TM03,TE16

TM03/TE16,TU77 BFT

CZTECC0

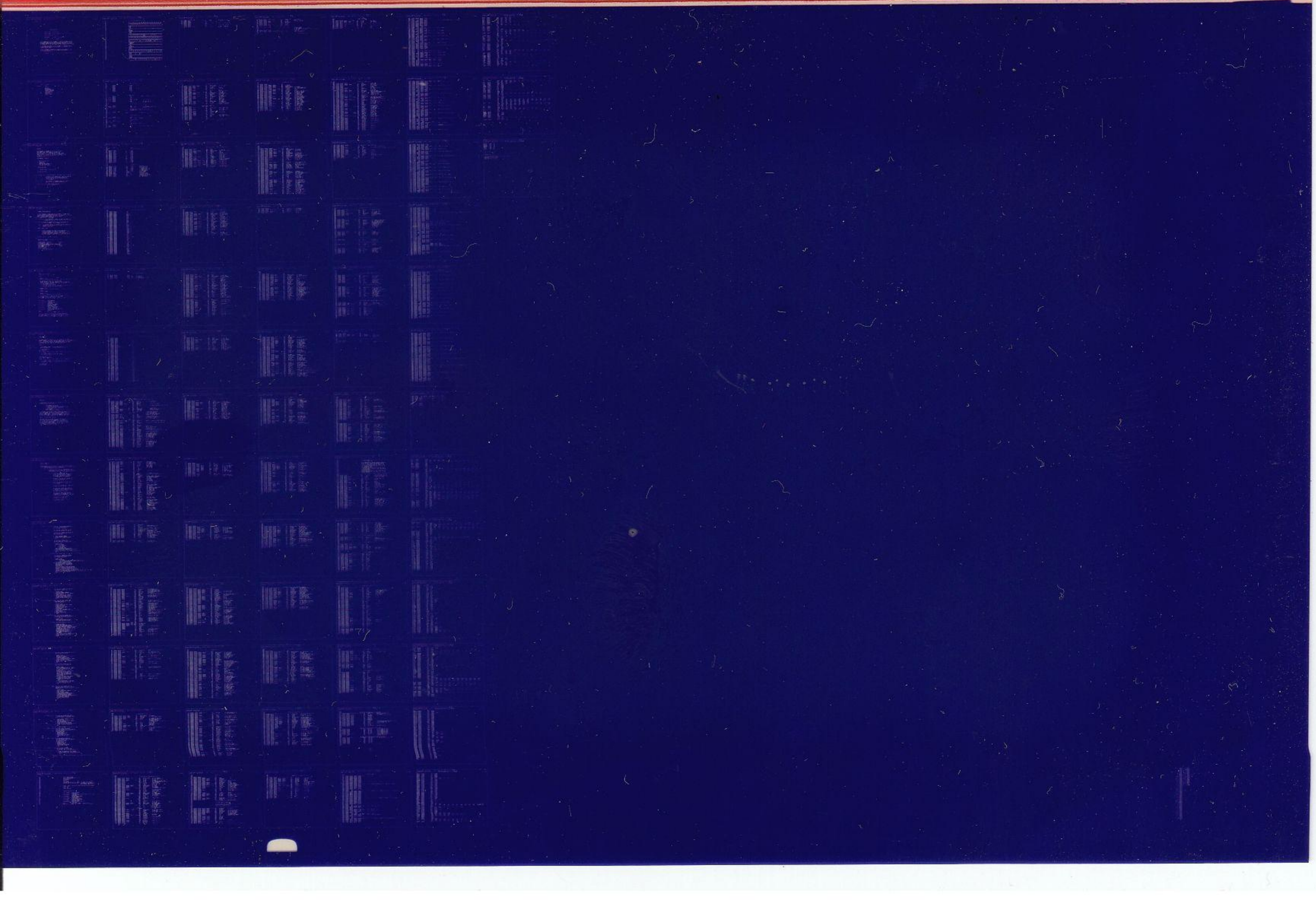
AH-A798C-MC

FICHE 1 OF 1

JAN 1980

digital

MADE IN USA



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IDENTIFICATION

PRODUCT CODE: AC-A797C-MC

PRODUCT NAME: CZTECCO TM03-TE16/TU77 BASIC FUNCTION TEST

DATE CREATED: 24 JUL 79

MAINTAINER: DIAGNOSTIC ENGINEERING

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1. ABSTRACT

THIS PROGRAM IS INTENDED TO TEST ALL OF THE BASIC FUNCTIONAL LEVEL OPERATIONS OF THE TM03/TE16 MAG TAPE SYSTEM. ALL FUNCTIONS; WRITE, READ, SPACE, ERASE, REWIND, ETC; WILL BE TESTED. IN ADDITION TO THE TM03/TE16 TESTS, THE RH WILL BE TESTED SEPARATELY IN SO FAR AS IT IS POSSIBLE TO SEPARATE THE RH FROM THE TM03/TE16 ITSELF.

2. REQUIREMENTS (HARDWARE)

A. ANY PDP11 PROCESSOR
B. 8K OF CORE
C. CONSOLE TTY
D. TM03 MAGTAPE CONTROLLER
E. MASS BUS CONTROLLER
F. TE16 MAG TAPE TRANSPORT

3. LOADING PROCEDURE

USE STANDARD BINARY LOADING PROCEDURE

4. STARTING PROCEDURE

THERE ARE TWO (2) STARTING ADDRESSES THAT MAYBE USED: 200(8) AND 210(8)

A. 200(8): STARTING AT THIS ADDRESS WILL CAUSE THE PROGRAM IDENTIFICATION TO BE PRINTED FOLLOWED BY REQUESTS FOR THE VARIOUS PARAMETERS NEEDED BY THE PROGRAM.

B. 210(8): THIS ADDRESS IS INTENDED FOR USE AS A RESTART ONLY AND WILL USE THE CURRENT PARAMETER VALUES.

**NOTE SEE ALSO SECTION 5-CONSOLE SWITCH SETTINGS
** TYPE ^C TO RESTART PROGRAM (@200)

4. AUTOMATIC MODE OPERATION

IF THIS PROGRAM IS LOADED AND RUN IN AUTOMATIC (CHAIN) MODES
DEFAULT RESPONSES TO OPERATOR REQUESTS ARE USED, AND ALL AVAIL-
ABLE TM03/TE16 COMBINATIONS ARE TESTED. ADDITIONALLY THE SOFTWARE
SWR IS INVOKED WITH A SWITCH SETTING OF 000000
IF LOADED VIA ACT11 CHAIN MODE.

**EXCEPTION: IF THIS PROGRAM IS LOADED VIA TMDP CHAIN MODE THE
PROGRAM WILL NOT TEST TM03 DRIVE #0, TE16 SLAVE #0.

**NOTE: IN OREDER TO CHANGE THE SETTING OF THE SOFTWARE SWR,
SET LOC: 176(SWREG:) TO THE DESIRED SETTING.

** NOTE: THIS PROGRAM CONTAINS AN OPERATOR ASSISTED SUBTEST.THIS
SUBTEST IS NOT EXECUTED IN CHAIN MODE.TO RUN LOAD THE
PROGRAM IN DUMP MODE.

4.2 SAMPLE START AT 200

NOTE: DEFAULT RESPONSES ARE SHOWN IN ANGLE BRACKETS <>,
OPERATOR RESPONSES ARE SHOWN IN PARENTHESES (), AND
LOCATIONS CONTAINING THE DEFAULT ARE SHOWN IN [].
TO INVOKE THE DEFAULT RESPONSE TYPE (CR).NON STANDARD
MODE FOR JUMPERS IS M8931 (W2-IN) ,M8937(W2-IN,W1-OUT).

PARAMETER REQUEST: <DEFAULT> (RESPONSE) [LOCATION:]

```
TM03-TE16/TU77 BASIC FUNCTIONS TEST (DZTEC-B)
TYPE ^C TO RESTART

REGISTER START: <172440> (CR)                [REGS:]
VECTOR ADDRESS: <224> (CR)                   [VECT:]
IS CONTROLLER JUMPERED IN NON-STANDARD MODE
TYPE 2 FOR NON-STANDARD OR CR FOR STANDARD: <3> [JUMPER:]
DRIVE NUMBER: <0> (CR)                       [DRVN:]
SLAVE NUMBER: <0> (CR)                       [SLVN:]
SERIAL NO: 12345
RH ONLY (NO=0,YES=1): <0> (0)                [RHOF:]
        IF THE SOFTWARE SWR IS INVOKED:
SWR    <000000> NEW  - (CR)
```

5. CONSOLE SWITCH SETTING

CONTROL:

1) CONTROL G <^G>;
SELECTS THE SOFTWARE SWR AND ALLOWS THE USER TO SELECT NEW SWITCH SETTINGS.

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 NEW SWITCH SETTING
B) IF A <CR> IS THE FIRST KEY DEPRESSED THE SOFTWARE SWITCH
REGISTER CONTENTS WILL NOT BE CHANGED.

2) CONTROL A <^A>;
ALTERNATES USAGE OF SWR FROM HARDWARE TO SOFTWARE & VICE VERSA.

3) CONTROL C <^C>;
RESTARTS PROGRAM AT 200

4) CONTROL U <^U>;
DELETES ALL CHARACTERS TYPED IN RESPONSE TO A REQUEST.

ALL SWITCHES EXCEPT 5-9 ARE USED AND THE NORMAL, OR DEFAULT,
RUN IS DONE WITH ALL SWITCHES SET TO ZERO (0).
ALL HARDWARE SWITCHES ARE DYNAMIC, AND MAY BE CHANGED AT ANY TIME.

SW15(100000):	1-HALT ON ERROR
	0=CONTINUE
SW14(040000):	1=LOOP ON ERROR (SCOPE: RH TESTS ONLY)
	0-CONTINUE
SW13(020000):	1=DO NOT PRINT ERRORS
	0=PRINT ALL ERRORS
SW12(010000):	1-CONTINUOUS CYCLE
	0=HALT AT END OF PASS
SW11(004000):	1=INHIBIT ITERATION
	0=DO ALL ITERATIONS PER TEST
SW10(002000):	1=HALT AT END OF CURRENT TEST
	0=CONTINUE
SW9-5:	N/A
SW4-0:	SELECT TEST NUMBER::00-ALL TESTS

THE USE OF SW0-4 IS TO ALLOW SELECTION AND CONTINUOUS
EXECUTION OF ANY TEST. THE TEST SELECTION MAY BE CHANGED AT
ANY TIME, HOWEVER IT IS ADVISABLE TO USE SW10 TO STOP THE
PROGRAM AT THE END OF THE CURRENT TEST BEFORE SELECTING A TEST.

6. ERROR PRINTOUTS

THE ERROR PRINTOUTS FOR EACH TEST WILL APPEAR IN THE SAME GENERAL FORMAT. THE FIRST LINE WILL ALWAYS SHOW THE TEST NUMBER AND ITS TITLE. THE SECOND LINE WILL BE AN EXPLANATION OF THE ERROR. THE FOLLOWING LINES WILL SHOW THE APPROPRIATE REGISTER OR ADDRESS VALUES THAT ARE APPLICABLE TO THE INDIVIDUAL TEST

EXAMPLES:

1. THIS EXAMPLE SHOWS A TYPICAL ERROR PRINTOUT FOR THE WRITE READ TEST: A WRITE CRC ERROR OCCURRED ON SLAVE 6.

```
FT13: WRITE-READ TEST
WRITE ERROR NRZ
CS1     WC      BA      FC      CS2     DS      ER      TC
144260  000000  015650  000000  000103  150600  100000  101306
```

2. THIS EXAMPLE SHOWS A TYPICAL SPACE ERROR: THE FC IS NOT ZERO AT THE END OF THE OPERATION.

```
FT14:SPACE TEST
SPACE REVERSE ERROR NRZ
CS1     WC      BA      FC      CS2     DS      ER      TC
144230  177700  017162  177740  000114  150600  001000  161700
```

3. THIS EXAMPLE SHOWS A SPACE OPERATION WHICH RESULTED IN INCORRECT POSITIONING. SHOULD BE AT RECORD 20, IS AT RECORD 22.

```
FT14: SPACE TEST
POSITION ERROR:
REVERSE ERROR EXPT:20 RCVD:22
```

7. OPERATION

THE PROCEDURES FOR OPERATING THIS PROGRAM ARE QUITE SIMPLE
AND REQUIRE ONLY A FEW STEPS:

1. LOAD ADDRESS 200 OR 210
2. SET SWITCHES FOR DESIRED TEST CYCLE
   ****REFER TO SECTION 5 FOR DYNAMIC LOADING
   OF SOFTWARE SWITCH REGISTER.***
3. PRESS STAR
4. ENTER APPROPRIATE RESPONES TO THE TTY REQUESTS

ALL HARDWARE SWITCHES ARE DYNAMIC AND MAY BE CHANGED AT ANY
TIME. THE NORMAL, OR DEFAULT, OPERATING SEQUENCE IS ALL
SWITCHES DOWN (ZERO). THE END OF EACH PASS IS NOTED BY A
MESSAGE STATING END OF PASS AND THE NUMBER OF THAT PASS.
*****FOR THE DYNAMIC LOADING OF THE SOFTWARE SWITCH REGISTER REFER TO SECTION 5 ******

SINGLE TEST SELECTION: (SW0-SW4)

WHEN SW0-4 ARE SET TO ZERO (00) THE SCHEDULAR WILL
EXECUTE ALL OF THE TESTS IN SEQUENCE . IF SW0-4 IS
SET TO SOME SPECIFIC TEST NUMBER THAT PARTICULAR TEST
WILL BE EXECUTED CONTINUOUSLY. ANY TEST MAY BE SINGLE
SELECTED IN ANY ORDER; HOWEVER, THE BEST WAY TO AFFECT
THE CHANGE IS TO USE SW10 TO HALT THE CURRENT TEST, THEN
CHANGE NUMBER AND PRESS CONTINUE.

