
5181 016204 012704 024576 MOV #MSG3,R4

```

5182	016210	000004				TYPE		:TYPE MSG
5183	016212	032737	010000	000562		BIT	#10000,RDCMD	:SEE IF READ REVERSE
5184	016220	001402				BEQ	DERR1	:IF NOT: BR
5185	016222	111203				MOVB	(R2),R3	:GET CHAR
5186	016224	000401				BR	DERR2	
5187	016226	114203				MOVB	-(R2),R3	
5188	016230	004737	024342			JSR	PC,DOUT	:PRINT BAD CHAR
5189	016234	032737	010000	000562		BIT	#10000,RDCMD	:BRANCH IF NOT READ
5190	016242	001001				BNE	DERR4	:REVERSE
5191	016244	122122				CMPB	(R1)+,(R2)+	:RESET POINTERS
5192	016246	105237	000660			INCB	BBC	:BUMP BAD RECORD CNTR
5193	016252	122737	000010	000660		CMPB	#10,BBC	:SEE IF BLD BTH
5194	016260	001123				BNE	DEREX	:IF NOT: BR
5195	016262	032777	002000	162320		BIT	#2000,@SWR	:SEE IF PRINT INHIBIT
5196	016270	001003				BNE	1\$	:IF SO: BR
5197	016272	012704	024717			MOV	#MSG15,R4	
5198	016276	000004				TYPE		:TYPE MSG
5199	016300	105037	000660		1\$:	CLRB	BBC	:RESET BAD RECORD CNTR
5200	016304	000337	000660			SWAB	BBC	:POSITION BLD BTH AMOUNT
5201	016310	105237	000660			INCB	BBC	:BUMP AMOUNT
5202	016314	122737	000003	000660		CMPB	#3,BBC	:SEE IF HAD 3 BLD BTHS
5203	016322	101054				BHI	DERR4B	:IF NOT: BR
5204	016324	000337	000660			SWAB	BBC	:REPOSITION BBC
5205	016330	022705	177767			CMP	#177767,R5	:SEE IF ON LAST EIGHT CHARS
5206	016334	101473				BLOS	DERR6	:IF SO: BR
5207	016336	012705	177767			MOV	#177767,R5	:SET CHAR CNTR TO 8
5208	016342	032737	010000	000562		BIT	#10000,RDCMD	:SEE IF READ REVERSE
5209	016350	001416				BEQ	DERR4A	:IF NOT: BR
5210	016352	012701	027452			MOV	#WDATA,R1	:GET START OF BUFFER
5211	016356	012702	033460			MOV	#RDATA,R2	:GET START OF BUFFER
5212	016362	062701	000010			ADD	#10,R1	
5213	016366	062702	000010			ADD	#10,R2	:POINT TO START +10
5214	016372	032737	000001	000556		BIT	#1,FMCNT	:SEE IF ODD FRAME COUNT
5215	016400	001453				BEQ	DEREX	:IF NOT: BR
5216	016402	105722				TSTB	(R2)+	:BUMP POINTER
5217	016404	000451				BR	DEREX	
5218	016406	013737	000556	000644	DERR4A:	MOV	FMCNT,TEMP1	:LOAD CHAR COUNT
5219	016414	005137	000644			COM	TEMP1	
5220	016420	005237	000644			INC	TEMP1	
5221	016424	162737	000010	000644		SUB	#10,TEMP1	:POINT TO BUFFER -8
5222	016432	013701	000644			MOV	TEMP1,R1	:POINT TO NEXT CHAR
5223	016436	062701	027452			ADD	#WDATA,R1	:POINT TO NEXT WRITE CHAR
5224	016442	013702	000644			MOV	TEMP1,R2	:POINT TO END OF READ DATA -8 FORWARD
5225	016446	062702	033460			ADD	#RDATA,R2	:POINT TO NEXT CHAR
5226	016452	000426				BR	DEREX	:EXIT
5227	016454	000337	000660		DERR4B:	SWAB	BBC	:REPOSITION BBC
5228	016460	000241				CLC		
5229	016462	062705	000024			ADD	#24,R5	:SKIP 20 CHARS
5230	016466	103416				BCS	DERR6	:IF EXCEED RECORD SIZE: BR
5231	016470	032737	010000	000562		BIT	#10000,RDCMD	:SEE IF READ REVERSE
5232	016476	001405				BEQ	DERR5	:IF NOT: BR
5233	016500	162701	000024			SUB	#24,R1	
5234	016504	162702	000024			SUB	#24,R2	:RESET POINTERS
5235	016510	000407				BR	DEREX	
5236	016512	062701	000024		DERR5:	ADD	#24,R1	:SKIP 20 CHARS
5237	016516	062702	000024			ADD	#24,R2	:SKIP FORWARD 20 CHARS

5238	016522	000402			BR	DEREX	
5239	016524	012705	177777		DERR6: MOV	#-1,R5	:SET TO EOR
5240	016530	005777	162054		DEREX: TST	@SWR	:BRANCH IF NOT HALT ON ERROR
5241	016534	100012			BPL	DEREX1	
5242	016536	000000			HALT		
5243	016540	005737	000672		TST	PFLG	:SEE IF PRINTED
5244	016544	001006			BNE	DEREX1	:IF SO: BR
5245	016546	032777	002000	162034	BIT	#2000,@SWR	:SEE IF SHOULD PRINT
5246	016554	001002			BNE	DEREX1	:IF NOT: BR
5247	016556	000137	016070		JMP	DERRO	:ELSE PRINT
5248	016562	005037	000672		DEREX1: CLR	PFLG	:CLEAR FLAG
5249	016566	005237	000706		INC	DERFL	:BUMP DATA ERROR FLAG
5250	016572	000207			RTS	PC	:RETURN
5251							



5253  
5254  
5255  
5256  
5257  
5258  
5259  
5260  
5261  
5262  
5263  
5264  
5265  
5266  
5267  
5268  
5269  
5270  
5271  
5272  
5273  
5274  
5275  
5276  
5277  
5278  
5279  
5280  
5281  
5282  
5283  
5284  
5285  
5286  
5287  
5288  
5289  
5290  
5291  
5292  
5293  
5294  
5295  
5296  
5297  
5298  
5299  
5300  
5301  
5302  
5303  
5304  
5305  
5306  
5307  
5308

016574 005037 000644  
016600 005037 000646  
016604 005037 000650  
016610 111137 000644  
016614 111237 000646  
016620 013704 000676  
016624 016437 000770 000722  
016632 016437 001010 000720  
016640 032737 010000 000562  
016646 001005  
016650 124142  
016652 112137 000644  
016656 112237 000646  
016662 004737 016674  
016666 004737 017114  
016672 000207  
016674 113703 000644  
016700 113704 000646  
016704 140403  
016706 001001  
016710 000207  
016712 012737 000010 000712  
016720 132703 000001  
016724 001455  
016726 105737 000650  
016732 001016  
016734 005277 161760  
016740 005777 161754  
016744 10045  
016746 005777 002000 161634  
016754 001402  
016756 004737 022672  
016762 004737 017160  
016766 000415  
016770 005277 161726  
016774 005777 161722  
017000 100027  
017002 032777 002000 161600

```

:*****
:DROPS AND PICKS SUBROUTINE:
:
:THIS SUBROUTINE IS USED TO ACCUMULATE FROM
: EACH BAD DATA CHARACTER FOUND THE NUMBER
: OF BITS WHICH WERE EITHER DROPPED OR PICKED UP.
: TWO COUNTERS PER SLAVE ARE USED TO ACCUMULATE THIS
: INFORMATION AND CAN STORE UP TO 32K DROPS
: OR PICKS BEFORE OVERFLOWING. IF OVERFLOW IS
: ABOUT TO OCCUR, THESE ACCUMULATORS ARE
: PRINTED IN OCTAL AND RESET TO ZERO.
: THE CONTENTS OF THE ACCUMULATORS MAY BE
: DISPLAYED AT ANY TIME BY SETTING CONSOLE
: SWITCH FOURTEEN TO A ONE (1). THE PRINTOUT WILL OCCUR
: AT THE END OF THE CURRENT BLOCK CYCLE.
:*****
DRPKF: CLR TEMP1
      CLR TEMP2
      CLR TEMP3
      MOV (R1),TEMP1 ;LOAD GOOD CHAR
      MOV (R2),TEMP2 ;LOAD BAD CHAR
      MOV UNP,R4
      MOV PIK1(R4),BPKP
      MOV DRP1(R4),BDPP
      BIT #10000,RDCMD ;SEE IF READ REVERSE
      BNE DRPK ;IF SO: BR
      CMPB -(R1),-(R2) ;POINT TO CHAR
      MOV (R1)+,TEMP1 ;LOAD GOOD CHAR
      MOV (R2)+,TEMP2 ;LOAD BAD CHAR
DRPK: JSR PC,DROP ;GET DROPS
      JSR PC,PICK ;GET PICKS
      RTS PC ;EXIT
DROP: MOV TEMP1,R3 ;R3 = GOOD CHAR
      MOV TEMP2,R4 ;R4 = BAD CHAR
DPC: BICB R4,R3 ;GET DROPS/PICKS
      BNE DPCG ;IF SOME: BR
      RTS PC ;RETURN
DPCG: MOV #10,BCNT ;SET NUMBER TO CHECK
DPC0: BITB #1,R3 ;SEE IF DROPPED OR PICKED THIS BIT
      BEQ DPC2 ;IF NOT: BR
      TSTB TEMP3 ;SEE IF ON PICKS
      BNE DPC1 ;IF SO: BR
      INC @BDPP ;BUMP DROP CNTR
      TST @BDPP
      BPL DPC2 ;IF NO OVERFLOW: BR
      BIT #2000,@SWR ;SEE IF HAVE PRINTED DATA
      BEQ DPC0A ;IF SO: BR
DPC0A: JSR PC,PAPRT ;PRINT CYCLE NUMBER
      JSR PC,DPPRT ;PRINT DROPS AND PICKS
      BR DPC2A
DPC1: INC @BPKP ;BUMP PICK CNTR
      TST @BPKP ;SEE IF OVERFLOW
      BPL DPC2 ;IF NOT: BR
      BIT #2000,@SWR ;SEE IF HAVE PRINTED DATA

```

5309	017010	001402			BEQ	DPC1A		:IF SO: BR
5310	017012	004737	022672		JSR	PC,PAPRT		:PRINT CYCLE NUMBER
5311	017016	004737	017160		DPC1A: JSR	PC,DPPRT		:PRINT DROPS AND PICKS
5312	017022	013704	000676		DPC2A: MOV	UNP,R4		
5313	017026	016403	001010		MOV	DRP1(R4),R3		:SET DROP POINTER
5314	017032	016404	000770		MOV	PIK1(R4),R4		:SET PICK POINTER
5315	017036	012737	000010	000712	MOV	#10,BCNT		:SET NUMBER OF BITS
5316	017044	005023			DPC2B: CLR	(R3)+		:CLEAR DROPS
5317	017046	005024			CLR	(R4)+		:CLEAR PICK
5318	017050	005337	000712		DEC	BCNT		:SEE IF DONE
5319	017054	001373			BNE	DPC2B		:IF NOT: BR
5320	017056	000207			RTS	PC		:EXIT
5321	017060	000241			DPC2: CLC			
5322	017062	106003			RORB	R3		:GET NEXT BIT
5323	017064	005337	000712		DEC	BCNT		:SEE IF DONE
5324	017070	001410			BEQ	DPC3		
5325	017072	062737	000002	000722	ADD	#2,BPKP		
5326	017100	062737	000002	000720	ADD	#2,BDPP		
5327	017106	000137	016720		JMP	DPC0		:CONTINUE
5328	017112	000207			DPC3: RTS	PC		:RETURN
5329	017114	013704	000676		PICK: MOV	UNP,R4		:GET UNIT POINTER
5330	017120	016437	000770	000722	MOV	PIK1(R4),BPKP		:SET PICK POINTER
5331	017126	016437	001010	000720	MOV	DRP1(R4),BDPP		:SET DROP POINTER
5332	017134	113704	000644		MOVB	TEMP1,R4		:R4 = GOOD CHAR
5333	017140	113703	000646		MOVB	TEMP2,R3		:R3 = BAD CHAR
5334	017144	112737	000001	000650	MOVB	#1,TEMP3		:SET PICK FLAG
5335	017152	004737	016704		JSR	PC,DPC		:GO CHECK PICKS
5336	017156	000207			RTS	PC		:EXIT
5337	017160	012704	025215		DPPRT: MOV	#MSG26,R4		
5338	017164	000004			TYPE			:TYPE MSG
5339	017166	013704	000676		MOV	UNP,R4		
5340	017172	016437	001010	000720	MOV	DRP1(R4),BDPP		:SET DROP POINTER
5341	017200	016437	000770	000722	MOV	PIK1(R4),BPKP		:SET PICK POINTER
5342	017206	062737	000016	000720	ADD	#16,BDPP		
5343	017214	062737	000016	000722	ADD	#16,BPKP		
5344	017222	012737	000010	000712	MOV	#10,BCNT		:SET NUMBER TO PRINT
5345	017230	017703	161464		DPPRT0: MOV	@BDPP,R3		
5346	017234	104400			TYPOCT			:PRINT DROPS
5347	017236	005337	000712		DEC	BCNT		:SEE IF DONE
5348	017242	001404			BEQ	DPPRT1		:IF NOT: BR
5349	017244	162737	000002	000720	SUB	#2,BDPP		:BUMP POINTER
5350	017252	000766			BR	DPPRT0		:CONTINUE FOR ALL 8 BITS
5351	017254	012737	000010	000712	DPPRT1: MOV	#10,BCNT		:SET NUMBER TO PRINT
5352	017262	012704	025226		MOV	#MSG27,R4		
5353	017266	000004			TYPE			:TYPE MSG
5354	017270	017703	161426		DPPRT2: MOV	@BPKP,R3		
5355	017274	104400			TYPOCT			:PRINT PICKS
5356	017276	005337	000712		DEC	BCNT		:SEE IF DONE
5357	017302	001404			BEQ	DPPRTX		:IF SO: BR
5358	017304	162737	000002	000722	SUB	#2,BPKP		:BUMP POINTER
5359	017312	000766			BR	DPPRT2		:CONTINUE FOR ALL 8 BITS
5360	017314	000207			DPPRTX: RTS	PC		:RETURN

5362  
5363  
5364  
5365  
5366  
5367  
5368  
5369  
5370  
5371  
5372  
5373  
5374  
5375  
5376  
5377  
5378  
5379  
5380  
5381  
5382  
5383  
5384  
5385  
5386  
5387  
5388  
5389  
5390  
5391  
5392  
5393  
5394  
5395  
5396  
5397  
5398  
5399  
5400  
5401  
5402  
5403  
5404  
5405  
5406  
5407  
5408  
5409  
5410  
5411  
5412  
5413  
5414  
5415  
5416  
5417

017316 013703 000556  
017322 032703 000001  
017326 001401  
017330 005303  
017332 005403  
017334 032737 000020 000552  
017342 001401  
017344 006203  
017346 032737 000010 000674  
017354 001414  
017356 032737 010000 000562  
017364 001405  
017366 012703 033460  
017372 162703 000002  
017376 000405  
017400 062703 033460  
017404 000402  
017406 062703 027452  
017412 010337 021064  
017416 012704 000007  
017422 012701 021066  
017426 005021  
017430 005304  
017432 001375  
017434 020377 161054  
017440 001402  
017442 005237 021066  
017446 032737 000010 000674  
017454 001006  
017456 005777 161034  
017462 001441