8. SUBTEST SUMMARIES

THE FOLLOWING IS A LIST OF ALL TESTS IN THEIR PROPER SEQUENCE.
A BASIC DESCRIPTION OF EACH TEST IS PROVIDED TO AID IN UNDERSTANDING
OF THE ERROR MESSAGES ASSOCIATED WITH EACH ONE.

A. RH TESTS: THE FIRST TEN (10) TESTS WILL PERFORM BASIC RH
OPERATIONS AS FAR AS IS POSSIBLE WITHOUT REQUIRING
THE TM03-TE16/TU77 ITSELF. (SEE RH ONLY OPTION; PAR 7)

FT1: RH ADDRESSING: THIS TEST WILL ASSURE THAT THE
RH WILL RESPOND WITHOUT CAUSING A BUS
TRAP TO ALL TM02 REGISTER ADDRESS
IN SEQUENCE STARTING AT THE ADDRESS
OF CS1 ENTERED BY THE OPERATOR.

FT2: RH REGISTER BITS READ/WRITE: THIS TEST WILL ASSURE THAT
ALL BITS OF THE RH WRITE/READ REGISTERS
CAN BE SET AND RESET.

FT3: RH INITIALIZE: THIS TEST WILL ASSURE THAT A RH INITIALIZE
(BIT 5 OF CS2=1) WILL INDEED CLEAR
THE RH ERRORS.

* FT4: SILO TEST 1: THIS TEST WILL ASSURE THAT A READ FROM
AN EMPTY SILO WILL CAUSE DLT TO SET.

* FT5: SILO TEST 2: THIS TEST WILL ASSURE THAT BOTH THE
IR AND OR BITS WILL CORRECTLY RESPOND
TO LOADING OF THE SILO WITH ALL ZEROS
AND THEN A WORD OF ALL ONES.

* FT6: SILO TEST 3: THIS TEST WILL WRITE AND THEN READ
THE ENTIRE SILO TO ASSURE THAT DATA CAN
BE PROPERLY FILLED AND READ. ALSO THE
PROPER STATUS OF IR AND OR ARE CHECKED.

* FT7: SILO TEST 4: THIS TEST WILL ASSURE PROPER RH11
RESPONSE TO SILO OVERFLOW.

* FT10: SILO TEST 5: THIS TEST WILL ASSURE SILO RESET
BY RH11' INITIALIZE.

**** NOTE: SILO TESTS (FT4-FT10) ARE FOR THE RH11 ONLY. *****

B. TM03-TE16/TU77 BASIC FUNCTIONS: THE FOLLOWING FOURTEEN (14) TESTS WILL ASSURE OPERATION OF THE MAG TAPE BASIC FUNCTIONS.

FT11: NOP TEST: THIS TEST WILL ASSURE THAT THE NOP FUNCTION EXECUTES WITH NO ERROR.

FT12: REWIND TEST: THIS TEST WILL ASSURE THAT THE REWIND FUNCTION WILL POSITION THE TAPE TO BOT WITH NO ERROR.

1. ISSUE A REWIND COMMAND
2. AWAIT PIP RESET (MOTION STOPPED)
3. ASSURE THAT NO ERROR OCCURED
4. END

FT13: WRITE/READ TEST: THIS TEST WILL ASSURE THAT THE UNIT UNDER TEST CAN WRITE AND READ IN ALL DENSITIES (FOR BOTH PE AND NRZ).

1. REWIND TO BOT
2. WRITE 100 RECORDS
   A, ALL ONES DATA
   B, 200 FRAMES
   C, 200 BPI; ODD
3. CHECK FOR ERRORS ON EACH RECORD
4. READ REVERSE THEN FORWARD ALL 100 RECORDS
5. CHECK FOR ERRORS ON EACH RECORD
6. REPEAT STEPS 2 THRU 5 FOR 556,800,1600 BPI
7. END.

DATA READ IS NOT CHECKED; ONLY THE FUNCTION IS TESTED, NOT THE MEDIUM.

FT14: SPACE TEST: THIS TEST WILL ASSURE THAT PROPER POSITIONING IS MAINTAINED BY BOTH SPACE FORWARD AND REVERSE.

1. REWIND TO BOT
2. WRITE 100 RECORDS
   A. EACH RECORD IS ONE FRAME LARGER THAN THE LAST.
      THIS WILL ALLOW FOR POSITION CHECKING BY RECORD SIZE.
3. EACH RECORD IS ERROR CHECKED.
4. DATA RELATED ERRORS ARE IGNORED.
5. NOW SPACE REVERSE 77 RECORDS AND READ REVERSE 1, THE FRAME COUNT SHOULD BE 100.
   THIS IS THE SIZE OF THE FIRST RECORD.
6. NOW SPACE FORWARD 76 RECORDS AND READ FORWARD 1, THE FRAME COUNT SHOULD BE 177.
   THIS IS THE SIZE OF THE NEXT TO LAST RECORD.
7. CONTINUE THE SPACE AND READ (DECREMENTING THE RECORD COUNT EACH TIME) UNTIL ALL POSITIONS HAVE BEEN CHECKED. IF POSITION IS LOST; TEST ENDS.
8. REPEAT STEPS 1 THRU 7 FOR PE.
9. END

FT15: ERASE TEST: THIS TEST WILL ASSURE THAT THE ERASE FUNCTION WILL INDEED ERASE TAPES.

1. REWIND TO BOT
2. ISSUE 200 ERRASE COMMANDS.
3. ASSURE NO ERRORS FOR EACH COMMAND.
4. REWIND TO BOT.
5. ISSUE A READ FORWARD COMMAND.
6. THE TAPE SHOULD MOVE FORWARD UNTIL STOPPED BY OPI (APPROX 25 FT).
7. ASSURE NO ERRORS OTHER THAN OPI.
8. END

FT16: TAPE MARK WRITE/READ: THIS TEST WILL ASSURE THAT A TAPE MARK CAN BE WRITTEN AND READ IN BOTH PE AND NRZ.

1. REWIND TO BOT.
2. ISSUE A WRITE TAPE MARK COMMAND.
3. ASSURE NO ERRORS.
4. ASSURE THAT TAPE MARK STATUS IS SET IN DRIVE STATUS (BIT 2).
5. READ REVERSE.
6. ASSURE THAT TAPE MARK IS SET.
7. ASSURE THAT NO ERRORS OTHER THAN FCE OCCURED.
8. READ FORWARD.
9. REPEAT STEPS 6 AND 7
10. REPEAT STEPS 1 THRU 9 FOR PE.
11. END

FT17: TAPE MARK SPACE TEST: THIS TEST WILL ASSURE THAT SPACING WILL BE TERMINATED BY RECOGNITION OF TAPE MARK BOTH IN PE AND NRZ.

1. REWIND TO BOT.
2. WRITE THE FOLLOWING PATTERN OF TAPE MARKS AND DATA RECORDS:

TM:20 RECS:TM:40 RECS:TM:60 RECS:TM:100 RECS:TM:

3. ASSURE NO ERRORS.
4. ASSURE THAT TAPE MARK STATUS IS SET FOR TM WRITES.
5. NOW SPACE REVERSE 200 RECORDS.
6. THE SPACE OPERATION SHOULD STOP ON EACH TAPE MARK IT FINDS. THEREFOR 5 SPACE COMMANDS ARE ISSUED TO COVER THE ENTIRE PATTERN WRITTEN ON TAPE.
   BOT SHOULD NEVER BE REACHED AND THE FRAME COUNT WILL REFELCT THE NUMBER OF RECORDS BETWEEN TAPE MARKS.
7. REPEAT STEP 6 IN THE FORWARD DIRECTION.
8. ASSURE NO ERRORS OTHER THAN FCE.
9. REPEAT STEPS 1 THRU 8 FOR PE
10. END

FT20: WRITE CHECK TEST: BOTH WRITE CHECK FORWARD AND REVERSE ARE TESTED IN BOTH PE AND NRZ.

1. REWIND TO BOT.
2. WRITE A 400 FRAME RECORD USING DATA PATTERN 3 (125125).
3. ASSURE NO ERRORS OCCURED.
4. ISSUE A REVERSE WRITE CHECK COMMAND.
5. ASSURE NO ERRORS OCCURED.
6. REPEAT STEP 5 FOR A FORWARD WRITE CHECK.
7. REPEAT STEPS 1 THRU 6 FOR PE.
8. END

FT21: ERASE HEAD TEST: THIS TEST WILL ASSURE THAT THE ERASE HEAD ITSELF IS OPERATING.

1. REWIND TO BOT.
2. WRITE 2 RECORDS OF 800(10) FRAMES EACH. EACH RECORD WILL BE 1 INCH OF TAPE. DATA IS NOT ALL ONES.
3. REWIND TO BOT.
4. NOW WRITE A 400(10) FRAME RECORD. THIS RECORD WILL BE ONE HALF INCH OF TAPE. THE ERASE HEAD SHOULD CLEAR THE REMAINDER OF THE FIRST RECORD (ONE HALF INCH).
5. REWIND TO BOT.
6. NOW READ THE SHORT FIRST RECORD. IT SHOULD BE 400(10) FRAMES.
7. NOW READ THE SECOND RECORD. IT SHOULD BE STILL 800(10) FRAMES.
8. IF THE SECOND RECORD IS 100 LONG, THE ERASE HEAD DID NOT FUNCTION OR IT IS IN THE WRONG POLARITY.
10. END

FT22: BUFFERED COMMAND: THIS TEST WILL ASSURE THAT THE TM02 WILL ACCEPT AND EXECUTE ANOTHER COMMAND WHILE ITS SELECTED SLAVE IS REWINDING.

1. REWIND TO BOT.
2. ISSUE 3 LONG WRITE COMMANDS TO ASSURE BEING OFF BOT.
3. ISSUE A REWIND COMMAND.
4. AS SOON AS DRIVE READY BECOMES SET, ISSUE ANOTHER WRITE COMMAND.
5. THE NEXT DRIVE READY SHOULD BE AFTER THE TAPE HAS REACHED BOT AND EXECUTED THE BUFFERED WRITE COMMAND.
6. ASSURE NO ERRORS OCCURED.
7. END

FT23: READ IN PRESET: THIS TEST WILL ASSURE THAT UNIT 0
IS REWOUND AND SET TO 800 BPI NORMAL.
(ONLY IF SLAVE 0 IS SELECTED).

1. ISSUE A WRITE COMMAND TO ASSURE
   BEING OFF BOT.
2. ISSUE THE READ-IN PRESET COMMAND.
3. AWAIT MOTION STOP.
4. ASSURE THAT BOT WAS REACHED.
5. ASSURE THAT THE TAPE CONTROL REGISTER
   IS SET TO 800 BPI,NORMAL,ODD.
6. END

(THIS TEST IS ONLY PERFORMED IF THE SELECTED SLAVE IS ZERO (0).