```

ERCHK: MOV    FMCNT,R3      ;GET FRAME COUNT
        BIT    #1,R3       ;SEE IF ODD
        BEQ    ER0         ;IF NOT: BR
        DEC    R3          ;BUMP COUNT
ER0:    NEG    R3
        BIT    #20,UDES    ;SEE IF CORE DUMP
        BEQ    ER0B       ;IF NOT: BR
        ASR    R3          ;SET TO FC/2
ER0B:   BIT    #10,MTC1    ;SEE IF WRITE OP
        BEQ    ER1         ;IF SO: BR
        BIT    #10000,RDCMD
        BEQ    ER0A
        MOV    #RDATA,R3
        SUB    #2,R3       ;SET POINTER
        BR    ER2
ER0A:   ADD    #RDATA,R3   ;BUILD EXPT READ ADDRESS
        BR    ER2
ER1:    ADD    #WDATA,R3   ;BUILD EXPT WRITE ADDRESS
ER2:    MOV    R3,CADER    ;SAVE ADDRESS
        MOV    #7,R4
        MOV    #BAER,R1
ER2A0:  CLR    (R1)+       ;CLEAR FLAGS
        DEC    R4
        BNE   ER2A0
        CMP    R3,@BA     ;SEE IF ADDRESS OK
        BEQ   ER2A1       ;IF SO: BR
        INC    BAER       ;SET BUS ADDRESS ERROR
ER2A1:  BIT    #10,MTC1    ;SEE IF WRITE OPER
        BNE   ER2B       ;IF NOT: BR
ER2A:   TST    @FC        ;SEE IF FC=0
        BEQ   ER3         ;IF SO: BR
    
```

```

*****
;STATUS CHECK SUBROUTINE:
;
;THIS SUBROUTINE IS USED TO PERFORM A CHECK OF
;BOTH THE MASSBUS CONTROLLER (RH11) AND THE TAPE
;CONTROLLER (TM03). THE RH11 IS CHECKED FOR ERRORS
;AS REFLECTED IN REGISTERS CS1 AND CS2 AND ALSO THAT
;THE BUS ADDRESS (BA) AND WORD COUNT (WC) ARE
;CORRECT. THE TM03 IS CHECKED FOR DRIVE STATIS (DS),
;DRIVE ERRORS (ER), AND PROPER FRAME COUNT. THE SPECIAL
;CHECK CHARACTERS (CRC+LRC) ARE ALSO CHECKED WHEN
;APPROPRIATE (IE: NRZ READ OR WRITE). CERTAIN TYPES
;OF DRIVE ERRORS IN PE OPERATION WILL BE ACCOMPANIED
;BY THE DISPLAY OF THE DEAD TRACK REGISTER (CC). THESE
;TYPES ARE ER BITS 15,10,7,6. THE PRINTOUTS OF BAD
;CRC,LRC,FC, AND BA WILL SHOW BOTH THE EXPECTED AND
;RECEIVED VALUES (IE: EXPT-RCVD). ONLY THOSE REGISTERS
;WHICH ARE IN ERROR WILL BE PRINTED AND ALL PRINTOUTS
;ARE IN OCTAL FORMAT WITH NO LEADING ZEROS. AS IN
;DATA ERRORS, STATUS ERRORS ARE PRECEDED BY HEADER
;DESCRIBING THE HARDWARE UNDER TEST, THE BLOCKING
;INFORMATION, AND THE ERROR TYPE.
*****
    
```

5418	017464	005237	021074			INC	FCER		:SET FC ERROR
5419	017470	000436				BR	ER3		
5420	017472	032737	000040	000674	ER2B:	BIT	#40,MTC1		:SEE IF SPACE OPER
5421	017500	001766				BEQ	ER2A		:IF SO: BR
5422	017502	005737	000700			TST	TMFLG		:SEE IF TM TIME
5423	017506	001011				BNE	ER2D		:IF SO: BR
5424	017510	013703	000556			MOV	FMCNT,R3		
5425	017514	005403				NEG	R3		:R3 = EXPT RECORD SIZE
5426	017516	020377	160774		ER2C:	CMP	R3,@FC		:SEE IF FC = EXPT
5427	017522	001421				BEQ	ER3		:IF SO: BR
5428	017524	005237	021074			INC	FCER		:SET FC ERROR FLAG
5429	017530	000416				BR	ER3		
5430	017532	032737	002000	000552	ER2D:	BIT	#2000,UDES		:SEE IF PE
5431	017540	001346				BNE	ER2A		:IF SO: BR
5432	017542	032737	010000	000562		BIT	#10000,RDCMD		:SEE IF READ REVERSE
5433	017550	001003				BNE	ER2E		:IF SO: BR
5434	017552	012703	000002			MOV	#2,R3		
5435	017556	000757				BR	ER2C		:LOOK FOR EXPT = 2
5436	017560	012703	000001		ER2E:	MOV	#1,R3		
5437	017564	000754				BR	ER2C		:GO CHECK FC FOR TM
5438	017566	032777	160000	160714	ER3:	BIT	#160000,@C1		:SEE IF COUNT ERROR
5439	017574	001437				BEQ	ER4		
5440	017576	017703	160716			MOV	@CS,R3		:GET CONT STATUS REG
5441	017602	042703	000307			BIC	#307,R3		:MASK OUT IR,OR,UNIT NO. & SEE IF OTHER ERRORS
5442	017606	001406				BEQ	ER3A		:IF NOT: BR
5443	017610	005737	000700			TST	TMFLG		:SEE IF TAPE MARK TIME
5444	017614	001425				BEQ	ER3B		:IF NOT: BR
5445	017616	042703	001000			BIC	#1000,R3		:MASK MISSED TRANS & BR IF OTHER ERRORS
5446	017622	001022				BNE	ER3B		
5447	017624	032777	060000	160656	ER3A:	BIT	#60000,@C1		:SEE IF EITHER TRE OR MCPE
5448	017632	001420				BEQ	ER4		:IF NOT: BR
5449	017634	005737	000700			TST	TMFLG		:SEE IF TM TIME
5450	017640	001413				BEQ	ER3B		:IF NOT: BR
5451	017642	017703	160656			MOV	@ER,R3		:GET ERROR REGISTER
5452	017646	032737	000010	000552		BIT	#10,UDES		:SEE IF EVEN PARITY
5453	017654	001402				BEQ	ER3A1		:IF NOT: BR
5454	017656	042703	000100			BIC	#100,R3		:MASK PAR
5455	017662	042703	001000		ER3A1:	BIC	#1000,R3		:MASK FCE
5456	017666	001402				BEQ	ER4		:IF NO ERRORS EXCEPT FCE: BR
5457	017670	005237	021070		ER3B:	INC	CONER		:SET CONT ERROR FLAG
5458	017674	032777	040000	160620	ER4:	BIT	#40000,@DS		:SEE IF DRIVE ERROR
5459	017702	001420				BEQ	ER6		:IF NOT: BR
5460	017704	005737	000700			TST	TMFLG		:SEE IF TAPE MARK TIME
5461	017710	001413				BEQ	ER4A		:IF NOT: BR
5462	017712	017703	160606			MOV	@ER,R3		:GET ER
5463	017716	032737	000010	000552		BIT	#10,UDES		:SEE IF EVEN PARITY
5464	017724	001402				BEQ	ER4A1		:IF NOT: BR
5465	017726	042703	000100			BIC	#100,R3		:MASK PAR
5466	017732	042703	001000		ER4A1:	BIC	#1000,R3		:MASK OUT FCE & BRANCH IF
5467	017736	001402				BEQ	ER6		:NO OTHER ERRORS
5468	017740	005237	021072		ER4A:	INC	DRVER		:SET DRIVER ERROR FLAG
5469	017744	032737	002000	000552	ER6:	BIT	#2000,UDES		
5470	017752	001071				BNE	ERPT		:IF IN PE MODE: BR
5471	017754	032777	020000	160626		BIT	#20000,@SWR		:SEE IF NO DATA CHECK
5472	017762	001065				BNE	ERPT		:IF NOT: BR (ALLOW READ OF UNKNOWN TAPES)
5473	017764	032737	000040	000674		BIT	#40,MTC1		:SEE IF WRITE OR READ OP

5474	017772	001461			BEQ	ERPT	:IF NOT: BR
5475	017774	005737	000700		TST	TMFLG	:SEE IF TAPE MARK TIME
5476	020000	001413			BEQ	ER6A	:IF NOT: BR
5477	020002	013737	015442	021106	MOV	EXCRC,CRCSV	:SAVE CRC
5478	020010	013737	015444	021104	MOV	EXLRC,LRCV	:SAVE LRC
5479	020016	005037	015442		CLR	EXCRC	
5480	020022	012737	000023	015444	MOV	#23,EXLRC	:SET CRC/LRC FOR TM
5481	020030	032737	000060	000552	ER6A: BIT	#60,UDES	:SEE IF FORMAT 14
5482	020036	001037			BNE	ERPT	:IF NOT: BR
5483	020040	017703	160464		MOV	@CC,R3	:GET CRC CHARACTER
5484	020044	042703	177000		BIC	#177000,R3	
5485	020050	023703	015442		CMP	EXCRC,R3	
5486	020054	001402			BEQ	ER7	:IF CRC GOOD: BR
5487	020056	005237	021100		INC	CRCER	:SET ERROR FLAG
5488	020062	017703	160446		ER7: MOV	@MR,R3	:GET LRC
5489	020066	000303			SWAB	R3	
5490	020070	005703			TST	R3	
5491	020072	100002			BPL	ER10	
5492	020074	052703	000400		BIS	#400,R3	
5493	020100	042703	177000		ER10: BIC	#177000,R3	
5494	020104	023703	015444		CMP	EXLRC,R3	
5495	020110	001412			BEQ	ERPT	:IF LRC GOOD: BR
5496	020112	010337	021102		MOV	R3,ACTLRC	:SAVE ACTUAL LRC
5497	020116	005237	021076		INC	LRCER	:SET LRC ERROR FLAG
5498	020122	032737	010000	000562	BIT	#10000,RDCMD	:SEE IF READ REVERSE
5499	020130	001402			BEQ	ERPT	:IF NOT: BR
5500	020132	005037	021076		CLR	LRCER	:ELSE CLEAR LRC ERROR
5501	020136	012703	000006		ERPT: MOV	#6,R3	
5502	020142	005037	000710		CLR	SERFL	:CLEAR ERROR FLAG
5503	020146	005037	000724		CLR	ERSAV	
5504	020152	012704	021066		MOV	#BAER,R4	
5505	020156	005724			ERPTT: TST	(R4)+	:SEE IF ANY ERROR
5506	020160	001004			BNE	ERPTG	:IF SO: BR
5507	020162	005303			DEC	R3	
5508	020164	001374			BNE	ERPTT	
5509	020166	000137	021020		JMP	ERPX1	
5510	020172	005237	000710		ERPTG: INC	SERFL	:SET ERROR FLAG
5511	020176	017737	160322	000724	MOV	@ER,ERSAV	:SAVE ERROR REGISTER
5512	020204	032777	002000	160376	BIT	#2000,@SWR	:SEE IF PRINT
5513	020212	001420			BEQ	ERPT0	:IF SO: BR
5514	020214	022737	000002	000714	CMP	#2,RTYFL	:SEE IF READ RETRY
5515	020222	001006			BNE	ERPTG1	:IF NOT: BR
5516	020224	013703	000704		MOV	RTCNT,R3	
5517	020230	005203			INC	R3	:BUMP RETRY COUNT
5518	020232	020337	000604		CMP	R3,RETRY	:SEE IF LAST RETRY
5519	020236	001406			BEQ	ERPT0	:IF SO: BR
5520	020240	022737	000002	021072	ERPTG1: CMP	#2,DRVER	:SEE IF TM STATUS ERROR
5521	020246	001402			BEQ	ERPT0	:IF SO: BR
5522	020250	000137	020700		JMP	ERPX0	
5523	020254	005237	000672		ERPT0: INC	PFLG	
5524	020260	004737	022672		JSR	PC,PAPRT	:PRINT HEADER
5525	020264	013704	000654		MOV	EMADDR,R4	
5526	020270	000004			TYPE		:TYPE MSG
5527	020272	004737	021110		JSR	PC,FRPRT	:PRINT F OR R
5528	020276	005737	000700		TST	TMFLG	
5529	020302	001407			BEQ	ERPT1	

5530	020304	022737	026153	000654		CMP	#MSG54,EMADDR	
5531	020312	001403				BEQ	ERPT1	
5532	020314	012704	026171			MOV	#MSG56,R4	:PRINT TM
5533	020320	000004				TYPE		:TYPE MSG
5534	020322	005737	021070		ERPT1:	TST	CONER	
5535	020326	001414				BEQ	ERPT2	:IF NO CONT ERROR: BR
5536	020330	012704	025045			MOV	#MSG23,R4	
5537	020334	000004				TYPE		:TYPE MSG
5538	020336	017703	160146			MOV	@C1,R3	
5539	020342	104400				TYPOCT		:PRINT CONTROL 1
5540	020344	012704	025072			MOV	#MSG23D,R4	:PRINT CS TAG
5541	020350	000004				TYPE		:TYPE MSG
5542	020352	017703	160142			MOV	@CS,R3	
5543	020356	104400				TYPOCT		:PRINT CONT STATUS
5544	020360	005737	021072		ERPT2:	TST	DRVER	
5545	020364	001414				BEQ	ERPT3	:IF SO DRIVE ERROR: BR
5546	020366	012704	025100			MOV	#MSG23E,R4	
5547	020372	000004				TYPE		:TYPE MSG
5548	020374	017703	160122			MOV	@DS,R3	
5549	020400	104400				TYPOCT		:PRINT DRIVE STATUS
5550	020402	012704	025105			MOV	#MSG23F,R4	
5551	020406	000004				TYPE		:TYPE MSG
5552	020410	017703	160110			MOV	@ER,R3	
5553	020414	104400				TYPOCT		:PRINT DRIVE ERROR
5554	020416	005737	021066		ERPT3:	TST	BAER	
5555	020422	001416				BEQ	ERPT4	:IF NO BA ERROR: BR
5556	020424	012704	025060			MOV	#MSG23B,R4	
5557	020430	000004				TYPE		:TYPE MSG
5558	020432	017703	160056			MOV	@BA,R3	
5559	020436	104400				TYPOCT		:PRINT BUS ADDRESS
5560	020440	012737	000255	000640		MOV	#255,TOB	
5561	020446	004737	024064			JSR	PC,TOG	:PRINT /
5562	020452	013703	021064			MOV	CADER,R3	
5563	020456	104400				TYPOCT		:PRINT EXPT BUS ADDRESS
5564	020460	005737	021074		ERPT4:	TST	FCER	
5565	020464	001406				BEQ	ERPT5	:IF NO FC ERROR: BR
5566	020466	012704	025065			MOV	#MSG23C,R4	
5567	020472	000004				TYPE		:TYPE MSG
5568	020474	017703	160016			MOV	@FC,R3	
5569	020500	104400				TYPOCT		:PRINT FRAME COUNT
5570	020502	012704	025053		ERPT5:	MOV	#MSG23A,R4	
5571	020506	000004				TYPE		:TYPE MSG
5572	020510	017703	157776			MOV	@WC,R3	
5573	020514	104400				TYPOCT		:PRINT WORD COUNT
5574	020516	005737	021100			TST	CRCER	
5575	020522	001420				BEQ	ERPT5A	:IF NO CRC ERROR: BR
5576	020524	012704	026216			MOV	#MSG58,R4	
5577	020530	000004				TYPE		:TYPE MSG
5578	020532	017703	157772			MOV	@CC,R3	
5579	020536	042703	177000			BIC	#177000,R3	
5580	020542	104400				TYPOCT		:PRINT ACTUAL CRC
5581	020544	012737	000255	000640		MOV	#255,TOB	
5582	020552	004737	024064			JSR	PC,TOG	
5583	020556	013703	015442			MOV	EXCRC,R3	
5584	020562	104400				TYPOCT		:PRINT EXPECTED CRC
5585	020564	005737	021076		ERPT5A:	TST	LRCER	

5586	020570	001416				BEQ	ERPT6		;IF NO LRC ERROR: BR
5587	020572	012704	026224			MOV	#MSG59,R4		
5588	020576	000004				TYPE			;TYPE MSG
5589	020600	013703	021102			MOV	ACTLRC,R3		
5590	020604	104400				TYPOCT			;PRINT ACTUAL LRC
5591	020606	012737	000255	000640		MOV	#255,TOB		
5592	020614	004737	024064			JSR	PC,TOG		
5593	020620	013703	015444			MOV	EXLRC,R3		
5594	020624	104400				TYPOCT			;PRINT EXPECTED LRC
5595	020626	005737	021072			ERPT6: TST	DRVER		
5596	020632	001421				BEQ	ERPT7		;IF NO DRIVE ERROR: BR
5597	020634	032737	002000	000552		BIT	#2000,UDES		
5598	020642	001415				BEQ	ERPT7		;IF NO PE: BR
5599	020644	017704	157654			MOV	@ER,R4		
5600	020650	042704	075477			BIC	#75477,R4		;MASK OUT ALL BUT BITS 15,10,7,6
5601	020654	001410				BEQ	ERPT7		;IF NO CONDITIONALS SET: BR
5602	020656	012704	025117			MOV	#MSG23H,R4		
5603	020662	000004				TYPE			;TYPE MSG
5604	020664	017703	157640			MOV	@CC,R3		
5605	020670	042703	177000			BIC	#177000,R3		;MASK CC
5606	020674	104400				TYPOCT			;PRINT CHECK CHARACTERS
5607	020676	000240				ERPT7: NOP			
5608	020700	005777	157704			ERPX0: TST	@SWR		;BRANCH IF NOT HALT ON ERROR
5609	020704	100012				BPL	ERPX		
5610	020706	000000				HALT			
5611	020710	005737	000672			TST	PFLG		;SEE IF HAVE PRINTED
5612	020714	001006				BNE	ERPX		;IF SO: BR
5613	020716	032777	002000	157664		BIT	#2000,@SWR		;SEE IF SHOULD PRINT
5614	020724	001002				BNE	ERPX		;IF NOT: BR
5615	020726	000137	020254			JMP	ERPT0		;PRINT ERROR
5616	020732	005037	000672			ERPX: CLR	PFLG		
5617	020736	005737	000566			TST	CRCC		;BRANCH IF CRC ERROR
5618	020742	001007				BNE	1\$		;CORRECTION DESIRED
5619	020744	012777	000040	157546		MOV	#40,@CS		;ELSE INIT
5620	020752	013777	000550	157540		MOV	DVN,@CS		;RESET DRIVE NUMBER
5621	020760	000414				BR	2\$		
5622	020762	012777	000011	157520	1\$:	MOV	#11,@C1		;DRIVE CLEAR
5623	020770	017704	157532			MOV	@AS,R4		
5624	020774	010477	157526			MOV	R4,@AS		;CLEAR AS
5625	021000	013704	000510			MOV	C1,R4		
5626	021004	005204				INC	R4		
5627	021006	152714	000100			BISB	#100,(R4)		;RESET TRE
5628	021012	013777	000552	157522	2\$:	MOV	UDES,@TC		;RESET TC
5629	021020	032737	000040	000674	ERPX1:	BIT	#40,MTC1		
5630	021026	001415				BEQ	ERPX2		;IF NOT READ/WRITE OP: BR
5631	021030	005737	000700			TST	TMFLG		
5632	021034	001412				BEQ	ERPX2		;IF NOT TM TIME: BR
5633	021036	032737	002000	000552		BIT	#2000,UDES		;CHECK UDES
5634	021044	001006				BNE	ERPX2		;BR IF PE
5635	021046	013737	021106	015442		MOV	CRCSV,EXCRC		;RESTORE CRC
5636	021054	013737	021104	015444		MOV	LRCSV,EXLRC		;RESTORE LRC
5637	021062	000207				ERPX2: RTS	PC		;EXIT
5638	021064	000000				CADER:	0		;EXPT ADDRESS SAVE
5639	021066	000000				BAER:	0		
5640	021070	000000				CONER:	0		
5641	021072	000000				DRVER:	0		

5642 021074 000000  
5643 021076 000000  
5644 021100 000000  
5645 021102 000000  
5646 021104 000000  
5647 021106 000000

FCER: 0  
LRCER: 0  
CRCER: 0  
ACTLRC: 0  
LRCSV: 0  
CRCSV: 0

5648  
5649  
5650  
5651  
5652  
5653  
5654  
5655  
5656  
5657

```
*****  
:F FOR FORWARD/R FOR REVERSE PRINT SUBROUTINE:  
:  
:THIS SUBROUTINE IS USED TO PRINT OUT THE  
:TAPE DIRECTION USED WHEN ANY ERROR IS  
:DETECTED IN STATUS OF READ OR WRITE, DATA, OR  
:SPACING OPERATIONS.  
:*****
```

5658 021110 032737 000010 000674  
5659 021116 001411  
5660 021120 012704 024753  
5661 021124 032737 000002 000674  
5662 021132 001002  
5663 021134 012704 024750  
5664 021140 000004  
5665 021142 000207  
5666

```
FRPRT: BIT #10,MTC1 ;SEE IF WRITE COMMAND  
BEQ 2$ ;IF SO: BR  
MOV #MSG17,R4 ;SET TO TYPE REVERSE MSG  
BIT #2,MTC1 ;BRANCH IF REVERSE  
BNE 1$  
MOV #MSG16,R4 ;SET FORWARD MESSAGE  
1$: TYPE ;TYPE MSG  
2$: RTS PC ;EXIT
```



5668  
5669  
5670  
5671  
5672  
5673  
5674  
5675  
5676  
5677  
5678  
5679  
5680  
5681  
5682  
5683  
5684  
5685  
5686  
5687  
5688  
5689  
5690  
5691  
5692  
5693  
5694  
5695  
5696  
5697  
5698  
5699  
5700  
5701  
5702  
5703  
5704  
5705  
5706  
5707  
5708  
5709  
5710  
5711  
5712  
5713  
5714  
5715  
5716  
5717  
5718  
5719  
5720  
5721  
5722  
5723

021144 005037 000644  
021150 013777 000550 157342  
021156 032777 010000 157336  
021164 001026  
021166 005237 000644  
021172 001371  
021174 004737 022672  
021200 032737 000010 000674  
021206 001004  
021210 012704 024610  
021214 000004  
021216 000405  
021220 012704 024615  
021224 000004  
021226 004737 021110  
021232 012704 025175  
021236 000004  
021240 000000  
021242 032777 020000 157252  
021250 001411  
021252 004737 022672  
021256 012704 027300  
021262 000004  
021264 032777 020000 157230 1\$:  
021272 001374  
021274 022737 000026 000674  
021302 001003

```

:*****
:TAPE COMMAND EXECUTE SUBROUTINE:
:
:THIS SUBROUTINE IS USED TO EXECUTE THE
:MAG TAPE COMMAND DESCRIBED BY THE READ
:OR WRITE ROUTINE. THE FINAL COMMAND IS
:SENT TO THE DEVICE REGISTER ALONG WITH THE
:INTERRUPT ENABLE AND GO BITS.
:ONCE THE COMMAND IS ISSUED, AN INTERRUPT
:TIMER IS STARTED AND IF NO INTERRUPT IS RETURNED
:BEFORE TIME OUT OCCURS, AN ERROR WILL BE
:PRINTED AND THE PROGRAM STOPPED. TESTING MAY
:BE RESUMED BY PRESSING THE CONTINUE SWITCH.
:TWO INTERRUPT HANDLERS ARE USED, ONE FOR MAG TAPE
:AND ANOTHER FOR TELETYPE (TTY).
:UPON RECEIPT OF A MAG TAPE INTERRUPT, HOUSEKEEPING
:IS PERFORMED AND CONTROL RETURNED TO THE CALLING
:ROUTINE (READ,WRITE,ETC).
:RECEIPT OF A TTY INTERRUPT WILL CAUSE THE
:PROGRAM TO CHECK FOR ENTRY OF A CNTRL C CHARACTER.
:IF NOT CNTRL C, THEN CONTINUATION OF WAIT FOR MAG
:TAPE INTERRUPT IS RETURNED. IF, HOWEVER, THE TTY
:INTERRUPT WAS CAUSED BY ENTRY OF A CNTRL C,
:THEN AT THIS TIME REQUESTS FOR NEW STALL VALUES
:ARE PRINTED AND THE RESPONSES ENTERED. RESUMPTION
:OF TAPE INTERRUPT WAIT IS THEN RESUMED.
:*****
TAPG: CLR TEMP1
MOV DVN,@CS ;SET DRIVE NO.
TAPG0: BIT #10000,@DS ;SEE IF HAVE MOL
BNE TAPG3 ;IF SO: BR
INC TEMP1 ;SEE IF TIMED OUT
BNE TAPG0 ;WAIT FOR READY
JSR PC,PAPRT ;PRINT CYCLE NUMBER
BIT #10,MTC1 ;SEE IF WRITE OP
BNE TAPG1 ;IF NOT: BR
MOV #MSG5,R4
TYPE ;TYPE MSG
BR TAPG2
TAPG1: MOV #MSG6,R4
TYPE ;TYPE MSG
JSR PC,FRPRT ;PRINT F OR R
TAPG2: MOV #MSG25,R4
TYPE ;TYPE MSG
HALT
TAPG3: BIT #20000,@DS ;SEE IF PIP RESET
BEQ TAPG3F ;IF SO: BR
JSR PC,PAPRT ;PRINT HEADER
MOV #MSG116,R4
TYPE ;TYPE MSG
TAPG3F: BIT #20000,@DS
BNE 1$ ;AWAIT PIP RESET
CMP #26,MTC1 ;SEE IF WRITE TM
BNE TAPG3A ;IF NOT: BR

```



```

5773
5774
5775 021556 017746 157032
5776 021562 042716 000200
5777 021566 122716 000003
5778 021572 001005
5779 021574 000005
5780 021576 005077 157004
5781 021602 000137 000200
5782 021606 122716 000001
5783 021612 001016
5784 021614 022737 000176 000610
5785 021622 001015
5786 021624 012737 177570 000610
5787 021632 004737 023376
5788 021636 012704 027424
5789 021642 000004
5790 021644 004737 023420
5791 021650 022716 000007
5792 021654 001005
5793 021656 012737 000176 000610
5794 021664 004737 023306
5795 021670 022716 000002
5796 021674 001042
5797 021676 004737 023376
5798 021702 005237 014076
5799 021706 004737 013650
5800 021712 032777 000040 156670
5801 021720 001426
5802 021722 012704 025750
5803 021726 000004
5804 021730 013703 000602
5805 021734 104400
5806 021736 012705 000602
5807 021742 012701 000007
5808 021746 012702 177777
5809 021752 012703 002000
5810 021756 004737 023442
5811 021762 004737 023420
5812 021766 005726
5813 021770 012716 011266
5814 021774 000002
5815 021776 004737 023420
5816 022002 005726
5817 022004 000002
5818
5819
5820 022006 000240
5821 022010 042777 000037 156516
5822 022016 013716 000664
5823 022022 000002

;TTY INTERRUPT HANDLER
TTINT: MOV @TKB,-(SP) ;GET CHARACTER
      BIC #200,(SP) ;STRIP PARITY BIT
      CMPB #3,(SP) ;BRANCH IF NOT ^C
      BNE 1$
      RESET ;RESET ALL I/O
      CLR @PSW ;CLEAR PSW
      JMP @#200 ;RESTART PROGRAM
1$: CMPB #1,(SP) ;BRANCH IF NOT ^A
   BNE 2$
   CMP #SWREG,SWR ;BRANCH IF HARDWARE SWR IS INVOKED
   BNE 3$
   MOV #177570,SWR ;INVOKE HARWARE SWR
   JSR PC,SAVE ;SAVE REGISTERS ON THE STACK
   MOV #MSG121,R4 ;TYPE 'HARDWARE SWR IN USE'
   TYPE
   JSR PC,RESTORE ;RESTORE REGISTERS
2$: CMP #7,(SP) ;BRANCH IF NOT ^G
   BNE 4$
3$: MOV #SWREG,SWR ;INVOKE SOFTWARE SWR
   JSR PC,GTSWR ;GET SWITCHES
4$: CMP #2,(SP) ;BRANCH IF NOT ^B
   BNE 6$
   JSR PC,SAVE ;SAVE REGISTERS ON THE STACK
   INC SCVFL ;SET FLAG
   JSR PC,TINP3A ;GO CHECK CRC CORRECTION
   BIT #40,@SWR ;BRANCH IF NOT YOZZLING
   BEQ 5$
   MOV #MSG44,R4 ;REQUEST NEW YOZZLE STALL
   TYPE ;TYPE MSG
   MOV YSTAL,R3
   TYPOCT ;PRINT PRESENT STALL
   MOV #YSTAL,R5 ;SET ADDRESS OF YSTL
   MOV #7,R1 ;SET NUMBER OF CHAR TO INPUT
   MOV #-1,R2 ;SET MAXIMUM LIMIT
   MOV #2000,R3 ;SET MINIMUM LIMIT
   JSR PC,TTR ;GO GET VALUE
   JSR PC,RESTORE ;RESTORE REGISTERS
   TST (SP)+ ;POP CHARACTER OF THE STACK
   MOV #YOZ,(SP) ;RETURN TO 'YOZ'
   RTI ;RETURN TO YOZ
5$: JSR PC,RESTORE
6$: TST (SP)+ ;POP CHARACTER OFF THE STACK
   RTI ;RETURN