FT24: AUTOMATIC DENSITY SELECTION -WRITE NRZ,READPF:
THIS TEST ASSURES THAT AW NRZ WRITTEN
TAPE WHEN READ AS PE WILL SWITCH THE
SLAVE TO NRZ MODE.
1. REWIND SLAVE
2. WRITE AN NRZ RECORD
3. REWIND SLAVE
4. READ RECORD IN PE MODE
5. CHECK DS REG PES BIT=0
6. END

FT25: AUTOMATIC DENSITY SELECTION-WRITE PE,READ NRZ:
THIS TEST ASSURES THAT A PE WRITTEN
TAPE WHEN READ AS NRZ WILL SWITCH
THE SLAVE TO PE MODE.
1. REWIND SLAVE
2. WRITE A PE RECORD
3. REWIND A SLAVE
4. READ RECORD IN NRZ MODE
5. CHECK DS REG PES BIT=1
6. END.

FT27: REWIND: OFF LINE THIS TEST WILL ASSURE
THAT THE UNIT WILL REWIND AND
GO OFF LINE. (NOT IF IN CONTINUOUS CYCLE)

1. ISSUE THE REWIND OFF-LINE COMMAND.
2. ASSURE THAT MOL (BIT 12 OF DRIVE STATUS)
   IS RESET INDICATING THE UNIT WENT OFF LINE.
3. END