;MAG TAPE INTERRUPT HANDLER
MTINT: NOP
MTINTA: BIC #37,@MR ;CLEAR MAINT MODE
        MOV RTRN,(SP) ;SET RETURN TO (RTRN)
        RTI ;RETURN

```

```

5825
5826
5827
5828
5829
5830
5831
5832
5833
5834 022024 012704 026722
5835 022030 000004
5836 022032 012705 000744
5837 022036 012701 000002
5838 022042 012702 000001
5839 022046 012703 000000
5840 022052 004737 023442
5841 022056 005037 000740
5842 022062 004737 022212
5843 022066 012704 026654
5844 022072 000004
5845 022074 012704 026703
5846 022100 000004
5847 022102 013703 000740
5848 022106 104400
5849 022110 012704 026712
5850 022114 000004
5851 022116 012700 000746
5852 022122 005710
5853 022124 100403
5854 022126 012003
5855 022130 104400
5856 022132 000773
5857 022134 004737 022376
5858 022140 012700 001050
5859 022144 012701 001720
5860 022150 105020
5861 022152 005301
5862 022154 001375
5863 022156 004737 022536
5864 022162 022737 000007 000740
5865 022170 001403
5866 022172 005237 000740
5867 022176 000731
5868 022200 005737 000744
5869 022204 001324
5870 022206 000137 005004

```

```

:*****
:AUTO SEQUENCE
:
:THIS ROUTINE ENTERED VIA STARTING ADDRESS 240
:WILL EXERCISE ALL AVAILABLE SLAVES ON ALL AVAILABLE
:DRIVES IN BOTH PE AND NRZ ACCORDING TO THE PRESELECTED
:TEST PLAN. IF NRZ ONLY, PE TESTING WILL NOT BE ATTEMPTED.
:*****
ASEQ:  MOV    #MSG104,R4
      TYPE
      MOV    #ASEQCF,R5      ;TYPE MSG
      MOV    #2,R1          ;SET ADDRESS OF ENTRY
      MOV    #1,R2          ;SET SIZE OF ENTRY
      MOV    #0,R3          ;SET UPPER LIMIT
      MOV    #0,R3          ;SET LOWER LIMIT
      JSR    PC,TTR         ;GO GET INPUT
ASEQ0: CLR    ADRVN         ;CLEAR DRV NUM
ASEQ1: JSR    PC,HRDS       ;GO SELECT HARDWARE CONFIGURATION
      MOV    #MSG101,R4
      TYPE
      MOV    #MSG102,R4    ;TYPE MSG
      TYPE
      MOV    ADRVN,R3      ;TYPE MSG
      TYPOCT
      MOV    #MSG103,R4    ;PRINT TM03
      TYPE
      MOV    #UN1,R0       ;TYPE MSG
      TST    (R0)          ;POINT TO START OF SLAVE TABLE
      BMI    ASEQ3         ;SEE IF END
      MOV    (R0)+,R3      ;IF SO: BR
      TYPOCT
      BR     ASEQ2         ;PRINT SLAVE TABLE
      JSR    PC,AMOD1      ;DO ALL
      MOV    #STTBL,R0     ;GO DO MODE 1(NRZ)
      MOV    #ENDTBL-STTBL,R1 ;POINTER TO THE TABLE
      CLRB  (R0)+         ;AND #OF BYTES IN TABLE
      DEC   R1            ;CLEAR STATISTIC COUNTER
      BNE   -4
      JSR    PC,AMOD2      ;GO DO MODE 2(PE)
ASEQ4: CMP    #7,ADRVN    ;SEE IF DONE ALL DRIVES
      BEQ   ASEQX         ;IF SO: BR
      INC   ADRVN         ;BUMP DRIVE NUMBER
      BR    ASEQ1         ;CONTINUE
ASEQX: TST    ASEQCF      ;SEE IF CONTINUOUS AUTO SEQ
      BNE   ASEQ0         ;++B CONTINUE TESTING
      JMP   TEND

```

```

5872
5873                                     ;SUBROUTINE TO SELECT AUTO SEQUENCE HARDWARE*****
5874
5875 022212 005037 005054      HRDS: CLR      REOTC      ;CLEAR EOT UNIT CNTR
5876 022216 005037 000644      CLR      TEMP1
5877 022222 012777 000040 156270  MOV      #40,@CS      ;INIT
5878 022230 013777 000740 156262  MOV      ADRVN,@CS    ;SET DRIVE
5879 022236 032777 010000 156254  BIT      #10000,@CS   ;TEST FOR NON-EXISTANT DRIVE
5880 022244 001403                BEQ      2$           ;IF DRIVE AVAIL: BR
5881 022246 005726                1$: TST      (SP)+      ;RESET STACK POINTER
5882 022250 000137 022162      JMP      ASEQ4       ;GO SEE IF TRIED ALL DRIVES
5883 022254 005000                2$: CLR      R0
5884 022256 012701 000746      MOV      #UN1,R1     ;SET START OF SLAVE TABLE
5885 022262 005737 003040      TST      CHNFLG     ;BRANCH IF NOT IN CHAIN MODE
5886 022266 001410                BEQ      3$
5887 022270 122737 000006 000041  CMPB    #6,@#41     ;BRANCH IF NOT LOADED VIA TMDP
5888 022276 001004                BNE     3$
5889 022300 005737 000740      TST      ADRVN      ;BRANCH IF NOT DRIVE 0
5890 022304 001001                BNE     3$
5891 022306 005200                INC     R0           ;DO NOT TEST SLAVE 0
5892 022310 010077 156226      3$: MOV     R0,@TC     ;SELECT SLAVE
5893 022314 032777 010000 156200  BIT     #10000,@DS   ;SEE IF SLAVE AVAIL FOR TEST(MOL)
5894 022322 001403                BEQ     4$           ;IF NOT: BR
5895 022324 005237 000644      INC     TEMP1       ;SET SLAVE FOUND FLAG
5896 022330 010021                MOV     R0,(R1)+    ;LOAD SLAVE TABLE
5897 022332 005200                4$: INC     R0       ;STEP TO NEXT SLAVE
5898 022334 022700 000010      CMP     #10,R0      ;BRANCH IF ALL SLAVE NOT DONE
5899 022340 001363                BNE     3$
5900 022342 005737 000644      5$: TST     TEMP1     ;SEE IF FOUND ANY SLAVES
5901 022346 001737                BEQ     1$           ;IF NOT: BR
5902 022350 013737 000644 005054  MOV     TEMP1,REOTC ;SET NUMBER OF UNITS
5903 022356 000337 000644      SWAB    TEMP1
5904 022362 053737 000644 005054  BIS     TEMP1,REOTC ;SET EOT CNTR
5905 022370 012711 177777      MOV     #-1,(R1)    ;TERMINATE SLAVE TABLE
5906 022374 000207                RTS     PC           ;RETURN TO SEQ

```

```

5908
5909
5910
5911 022376 005037 000656
5912 022402 012701 000746
5913 022406 052721 001700
5914 022412 022711 177777
5915 022416 001373
5916 022420 004737 005070
5917 022424 012737 000006 000742
5918 022432 012737 174000 000556
5919 022440 012737 000100 000554
5920 022446 013737 000740 000550
5921 022454 012737 000001 000560
5922 022462 005037 000564
5923 022466 005037 000570
5924 022472 004737 003346
5925 022476 012737 000010 000560
5926 022504 004737 003346
5927 022510 012737 000014 000560
5928 022516 004737 003346
5929 022522 012737 177777 000560
5930 022530 004737 003346
5931 022534 000207

;SUBROUTINE TO SELECT NRZ AUTO TEST MODE*****
AMOD1: CLR BLCNTR ;ASSURE BLOCK COUNTER IS 0
MOV #UN1,R1 ;GET START OF SLAVE TABLE
1$: BIS #1700,(R1)+ ;SET ALL SLAVE TO NRZ,NORM,ODD
CMP #-1,(R1) ;LOOP UNTIL REACED END OF TABLE
BNE 1$
JSR PC,RWDA ;GO REWIND ALL AVAIL SLAVES
MOV #6,ABLNT ;SET NUMBER OF BLOCKS FOR MODE 1
MOV #-4000,FMCNT ;SET FC = 4000
MOV #100,RCNT ;SET REC CNTR = 100
MOV ADRVN,DVN ;SELECT DRIVE
MOV #1,PATRN ;SELECT PATTERN 1
CLR TMEX ;ASSURE NO TMK
CLR INTRF ;ASSURE NORMAL READ
JSR PC,STAUTO ;GO DO AUTO MODE 1
MOV #10,PATRN ;SELECT PATTERN 10
JSR PC,STAUTO ;GO DO PATTERN 10
MOV #14,PATRN ;SELECT PATTERN 14
JSR PC,STAUTO
3$: MOV #-1,PATRN ;SELECT AUTO RANDOM DATA
JSR PC,STAUTO
RTS PC ;RETURN TO SEQ
  
```

```
5933
5934
5935
5936 022536 005037 000656
5937 022542 012701 000746
5938 022546 042711 001700
5939 022552 052721 002300
5940 022556 022711 177777
5941 022562 001371
5942 022564 004737 005070
5943 022570 012737 000006 000742
5944 022576 012737 174000 000556
5945 022604 012737 000100 000554
5946 022612 012737 000010 000560
5947 022620 004737 003346
5948 022624 012737 000014 000560
5949 022632 004737 003346
5950 022636 012737 000015 000560
5951 022644 004737 003346
5952 022650 012737 177777 000742
5953 022656 012737 177777 000560
5954 022664 004737 003346
5955 022670 000207
5956
5957
```

```

;SUBROUTINE TO SELECT PE AUTO TEST MODE*****
AMOD2: CLR BLCNTR ;CLEAR BLOCK CNTR
MOV #UN1,R1 ;SET START OF SLAVE TABLE
1$: BIC #1700,(R1) ;CLEAR NRZ
BIS #2300,(R1)+ ;SET TO PE NORM, ODD
CMP #-1,(R1) ;LOOP UNTIL END OF TABLE
BNE 1$
JSR PC,RWINDA ;REWIND ALL SLAVES
MOV #6,ABLCNT ;SET AUTO BLOCK COUNT
MOV #-4000,FMCNT ;SET FC = 4000
MOV #100,RCNT ;SET REC CNTR TO 100
MOV #10,PATRN ;SELECT PATTERN 10
JSR PC,STAUTO ;GO DO AUTO SEQ
MOV #14,PATRN ;SELECT PATTERN 14
JSR PC,STAUTO
MOV #15,PATRN ;SELECT PATTERN 15
JSR PC,STAUTO
MOV #-1,ABLCNT ;FORCE TO END OF TAPE
MOV #-1,PATRN ;SELECT AUTO RANDOM DATA
JSR PC,STAUTO
3$: RTS PC ;RETURN TO SEQ
```

5959  
5960  
5961  
5962  
5963  
5964  
5965  
5966  
5967  
5968  
5969  
5970  
5971  
5972  
5973  
5974  
5975  
5976  
5977  
5978  
5979  
5980  
5981  
5982  
5983  
5984  
5985  
5986  
5987  
5988  
5989  
5990  
5991  
5992  
5993  
5994  
5995  
5996  
5997  
5998  
5999  
6000  
6001  
6002  
6003  
6004  
6005  
6006  
6007  
6008  
6009  
6010  
6011  
6012  
6013  
6014

022672 012704 024666  
022676 000004  
022700 013703 000550  
022704 104400  
022706 012704 024652  
022712 000004  
022714 013703 000552  
022720 042703 177770  
022724 104400  
022726 012704 026232  
022732 000004  
022734 013703 000552  
022740 000303  
022742 042703 177770  
022746 104400  
022750 012704 026236  
022754 000004  
022756 005003  
022760 032737 000010 000552  
022766 001402  
022770 012703 000001  
022774 104400  
022776 012704 026242  
023002 000004  
023004 013703 000552  
023010 000241  
023012 006003  
023014 006003  
023016 006003  
023020 006003  
023022 042703 177760  
023026 104400  
023030 012704 024627  
023034 000004  
023036 032777 000400 155544  
023044 001406  
023046 012737 000122 000640  
023054 004737 024064  
023060 000411  
023062 005737 000736