(THIS TEST IS NOT PERFORMED WHEN CONTINUOUS CYCLE OPERATION IS SELECTED: SW 12 1)

```
                        .LIST   BIN,LOC,SEQ
                        .TITLE CZTECC0 TM03-TE16/TU77 BFT
                        ;BASIC FUNCTION TEST
                        ;AC-A797B-MC
                        ;FEB 77
                        ;J.G. ADAMS
                        ;REVISED JUN 1977 BY J.G. ADAMS ;+*B ADDED TU77 CAPABILITY
                        ;REVISED NOV 1978 BY MIKE PAGE  ;+ DESIGNATES CODE ADDED FOR
                                                        ;NON-STANDARD JUMPER CONFIG.

                        .MCALL  .$ACT11,.$EOP,$CATCH,$SAVE,$RESTORE,$CHAIN,$CHNMODE
                        .NLIST  MC
                        .LIST   ME
                        .ENABLE ABS,AMA


                        ;CONSOLE SWITCHES*********
                        ;
                        ;SW15(100000):  1=HALT ON ERROR
                        ;               0=CONTINUE
                        ;SW14(040000)   1=LOOP ON ERROR (SCOPE(040000) RH TESTS ONLY)
                        ;               0=CONTINUE
                        ;SW13(02000):   1=DO NOT PRINT ERRORS
                        ;               0=PRINT ERRORS
                        ;SW12(010000):  1=CONTINUOUS CYCLE
                        ;               0=HALT AT END OF PASS
                        ;SW11(40000):   1=INHIBIT ITERATIONS
                        ;               0=DO ITERATIONS
                        ;SW10(002000):  1=HALT AT END OF EACH TEST
                        ;               0=CONTINUE
                        ;SW0-4:         SELECT TEST NUMBER :: 00=ALL TESTS
                    ;USE SOFTWARE SWR IF HARDWARE SWR <15::00> = 177777 OR NOT AVAIL.
```

```
                        ;TE16/TU77 REGISTER BITS**********
                        ;
                        ;15 ;14 ;13 ;12 ;11 ;10 ;09 ;08 ;07 ;06 ;05 ;04 ;03 ;02 ;01 ;00 ;
                        ;XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
                ;CS1:   ;SC ;TRE;MCP;SPR;DNA;PSL;A17;A16;RDY;IE ;FUN;FUN;FUN;FUN;FUN;GO ;
                        ;   ;   ;   ;   ;   ;   ;   ;   ;   ;   ;   ;   ;   ;   ;   ;
                        ;XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
                ;WC:    ; WORD                                                          ;
                        ; COUNT                                                         ;
                        ;XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
                ;BA:    ; BUS                                                           ;
                        ; ADDRESS                                                       ;
                        ;XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
                ;FC:    ; FRAME                                                         ;
                        ; COUNT                                                         ;
                        ;XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
                ;CS2:   ;DLT;WCE;UPE;NED;NEM;PGE;MXF;MDP;OR ;IR ;CLR;PAT;BAI;U2 ;U1 ;U0 ;
                        ;   ;   ;   ;   ;   ;   ;   ;ERR;   ;   ;   ;   ;   ;   ;   ;
                        ;XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
                ;DS:    ;ATA;ERR;PIP;MOL;WRL;EOT;SPR;DPR;DRY;SSC;PES;SDN;IDB;TMK;BOT;SLA;
                        ;   ;   ;   ;   ;   ;   ;   ;   ;   ;   ;   ;   ;   ;   ;   ;
                        ;XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
                ;ER:    ;CDE;UNS;OPI;DTE;NEF;CS ;FCE;NSG;PEF;INC;DAT;FMT;CNT;RMR;ILR;ILF;
                        ;CRC;   ;   ;   ;ITM;   ;   ;LRC;VPE;BPE;   ;BPE;   ;   ;   ;
                        ;XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
                ;ATS:   ; ATTENTION                                                     ;
                        ; SUMMARY                                                       ;
                        ;XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
                ;CC:    ; CHECK                                                         ;
                        ; CHARACTER                                                     ;
                        ;XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
                ;DB:    ; DATA                                                          ;
                        ; BUFFER                                                        ;
                        ;XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
                ;MR:    ;DB ;DB ;DB ;DB ;DB ;DB ;DB ;DB ;DB ;WRT;MM ;OP ;OP ;OP ;OP ;MM ;
                        ; 0 ; 1 ; 2 ; 3 ; 4 ; 5 ; 6 ; 7 ; P ;CLK;CLK; 4 ; 3 ; 2 ; 1 ;GO ;
                        ;XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
                ;DT:    ; DRIVE      ; 7 ;    ;SLV;                                   ;
                        ; TYPE       ;CH ;    ;PR ;                                   ;
                        ;XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
                ;SN:    ; SERIAL                                                        ;
                        ; NUMBER                                                        ;
                        ;XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
                ;TC:    ;ACL;FCS;SAC;ENA;SPR;DEN;DEN;DEN;FMT;FMT;FMT;FMT;EVN;SSN;SSN;SSN;
                        ;   ;   ;   ;DT ;   ; 4 ; 2 ; 1 ; 8 ; 4 ; 2 ; 1 ;PAR; 4 ; 2 ; 1 ;
                        ;XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
```

```
                                        ;REGISTER EQUIVS**********

            000000                      R0=%0
            000001                      R1=%1
            000002                      R2=%2
            000003                      R3=%3
            000004                      R4=%4
            000005                      R5=%5
            000006                      SP=%6
            000007                      PC=%7


                                    ;ACT11 HOOK ***********
            000764                      $SVPC=.                 ;SAVE CURRENT LOCATION CTR
            000042                      .=42
000042      000000                      .WORD   0
            000046                      .=46
000046      003222                      .WORD   $ENDAD          ;SET LOCATION 46
            000052                      .=52
000052      000000                      .WORD   0               ;SET LOCATION 52 = 0
            000764                      .=$SVPC                 ;RESTORE LOCATION CTR

                                        ;TTY INTERRUPT VECTOR**********

            000060                      .=60
000060      013532                      .WORD   TTINT           ;TTY INTERRUPT HEADER ADDRESS
000062      000340                      .WORD   340             ;PRIORITY LEVEL 7

                                        ;SOFTWARE SWITCH REGISTER**********
                                    ;USED IF HARDWARE SWR <15::00> = 177777 OR NOT AVAIL.

            000176                      .=176
000176      000000              SWREG:  0                       ;SOFTWARE SWITCH REGISTER


                                        ;START ADDRESS**********

            000200                      .=200
000200      000137  001600              JMP     START   ;PROGRAM START

                                        ;RESTART ADDRESS**********
            000210                      .=210
000210      000137  002540              JMP     ST4

                                        ;TM03 INTERRUPT VECTOR**********

            000224                      .=224
000224      013522                      MTINT           ;TAPE INTERRUPT HANDLER ADDRESS
000226      000340                      340
```

```
                        000510                          .=510
                                                        ;MASS BUS REGISTER EQUIVS**********

000510  172440                         C1:     172440
000512  172442                         WC:     172442
000514  172444                         BA:     172444
000516  172446                         FC:     172446
000520  172450                         CS:     172450
000522  172452                         DS:     172452
000524  172454                         ER:     172454
000526  172456                         AS:     172456
000530  172460                         CC:     172460
000532  172462                         DB:     172462
000534  172464                         MR:     172464
000536  172466                         DT:     172466
000540  172470                         SN:     172470
000542  172472                         TC:     172472
000544  172474                         BAE:    172474

                                                        ;CONSTANTS**********

000546  177776                         PSW:    177776          ;PROCESSOR STATUS
000550  177570                         SWR:    177570          ;SWITCH REGISTER
000552  177560                         TKS:    177560          ;TTY READER STATUS
000554  177562                         TKB:    177562          ;TTY READ BUFFER
000556  177564                         TPS:    177564          ;TTY PUNCH STATUS
000560  177566                         TPB:    177566          ;TTY PUNCH BUFFER
000562  177777                         SERNUM: 177777          ;SERIAL NUMBER
000564  000011                         DRVTP:  011             ;DRIVE TYPE
000566  000010                         ITAMT:  10              ;ITERATION AMOUNT
000570  000224                         VECT:   224             ;INTERRUPT VECTOR(RH)
000572  172440                         REGS:   172440          ;STARTING REGISTER ADDRESS
000574  000004                         BTRP:   4               ;BUS TRAP ADDRESS
000576  000006                         BTRP2:  6               ;BUS TRAP PRIORITY LEVEL 7
```

```
                                        ;FLAGS AND COUNTERS**********

000600  000000          TOB:    0
000602  000000          TIB:    0
000604  000000          RH17F:  0
000606  000000          HDRFL:  0
000610  000000          EMADDR: 0
000612  000000          DRVN:   0
000614  000000          SLVN:   0
000616  000000          BADDR:  0
000620  000000          FCNT:   0
000622  000000          WCNT:   0
000624  000000          RCNT:   0
000626  000000          ERRP:   0
000630  000000          ERRP1:  0
000632  000000          RRD:    0
000634  000000          RFD:    0
000636  000000          RDYDX:  0
000640  000000          OPDYX:  0
000642  000000          SCNT:   0
000644  000000          PFLG:   0
000646  000000          RTRN:   0
000650  000000          ERADD:  0
000652  000000          TEMP1:  0
000654  000000          TEMP2:  0
000656  000000          TEMP3:  0
000660  000000          STMSK:  0
000662  000000          ITCNT:  0
000664  000000          DSAV:   0
000666  000000          SAV1:   0
000670  000000          SAV2:   0
000672  000000          SAV3:   0
000674  000000          SCOLP:  0
000676  000000          ITRLP:  0
000700  000000          EXFL:   0
000702  000000          PEXFL:  0
000704  000000          STFLG:  0
000706  000000          LTADD:  0
000710  000000          FUN:    0
000712  000000          SERFL:  0
000714  000000          CRCNT:  0
000716  000000          UDES:   0
000720  000000          PATRN:  0
000722  000000          RHTF:   0
000724  000000          NRZOF:  0
000726  000000          RHOF:   0
000730  000000          PCNTR:  0
000732  000000          TEMPST: 0
000734  000000          COUNT:  0
000736  000000          RDSW:   0
000740  000000          NONSTD: 0
000742  000000          JUMPER: 0
```

```
                                        ;DATA PATTERN GENERATORS*****

000744  000000            DATBL:  0
000746  013216            DATA0:  DAT1    ;ALL ONE BITS
000750  013236            DATA1:  DAT2    ;ALL ZERO BITS
000752  013242            DATA2:  DAT3    ;ALTERNATING ONE/ZERO BITS
000754  013250            DATA3:  DAT4    ;ALL BITS 0-377
```

```
752
753                                     ;LOGIC TEST ENTRY TABLE**********
754
755  000756  000000           TSTTBL: 0
756  000760  000000                   0
757  000762  003264                   FT1
758  000764  003264                   FT1
759  000766  003372                   FT2
760  000770  003372                   FT2
761  000772  003714                   FT3
762  000774  003714                   FT3
763  000776  004134                   FT4
764  001000  004134                   FT4
765  001002  004262                   FT5
766  001004  004262                   FT5
767  001006  004454                   FT6
768  001010  004454                   FT6
769  001012  004726                   FT7
770  001014  004726                   FT7
771  001016  005022                   FT10
772  001020  005022                   FT10
773  001022  005156                   FT11
774  001024  005156                   FT11
775  001026  005274                   FT12
776  001030  005274                   FT12
777  001032  005406                   FT13
778  001034  005406                   FT13
779  001036  005720                   FT14
780  001040  005720                   FT14
781  001042  006572                   FT15
782  001044  006572                   FT15
783  001046  007204                   FT16
784  001050  007204                   FT16
785  001052  007432                   FT17
786  001054  007432                   FT17
787  001056  010034                   FT20
788  001060  010034                   FT20
789  001062  010260                   FT21
790  001064  010260                   FT21
791  001066  010612                   FT22
792  001070  010612                   FT22
793  001072  011016                   FT23
794  001074  011016                   FT23
795  001076  011236                   FT24
796  001100  011236                   FT24
797  001102  011430                   FT25
798  001104  011430                   FT25
799  001106  011622                   FT26
800  001110  011622                   FT26
801  001112  012060                   FT27
802  001114  012060                   FT27
803  001116  003156                   .WORD   TEND
804  001120  000027           TLAST:  .WORD   27              ;CONTAINS # OF TESTS
```

```
  805          001600                          .=1600