```

:*****
:ERROR HEADER PRINT SUBROUTINE:
:
:THIS ROUTINE IS USED TO PRINT OUT A HEADER
:WITH EACH ERROR MESSAGE. THE PRINT IS IN TWO
: LINES AND CONTAINS THE FOLLOWING INFORMATION.
:LINE 1: DRIVE NO. SLAVE NO. DENSITY PARITY FORMAT
:LINE 2: CURRENT BLOCK NUMBER, RECORD NUMBER IN
:WHICH THE ERROR OCCURED PLUS THE TOTAL NUMBER
:OF RECORDS IN THIS BLOCK, THE RECORD SIZE (NUMBER
:OF CHARACTERS), AND THE ERROR TYPE (READ,WRITE, SPACE, ETC)
:PLUS THE TAPE DIRECTION (FORWARD OR REVERSE).
:ALL NUMBERS ARE IN OCTAL.
:*****
PAPRT:  MOV    #MSG12,R4
        TYPE                   ;TYPE MSG
        MOV    DVN,R3
        TYPOCT                  ;PRINT DRIVE NUMBER
        MOV    #MSG11,R4
        TYPE                   ;TYPE MSG
        MOV    UDES,R3
        BIC    #177770,R3
        TYPOCT                  ;PRINT UNIT NUMBER
        MOV    #MSG60,R4
        TYPE                   ;TYPE MSG
        MOV    UDES,R3
        SWAB   R3
        BIC    #177770,R3
        TYPOCT                  ;PRINT DENSITY
        MOV    #MSG61,R4
        TYPE                   ;TYPE MSG
        CLR    R3
        BIT    #10,UDES
        BEQ    PAPRT0
        MOV    #1,R3
        TYPOCT                  ;PRINT PARITY
PAPRT0: MOV    #MSG62,R4
        TYPE                   ;TYPE MSG
        MOV    UDES,R3
        CLC
        ROR   R3
        ROR   R3
        ROR   R3
        ROR   R3
        BIC    #177760,R3
        TYPOCT                  ;PRINT FORMAT
        MOV    #MSG8,R4
        TYPE                   ;TYPE MSG
        BIT    #400,@SWR
        BEQ    PAPRTB
        MOV    #122,TOB
        JSR   PC,TOG
        BR    PAPRTD
        TST   ASEQF
        ;SEE IF AUTO SEQ

```



6015	023066	001403			BEQ	PAPRTC	:IF NOT: BR
6016	023070	005737	000560		TST	PATR	:SEE IF AUTO RANDOM
6017	023074	100764			BMI	PAPRTA	:IF SO: BR
6018	023076	013703	000560		PAPRTC: MOV	PATR,R3	
6019	023102	104400			TYPOCT		:PRINT PATRN NUMBER
6020	023104	012704	024704		PAPRTD: MOV	#MSG13,R4	
6021	023110	000004			TYPE		:TYPE MSG
6022	023112	013703	000656		MOV	BLCNTR,R3	
6023	023116	104400			TYPOCT		:PRINT NUMBER
6024	023120	012704	024712		MOV	#MSG14,R4	
6025	023124	000004			TYPE		:TYPE MSG
6026	023126	010003			MOV	R0,R3	
6027	023130	032737	000010	000674	BIT	#10,MTC1	:SEE IF WRITE OPERATION
6028	023136	001404			BEQ	PAPRT1	:IF SO: BR
6029	023140	032737	010000	000562	BIT	#10000,RDCMD	:SEE IF READ REVERSE
6030	023146	001016			BNE	PAPRT3	:IF SO: BR
6031	023150	013703	000554		PAPRT1: MOV	RCNT,R3	
6032	023154	005737	000700		TST	TMFLG	:SEE IF TAPE MARK TIME
6033	023160	001010			BNE	PAPRT2	:IF SO: BR
6034	023162	022737	012106	000664	CMP	#B1,RTRN	
6035	023170	001003			BNE	PAPRTY	:IF NOT BACK SPACE: BR
6036	023172	005737	000714		TST	RTYFL	
6037	023176	001402			BEQ	PAPRT3	:IF NOT RETRY: BR
6038	023200	160003			PAPRTY: SUB	R0,R3	:GET RECORD NUMBER
6039	023202	005203			PAPRT2: INC	R3	
6040	023204	104400			PAPRT3: TYPOCT		:PRINT RECORD NUMBER
6041	023206	012737	000055	000640	MOV	#55,TOB	:LOAD DASH (-)
6042	023214	004737	024064		JSR	PC,TOG	:PRINT DASH (-)
6043	023220	013703	000554		MOV	RCNT,R3	
6044	023224	104400			TYPOCT		:PRINT RECORD COUNT
6045	023226	012704	024622		MOV	#MSG7,R4	
6046	023232	000004			TYPE		:TYPE MSG
6047	023234	013703	000556		MOV	FMCNT,R3	:GET CHARACTER COUNT
6048	023240	005403			NEG	R3	:FORM TWO'S COMPLEMENT
6049	023242	104400			TYPOCT		:PRINT RECORD SIZE
6050	023244	012737	000001	000666	MOV	#1,HDRFL	:SET HEADER FLAG
6051	023252	000207			RTS	PC	:RETURN
6052							

6054  
6055  
6056  
6057  
6058  
6059  
6060  
6061  
6062  
6063  
6064  
6065  
6066  
6067  
6068  
6069  
6070  
6071  
6072  
6073  
6074  
6075  
6076  
6077  
6078  
6079  
6080  
6081  
6082  
6083  
6084  
6085  
6086  
6087  
6088  
6089  
6090  
(1)  
(1)  
(1)  
(1)  
(1)  
(1)  
(1)  
(1)  
(1)  
(1)  
(1)  
6091  
(1)  
(1)  
(1)  
(1)  
(1)  
(1)  
(1)  
(1)  
(1)

```

:*****
:RANDOM NUMBER GENERATOR SUBROUTINE:
:
:THIS SUBROUTINE IS USED TO GENERATE THE RANDOM
:NUMBERS REQUIRED FOR USE AS RANDOM DATA,
:RECORD COUNT, AND CHARACTER COUNT.
:*****
RANG:  ADD      RANSAV,RANBAS
      ADD      RANBAS,RANSAV      ;GET NEW NUMBER
      CMP      RANSAV,R1          ;SEE IF NUMBER TOO BIG
      BHI     RANG                ;IF SO: BR
      CMP      R2,RANSAV          ;SEE IF NUMBER TOO SMALL
      BHI     RANG                ;IF SO: BR
      RTS     PC                  ;EXIT

;SUBROUTINE TO GET NEW SOFTWARE SWR
GTSWR: CMP      #SWREG,SWR        ;BRANCH IF SOFTWARE SWR
      BNE     1$                 ;NOT INVOKED
      JSR     PC,,SAVE           ;SAVE REGISTERS ON THE STACK
      MOV     #SMSWR,R4         ;TYPE 'SWR = '
      TYPE   ;TYPE MSG
      MOV     @SWR,R3           ;GET CURRENT SWR
      TYPOCT
      MOV     #SMNEW,R4         ;ASK FOR NEW SETTING
      TYPE   ;TYPE MSG
      MOV     SWR,R5            ;TTR ROUTINE RETURNS VALUE TO (R5)
      MOV     #7,R1             ;LIMIT RESPONSE TO 7 CHARS
      MOV     #177777,R2        ;BETWEEN 0 AND 177777
      MOV     #0,R3
      JSR     PC,TTR             ;GET RESPONSE
      JSR     PC,,RESTORE        ;RESTORE REGISTERS
1$:    RTS     PC                ;RETURN

;:ROUTINE TO SAVE REGISTERS ON THE STACK
.SAVE: MOV     %5,-(SP)          ;:R5 IS SAVED AT 12(SP)
      MOV     %4,-(SP)          ;:R4 IS SAVED AT 10(SP)
      MOV     %3,-(SP)          ;:R3 IS SAVED AT 6(SP)
      MOV     %2,-(SP)          ;:R2 IS SAVED AT 4(SP)
      MOV     %1,-(SP)          ;:R1 IS SAVED AT 2(SP)
      MOV     %0,-(SP)          ;:R0 IS SAVED AT (SP)
      MOV     14(SP),-(SP)      ;:PUSH RETURN PC ON THE STACK
      RTS     PC                ;:RETURN TO CALLER

;:ROUTINE TO RESTORE REGISTERS SAVED ON THE STACK
.RESTORE:MOV  (SP)+,14(SP)      ;:STORE RETURN PC ON STACK
      MOV     (SP)+,%0
      MOV     (SP)+,%1
      MOV     (SP)+,%2
      MOV     (SP)+,%3
      MOV     (SP)+,%4
      MCV     (SP)+,%5
      RTS     PC                ;:RETURN

```

```

6093
6094
6095
6096
6097
6098
6099
6100
6101
6102
6103
6104
6105
6106
6107
6108
6109
6110 023442 010146
6111 023444 011601
6112 023446 005037 000644
6113 023452 005000
6114 023454 004737 023674
6115 023460 122737 000003 000642
6116 023466 001003
6117 023470 000005
6118 023472 000137 000200
6119 023476 122737 000015 000642
6120 023504 001004
6121 023506 005737 000644
6122 023512 001457
6123 023514 000451
6124 023516 122737 000025 000642
6125 023524 001004
6126 023526 012704 025237
6127 023532 000004
6128 023534 000743
6129 023536 122737 000177 000642
6130 023544 001011
6131 023546 000241
6132 023550 006000
6133 023552 006200
6134 023554 006200
6135 023556 012704 027354
6136 023562 000004
6137 023564 005201
6138 023566 000732
6139 023570 122737 000060 000642
6140 023576 101027
6141 023600 122737 000070 000642
6142 023606 101423
6143 023610 005237 000644
6144 023614 006300
6145 023616 006300
6146 023620 006300
6147 023622 042737 177770 000642
6148 023630 053700 000642

:*****
:TTY ENTRY SUBROUTINE:
:
:THIS SUBROUTINE IS USED BY THE TEST CONDITION
:ENTRY ROUTINE TO READ THE RESPONSE ENTERED
:AT THE TTY AND CHECK THEM FOR LEGALITY AND
:LIMITS. ALL RESPONSE MUST BE TYPED IN OCTAL
:(0-7) AND MUST FALL WITHIN THE LIMITS SET BY
:THE CALLING ROUTINE.
:IF AN ENTRY IS ILLEGAL OR OUTSIDE THE LIMITS,
:A QUESTION MARK IS TYPED (?) AND THE RESPONSE
:MAY BE REENTERED.
:ENTRIES MAY NOT EXCEED SIX (6) CHARACTERS AND
:MAY BE TERMINATED AT LESS THAN SIX BY TYPING A
:CARRIAGE RETURN
:*****
TTR: MOV R1, -(SP) ;SAVE CHAR COUNT
10$: MOV (SP), R1 ;RESTORE CHAR COUNT (FOR ^U)
CLR TEMP1 ;CLEAR FIRST CHARACTER FLAG
CLR R0
11$: JSR PC, TTIN ;GO READ CHARACTER
CMPB #3, TIB ;BRANCH IF NOT ^C
BNE 11$
RESET
JMP @#200 ;RESTART AT 200
11$: CMPB #15, TIB ;SEE IF CR
BNE 2$ ;IF NOT: BR
TST TEMP1 ;SEE IF FIRST CHARACTER
BEQ 9$ ;IF SO: BR
BR 6$ ;ELSE GO LOAD VALUE
2$: CMPB #25, TIB ;BRANCH IF NOT CONTROL U
BNE 21$
MOV #MSG28, R4 ;TYPE <CR><LF>
TYPE ;TYPE MSG
BR 10$
21$: CMPB #177, TIB ;BRANCH IF NOT 'RUBOUT'
BNE 3$
CLC ;REMOVE LAST CHARACTER
ROR R0
ASR R0
ASR R0
MOV #MSG118, R4 ;TYPE '\ '
TYPE ;TYPE MSG
INC R1 ;DEC CHAR RECEIVED COUNT
BR 1$ ;GET NEXT CHARACTER
3$: CMPB #60, TIB ;SEE IF CHAR IS LESS THAN 0
BHI TIB
4$: CMPB #70, TIB ;SEE IF CHAR IS GREATER THAN 7
BLOS TIB
5$: INC TEMP1 ;SET FIRST CHARACTER FLAG
ASL R0
ASL R0 ;SHIFT 3 LEFT
ASL R0
BIC #177770, TIB ;STRIP ASCII
BIS TIB, R0 ;LOAD CHARACTER

```

6149	023634	005301		DEC	R1	:SEE IF DONE
6150	023636	001306		BNE	1\$	:IF NOT: BR
6151	023640	020002		6\$: CMP	R0,R2	:SEE IF EXCEEDED MAXIMUM LIMIT
6152	023642	101005		BHI	TINER	
6153	023644	020300		7\$: CMP	R3,R0	:SEE IF BELOW MINIMUM LIMIT
6154	023646	101003		BHI	TINER	
6155	023650	010015		8\$: MOV	R0,(R5)	:LOAD VALUE
6156	023652	005726		9\$: TST	(SP)+	:POP CHAR COUNT OFF STACK
6157	023654	000207		RTS	PC	:EXIT
6158						
6159	023656	012704	025744	TINER: MOV	#MSG43,R4	
6160	023662	000004		TYPE		:TYPE MSG
6161	023664	005726		TST	(SP)+	:POP CHAR COUNT OFF STACK
6162	023666	162716	000020	SUB	#20,(SP)	:RESET SP TO START OF VALUE ROUTINE
6163	023672	000207		RTS	PC	:REDO VALUE ENTRY

```

6165
6166
6167
6168 023674 017746 154706
6169 023700 052777 000340 154700
6170 023706 005277 154700
6171 023712 105777 154674
6172 023716 100375
6173 023720 012677 154662
6174 023724 017737 154664 000642
6175 023732 042737 000200 000642
6176 023740 013737 000642 000640
6177 023746 004737 024064
6178 023752 000207
6179
6180
6181
6182 023754 112437 000640
6183 023760 105737 000640
6184 023764 001436
6185 023766 122737 000045 000640
6186 023774 001407
6187 023776 122737 C00041 000640
6188 024004 001436
6189 024006 004737 024064
6190 024012 000760
6191 024014 112737 000015 000640
6192 024022 004737 024064
6193 024026 012703 000006
6194 024032 005037 000640
6195 024036 004737 024064
6196 024042 005303
6197 024044 001372
6198 024046 112737 000012 000640
6199 024054 004737 024064
6200 024060 000735
6201 024062 000002
6202
6203 024064 105777 154526
6204 024070 100375
6205 024072 113777 000640 154520
6206 024100 000207
6207
6208 024102 012703 000002
6209 024106 012737 000007 000640
6210 024114 004737 024064
6211 024120 005303
6212 024122 001371
6213 024124 000713
6214
6215

;TTY READ SUBROUTINE*****
TTIN: MOV @PSW, -(SP) ;SAVE CURRENT PSW
      BIS #340, @PSW ;SET TO BR7 TO PREVENT INTRPT
      INC @TKS
1$: TSTB @TKS
   BPL 1$
   MOV (SP)+, @PSW ;RESTORE PSW ,OK TO INTRPT NOW
   MOV @TKB,TIB
   BIC #200,TIB ;STRIP PARITY BIT
   MOV TIB,TOB ;MOVE CHAR TO TTY OUTPUT BFR
   JSR PC,TOG ;ECHO CHARACTER
   RTS PC

;TTY OUTPUT SUBROUTINE*****
TTOUT: MOVB (R4)+,TOB
       TSTB TOB
       BEQ 3$
       CMPB #45,TOB
       BEQ 1$
       CMPB #41,TOB
       BEQ TBELL ;DO BELL
       JSR PC,TOG
       BR TTOUT
1$: MOVB #15,TOB
   JSR PC,TOG
2$: MOV #6,R3
   CLR TOB
   JSR PC,TOG
   DEC R3
   BNE 2$ ;DO FILLERS
   MOVB #12,TOB
   JSR PC,TOG
   BR TTOUT
3$: RTI ;RETURN