  806                                          ;PROGRAM START AND HOUSEKEEPING**********
  807
  808  001600  012706  000500          START:  MOV     #500,SP         ;SET STACK POINTER
  809  001604  013746  000006                  MOV     @#6,-(SP)               ;SAVE VECTORS
  810  001610  013746  000004                  MOV     @#4,-(SP)
  811  001614  012737  001640  000004          MOV     #1$,@#4                 ;SET UP FOR TIMEOUT
  812  001622  005037  000006                  CLR     @#6
  813  001626  022777  177777  176714          CMP     #-1,@SWR                ;REFERENCE HARDWARE SWITCH REGISTER
  814  001634  001402                          BEQ     2$
  815  001636  000404                          BR      3$
  816  001640  022626                  1$:     CMP     (SP)+,(SP)+             ;ADJUST STACK
  817  001642  012737  000176  000550  2$:     MOV     #SWREG,SWR              ;POINT TO SOFTWARE SWITCH REC
  818  001650  012637  000004          3$:     MOV     (SP)+,@#4               ;RESTORE VECTORS
  819  001654  012637  000006                  MOV     (SP)+,@#6
  820  001660  005027                          CLR     (PC)+           ;;CLEAR CHAIN INDICATOR
  821  001662  000000                  CHNFLG: .WORD   0               ;;CHAIN MODE INDICATOR
  822                                                                  ;;1/0 = CHAIN/NOT CHAIN MODE
  823  001664  005737  000042                  TST     @#42            ;;BRANCH IF IN DUMP MODE
  824  001670  001407                          BEQ     50$
  825  001672  012737  000176  000550          MOV     #SWREG,SWR      ;;INVOKE SOFTWARE SWR
  826  001700  005237  001662                  INC     CHNFLG          ;;SET CHNFLG = CHAIN MODE
  827  001704  000137  001710                  JMP     SCHN            ;;GO TO CHAIN ADDRESS
  828  001710                          50$:
  829  001710  000240                  SCHN:   NOP
  830  001712  122737  000006  000001  4$:     CMPB    #6,@#41         ;BRANCH IF LOADED VIA TMDP (DUMP MODE)
  831  001720  001005                          BNE     5$
  832  001722  012704  020032                  MOV     #MSG69,R4       ;ADVISE USER TO REMOVE TMDP FROM UUT
  833  001726  004737  014316                  JSR     PC,TTOUT
  834  001732  000000                          HALT
  835  001734  012704  015401          5$:     MOV     #MSG3,R4
  836  001740  004737  014316                  JSR     PC,TTOUT        ;PRINT TITLE
  837  001744  005737  001662                  TST     CHNFLG          ;SEE IF IN CHAIN MODE
  838  001750  001402                          BEQ     6$              ;IF NOT: BR
  839  001752  000137  002554                  JMP     TSCD            ;ELSE GO START TEST
  840  001756  112737  000043  015401  6$.     MOVB    #'#,MSG3        ;DO NOT PRINT TITLE ON RESTART
  841  001764  012704  015541          STOB:   MOV     #MSG4,R4
  842  001770  004737  014316                  JSR     PC,TTOUT        ;REQUEST REGISTER ADDRESS
  843  001774  013703  000572                  MOV     REGS,R3
  844  002000  004737  014446                  JSR     PC,OCTP         ;PRINT CURRENT ADDRESS
  845  002004  012705  000572                  MOV     #REGS,R5        ;SET ADDRESS SAVE LOC
  846  002010  012701  000007                  MOV     #7,R1           ;SET SIZE OF RESPONSE
  847  002014  012702  176400                  MOV     #176400,R2      ;SET UPPER LIMIT
  848  002020  012703  172300                  MOV     #172300,R3      ;SET LOWER LIMIT
  849  002024  004737  013774                  JSR     PC,TTR          ;GO GET RESPONSE
  850  002030  012704  015564                  MOV     #MSG5,R4
  851  002034  004737  014316                  JSR     PC,TTOUT        ;REQUEST VECTOR
  852  002040  013703  000570                  MOV     VECT,R3
  853  002044  004737  014446                  JSR     PC,OCTP         ;PRINT CURRENT VECTOR
  854  002050  012705  000570                  MOV     #VECT,R5        ;SET ADDRESS SAVE LOC
  855  002054  012701  000004                  MOV     #4,R1           ;SET SIZE OF RESPONSE
  856  002060  012702  000224                  MOV     #224,R2         ;SET UPPER LIMIT
  857  002064  012703  000150                  MOV     #150,R3         ;SET LOWER LIMIT
  858  002070  004737  013774                  JSR     PC,TTR          ;GO GET RESPONSE
  859  002074  013700  000570                  MOV     VECT,R0         ;GET VECTOR
  860  002100  012720  013522                  MOV     #MTINT,(R0)+    ;LOAD INTERRUPT ADDRESS IN VECTOR
```

```
  861  002104  012710  000340                    MOV     #340,(R0)       ;LOAD PRIORITY
  862  002110  013700  000572                    MOV     REGS,R0         ;GET START OF REGS
  863  002114  012701  000017                    MOV     #17,R1          ;SET NUMBER OF REGS
  864  002120  012702  000510                    MOV     #C1,R2          ;GET START OF TABLE
  865  002124  010022                    ST0:    MOV     R0,(R2)+        ;BUILD TABLE
  866  002126  062700  000002                    ADD     #2,R0           ;BUMP ADDRESS
  867  002132  005301                            DEC     R1              ;SEE IF DONE
  868  002134  001373                            BNE     ST0             ;IF NOT: BR
  869  002136  012702  000600                    MOV     #T0B,R2
  870  002142  012700  000054                    MOV     #54,R0
  871  002146  005022                    ST1:    CLR     (R2)+           ;CLEAR FLAGS + COUNTERS
  872  002150  005300                            DEC     R0
  873  002152  001375                            BNE     ST1
  874  002154  012737  000001  000722           MOV     #1,RHTF         ;SET ADDRESS TEST FLAG
  875  002162  000137  003016                    JMP     TSRH            ;GO DO INITIAL ADDRESS TEST PASS
  876  002166  012704  015643            ST1A:   MOV     #MSG10A,R4      ;
  877  002172  004737  014316                    JSR     PC,TTOUT        ;REQUEST JUMPER CONFIGURATION
  878  002176  012705  000742                    MOV     #JUMPER,R5      ;GET ADDRESS OF RESPONSE
  879  002202  012701  000002                    MOV     #2,R1           ;SET SIZE OF RESPONSE
  880  002206  012702  000004                    MOV     #4,R2           ;SET RANGE
  881  002212  012703  000000                    MOV     #0,R3           ;LOWER LIMIT
  882  002216  004737  013774                    JSR     PC,TTR          ;GET RESPONSE
  883  002222  022737  000002  000742           CMP     #2,JUMPER       ;TEST FOR NON-STANDARD MODE
  884  002230  001002                            BNE     1$
  885  002232  004737  013376                    JSR     PC,NOST         ;MODIFY TEST SCHEDULE
  886  002236  012704  016003            1$:     MOV     #MSG10,R4
  887  002242  004737  014316                    JSR     PC,TTOUT        ;REQUEST DRIVE NUMBER
  888  002246  013703  000612                    MOV     DRVN,R3         ;GET CURRENT DRIVE #
  889  002252  004737  014446                    JSR     PC,OCTP         ;AND TYPE IT
  890  002256  012705  000612                    MOV     #DRVN,R5        ;SET ADDRESS OF DRIVE NUMBER SAVE
  891  002262  012701  000002                    MOV     #2,R1           ;SET SIZE OF RESPONSE
  892  002266  012702  000007                    MOV     #7,R2           ;SET UPPER LIMIT
  893  002272  012703  000000                    MOV     #0,R3           ;SET LOWER LIMIT
  894  002276  004737  013774                    JSR     PC,TTR          ;GO GET RESPONSE
  895  002302  012777  000040  176210           MOV     #40,@CS         ;SET INIT
  896  002310  053777  000612  176202           BIS     DRVN,@CS        ;SET DRIVE NUMBER
  897  002316  005777  176166                    TST     @C1             ;ACCESS DRIVE
  898  002322  032777  010000  176170           BIT     #10000,@CS      ;SEE IF NED
  899  002330  001405                            BEQ     ST2             ;IF NOT: BR
  900  002332  012704  017002                    MOV     #MSG41,R4
  901  002336  004737  014316                    JSR     PC,TTOUT        ;PRINT NOT AVAIL
  902  002342  000711                            BR      ST1A            ;REDO DRIVE REQUEST
  903  002344  012704  016023            ST2:    MOV     #MSG11,R4
  904  002350  004737  014316                    JSR     PC,TTOUT        ;REQUEST SLAVE NUMBER
  905  002354  013703  000614                    MOV     SLVN,R3         ;GET CURRENT SLAVE #
  906  002360  004737  014446                    JSR     PC,OCTP         ;AND TYPE IT
  907  002364  012705  000614                    MOV     #SLVN,R5        ;SET ADDRESS OF SLAVE SAVE
  908  002370  012701  000002                    MOV     #2,R1           ;SET SIZE OF RESPONSE
  909  002374  012702  000007                    MOV     #7,R2           ;SET UPPER LIMIT
  910  002400  012703  000000                    MOV     #0,R3           ;SET LOWER LIMIT
  911  002404  004737  013774                    JSR     PC,TTR          ;GO GET RESPONSE
  912  002410  012777  000040  176102           MOV     #40,@CS         ;INIT
  913  002416  053777  000612  176074           BIS     DRVN,@CS        ;SET DRIVE NUMBER
  914  002424  013777  000614  176110           MOV     SLVN,@TC        ;LOAD SLAVE NUMBER
  915  002432  032777  002000  176076           BIT     #2000,@DT       ;SEE IF SLAVE PRESENT
  916  002440  001005                            BNE     ST3             ;IF SO: BR
```

```
  917  002442  012704  017023                MOV     #MSG42,R4
  918  002446  004737  014316                JSR     PC,TTOUT        ;PRINT NON-EXIST SLAVE
  919  002452  000734                          BR      ST2             ;REDO SLAVE REQUEST
  920  002454  012704  017044        ST3:    MOV     #MSG43,R4
  921  002460  004737  014316                JSR     PC,TTOUT        ;PRINT SERIAL NUMBER TAG
  922  002464  017703  176050                MOV     @SN,R3
  923  002470  004737  014774                JSR     PC,SNPT         ;PRINT SERIAL NUMBER
  924  002474  012704  017707                MOV     #MSG62,R4       ;GET REQUEST
  925  002500  004737  014316                JSR     PC,TTOUT        ;REQUEST RH11 ONLY RESPONSE
  926  002504  013703  000726                MOV     RHOF,R3         ;GET CURRENT FLAG SETTING
  927  002510  004737  014446                JSR     PC,OCTP         ;AND TYPE IT
  928  002514  012705  000726                MOV     #RHOF,R5        ;SET FLAG ADDRESS
  929  002520  012701  000002                MOV     #2,R1           ;SET SIZE OF RESPONSE
  930  002524  012702  000001                MOV     #1,R2           ;SET UPPER LIMIT
  931  002530  012703  000000                MOV     #0,R3           ;SET LOWER LIMIT
  932  002534  004737  013774                JSR     PC,TTR          ;GO GET RESPONSE
  933
  934                              ;START 210
  935  002540  012706  000500        ST4:    MOV     #500,SP         ;SET STACK PTR
  936  002544  005037  000730                CLR     PCNTR           ;CLEAR PASS COUNTER
  937  002550  004737  015076                JSR     PC,GTSWR        ;GET SWITCHES
```

```
                                        ;TEST SCHEDULAR**********
                                        
002554  052777  000100  175770  TSCD:   BIS     #100,@TKS       ;SET KEYBOARD IE BIT
002562  005037  000704                  CLR     STFLG           ;CLEAR SINGLE TEST FLAG
002566  005037  000604                  CLR     RH17F           ;SET RH INDICATOR = RH11
002572  013746  000004                  MOV     @#4,-(SP)       ;SAVE ERROR TRAP VECTORS
002576  013746  000006                  MOV     @#6,-(SP)       ;AND PRIORITY
002602  012737  002626  000004          MOV     #1$,@#4         ;SET TIME OUT TRAP TO 1$ BELOW
002610  005037  000006                  CLR     @#6
002614  005777  175724                  TST     @#BAE           ;REFERENCE BAE REGISTER
002620  012737  000001  000604          MOV     #1,RH17F        ;SET FLAG = RH70
002626  012637  000006          1$:     MOV     (SP)+,@#6       ;RESTORE ERROR TRAP
002632  012637  000004                  MOV     (SP)+,@#4
002636  017700  175706                  MOV     @SWR,R0
002642  042700  177740                  BIC     #177740,R0
002646  001125                          BNE     STSCD           ;GO SELECT SINGLE TEST
002650  005737  001662                  TST     CHNFLG          ;;BRANCH IF NOT IN CHAIN MODE
002654  001457                          BEQ     TSCDA
002656  012737  177777  000612          MOV     #-1,DRVN        ;;INITIALIZE DRIVE #
002664  012737  177777  000614  NXTDRV: MOV     #-1,SLVN        ;;INITIALIZE SLAVE #
002672  012777  000040  175620  1$:     MOV     #40,@CS         ;;INIT CONTROLLER
002700  005237  000612                  INC     DRVN            ;;STEP DRIVE #
002704  022737  000010  000612          CMP     #10,DRVN        ;;EXIT IF ALL DRIVES TESTED
002712  001524                          BEQ     $DONE           ;;FOR AVAILABILITY
002714  013777  000612  175576          MOV     DRVN,@CS        ;;LOAD DRIVE #
002722  005777  175562                  TST     @CS             ;;ACCESS DRIVE
002726  032777  010000  175564          BIT     #10000,@CS      ;;BRANCH IF DRIVE NON EXISTANT
002734  001356                          BNE     1$              ;;(NED = 1)
002736  005237  000614          NXTSLV: INC     SLVN            ;;STEP SLAVE # AND BRANCH
002742  001011                          BNE     1$              ;;IF NOT SLAVE 0
002744  005737  000612                  TST     DRVN            ;;BRANCH IF NOT DRIVE # 0
002750  001006                          BNE     1$
002752  122737  000006  000041          CMPB    #6,@#41         ;;BRANCH IF NOT TMDP
002760  001002                          BNE     1$
002762  005237  000614                  INC     SLVN            ;;STEP TO SLAVE # 1
002766  022737  000010  000614  1$:     CMP     #10,SLVN        ;;BRANCH IF ALL SLAVES TESTED
002774  001733                          BEQ     NXTDRV          ;;FOR AVAILABILITY
002776  013777  000614  175536          MOV     SLVN,@TC        ;;LOAD SLAVE UNIT #
003004  032777  002000  175524          BIT     #2000,@DT       ;;BRANCH IF SLAVE NOT
003012  001751                          BEQ     NXTSLV          ;;PRESENT (SPR = 0)
003014  000240                  TSCDA:  NOP
003016  012737  000756  000706  TSRH:   MOV     #TSTTBL,LTADD
003024  062737  000004  000706  TSCD0:  ADD     #4,LTADD
003032  013737  000706  000676  TSCD1:  MOV     LTADD,ITRLP
003040  062737  000002  000676          ADD     #2,ITRLP        ;SET ITERATION ADDRESS