TOG: TSTB @TPS
     BPL TOG
     MOVB TOB,@TPB
     RTS PC ;RETURN

TBELL: MOV #2,R3
1$: MOV #7,TOB
   JSR PC,TOG
   DEC R3
   BNE 1$
   BR TTOUT

```

```

6217                                     ;OCTAL OUTPUT SUBROUTINE*****
6218
6219 024126 005037 024340      OCTP:  CLR   OFL           ;CLEAR FLAG FOR LEADING ZERO
6220 024132 010304                MOV   R3,R4           ;SEE IF NUMBER IS ZERO
6221 024134 001003                BNE   OCTP0          ;IF NOT ZERO: BR
6222 024136 004737 024320      JSR   PC,OCTPG1      ;ELSE PRINT ZERO
6223 024142 000447                BR    OCTP3          ;SPACE AND EXIT
6224 024144 005704                OCTP0: TST  R4           ;BRANCH IF MSD = 0
6225 024146 100006                BPL   OCTP1
6226 024150 012704 000001        MOV   #1,R4
6227 024154 004737 024276      JSR   PC,OCTPG      ;PRINT 1
6228 024160 000137 024172      JMP   OCTP2
6229 024164 005004                OCTP1: CLR   R4
6230 024166 004737 024276      JSR   PC,OCTPG      ;PRINT 0
6231 024172 010304                OCTP2: MOV   R3,R4
6232 024174 006004                ROR   R4
6233 024176 006004                ROR   R4
6234 024200 006004                ROR   R4           ;POSITION DIGIT
6235 024202 006004                ROR   R4
6236 024204 000304                SWAB  R4
6237 024206 004737 024276      JSR   PC,OCTPG      ;PRINT DIGIT 2
6238 024212 010304                MOV   R3,R4
6239 024214 006004                ROR   R4
6240 024216 000304                SWAB  R4
6241 024220 004737 024276      JSR   PC,OCTPG      ;PRINT DIGIT 3
6242 024224 010304                MOV   R3,R4
6243 024226 006104                ROL   R4
6244 024230 006104                ROL   R4
6245 024232 000304                SWAB  R4
6246 024234 004737 024276      JSR   PC,OCTPG      ;PRINT DIGIT 4
6247 024240 010304                MOV   R3,R4
6248 024242 006004                ROR   R4
6249 024244 006004                ROR   R4
6250 024246 006004                ROR   R4
6251 024250 004737 024276      JSR   PC,OCTPG
6252 024254 010304                MOV   R3,R4
6253 024256 004737 024276      JSR   PC,OCTPG      ;PRINT DIGIT 5
6254 024262 012737 000240 000640 OCTP3: MOV   #240,TOB
6255 024270 004737 024064      JSR   PC,TOG        ;PRINT SPACE
6256 024274 000002                RTI                    ;EXIT
6257 024276 042704 177770      OCTPG: BIC   #177770,R4
6258 024302 001004                BNE   OCTPG0
6259 024304 005737 024340      TST   OFL
6260 024310 001001                BNE   OCTPG0
6261 024312 000207                RTS   PC
6262
6263 024314 005237 024340      OCTPG0: INC  OFL
6264 024320 052704 000260      OCTPG1: BIS  #260,R4
6265 024324 010437 000640      MOV   R4,TOB
6266 024330 004737 024064      JSR   PC,TOG
6267 024334 010304                MOV   R3,R4
6268 024336 000207                RTS   PC
6269 024340 000000                OFL:  0           ;FIRST CHAR FLAG
6270

```

```

6272
6273 ;DATA CHARACTER OUTPUT SUBROUTINE*****
6274
6275 024342 012704 000010 DOUT: MOV #10,R4 ;SET NUMBER TO PRINT
6276 024346 110337 000640 MOVB R3,TOB
6277 024352 105777 154240 1$: TSTB @TPS
6278 024356 100375 BPL 1$
6279 024360 105737 000640 TSTB TOB
6280 024364 100004 BPL 2$
6281 024366 012777 000061 154224 MOV #061,@TPB
6282 024374 000403 BR 3$
6283 024376 012777 000060 154214 2$: MOV #060,@TPB
6284 024404 006337 000640 3$: ASL TOB
6285 024410 005304 DEC R4
6286 024412 001357 BNE 1$
6287 024414 000207 RTS PC
6288
6289 024416 013703 000650 DOUTD: MOV TEMP3,R3
6290 024422 000303 SWAB R3
6291 024424 004737 024342 JSR PC,DOUT
6292 024430 013703 000650 MOV TEMP3,R3
6293 024434 004737 024342 JSR PC,DOUT
6294 024440 000207 RTS PC
6295
6296 ;TU45 SERIAL NUMBER PRINT SUBROUTINE*****
6297
6298 024442 010304 SNPT: MOV R3,R4
6299 024444 000304 SWAB R4
6300 024446 006004 ROR R4
6301 024450 006004 ROR R4
6302 024452 006004 ROR R4
6303 024454 006004 ROR R4
6304 024456 004737 024520 JSR PC,SNPG ;PRINT FIRST DIGIT
6305 024462 010304 MOV R3,R4
6306 024464 000304 SWAB R4
6307 024466 004737 024520 JSR PC,SNPG ;PRINT SECOND DIGIT
6308 024472 010304 MOV R3,R4
6309 024474 006004 ROR R4
6310 024476 006004 ROR R4
6311 024500 006004 ROR R4
6312 024502 006004 ROR R4
6313 024504 004737 024520 JSR PC,SNPG ;PRINT THIRD DIGIT
6314 024510 010304 MOV R3,R4
6315 024512 004737 024520 JSR PC,SNPG ;PRINT FOURTH DIGIT
6316 024516 000207 RTS PC ;EXIT
6317 024520 012737 000260 000640 SNPG: MOV #260,TOB ;SET NUMBER BASE
6318 024526 042704 177760 BIC #177760,R4 ;MASK NUMBER
6319 024532 050437 000640 BIS R4,TOB ;BUILD DIGIT
6320 024536 004737 024064 JSR PC,TOG ;GO TYPE
6321 024542 000207 RTS PC ;RETURN
6322

```