003046  005037  000660                  CLR     STMSK
003052  005037  000626                  CLR     ERRP
003056  005037  000606                  CLR     HDRFL           ;CLEAR PRINT HEADER FLAG
003062  017700  175620                  MOV     @LTADD,R0       ;SET POINTER TO TEST
003066  000110                          JMP     (R0)            ;GO TO TEST
003070  032777  002000  175452  TSCD2:  BIT     #2000,@SWR      ;SEE IF HALT ON TEST
003076  001401                          BEQ     TSCD3           ;IF NOT: BR
003100  000000                          HALT
003102  005737  000704          TSCD3:  TST     STFLG           ;SE IF SINGLE TEST
003106  001746                          BEQ     TSCD0           ;IF NOT: BR
003110  017700  175434                  MOV     @SWR,R0
```

```
  994  003114  042700  177740                BIC     #177740,R0      ;BRANCH IF ALL TESTS SELECTED
  995  003120  001615                       BEQ     TSCD
  996  003122  012737  000001  000704 STSCD: MOV     #1,STFLG        ;SET SINGLE TEST FLAG
  997  003130  023700  001120               CMP     TLAST,R0        ;SEE IF EXCEEDED TESTS
  998  003134  002410                       BLT     TEND            ;IF SO: BR
  999  003136  006300                       ASL     R0
 1000  003140  006100                       ROL     R0              ;SET TABLE MODIFIER
 1001  003142  012737  000756  000706       MOV     #TSTTBL,LTADD
 1002  003150  060037  000706               ADD     R0,LTADD        ;SET TEST POINTER
 1003  003154  000726                       BR      TSCD1
 1004  003156  005737  001662        TEND:  TST     CHNFLG          ;BRANCH IF IN CHAIN MODE
 1005  003162  001265                       BNE     NXTSLV
 1006  003164  012704  015577        $DONE: MOV     #MSG6,R4
 1007  003170  004737  014316               JSR     PC,TTOUT        ;PRINT END OF PASS
 1008  003174  013703  000730               MOV     PCNTR,R3
 1009  003200  004737  014446               JSR     PC,OCTP         ;PRINT PASS NUMBER
 1010  003204  005000                       CLR     R0
 1011  003206  005300               1$:     DEC     R0
 1012  003210  001376                       BNE     1$
 1013  003212  013700  000042               MOV     @#42,R0         ;GET ACT11 RETURN ADDRESS
 1014  003216  001405                       BEQ     HERE            ;BRANCH IF NOT ACT11
 1015  003220  000005                       RESET
 1016  003222  004710               $ENDAD: JSR     PC,(R0)
 1017  003224  000240                       NOP
 1018  003226  000240                       NOP
 1019  003230  000240                       NOP
 1020  003232  000240               HERE:   NOP
 1021  003234  005737  001662               TST     CHNFLG          ;BRANCH IF IN CHAIN MODE
 1022  003240  001005                       BNE     TENDX
 1023  003242  032777  010000  175300       BIT     #10000,@SWR     ;SEE IF HALT ON PASS
 1024  003250  001001                       BNE     TENDX           ;IF NOT: BR
 1025  003252  000000                       HALT
 1026  003254  005237  000730        TENDX: INC     PCNTR           ;BUMP PASS COUNTER
 1027  003260  000137  002554               JMP     TSCD            ;RESTART
```

```
1028
1029                                        ;RH ADDRESSING TEST**********
1030
1031  003264  012737  020126  000610  FT1:    MOV     #MSFT1,EMADDR   ;SET HEADER
1032  003272  012737  013660  000004          MOV     #TRAP,@#4       ;SET TRAP HANDLER ADDRESS
1033  003300  012737  000340  000006          MOV     #340,@#6
1034  003306  012700  000016                  MOV     #16,R0          ;SET NUMBER OF REGISTERS
1035  003312  013701  000510                  MOV     C1,R1           ;GET FIRST ADDRESS (CS1)
1036  003316  005711                  FT1A:   TST     (R1)            ;REFERENCE REGISTER
1037  003320  000240                          NOP                     ;IF ADDRESS IS BAD, BUS TRAP WILL OCCUR
1038  003322  005300                  FT1B:   DEC     R0              ;SEE IF DONE ALL
1039  003324  001403                          BEQ     FT1X            ;IF SO: BR
1040  003326  062701  000002                  ADD     #2,R1           ;BUMP ADDRESS POINTER
1041  003332  000771                          BR      FT1A            ;CONTINUE
1042  003334  012737  000006  000004  FT1X:   MOV     #6,@#4  ;RESET TRAP CATCHER
1043  003342  012737  000000  000006          MOV     #HALT,@#6
1044  003350  005737  000722                  TST     RHTF            ;SEE IF INITIAL ADDRESS TEST PASS
1045  003354  001404                          BEQ     FT1XX           ;IF NOT: BR
1046  003356  005037  000722                  CLR     RHTF            ;CLEAR FLAG
1047  003362  000137  002166                  JMP     ST1A            ;RETURN
1048  003366  000137  003070          FT1XX:  JMP     TSCD2           ;RETURN TO SCHEDULAR
```

```
1049
1050                                        ;RH REGISTER BITS READ/WRITE**********
1051
1052  003372  012737  020153  000610  FT2:    MOV     #MSFT2,EMADDR   ;SET TEST HEADER
1053  003400  012701  177777                  MOV     #-1,R1          ;SET ALL ONES PATTERN
1054  003404  004737  013474          FT2A:   JSR     PC,INIT1        ;GO INIT
1055  003410  013700  000512                  MOV     WC,R0           ;GET ADDRESS OF WORD COUNT
1056  003414  010102                          MOV     R1,R2           ;SET EXPT REGISTER BIT PATTERN
1057  003416  010110                          MOV     R1,(R0)         ;LOAD PATTERN
1058  003420  021002                          CMP     (R0),R2         ;SEE IF EXPT=RCVD
1059  003422  001410                          BEQ     FT2B            ;IF SO: BR
1060  003424  012737  016330  000650          MOV     #MSG25,ERADD    ;SET CODE
1061  003432  012737  003404  000674          MOV     #FT2A,SCOLP     ;SET SCOPE
1062  003440  004737  003560                  JSR     PC,FT2ER        ;GO DO ERROR
1063  003444  013700  000514          FT2B:   MOV     BA,R0           ;GET ADDRESS OF BUS ADDRESS
1064  003450  010102                          MOV     R1,R2
1065  003452  042702  000001                  BIC     #1,R2           ;SET EXPT PATTERN
1066  003456  010110                          MOV     R1,(R0)         ;LOAD PATTERN
1067  003460  020210                          CMP     R2,(R0)         ;SEE IF EXPT=RCVD
1068  003462  001410                          BEQ     FT2C            ;IF SO:BR
1069  003464  012737  016336  000650          MOV     #MSG26,ERADD    ;SET ERROR CODE
1070  003472  012737  003444  000674          MOV     #FT2B,SCOLP     ;SET SCOPE ADDRESS
1071  003500  004737  003560                  JSR     PC,FT2ER        ;GO DO ERROR
1072  003504  013700  000532          FT2C:   MOV     DB,R0           ;GET ADDRESS OF DATA BUFFER
1073  003510  010102                          MOV     R1,R2
1074  003512  010110                          MOV     R1,(R0)         ;LOAD PATTERN
1075  003514  012703  004000                  MOV     #4000,R3
1076  003520  005303                  FT2D:   DEC     R3.             ;DELAY
1077  003522  001376                          BNE     FT2D
1078  003524  020210                          CMP     R2,(R0)         ;SEE IF EXPT=RCVD
1079  003526  001410                          BEQ     FT2E            ;IF SO: BR
1080  003530  012737  016344  000650          MOV     #MSG27,ERADD    ;SET ERROR CODE
1081  003536  012737  003504  000674          MOV     #FT2C,SCOLP     ;SET SCOPE ADDRESS
1082  003544  004737  003560                  JSR     PC,FT2ER        ;GO DO ERROR
1083  003550  005701                  FT2E:   TST     R1              ;SEE IF DONE RESET
1084  003552  001453                          BEQ     FT2X            ;IF SO: BR
1085  003554  005001                          CLR     R1              ;SET ZERO PATTERN
1086  003556  000712                          BR      FT2A            ;DO ZERO BITS
1087  003560  000240                  FT2ER:  NOP
1088  003562  032777  020000  174760          BIT     #20000,@SWR     ;SEE IF PRINT ERROR
1089  003570  001034                          BNE     FT2ERB          ;IF NOT: BR
1090  003572  005737  000606                  TST     HDRFL           ;SEE ID DONE HEADER
1091  003576  001004                          BNE     FT2ERA          ;IF SO: BR
1092  003600  013704  000610                  MOV     EMADDR,R4
1093  003604  004737  014316                  JSR     PC,TTOUT        ;DO HEADER
1094  003610  012737  000001  000606  FT2ERA: MOV     #1,HDRFL        ;SET FLAG
1095  003616  013704  000650                  MOV     ERADD,R4
1096  003622  004737  014316                  JSR     PC,TTOUT        ;PRINT ERROR CODE
1097  003626  012704  016274                  MOV     #MSG22,R4
1098  003632  004737  014316                  JSR     PC,TTOUT        ;PRINT EXPT TAG
1099  003636  010103                          MOV     R1,R3
1100  003640  004737  014434                  JSR     PC,OCTPE        ;PRINT EXPT
1101  003644  012704  016304                  MOV     #MSG23,R4
1102  003650  004737  014316                  JSR     PC,TTOUT        ;PRINT RCVD TAG
1103  003654  011003                          MOV     (R0),R3
1104  003656  004737  014434                  JSR     PC,OCTPE        ;PRINT RCVD
```

```
 1105  003662  005777  174662          FT2ERB: TST     @SWR            ;SEE IF HALT ON ERROR
 1106  003666  100001                          BPL     FT2ERC          ;IF NOT: BR
 1107  003670  000000                          HALT
 1108  003672  004737  013270          FT2ERC: JSR     PC,SCOPE        ;GO SEE IF SCOPE ON ERROR
 1109  003676  000240                          NOP
 1110  003700  000207                          RTS     PC              ;IF NO SCOPE: CONTINUE TEST
 1111  003702  000240                  FT2X:   NOP
 1112  003704  004737  013324                  JSR     PC,ITER         ;GO SEE IF ITERATIONS
 1113  003710  000137  003070                  JMP     TSCD2           ;RETURN TO SCHEDULAR
```

```
1114
1115                                        ;RH INITIALIZE TEST**********
1116
1117  003714  012737  020210  000610  FT3:    MOV     #MSFT3,EMADDR   ;SET TEST HEADER
1118  003722  012737  003714  000674          MOV     #FT3,SCOLP
1119  003730  004737  013474                  JSR     PC,INIT1        ;GO INIT
1120  003734  052777  020000  174556          BIS     #20000,@CS      ;FORCE UPE =1
1121  003742  000240                          NOP
1122  003744  004737  013474                  JSR     PC,INIT1        ;GO INIT
1123  003750  005777  174534                  TST     @C1             ;SEE IF SC IS RESET
1124  003754  100005                          BPL     FT3A            ;IF SO: BR
1125  003756  012737  016402  000650          MOV     #MSG29,ERADD    ;SET ERROR CODE
1126  003764  004737  004050                  JSR     PC,FT3ER        ;GO DO ERROR
1127  003770  032777  040000  174512  FT3A:   BIT     #40000,@C1      ;SEE IF TRE IS RESET
1128  003776  001405                          BEQ     FT3B            ;IF SO: BR
1129  004000  012737  016431  000650          MOV     #MSG30,ERADD    ;SET ERROR CODE.
1130  004006  004737  004050                  JSR     PC,FT3ER        ;GO DO ERROR
1131  004012  017701  174502          FT3B:   MOV     @CS,R1          ;GET CS2
1132  004016  042701  000307                  BIC     #307,R1         ;MARK IR/OR
1133  004022  005701                          TST     R1              ;SEE IF RESET
1134  004024  001405                          BEQ     FT3X            ;IF SO: BR
1135  004026  012737  016461  000650          MOV     #MSG31,ERADD    ;SET ERROR CODE
1136  004034  004737  004050                  JSR     PC,FT3ER        ;GO DO ERROR
1137  004040  004737  013324          FT3X:   JSR     PC,ITER         ;GO SEE IF ITERATION
1138  004044  000137  003070                  JMP     TSCD2           ;RETURN TO SCHEDULAR
1139
1140                                        ;ERROR REPORT SUBROUTINE
1141  004050  000240          FT3ER:  NOP
1142  004052  032777  020000  174470          BIT     #20000,@SWR     ;SEE IF PRINT ERROR
1143  004060  001015                          BNE     2$              ;IF NOT: BR
1144  004062  005737  000606                  TST     HDRFL           ;SEE IF DONE HEADER
1145  004066  001006                          BNE     1$              ;IF SO: BR
1146  004070  013704  000610                  MOV     EMADDR,R4
1147  004074  004737  014316                  JSR     PC,TTOUT        ;PRINT HEADER
1148  004100  005237  000606                  INC     HDRFL
1149  004104  013704  000650          1$:     MOV     ERADD,R4
1150  004110  004737  014316                  JSR     PC,TTOUT        ;PRINT ERROR CODE
1151  004114  005777  174430          2$:     TST     @SWR            ;SEE IF HALT ON ERROR
1152  004120  100001                          BPL     3$              ;IF NOT: BR
1153  004122  000000                          HALT
1154  004124  000240          3$:     NOP
1155  004126  004737  013270                  JSR     PC,SCOPE        ;GO SEE IF SCOPE
1156  004132  000207                          RTS     PC              ;IF NOT: BR
```

```
1157
1158                                        ;RH11 SILO TEST 1: EPMTY SILO READ**********
1159
1160  004134  005737  000604        FT4:    TST     RH17F
1161  004140  001141                BNE     FT5X            ;IF RH70: BR
1162  004142  012737  020242  000610        MOV     #MSFT4,EMADDR   ;SET TEST TEST HEADER
1163  004150  012777  000040  174342        MOV     #40,@CS         ;INIT
1164  004156  017700  174350                MOV     @DB,R0          ;READ DB
1165  004162  005777  174332                TST     @CS             ;SEE IF DLT IS SET
1166  004166  100013                BPL     FT4ER           ;IF NOT: BR
1167  004170  005777  174314                TST     @C1             ;SEE IF SC IS SET
1168  004174  100014                BPL     FT4ERA          ;IF NOT: BR
1169  004176  032777  040000  174304        BIT     #40000,@C1      ;SEE IF TRE IS SET
1170  004204  001414                BEQ     FT4ERB          ;IF NOT: BR
1171  004206  004737  013324        FT4X:   JSR     PC,ITER         ;GO SEE IF ITERATION
1172  004212  000137  003070                JMP     TSCD2           ;RETURN TO SCHEDULAR
1173  004216  012737  016511  000650  FT4ER:  MOV     #MSG32,ERADD    ;SET ERROR CODE
1174  004224  000407                BR      FT4ERC
1175  004226  012737  016527  000650  FT4ERA: MOV     #MSG33,ERADD    ;SET ERROR CODE
1176  004234  000403                BR      FT4ERC