```

6324
6325                                     :ERROR MESSAGES*****
6326
6327 024544 051445 051127 036440 $MSWR: .ASCIZ /%SWR = /
      024552 000040
6328 024554 047040 053505 036440 $MNEW: .ASCIZ / NEW = /
      024562 000040
6329 024564 042052 020105 000 MSG1: .ASCIZ /*DE /
6330 024571 045 035507 000040 MSG2: .ASCIZ /%G: /
6331 024576 041045 020073 000 MSG3: .ASCIZ /%B; /
6332 024603 045 047103 000040 MSG4: .ASCIZ /%CN /
6333 024610 053452 020105 000 MSG5: .ASCIZ /*WE /
6334 024615 052 042522 000040 MSG6: .ASCIZ /*RE /
6335 024622 051052 020123 000 MSG7: .ASCIZ /*RS /
6336 024627 052 040520 051124 MSG8: .ASCIZ /*PATRN /
      024634 020116 000
6337 024637 045 047123 020072 MSG9: .ASCIZ /%SN: /
      024644 000
6338 024645 052 042523 000040 MSG10: .ASCIZ /*SE /
6339 024652 051452 040514 042526 MSG11: .ASCIZ /*SLAVE NO. /
      024660 047040 027117 000040
6340 024666 022445 042045 044522 MSG12: .ASCIZ /%%DRIVE NO. /
      024674 042526 047040 027117
      024702 000040
6341 024704 025045 047102 000040 MSG13: .ASCIZ /**BN /
6342 024712 051052 020116 000 MSG14: .ASCIZ /**RN /
6343 024717 045 020041 020040 MSG15: .ASCIZ /%!          BAD RECORD%%/
      024724 020040 020040 020040
      024732 041040 042101 051040
      024740 041505 051117 022504
      024746 000045
6344 024750 043040 000 MSG16: .ASCIZ / F/
6345 024753 040 000122 MSG17: .ASCIZ / R/
6346 024756 020041 047505 020124 MSG20: .ASCIZ /! EOT NO: /
      024764 047516 020072 000
6347
6348 024771 045 047111 042524 MSG21: .ASCIZ /%INTERCHANGE READ = /
      024776 041522 040510 043516
      025004 020105 042522 042101
      025012 036440 000040
6349 025016 020445 046111 042514 MSG22: .ASCIZ /%!ILLEGAL BOT: HALT%%%/
      025024 040507 020114 047502
      025032 035124 044040 046101
      025040 022524 022445 000
6350 025045 045 051503 020061 MSG23: .ASCIZ /%CS1 /
      025052 000
6351 025053 045 041527 000040 MSG23A: .ASCIZ /%WC /
6352 025060 041045 020101 000 MSG23B: .ASCIZ /%BA /
6353 025065 045 041506 000040 MSG23C: .ASCIZ /%FC /
6354 025072 041445 031123 000040 MSG23D: .ASCIZ /%CS2 /
6355 025100 042045 020123 000 MSG23E: .ASCIZ /%DS /
6356 025105 045 051105 000040 MSG23F: .ASCIZ /%ER /
6357 025112 040445 020123 000 MSG23G: .ASCIZ /%AS /
6358 025117 045 045503 000040 MSG23H: .ASCIZ /%CK /
6359 025124 042045 020102 000 MSG23I: .ASCIZ /%DB /
6360 025131 045 051115 000040 MSG23J: .ASCIZ /%MR /

```



6361	025136	042045	020124	000	MSG23K:	.ASCIZ	/%DT /
6362	025143	045	041524	000040	MSG23L:	.ASCIZ	/%TC /
6363	025150	051445	020116	000	MSG23M:	.ASCIZ	/%SN /
6364	025155	045	047041	020117	MSG24:	.ASCIZ	/%!NO INTERRUPT%/
	025162	047111	042524	051122			
	025170	050125	022524	000			
6365	025175	045	047041	020117	MSG25:	.ASCIZ	/%!NO MOL: HALT%/
	025202	047515	035114	044040			
	025210	046101	022524	000			
6366	025215	045	051104	050117	MSG26:	.ASCIZ	/%DROPS: /
	025222	035123	000040				
6367	025226	050045	041511	051513	MSG27:	.ASCIZ	/%PICKS: /
	025234	020072	000				
6368	025237	045	000		MSG28:	.ASCIZ	/%/
6369	025241	045	052045	047515	MSG30:	.ASCIZ	'%%TM03-TU45 AUTO SEQUENCE (CZTURBO)%';++B
	025246	026463	052524	032464			
	025254	040440	052125	020117			
	025262	042523	052521	047105			
	025270	042503	024040	055103			
	025276	052524	041122	024460			
	025304	000045					
6370	025306	022445	046524	031460	MSG31:	.ASCIZ	'%%TM03-TU45 DATA RELIABILITY TEST (CZTURBO)%';++B
	025314	052055	032125	020065			
	025322	040504	040524	051040			
	025330	046105	040511	044502			
	025336	044514	054524	052040			
	025344	051505	020124	041450			
	025352	052132	051125	030102			
	025360	022451	000				
6371	025363	124	050131	020105	MSG31A:	.ASCIZ	/%TYPE <CR> TO TERMINATE ALL REQUESTS & ^C TO RESTART%/
	025370	041474	037122	052040			
	025376	020117	042524	046522			
	025404	047111	052101	020105			
	025412	046101	020114	042522			
	025420	052521	051505	051524			
	025426	023040	057040	020103			
	025434	047524	051040	051505			
	025442	040524	052122	000045			
6372	025450	051445	040514	042526	MSG32:	.ASCIZ	/%SLAVE NUMBER = /
	025456	047040	046525	042502			
	025464	020122	020075	000			
6373	025471	045	042504	051516	MSG33:	.ASCIZ	/%DENSITY = /
	025476	052111	020131	020075			
	025504	000					
6374	025505	045	040520	044522	MSG34:	.ASCIZ	/%PARITY = /
	025512	054524	036440	000040			
6375	025520	051045	041505	051117	MSG35:	.ASCIZ	/%RECORD COUNT = /
	025526	020104	047503	047125			
	025534	020124	020075	000			
6376	025541	045	044103	051101	MSG36:	.ASCIZ	/%CHAR COUNT = /
	025546	041440	052517	052116			
	025554	036440	000040				
6377	025560	050045	052101	042524	MSG37:	.ASCIZ	/%PATTERN NUMBER = /
	025566	047122	047040	046525			
	025574	042502	020122	020075			
	025602	000					

6378	025603	045	044523	043516	MSG38:	.ASCIZ	/%SINGLE PASS = /
	025610	042514	050040	051501			
	025616	020123	020075	000			
6379	025623	045	051103	020103	MSG39:	.ASCIZ	/%CRC CORRECTION (YES=1,NO=0) = /
	025630	047503	051122	041505			
	025636	044524	047117	024040			
	025644	042531	036523	026061			
	025652	047516	030075	020051			
	025660	020075	000				
6380	025663	045	042445	052116	MSG40:	.ASCIZ	/%ENTER STALLS%READ = /
	025670	051105	051440	040524			
	025676	046114	022523	042522			
	025704	042101	036440	000040			
6381	025712	053445	044522	042524	MSG41:	.ASCIZ	/%WRITE = /
	025720	036440	000040				
6382							
6383	025724	052045	051125	020116	MSG42:	.ASCIZ	/%TURN AROUND = /
	025732	051101	052517	042116			
	025740	036440	000040				
6384	025744	037445	000045		MSG43:	.ASCIZ	/%?%/
6385	025750	042445	052116	051105	MSG44:	.ASCIZ	/%ENTER YOZZLE STALL = /
	025756	054440	055117	046132			
	025764	020105	052123	046101			
	025772	020114	020075	000			
6386	025777	045	051105	020122	MSG45:	.ASCIZ	/%ERR AMT /
	026004	046501	020124	000			
6387	026011	045	041506	000040	MSG46:	.ASCIZ	/%FC /
6388	026016	041445	020101	000	MSG47:	.ASCIZ	/%CA /
6389	026023	045	047041	020117	MSG48:	.ASCIZ	/%!NO BOT ON REWIND: HALT%/
	026030	047502	020124	047117			
	026036	051040	053505	047111			
	026044	035104	044040	046101			
	026052	022524	000045				
6390	026056	047045	052117	040440	MSG49:	.ASCIZ	/%NOT AVAIL /
	026064	040526	046111	000040			
6391	026072	044445	046114	043505	MSG50:	.ASCIZ	/%ILLEGAL DRIVE TYPE /
	026100	046101	042040	044522			
	026106	042526	052040	050131			
	026114	020105	000				
6392	026117	045	051104	053111	MSG52:	.ASCIZ	/%DRIVE NUMBER = /
	026124	020105	052516	041115			
	026132	051105	036440	000040			
6393	026140	043045	051117	040515	MSG53:	.ASCIZ	/%FORMAT = /
	026146	020124	020075	000			
6394	026153	052	042527	052040	MSG54:	.ASCIZ	/*WE TM/
	026160	000115					
6395	026162	051452	020105	046524	MSG55:	.ASCIZ	/*SE TM/
	026170	000					
6396	026171	040	046524	000	MSG56:	.ASCIZ	/ TM/
6397	026175	045	047516	026516	MSG57:	.ASCIZ	/%NON-EXIST SLAVE/
	026202	054105	051511	020124			
	026210	046123	053101	000105			
6398	026216	041445	041522	000040	MSG58:	.ASCIZ	/%CRC /
6399	026224	046045	041522	000040	MSG59:	.ASCIZ	/%LRC /
6400	026232	042052	000040		MSG60:	.ASCIZ	/*D /
6401	026236	050052	000040		MSG61:	.ASCIZ	/*P /

6402	026242	043052	000040		MSG62: .ASCIZ /*F /
6403	026246	025045	051117	043511	MSG64: .ASCIZ /*ORIGINAL ERROR*/
	026254	047111	046101	042440	
	026262	051122	051117	000052	
6404	026270	051045	052105	054522	MSG65: .ASCIZ /*RETRY: /
	026276	020072	000		
6405	026301	052	051441	020105	MSG66: .ASCIZ /*!SE RTRY /
	026306	052122	054522	000040	
6406	026314	020452	051105	051501	MSG67: .ASCIZ /*!ERASE/
	026322	000105			
6407	026324	051045	051105	053105	MSG68: .ASCIZ /*REREV: /
	026332	020072	000		
6408	026335	045	040524	042520	MSG69: .ASCIZ /*TAPE MARK = /
	026342	046440	051101	020113	
	026350	020075	000		
6409	026353	045	047041	020117	MSG70: .ASCIZ /*!NO DRY FROM REWIND: HALT%/
	026360	051104	020131	051106	
	026366	046517	051040	053505	
	026374	047111	035104	044040	
	026402	046101	022524	000	
6410	026407	045	047516	026516	MSG71: .ASCIZ /*NON-EXIST DRIVE/
	026414	054105	051511	020124	
	026422	051104	053111	000105	
6411	026430	051045	043105	042127	MSG72: .ASCIZ /*REFWD: /
	026436	020072	000		
6412	026441	045	052127	051105	MSG73: .ASCIZ /*WTERR: /
	026446	035122	000040		
6413	026452	051045	043505	051511	MSG74: .ASCIZ /*REGISTER START = /
	026460	042524	020122	052123	
	026466	051101	020124	020075	
	026474	000			
6414	026475	045	042526	052103	MSG75: .ASCIZ /*VECTOR = /
	026502	051117	036440	000040	
6415	026510	042045	051105	053105	MSG76: .ASCIZ /*DEREV: /
	026516	020072	000		
6416	026521	045	042504	053506	MSG77: .ASCIZ /*DEFWD: /
	026526	035104	000040		
6417	026532	020445	047516	026516	MSG78: .ASCIZ /*!NON-RETRYABLE WRITE ERROR: ER /
	026540	042522	051124	040531	
	026546	046102	020105	051127	
	026554	052111	020105	051105	
	026562	047522	035122	042440	
	026570	020122	000		
6418	026573	045	047041	047117	MSG79: .ASCIZ /*!NON-RETRYABLE READ ERROR: ER /
	026600	051055	052105	054522	
	026606	041101	042514	051040	
	026614	040505	020104	051105	
	026622	047522	035122	042440	
	026630	020122	000		
6419	026633	045	020441	047105	MSG100: .ASCIZ /*!!END OF PASS %/
	026640	020104	043117	050040	
	026646	051501	020123	000045	
6420	026654	022445	025052	025052	MSG101: .ASCIZ /*%*****%/
	026662	025052	025052	025052	
	026670	025052	025052	025052	
	026676	025052	025052	000	

6421	026703	052	046524	031460	MSG102: .ASCIZ /*TM03 /
	026710	000040			
6422	026712	051452	040514	042526	MSG103: .ASCIZ /*SLAVE /
	026720	000040			
6423	026722	040445	052125	020117	MSG104: .ASCIZ /%AUTO CONT: /
	026730	047503	052116	020072	
	026736	000			
6424	026737	045	042522	047503	MSG105: .ASCIZ /%RECOVERED/
	026744	042526	042522	000104	
6425	026752	020452	041041	042101	MSG106: .ASCIZ /*!!BAD TAPE OVERFLOW/
	026760	052040	050101	020105	
	026766	053117	051105	046106	
	026774	053517	000		
6426	026777	045	042522	044527	MSG16A: .ASCIZ /%REWIND TAPE; RESTART AT BLOCK 1/
	027004	042116	052040	050101	
	027012	035505	051040	051505	
	027020	040524	052122	040440	
	027026	020124	046102	041517	
	027034	020113	000061		
6427	027040	020445	052441	051116	MSG107: .ASCIZ /%!!UNRECOVERABLE BAD SPOT/
	027046	041505	053117	051105	
	027054	041101	042514	041040	
	027062	042101	051440	047520	
	027070	000124			
6428	027072	041045	042101	051040	.ASCIZ /%BAD RECORD LEFT ON TAPE%/
	027100	041505	051117	020104	
	027106	042514	052106	047440	
	027114	020116	040524	042520	
	027122	000045			
6429	027124	020452	050041	051517	MSG109: .ASCIZ /*!!POSITION LOST IN RETRY/
	027132	052111	047511	020116	
	027140	047514	052123	044440	
	027146	020116	042522	051124	
	027154	000131			
6430	027155	051445	051525	042520	MSG110: .ASCIZ /%SUSPECT BAD TAPE/
	027164	052103	041040	042101	
	027172	052040	050101	000105	
6431	027200	051045	050105	040505	MSG111: .ASCIZ /%REPEAT: /
	027206	035124	000040		
6432	027212	041040	042101	052040	MSG112: .ASCIZ / BAD TAPE SPOTS%/
	027220	050101	020105	050123	
	027226	052117	022523	000	
6433					
6434	027233	045	051440	043117	MSG113: .ASCIZ /% SOFT: /
	027240	035124	000040		
6435					
6436	027244	020045	040510	042122	MSG114: .ASCIZ /% HARD: /
	027252	020072	000		
6437					
6438	027255	045	020441	040510	MSG115: .ASCIZ /%!!HARD READ ERROR/
	027262	042122	051040	040505	
	027270	020104	051105	047522	
	027276	000122			
6439	027300	020445	047125	052111	MSG116: .ASCIZ /%!UNIT IS REWINDING: TEST WILL START AT BOT/
	027306	044440	020123	042522	
	027314	044527	042116	047111	

	027322	035107	052040	051505	
	027330	020124	044527	046114	
	027336	051440	040524	052122	
	027344	040440	020124	047502	
	027352	000124			
6440	027354	000134			MSG118: .ASCIZ /\
6441	027356	051045	046505	053117	MSG120: .ASCIZ /%REMOVE TMDP FROM SLAVE TO BE TESTED%/
	027364	020105	046524	050104	
	027372	043040	047522	020115	
	027400	046123	053101	020105	
	027406	047524	041040	020105	
	027414	042524	052123	042105	
	027422	000045			
6442	027424	044045	051101	053504	MSG121: .ASCIZ /%HARDWARE SWR IN USE%/
	027432	051101	020105	053523	
	027440	020122	047111	052440	
	027446	042523	000045		
6443					
6444					
6445	027452	000000			WDATA: 0 .EVEN ;WRITE BUFFER
6446					
6447		033460			
6448	033460	000000			RDATA: 0 .+.4004 ;READ BUFFER
6449					
6450		000001			.END





DAT0D	014442	4778#	4786						
DAT0E	014452	4780#	4785						
DAT0F	014466	4782	4784#						
DAT1	014476	3122	4792#						
DAT1A	014502	4793#	4802	4825	4830	4879			
DAT10	014620	3129	4846#						
DAT11	014650	3130	4858#						
DAT12	014670	3131	4868#						
DAT13	014712	3132	4878#						
DAT14	014722	3133	4883#						
DAT15	014752	3134	4899#						
DAT2	014516	3123	4801#						
DAT3	014522	3124	4806#						
DAT3A	014530	4808#	4819						
DAT4	014546	3125	4817#						
DAT5	014556	3126	4824#						
DAT6	014564	3127	4829#						
DAT7	014572	3128	4834#						
DB	000532	2811#							
DCHK	015446	4059	4253	5036#					
DCHKO	015474	5040	5042#						
DEREV1	001170	2993#	3320	5122*					
DEREX	016530	5194	5215	5217	5226	5235	5238	5240#	
DEREX1	016562	5241	5244	5246	5248#				
DERFL	000706	2873#	5037*	5113	5249*				
DERR	016060	5106	5154#						
DERRO	016070	5156#	5247						
DERROA	016120	5158	5163#						
DERROB	016152	5169	5172#						
DERROC	016176	5176	5179#						
DERROD	016200	5178	5180#						
DERR1	016226	5184	5187#						
DERR2	016230	5186	5188#						
DERR3	016244	5191#							
DERR4	016246	5155	5190	5192#					
DERR4A	016406	5209	5218#						
DERR4B	016454	5203	5227#						
DERR5	016512	5232	5236#						
DERR6	016524	5206	5230	5239#					
DFX	016056	5114	5116	5121	5123#				
DFO	015750	5062	5101#	5110					
DFOA	015644	5072	5074#	5111					
DFOAO	015666	5078	5080#						
DFOA1	015702	5083	5085#						
DFOA2	015716	5088	5090#						
DFOA3	015732	5093	5095#						
DFOA4	015736	5075	5097#						
DFOB	015604	5063#							
DFOB0	015626	5066	5069#						
DFOC	015564	5055	5059#						
DFOCO	015574	5045	5047	5049	5061#				
DFOD	015550	5051	5056#						
DFOE	015542	5053#	5058						
DFOF	015534	5050#	5054						
DF1	015762	5098	5102	5105#					
DF2	015772	5100	5104	5107#					







LRCER	021076	5497*	5500*	5585	5643#
LRCSV	021104	5478*	5636	5646#	
MR	000534	2812#	5488	5743*	5821*
MSG1	024564	5160	6329#		
MSG10	024645	4280	4300	6338#	
MSG100	026633	3442	6419#		
MSG101	026654	5843	6420#		
MSG102	026703	5845	6421#		
MSG103	026712	5849	6422#		
MSG104	026722	5834	6423#		
MSG105	026737	3708	4125	6424#	
MSG106	026752	3379	6425#		
MSG107	027040	3861	6427#		
MSG109	027124	3375	6429#		
MSG11	024652	5979	6339#		
MSG110	027156	3727	6430#		
MSG111	027200	3733	6431#		
MSG112	027212	3851	6432#		
MSG113	027233	3287	3307	6434#	
MSG114	027244	3292	3312	6436#	
MSG115	027255	4161	6438#		
MSG116	027300	5718	6439#		
MSG118	027354	6135	6440#		
MSG12	024666	5975	6340#		
MSG120	027356	3160	6441#		
MSG121	027424	5788	6442#		
MSG13	024704	3814	6020	6341#	
MSG14	024712	3818	6024	6342#	
MSG15	024717	5197	6343#		
MSG16	024750	5663	6344#		
MSG16A	026777	3388	6426#		
MSG17	024753	5660	6345#		
MSG2	024571	5173	6330#		
MSG20	024756	3382	6346#		
MSG21	024771	4618	6348#		
MSG22	025016	4004	6349#		
MSG23	025045	5536	6350#		
MSG23A	025053	5570	6351#		
MSG23B	025060	5556	6352#		
MSG23C	025065	5566	6353#		
MSG23D	025072	5540	6354#		
MSG23E	025100	5546	6355#		
MSG23F	025105	5550	6356#		
MSG23G	025112	6357#			
MSG23H	025117	5602	6358#		
MSG23I	025124	6359#			
MSG23J	025131	6360#			
MSG23K	025136	6361#			
MSG23L	025143	6362#			
MSG23M	025150	6363#			
MSG24	025155	5765	6364#		
MSG25	025175	5712	6365#		
MSG26	025215	5337	6366#		
MSG27	025226	5352	6367#		
MSG28	025237	3827	3843	6126	6368#
MSG3	024576	5181	6331#		

MSG30	025241	4434	6369#																	
MSG31	025306	4431	6370#																	
MSG31A	025363	4438	4440*	6371#																
MSG32	025450	4493	6372#																	
MSG33	025471	4532	6373#																	
MSG34	025505	4544	6374#																	
MSG35	025520	4577	6375#																	
MSG36	025541	4587	6376#																	
MSG37	025560	4599	6377#																	
MSG38	025603	4627	6378#																	
MSG39	025623	4636	6379#																	
MSG4	024603	5163	6332#																	
MSG40	025663	4650	6380#																	
MSG41	025712	4659	6381#																	
MSG42	025724	4668	6383#																	
MSG43	025744	6159	6384#																	
MSG44	025750	5802	6385#																	
MSG45	025777	6386#																		
MSG46	026011	6387#																		
MSG47	026016	6388#																		
MSG48	026023	3422	3508	6389#																
MSG49	026056	3252	3335	6390#																
MSG5	024610	3584	5706	6333#																
MSG50	026072	4523	6391#																	
MSG52	026117	4476	6392#																	
MSG53	026140	4556	6393#																	
MSG54	026153	3636	5530	6394#																
MSG55	026162	4290	6395#																	
MSG56	026171	5532	6396#																	
MSG57	026175	4516	6397#																	
MSG58	026216	5576	6398#																	
MSG59	026224	5587	6399#																	
MSG6	024615	3397	3484	3969	5709	6334#														
MSG60	026232	3399	5984	6400#																
MSG61	026236	5990	6401#																	
MSG62	026242	5997	6402#																	
MSG64	026246	3625	3675	4115	6403#															
MSG65	026270	3272	3710	3729	4127	4150	6404#													
MSG66	026301	3774	6405#																	
MSG67	026314	3789	6406#																	
MSG68	026324	3302	6407#																	
MSG69	026335	4609	6408#																	
MSG7	024622	6045	6335#																	
MSG70	026353	3486	6409#																	
MSG71	026407	4487	6410#																	
MSG72	026430	3282	6411#																	
MSG73	026441	3277	6412#																	
MSG74	026452	4443	6413#																	
MSG75	026475	4452	6414#																	
MSG76	026510	3317	6415#																	
MSG77	026521	3297	6416#																	
MSG78	026532	3617	3665	3720	6417#															
MSG79	026573	4109	4143	6418#																
MSG8	024627	6007	6336#																	
MSG9	024637	4528	6337#																	
MTC1	000674	2868#	3587*	3637*	3791*	3988*	3990*	4194*	4196*	4215*	4217*	4285*	4302*	5395						

MTINT	022006	5414	5420	5473	5629	5658	5661	5704	5722	5741	5744	5749*	5751	6027
MTINTA	022010	2784	4462	5820#										
NOP =	000240	5770	5821#											
NRTP	011252	2739#												
NRZOF	000652	3619	3667	3722	4111	4145	4171#							
OCTP	024126	2859#												
OCTPG	024276	2756	6219#											
OCTPGO	024314	6227	6230	6237	6241	6246	6251	6253	6257#					
OCTPG1	024320	6258	6260	6263#										
OCTP0	024144	6222	6264#											
OCTP1	024164	6221	6224#											
OCTP2	024172	6225	6229#											
OCTP3	024262	6228	6231#											
OFL	024340	6223	6254#											
ONE	014232	6219*	6259	6263*	6269#									
PAPRT	022672	4728	4730#											
		3251	3268	3334	3372	3398	3421	3485	3507	3616	3664	3719	3860	4003
		4108	4142	5159	5302	5310	5524	5703	5717	5761	5975#			
PAPRTA	023046	6011#	6017											
PAPRTB	023062	6010	6014#											
PAPRTC	023076	6015	6018#											
PAPRTD	023104	6013	6020#											
PAPRTY	023200	6035	6038#											
PAPRT0	022774	5994	5996#											
PAPRT1	023150	6028	6031#											
PAPRT2	023202	6033	6039#											
PAPRT3	023204	6030	6037	6040#										
PARS	014332	4723	4725*	4745*	4746*	4749#								
PATRN	000560	2825#	4601	4604	4713	4719	4733	5921*	5925*	5927*	5929*	5946*	5948*	5950*
		5953*	6016	6018										
PATS	014330	3189*	3438*	4354*	4719	4734*	4748#	5057*						
PFLG	000672	2867#	5156*	5243	5248*	5523*	5611	5616*						
PICK	017114	5285	5329#											
PIK1	000770	2906#	5277	5314	5330	5341								
PIK2	000772	2907#												
PIK3	000774	2908#												
PIK4	000776	2909#												
PIK5	001000	2910#												
PIK6	001002	2911#												
PIK7	001004	2912#												
PIK8	001006	2913#												
PRB	000624	2843#	4766											
PRS	000622	2842#	4760*	4762*	4763									
PSW	000606	2836#	5752*	5758*	5780*	6168	6169*	6173*						
RANBAS	000626	2844#	3343*	6063*	6064									
RANG	023254	4351	4369	4924	6063#	6066	6068							
RANSAV	000630	2845#	3344*	4352*	4353	4370	4925	6063	6064*	6065	6067			
RANSET	004276	3183	3343#	3437										
RCNT	000554	2823#	3345*	3583	3754	3927	3960	4298	4370*	4579	4581	4586	5919*	5945*
		6031	6043											
RCNTR	012202	3241	4367#											
RCSAV	000632	2846#	3345	4586*										
RDA	010004	3962	3964	3969#										
RDATA	033460	3776	3978	4014	4024	4206	4227	4240	4281	4293	4296	4306	4741	4781
		5043	5166	5211	5225	5399	5402	6448#						
RDCMD	000562	2826#	3882*	3890*	3894	3902*	3909*	3915*	3919	3923*	3963	3971	3979	3993

		4018	4025	4048	4067	4077	4132	4164	4192	4207	4225	5061	5109	5118
RDERR1	001150	5168	5175	5183	5189	5208	5231	5279	5397	5432	5498	6029		
RDER1	001110	2982#	3305	4020*	4052*									
RDER2	001112	2960#	3285	4022*	4050*									
RDER3	001114	2961#												
RDER4	001116	2962#												
RDER5	001120	2963#												
RDER6	001122	2964#												
RDER7	001124	2965#												
RDER8	001126	2966#												
RDEX	010672	2967#												
RDFL	015064	4078	4080	4082	4084	4088#								
RDRTG	010766	2778*	3168*	3439*	4709	4716*	4928*	4930#						
RDRTX	011250	4118#	4160											
RDRTY	010700	4167	4169#											
RDRT0	010712	4053	4102#											
RDRT1	010744	4103	4105#											
RDRT1A	010742	4107	4113#											
RDRT1B	010762	4112#												
RDRT2	011044	4114	4117#											
RDRT3	011066	4124	4131#											
RDRT4	011072	4133	4136#											
RDRT5	011074	4135	4137#											
RDRT5A	011140	4135	4138#											
RDRT5B	011150	4122	4148#											
RDRT6	011200	4141	4150#											
RDRT7	011244	4147	4155	4158#										
RDX	010676	4149	4168#											
RDO	010042	4165												
RD1	010110	4089#												
RD1A	010124	3972	3974	3977#	4076	4087								
RD1B	010132	3984	3987#											
RD1D	010140	3980	3990#											
RD10	010616	3989	3991#											
RD11	010626	3992#												
RD2	010144	4070	4072	4074#										
RD3	010204	4075	4077#											
RD4	010234	3991	3993#											
RD4A	010332	3994	3996	3998	4001#									
RD4A0	010364	4002	4008#											
RD4A1	010406	4013	4024#											
RD4A2	010430	4026	4031#											
RD4B	010436	4034	4037#											
RD4C	010442	4028	4030	4040	4042#									
RD4D	010472	4011	4044#											
RD4E	010476	4043	4045#											
RD5	010506	4049	4052#											
RD6	010530	4051	4053#											
RD7	010554	4009	4046	4055#										
RD7A	010604	4021	4023	4056	4058	4060#								
READ	007744	4063	4065#											
REGS	000544	4068	4071#											
REOT	004330	3891	3903	3916	3924	3960#								
REOTC	005054	2819#	4445	4447	4464									
		3362#	3686	3782	3806	3906	3930							
		3213	3215*	3402*	3408*	3409	3410*	3411*	3450#	3467*	3468	3469*	3470*	4425*
		4568*	4574	4575*	4576*	5875*	5902*	5904*						



SN	000540	2814#	4530													
SNPG	024520	6304	6307	6313	6315	6317#										
SNPT	024442	4531	6298#													
SPFLG	000572	2830#	3440	4629	4631											
STAL	000670	2866#	3249*	3260*	3263*	3332*	3395*	3482*	3601*	3772*	3896*	3921*	4065*	4189*		
		4198*	4202*	4204*	4278*	4304*	4308*	4332*	5748*	5756*						
STALL	012132	3261	3264	3602	3773	3897	3922	4066	4190	4205	4279	4309	4332#	4333		
START	003026	2772	2797	3155#												
STARTA	003160	2779	3176#	4007												
STARTB	003164	3169	3177#													
STARTC	003152	2775	3172#													
STARTD	003244	3173	3191#													
STARTE	003236	3190#	3449													
START1	003406	3216#	3339													
START2	003524	3234	3236#													
START3	003540	3237	3239#													
START4	003554	3221	3240	3242#	3250	3255										
START5	004216	3266	3326#													
START6	004234	3330#	3333													
START7	004264	3244	3331	3338#	3407											
START8	004272	3329	3339#													
STAR1A	003420	3218#														
STAR1B	003440	3219	3222#													
STAR1C	003474	3224	3226	3230#												
STAR4A	003634	3248	3256#													
STAR40	003566	3243	3245#													
STAUT	003136	2791	3159	3162	3167#											
STAUTO	003346	3207#	5924	5926	5928	5930	5947	5949	5951	5954						
STFLG	000640	2853#	3177	3178												
STP	003734	3269	3271#	3391												
STPX	004202	3270	3323#													
STTBL	001050	2937#	3184	3185	5858	5859										
SWR	000610	2837#	3157*	3193	3197	3201*	3233	3236	3239	3265	3326	3461	3580	3598		
		3611	3623	3642	3659	3673	3682	3706	3725	3883	3886	3888	3892	3899		
		3910	3912	3917	4008	4055	4062	4102	4113	4123	4148	4221	4249	4255		
		4288	5154	5195	5240	5245	5300	5308	5471	5512	5608	5613	5759	5767		
		5784	5786*	5793*	5800	6009	6073	6078	6082							
SWREG	000176	2768#	3157	3193	3201	5784	5793	6073								
TAPG	021144	3589	3641	3794	3992	4199	4220	4287	4305	5697#						
TAPG0	021156	5699#	5702													
TAPG1	021220	5705	5709#													
TAPG2	021232	5708	5712#													
TAPG3	021242	5700	5715#													
TAPG3A	021312	5723	5726#													
TAPG3B	021326	5725	5728	5730#												
TAPG3C	021346	5733	5736#													
TAPG3D	021412	5740	5742	5744#												
TAPG3E	021436	5747	5749#													
TAPG3F	021274	5716	5722#													
TAPG4	021464	5754#	5755	5757												
TAPG5	021500	5758#														
TAPG6	021542	5760	5767#													
TAPG7	021552	5768	5770#													
TBELL	024102	6188	6208#													
TC	000542	2815#	3246*	3362*	3415*	3477*	3497*	3500*	3515*	3528*	4513*	5628*	5892*			
TEMP1	000644	2856#	4501	4539	4551	4563	4761*	4767	4771*	5218*	5219*	5220*	5221*	5222		



		5224	5271*	5274*	5282*	5287	5332	5697*	5701*	5753*	5754*	5876*	5895*	5900
		5902	5903*	5904	6112*	6121	6143*							
TEMP2	000646	2857#	4495*	4496	4534*	4546*	4558*	4683*	4687	4772*	4779	5272*	5275*	5283*
		5288	5333											
TEMP3	000650	2858#	3716*	3723*	3737	3739*	4139*	4146*	4154	4156*	5273*	5295	5334*	6289
		6292												
TEND	005004	3442#	5870											
TIB	000642	2855#	6115	6119	6124	6129	6139	6141	6147*	6148	6174*	6175*	6176	
TINER	023656	6140	6142	6152	6154	6159#								
TINF	000636	2852#	3167*	3172*	3176*	3432*	4421	4648						
TINP	012226	3205	4421#											
TINPX	014070	4647	4649	4677#										
TINPO	012614	4486	4493#	4504	4518	4572								
TINPOB	012704	4502	4508#											
TINPOC	012744	4514#												
TINPOD	012764	4515	4519#											
TINPOE	013022	4522	4528#											
TINP1	013040	4532#												
TINP2	013116	4540	4544#											
TINP2A	013174	4552	4556#											
TINP2B	013252	4564	4568#											
TINP2C	013300	4507	4570	4573#										
TINP3	013320	4577#												
TINP3A	013650	4636#	5799											
TINP4	013714	4423	4646#											
TKB	000614	2839#	5775	6174										
TKS	000612	2838#	3216*	6170*	6171									
TMEX	000564	2827#	3633	3973	4081	4282	4611	4613	5922*					
TMFLG	000700	2870#	3635*	3679*	3696	3970*	3975*	3997	4010	4057	4069*	4083	4085*	4088*
		4200	4223	4251	5422	5443	5449	5460	5475	5528	5631	6032		
TOB	000640	2854#	5560*	5581*	5591*	6011*	6041*	6176*	6182*	6183	6185	6187	6191*	6194*
		6198*	6205	6209*	6254*	6265*	6276*	6279	6284*	6317*	6319*			
TOG	024064	5561	5582	5592	6012	6042	6177	6189	6192	6195	6199	6203#	6204	6210
		6255	6266	6320										
TPB	000620	2841#	6205*	6281*	6283*									
TPOS	014100	4543	4555	4567	4683#	4685								
TPOS1	014110	4510	4686#											
TPS	000616	2840#	6203	6277										
TSTAL	000600	2833#	3260	3263	3772	3896	3921	4278	4308	4670	4672			
TTIN	023674	6114	6168#											
TTINT	021556	2762	5775#											
TTOUT	023754	2751	6182#	6190	6200	6213								
TTR	023442	4451	4460	4482	4500	4538	4550	4562	4585	4596	4608	4617	4626	4635
		4644	4658	4667	4676	5810	5840	6086	6110#					
TWO	014226	4726	4729#											
TYPE =	000004	2754#	3161	3253	3273	3278	3283	3288	3293	3298	3303	3308	3313	3318
		3336	3380	3383	3389	3400	3423	3443	3487	3509	3618	3626	3666	3676
		3709	3711	3721	3728	3730	3734	3815	3819	3828	3844	3852	3862	4005
		4110	4116	4126	4128	4144	4151	4162	4436	4439	4444	4453	4477	4488
		4494	4517	4524	4529	4533	4545	4557	4578	4588	4600	4610	4619	4628
		4637	4651	4660	4669	5161	5164	5174	5182	5198	5338	5353	5526	5533
		5537	5541	5547	5551	5557	5567	5571	5577	5588	5603	5664	5707	5710
		5713	5719	5763	5766	5789	5803	5835	5844	5846	5850	5976	5980	5985
		5991	5998	6008	6021	6025	6046	6077	6081	6127	6136	6160		
TYPOCT=	104400	2758#	3276	3281	3286	3291	3296	3301	3306	3311	3316	3321	3387	3713
		3732	3736	3813	3817	3822	3850	4130	4153	4172	4446	4455	4527	4580





DTBOOT	1243#		
GETANS	767#		
LDPDR	515#		
LPDP11	1268#		
PSPTAG	746#		
REGBOX	132#		
RESLDR	873#		
SAVLDR	855#		
SVTK\$	1141#		
\$CATCH	1124#		
\$CHAIN	89#	2641#	3157
\$CHNMO	105#		
\$CNV16	606#		
\$CNV18	635#		
\$CNV48	704#		
\$CPCHK	897#		
\$CPREG	17#		
\$CPVEC	167#		
\$FPREG	46#		
\$GETAN	771#		
\$KMMRE	347#		
\$KWPD	998#		
\$KW11	929#		
\$LCTRL	2#		
\$LPREG	186#		
\$MAMFO	1176#		
\$MMBIT	207#		
\$MMREG	264#		
\$PDRBI	385#		
\$POWER	439#		
\$PSWBI	147#		
\$RECO	795#		
\$RESLD	876#		
\$RESTO	476#	2641#	6091
\$SAVE	464#	2641#	6090
\$SAVLD	858#		
\$SETTB	508#		
\$SHIFT	489#		
\$SMMRE	309#		
\$STINS	8#		
\$STKPT	202#		
\$ST200	1136#		
\$SVTK	1146#		
\$SWOPT	56#		
\$TCDRV	1029#		
\$TCREG	192#		
\$TRAPS	402#		
\$TYPE	518#		
\$TYPEF	592#		
\$UMPRE	272#		
\$VECTA	1163#		
.\$ACT1	67#	2641#	2759
.\$EOP	78#	2641#	3444
. ABS.	033462	000	

TMO3/TU45 DATA RELIABILITY PROGRAM  
CZTURB.P11 15-MAY-80 12:18

C 11  
MACY11 30A(1052) 15-MAY-80 12:23 PAGE 78-1  
CROSS REFERENCE TABLE -- MACRO NAMES

SEQ 0132

ERRORS DETECTED: 0

CZTURB.CZTURB/CRF=CZTURB.P11  
RUN-TIME: 23 40 4 SECONDS  
RUN-TIME RATIO: 173/68=2.5  
CORE USED: 15K (29 PAGES)