1177  004236  012737  016544  000650  FT4ERB: MOV     #MSG34,ERADD    ;SET ERROR CODE.
1178  004244  000240                FT4ERC: NOP
1179  004246  012737  004134  000674        MOV     #FT4,SCOLP      ;SET SCOPE ADDRESS
1180  004254  004737  004050                JSR     PC,FT3ER        ;GO PRINT ERROR
1181  004260  000752                BR      FT4X
```

```
1182
1183                                        ;RH11 SILO TEST 2: IR/OR CHECK**********
1184
1185  004262  005737  000604        FT5:    TST     RH17F           ;SEE IF RH70
1186  004266  001066                         BNE     FT5X            ;IF SO: BR
1187  004270  012737  020272  000610        MOV     #MSFT5,EMADDR   ;SET TEST HEADER
1188  004276  012737  004304  000674        MOV     #FT5A,SCOLP     ;SET SCOPE ADDRESS
1189  004304  004737  013474        FT5A:   JSR     PC,INIT1        ;GO INIT
1190  004310  032777  000100  174202        BIT     #100,@CS        ;SEE IF IR IS SET
1191  004316  001005                         BNE     FT5B            ;IF SO: BR
1192  004320  012737  016562  000650        MOV     #MSG35,ERADD    ;SET ERROR CODE
1193  004326  004737  004050                JSR     PC,FT3ER        ;GO DO ERROR
1194  004332  032777  000200  174160  FT5B:  BIT     #200,@CS        ;SEE IF OR IS RESET
1195  004340  001405                         BEQ     FT5C            ;IF SO: BR
1196  004342  012737  016607  000650        MOV     #MSG36,ERADD    ;SET ERROR CODE
1197  004350  004737  004050                JSR     PC,FT3ER        ;GO DO ERROR
1198  004354  012777  000000  174150  FT5C:  MOV     #0,@DB          ;LOAD ZERO INTO SILO
1199  004362  032777  000200  174130        BIT     #200,@CS        ;SEE THAT OR RESET
1200  004370  001405                         BEQ     FT5D            ;IF IT DOES: BR
1201  004372  012737  016636  000650        MOV     #MSG37,ERADD    ;SET ERROR CODE
1202  004400  004737  004050                JSR     PC,FT3ER        ;GO DO ERROR
1203  004404  012777  177777  174120  FT5D:  MOV     #-1,@DB         ;LOAD SILO WITH -1
1204  004412  012700  004000                MOV     #4000,R0
1205  004416  032777  000200  174074  FT5E:  BIT     #200,@CS        ;SEE IF OR IS SET
1206  004424  001007                         BNE     FT5X            ;IF SO: BR
1207  004426  005300                         DEC     R0
1208  004430  001372                         BNE     FT5E            ;AWAIT OR
1209  004432  012737  016636  000650        MOV     #MSG37,ERADD    ;SET ERROR CODE
1210  004440  004737  004050                JSR     PC,FT3ER        ;GO DO ERROR
1211  004444  004737  013324        FT5X:   JSR     PC,ITER         ;GO SEE IF ITERATION
1212  004450  000137  003070                JMP     TSCD2           ;RETURN TO SCHEDULAR
```

```
1213
1214                                        ;RH11 SILO TEST 3: SILO DATA TEST**********
1215
1216  004454  005737  000604        FT6:    TST     RH17F
1217  004460  001052                        BNF     FT6X            ;IF RH70: BR
1218  004462  012737  020322  000610        MOV     #MSFT6,EMADDR   ;SET TEST HEADER
1219  004470  012737  004476  000674        MOV     #FT6A,SCOLP     ;SET SCOPE ADDRESS
1220  004476  004737  013474        FT6A:   JSR     PC,INIT1        ;GO INIT
1221  004502  005000                        CLR     R0              ;PRESET DATA
1222  004504  010077  174022        FT6B:   MOV     R0,@DB          ;LOAD SILO
1223  004510  005200                        INC     R0              ;BUMP DATA
1224  004512  022700  000102                CMP     #102,R0         ;SEE IF FILLED ALL
1225  004516  001372                        BNE     FT6B            ;IF NOT: BR
1226  004520  032777  000100  173772        BIT     #100,@CS        ;SEE IF IR IS RESET.
1227  004526  001405                        BEQ     FT6C            ;IF SO: BR
1228  004530  012737  016747  000650        MOV     #MSG40,ERADD    ;SET ERROR CODE
1229  004536  004737  004050                JSR     PC,FT3ER        ;GO DO ERROR
1230  004542  032777  000200  173750  FT6C:  BIT     #200,@CS        ;SEE IF OR IS SET
1231  004550  001005                        BNE     FT6D            ;IF SO: BR
1232  004552  012737  016675  000650        MOV     #MSG38,ERADD    ;SET ERROR CODE
1233  004560  004737  004050                JSR     PC,FT3ER        ;GO DO ERROR
1234  004564  005000        FT6D:   CLR     R0              ;PRESET DATA
1235  004566  017701  173740        FT6E:   MOV     @DB,R1          ;READ SILO
1236  004572  020001                        CMP     R0,R1           ;SEE IF EXPT=RCVD
1237  004574  001010                        BNE     FT6DE           ;IF NOT: BR
1238  004576  005200                        INC     R0              ;BUMP DATA
1239  004600  022700  000102                CMP     #102,R0         ;SEE IF DONE ALL
1240  004604  001370                        BNE     FT6E            ;IF NOT: BR
1241  004606  004737  013324        FT6X:   JSR     PC,ITER         ;GO SEE IF ITERATION
1242  004612  000137  003070                JMP     TSCD2           ;RETURN TO SCHEDULAR
1243
1244  004616  000240        FT6DE:  NOP
1245  004620  032777  020000  173722        BIT     #20000,@SWR     ;SEE IF PRINT ERROR
1246  004626  001032                        BNE     FT6DEB          ;IF NOT: BR
1247  004630  005737  000606                TST     HDRFL           ;SEE IF DONE HEADER
1248  004634  013701  000610                MOV     EMADDR,R1
1249  004640  004737  014316                JSR     PC,TTOUT        ;PRINT HEADER
1250  004644  005237  000606                INC     HDRFL           ;SET FLAG
1251  004650  012704  016727        FT6DEA: MOV     #MSG39,R4
1252  004654  004737  014316                JSR     PC,TTOUT        ;PRINT SILO READ ERROR
1253  004660  012704  016274                MOV     #MSG22,R4
1254  004664  004737  014316                JSR     PC,TTOUT        ;PRINT EXPT TAG
1255  004670  010003                        MOV     R0,R3
1256  004672  004737  014446                JSR     PC,OCTP         ;PRINT EXPT
1257  004676  012704  016304                MOV     #MSG23,R4
1258  004702  004737  014316                JSR     PC,TTOUT        ;PRINT RCVD TAG
1259  004706  010103                        MOV     R1,R3
1260  004710  004737  014446                JSR     PC,OCTP         ;PRINT RCVD
1261  004714  005777  173630        FT6DEB: TST     @SWR            ;SEE IF HALT ON ERROR
1262  004720  100001                        BPL     FT6DEX          ;IF NOT: BR
1263  004722  000000                        HALT
1264  004724  000207        FT6DEX: RTS     PC              ;RETURN TO TEST
```

```
1265
1266                                        ;RH11 SILO TEST 4: SILO OVERFLOW**********
1267
1268  004726  005737  000604          FT7:  TST     RH17F
1269  004732  001021                      BNE     FT7X            ;IF RH70: BR
1270  004734  012737  020352  000610      MOV     #MSFT7,EMADDR   ;SET TEST HEADER
1271  004742  012737  004726  000674      MOV     #FT7,SCOLP      ;SET SCOPE ADDRESS
1272  004750  004737  013474              JSR     PC,INIT1        ;GO INIT
1273  004754  012700  000103              MOV     #103,R0         ;SET SIZE OF SILO +1
1274  004760  010077  173546          FT7A: MOV     R0,@DB          ;LOAD SILO
1275  004764  005300                      DEC     R0              ;SEE IF DONE
1276  004766  001374                      BNE     FT7A            ;IF NOT: BR
1277  004770  005777  173524              TST     @CS             ;SEE IF DLT IS SET
1278  004774  100004                      BPL     FT7ER           ;IF NOT: BR
1279  004776  004737  013324          FT7X: JSR     PC,ITER         ;GO SEE IF ITERATION
1280  005002  000137  003070              JMP     TSCD2           ;RETURN TO SCHEDULAR
1281  005006  012737  016511  000650  FT7ER: MOV     #MSG32,ERADD    ;SET ERROR CODE
1282  005014  004737  004050              JSR     PC,FT3ER        ;GO DO ERROR
1283  005020  000766                      BR      FT7X
```

```
1284
1285                                        ;RH11 SILO TEST 5: SILO RESET**********
1286
1287  005022  005737  000604          FT10:  TST     RH17F
1288  005026  001034                        BNE     FT10X           ;IF RH70: BR
1289  005030  012737  020402  000610        MOV     #MSFT10,EMADDR  ;SET TEST HEADER
1290  005036  012737  005022  000674        MOV     #FT10,SCOLP     ;SET SCOPE ADDRESS
1291  005044  012777  000040  173446        MOV     #40,@CS         ;INITIALIZE
1292  005052  012700  000004                MOV     #4,R0           ;SET NUMBER OF SILO WRITER
1293  005056  010077  173450          FT10A: MOV     R0,@DB          ;WRITE SILO
1294  005062  005300                        DEC     R0              ;SEE IF DONE
1295  005064  001374                        BNE     FT10A           ;IF NOT: BR
1296  005066  052777  000040  173424        BIS     #40,@CS         ;INITIALIZE
1297  005074  012777  177777  173430        MOV     #-1,@DB         ;WRITE SILO
1298  005102  017701  173424                MOV     @DB,R1          ;READ SILO 1
1299  005106  017701  173420                MOV     @DB,R1          ;READ SILO 2
1300  005112  005777  173402                TST     @CS             ;SEE IF DLT IS SET
1301  005116  100011                        BPL     FT10ER          ;IF NOT: BR
1302  005120  004737  013324          FT10X: JSR     PC,ITER         ;GO SEE IF ITERATION
1303  005124  005737  000726                TST     RH0F            ;SEE IF RH11 ONLY
1304  005130  001402                        BEQ     FT10XX          ;IF NOT: BR
1305  005132  000137  003156                JMP     TEND            ;ELSE GO TO END
1306  005136  000137  003070          FT10XX: JMP     TSCD2           ;RETURN TO SCHEDULAR
1307  005142  012737  016511  000650  FT10ER: MOV     #MSG32,ERADD    ;SET ERROR CODE
1308  005150  004737  004050                JSR     PC,FT3ER        ;GO DO ERROR
1309  005154  000767                        BR      FT10X
```

```
1310                                                ;NOP TEST*****
1311
1312  005156  000240                          FT11:  NOP
1313  005160  012737  005156  000674                 MOV     #FT11,SCOLP     ;SET SCOPE ADDRESS
1314  005166  004737  013474                         JSR     PC,INIT1
1315  005172  012737  000300  000716                 MOV     #300,UDES       ;SET TC= ALL NRZ,NORM,ODD
1316  005200  012737  177777  000620                 MOV     #-1,FCNT        ;SET FC= ALL OVER
1317  005206  012737  177777  000622                 MOV     #-1,WCNT        ;SET WC= ALL OVER
1318  005214  012737  177777  000616                 MOV     #-1,BADDR       ;SET BA= ALL OVER
1319  005222  012737  000001  000636                 MOV     #1,RDYDX        ;SET DELAY
1320  005230  012737  000001  000640                 MOV     #1,OPDYX        ;SET OP DELAY
1321  005236  012737  000001  000710                 MOV     #1,FUN          ;SET NOP FUNCTIONS CODE
1322  005244  004737  012304                         JSR     PC,EXEC         ,GO EXECUTE COMMAND
1323  005250  000240                                 NOP
1324  005252  012737  020433  000610                 MOV     #MSFT11,EMADDR
1325  005260  004737  012504                         JSR     PC,ERCHK        ;GO CHECK REGISTER
1326  005264  004737  013324                         JSR     PC,ITER         ;GO SEE IF ITERATIONS
1327  005270  000137  003070                         JMP     TSCD2           ;RETURN TO SCHEDULAR
```

```
1328                                                ;REWIND TEST*****
1329
1330  005274  000240                        FT12:   NOP
1331  005276  012737  005274  000674               MOV     #FT12,SCOLP
1332  005304  004737  013474                       JSR     PC,INIT1        ;GO INITIALIZE
1333  005310  052777  001700  173224               BIS     #1700,@TC       ;SET TO NRZ,NORMAL
1334  005316  012737  177760  000620               MOV     #-20,FCNT       ;SET FC=20
1335  005324  012737  177770  000622               MOV     #-10,WCNT       ;SET WC=10
1336  005332  012737  021310  000616               MOV     #WDATA,BADDR    ;SET BA=WRITE BUFFER
1337  005340  012737  000007  000710               MOV     #7,FUN          ;SET REWIND OP CODE
1338  005346  004737  012304                       JSR     PC,EXEC         ;GO EXECUTE COMMAND
1339  005352  000240                               NOP
1340  005354  032777  020000  173140  FT12A:  BIT     #20000,@DS
1341  005362  001374                               BNE     FT12A           ;AWAIT PIP
1342  005364  012737  020453  000610               MOV     #MSFT12,EMADDR
1343  005372  004737  012504                       JSR     PC,ERCHK        ;GO CHECK FOR ERROR
1344  005376  004737  013324                       JSR     PC,ITER         ;GO SEE IF ITERATION
1345  005402  000137  003070                       JMP     TSCD2           ;RETURN TO SCHEDULAR
1346
```

```
1347                                        ;WRITE/READ TEST*****
1348
1349  005406  000240                FT13:   NOP
1350  005410  012737  000001  000636        MOV     #1,RDYDX
1351  005416  012737  000001  000640        MOV     #1,OPDYX
1352  005424  012737  000100  000624        MOV     #100,RCNT       ;SET RECORD COUNT
1353  005432  012737  020476  000610        MOV     #MSFT13,EMADDR  ;SET TEST HEADER
1354  005440  012737  000001  000720        MOV     #1,PATRN
1355  005446  004737  013156                JSR     PC,DSUP         ;SET UP ALL ONES DATA PATTERN
1356  005452  012737  001700  000716        MOV     #1700,UDES      ;SET TO 800 BP: NORMAL
1357  005460  004737  012436        FT13A:  JSR     PC,RWND         ;GO REWIND
1358  005464  012737  177600  000620        MOV     #-200,FCNT      ;SET FC
1359  005472  012737  177700  000622        MOV     #-100,WCNT      ;SET WC
1360  005500  012737  021310  000616        MOV     #WDATA,BADDR    ;SET BA
1361  005506  012737  000061  000710        MOV     #61,FUN         ;SET WRITE OP-CODE
1362  005514  012737  016043  000626        MOV     #MSG12,ERRP
1363  005522  004737  012304        FT13B:  JSR     PC,EXEC         ;GO EXECUTE COMMAND
1364  005526  005037  000674                CLR     SCOLP           ;NO SCOPE LOOP
1365  005532  004737  012504                JSR     PC,ERCHK        ;GO CHECK ERROR
1366  005536  005337  000624                DEC     RCNT            ;SEE IF DONE ALL
1367  005542  001367                        BNE     FT13B           ;IF NOT: BR
1368  005544  012737  000100  000624        MOV     #100,RCNT       ;SET RECORD COUNT
1369  005552  012737  023022  000616        MOV     #RDATA,BADDR
1370  005560  062737  000200  000616        ADD     #200,BADDR      ;SET BA
1371  005566  012737  000077  000710        MOV     #77,FUN         ;SET READ REVERSE OP-CPDE
1372  005574  012737  016061  000626        MOV     #MSG13,ERRP
1373  005602  004737  012304        FT13C:  JSR     PC,EXEC         ;GO EXECUTE COMMAND
1374  005606  004737  012504                JSR     PC,ERCHK        ;GO CHECK ERROR
1375  005612  005337  000624                DEC     RCNT            ;SEE IF READ ALL
1376  005616  001371                        BNE     FT13C           ;IF NOT:BR
1377  005620  162737  000200  000616        SUB     #200,BADDR      ;SET BA
1378  005626  012737  000071  000710        MOV     #71,FUN         ;SET READ FORWARD OP-CODE
1379  005634  012737  016106  000626        MOV     #MSG14,ERRP
1380  005642  012737  000100  000624        MOV     #100,RCNT       ;SET RECORD COUNT
1381  005650  004737  012304        FT13D:  JSR     PC,EXEC         ;GO EXECUTE COMMAND
1382  005654  004737  012504                JSR     PC,ERCHK        ;GO CHECK ERRORS
1383  005660  005337  000624                DEC     RCNT            ;SEE IF DONE ALL
1384  005664  001371                        BNE     FT13D           ;IF NOT:BR
1385  005666  032737  002000  000716        BIT     #2000,UDES      ;SEE IF DONE PE
1386  005674  001007                        BNE     FT13X           ;IF SO: BR
1387  005676  012737  002300  000716        MOV     #2300,UDES      ;SET PE MODE
1388  005704  012737  000100  000624        MOV     #100,RCNT       ;RESET RECORD COUNT
1389  005712  000662                        BR      FT13A           ;GO DO NEXT DENSITY
1390  005714  000137  003070        FT13X:  JMP     TSCD2           ;RETURN TO SCHEDULAR
```

```
1391                                        ;SPACE TEST*****
1392
1393  005720  000240                FT14:   NOP
1394  005722  012737  020525  000610        MOV     #MSFT14,EMADDR  ;SET TEST HEADER
1395  005730  012737  001700  000716        MOV     #1700,UDES      ;SET NRZ,NORMAL
1396  005736  004737  01243'        FT14A1: JSR     PC,RWND         ;GO INITIALIZE
1397  005742  012737  000100  000624        MOV     #100,RCNT       ;SET NUMBER OF RECORDER
1398  005750  012737  177777  021310        MOV     #-1,WDATA       ;SET DATA PATTERN
1399  005756  012737  177700  000620        MOV     #-100,FCNT      ;PRESET FRAME CNT
1400  005764  012737  177740  000622        MOV     #-40,WCNT       ;PRESET WORD CNT
1401  005772  004737  013474        FT14A:  JSR     PC,INIT1        ;GO REWIND
1402  005776  012737  001000  000640        MOV     #1000,OPDYX
1403  006004  012737  040000  000636        MOV     #40000,RDYDX
1404  006012  012737  000061  000710        MOV     #61,FUN         ;SET WRITE OP-CODE
1405  006020  012737  102300  000660        MOV     #102300,STMSK   ;MASK DATA RELATED ERRORS
1406  006026  052777  000010  172464        BIS     #10,@CS         ;INHIBIT BUS ADDRESS INCREMENT
1407  006034  004737  012304                JSR     PC,EXEC         ;GO EXECUTE COMMAND
1408  006040  012737  017166  000626        MOV     #MSG46,ERRP     ;SET ERROR CODE
1409  006046  004737  012504                JSR     PC,ERCHK        ;GO CHECK ERRORS
1410  006052  005737  000712                TST     SERFL           ;SEE IF ERROR
1411  006056  001402                        BEQ     FT14A2          ;IF NOT: BR
1412  006060  000137  006544                JMP     FT14X           ;ELSE EXIT
1413  006064  005337  000620        FT14A2: DEC     FCNT            ;BUMP FC
1414  006070  032737  000001  000620        BIT     #1,FCNT         ;SEE IF SHOULD BUMP WC
1415  006076  001403                        BEQ     FT14A3          ;IF NOT: BR
1416  006100  162737  000001  000622        SUB     #1,WCNT         ;BUMP WC
1417  006106  005337  000624        FT14A3: DEC     RCNT            ;SEE IF DONE ALL
1418  006112  001327                        BNE     FT14A           ;WRITE ALL RECORDS
1419  006114  012737  000100  000632        MOV     #100,RRD        ;PRESET RECORD POSITION
1420  006122  012737  000176  000634        MOV     #176,RFD
1421  006130  012737  177701  000642        MOV     #-77,SCNT       ;SET SPACE AMOUNT
1422  006136  012737  000033  000710  FT14B: MOV     #33,FUN         ;SET OP-CODE SPACE REVERSE
1423  006144  004737  012304                JSR     PC,EXEC         ;GO EXECUTE COMMAND
1424  006150  012737  017237  000626        MOV     #MSG48,ERRP     ;SET ERROR CODE
1425  006156  004737  012504                JSR     PC,ERCHK        ;GO CHECK ERRORS
1426  006162  005737  000712                TST     SERFL           ;SEE IF ERROR
1427  006166  001166                        BNE     FT14X           ;IF SO: BR
1428  006170  004737  006264                JSR     PC,FT14RR       ;GO READ REVERSE + CHECK DATA
1429  006174  000240                        NOP
1430  006176  012737  000031  000710        MOV     #31,FUN         ;SET SPACE FORWARD OP-CODE
1431  006204  005237  000642                INC     SCNT            ;SET SPACE AMOUNT
1432  006210  001555                        BEQ     FT14X           ;IF DONE: BR
1433  006212  004737  012304                JSR     PC,EXEC         ;GO EXECUTE COMMAND
1434  006216  012737  017212  000626        MOV     #MSG47,ERRP     ;SET ERROR CODE
1435  006224  004737  012504                JSR     PC,ERCHK        ;GO CHECK ERROR
1436  006230  005737  000712                TST     SERFL           ;SEE IF ERROR FLAG
1437  006234  001143                        BNE     FT14X           ;IF NO: BR
1438  006236  004737  006326                JSR     PC,FT14RF       ;GO READ FORWARD FOR POSITION CHECK
1439  006242  000240                        NOP
1440  006244  005237  000642                INC     SCNT            ;DECREMENT SPACE AMOUNT
1441  006250  001535                        BEQ     FT14X           ;IF DONE: BR
1442  006252  005237  000632                INC     RRD             ;BUMP DATA EXPT
1443  006256  005337  000634                DEC     RFD             ;BUMP DATA EXPT
1444  006262  000725                        BR      FT14B
1445  006264  000240                FT14RR: NOP
1446  006266  012737  023022  000616        MOV     #RDATA,BADDR    ;SET BA
```

```
1447  006274  012737  000077  000710          MOV     #77,FUN         ;SET READ REVERSE OP-CODE
1448  006302  004737  012304                  JSR     PC,EXEC         ;GO EXECUTE COMMAND
1449  006306  000240                          NOP
1450  006310  013705  000632                  MOV     RRD,R5
1451  006314  020577  172176                  CMP     R5,@FC          ;SEE IF CORRECT RECORD
1452  006320  001020                          BNE     FT14RER         ;IF NOT: BR
1453  006322  000137  006354                  JMP     FT14EC          ;GO CLEAR RH11 ERROR BIT
1454  006326  000240          FT14RF: NOP
1455  006330  012737  000071  000710          MOV     #71,FUN         ;SET READ FORWARD OP-CODE
1456  006336  004737  012304                  JSR     PC,EXEC         ;GO EXECUTE COMMAND
1457  006342  013705  000634                  MOV     RFD,R5
1458  006346  020577  172144                  CMP     R5,@FC          ;SEE IF CORRECT RECORD
1459  006352  001003                          BNE     FT14RER         ;IF NOT: BR
1460  006354  004737  013474          FT14EC: JSR     PC,INIT1        ;CLEAR RH
1461  006360  000207                          RTS     PC              ;RETURN
1462  006362  000240          FT14RER: NOP
1463  006364  032777  020000  172156          BIT     #20000,@SWR     ;SEE IF PRINT INHIBITED
1464  006372  001060                          BNE     FT14R3          ;IF SO: BR
1465  006374  012704  020525                  MOV     #MSFT14,R4
1466  006400  004737  014316                  JSR     PC,TTOUT        ;PRINT HEADER
1467  006404  012704  015621                  MOV     #MSG9,R4
1468  006410  004737  014316                  JSR     PC,TTOUT        ;PRINT ERROR TYPE
1469  006414  012704  016261                  MOV     #MSG20,R4       ;SET NRZ TAG POINTER
1470  006420  032737  002000  000716          BIT     #2000,UDES      ;SEE IF PE
1471  006426  001402                          BEQ     FT14R0          ;IF NOT: BR
1472  006430  012704  016267                  MOV     #MSG21,R4       ;ELSE SET PE TAG POINTER
1473  006434  004737  014316          FT14R0: JSR     PC,TTOUT        ;PRINT TAG
1474  006440  032737  000002  000710          BIT     #2,FUN          ;SEE IF READ REVERSE
1475  006446  001003                          BNE     FT14R1          ;IF SO: BR
1476  006450  012704  016241                  MOV     #MSG17,R4
1477  006454  000402                          BR      FT14R2          ;GO PRINT
1478  006456  012704  016221          FT14R1: MOV     #MSG16,R4
1479  006462  004737  014316          FT14R2: JSR     PC,TTOUT        ;PRINT FRWD/REV
1480  006466  012704  016274                  MOV     #MSG22,R4
1481  006472  004737  014316                  JSR     PC,TTOUT        ;PRINT EXPT TAG
1482  006476  010503                          MOV     R5,R3
1483  006500  042703  177700                  BIC     #177700,R3      ;MASK RECORD NUMBER
1484  006504  004737  014446                  JSR     PC,OCTP         ;PRINT EXPT RECORD NUMBER
1485  006510  012704  016304                  MOV     #MSG23,R4
1486  006514  004737  014316                  JSR     PC,TTOUT        ;PRINT RCVD TAG
1487  006520  017703  171772                  MOV     @FC,R3
1488  006524  042703  177700                  BIC     #177700,R3      ;MASK RECORD NUMBER
1489  006530  004737  014446                  JSR     PC,OCTP         ;PRINT ACTUAL RECORD NUMBER
1490  006534  005777  172010          FT14R3: TST     @SWR            ;SEE IF HALT ON ERROR
1491  006540  100001                          BPL     FT14X           ;IF NOT: BR
1492  006542  000000                          HALT
1493  006544  032737  002000  000716  FT14X:  BIT     #2000,UDES      ;SEE IF DONE PE
1494  006552  001005                          BNE     FT14XX          ;IF SO: BR
1495  006554  012737  002300  000716          MOV     #2300,UDES      ;SET TO PE
1496  006562  000137  005736                  JMP     FT14A1          ;DO IN PE
1497  006566  000137  003070          FT14XX: JMP     TSCD2           ;RETURN TO SCHEDULAR
```

```
1498                                            ;ERASE TEST*****
1499
1500  006572  000240                    FT15:   NOP
1501  006574  005037  000660                    CLR     STMSK
1502  006600  012737  000100  000636          MOV     #100,RDYDX
1503  006606  012737  000010  000640          MOV     #10,OPDYX
1504  006614  012737  020547  000610          MOV     #MSFT15,EMADDR  ;SET TEST HEADER
1505  006622  004737  012436                  JSR     PC,RWND         ;REWIND
1506  006626  012737  023022  000616          MOV     #RDATA,BADDR    ;SET BA
1507  006634  012737  001700  000716          MOV     #1700,UDES      ;SET NRZ, NORMAL
1508  006642  012737  000025  000710  FT15A:   MOV     #25,FUN         ;SET ERASE OP-CODE
1509  006650  012737  000454  000624          MOV     #300.,RCNT      ;++B SET TO ERASE 300 TIMES
1510  006656  004737  012304          FT15B:  JSR     PC,EXEC         ;GO EXECUTE COMMAND
1511  006662  012737  017166  000626          MOV     #MSG46,ERRP     ;SET ERROR CODE
1512  006670  004737  012504                  JSR     PC,ERCHK        ;GO CHECK ERRORS
1513  006674  005737  000712                  TST     SERFL           ;SEE IF ANY ERRORS
1514  006700  001032                          BNE     FT15X           ;IF SO EXIT
1515  006702  005337  000624                  DEC     RCNT            ;SEE IF DONE ERASING
1516  006706  001363                          BNE     FT15B           ;IF NOT: BR
1517  006710  000240                          NOP
1518  006712  004737  012436                  JSR     PC,RWND         ;REWIND
1519  006716  012737  177600  000622          MOV     #-200,WCNT      ;SET WC
1520  006724  012737  000071  000710          MOV     #71,FUN         ;SET READ FORWARD OP-CODE
1521  006732  012737  000040  000636          MOV     #40,RDYDX       ;SET DELAY
1522  006740  004737  012304                  JSR     PC,EXEC         ;GO EXECUTE COMMAND
1523  006744  000240                          NOP
1524  006746  012737  017640  000626          MOV     #MSG60,ERRP     ;SET ERROR CODE
1525  006754  012737  020000  000660          MOV     #20000,STMSK
1526  006762  004737  012504                  JSR     PC,ERCHK        ;GO CHECK ERRORS
1527                                            ;*********************************************
1528
1529                                            ;THIS CODE ADDED TO FORM REV C
1530
1531                                            ;THE SSC BIT AND THE PIP BIT IN THE DRIVE STATUS REG
1532                                            ;SHOULD NOT BE SET CONCURRENTLY
1533
1534                                            ;*********************************************
1535
1536  006766  012737  000100  000636  FT15X:  MOV     #100,RDYDX      ;SET DELAY
1537  006774  012737  000010  000640          MOV     #10,OPDYX
1538  007002  012737  000020  000624          MOV     #20,RCNT        ;SET UP FOR 20 ERASES
1539  007010  012737  023022  000616  1$:     MOV     #RDATA,BADDR    ;SET UP BUSS ADDRS
1540  007016  012737  001700  000716          MOV     #1700,UDES      ;SET UP TAPE CONTROL
1541  007024  012737  000025  000710          MOV     #25,FUN         ;SET FUN FOR ERASE
1542  007032  004737  012304                  JSR     PC,EXEC         ;GO EXECUTE CMD
1543  007036  005337  000624                  DEC     RCNT            ;DECREMENT THE NUMBER OF EXECUTES
1544  007042  001362                          BNE     1$              ;BRANCH IF MORE LEFT
1545  007044  012777  001700  171470          MOV     #1700,@TC
1546  007052  012777  177760  171436          MOV     #-20,@FC
1547  007060  012777  177770  171424          MOV     #-10,@WC
1548  007066  012777  021310  171420          MOV     #WDATA,@BA
1549  007074  012777  000007  171406          MOV     #7,@C1          ;DO REWIND
1550  007102  000240                          NOP
1551  007104  032777  000100  171410  2$:     BIT     #100,@DS        ;WAIT FOE SSC
1552  007112  001774                          BEQ     2$
1553  007114  017737  171402  000652          MOV     @DS,TEMP1       ;READ DRIVE STATUS REG IMMEDIATELY
```

```
1554  007122  032737  020000  000652          BIT     #20000,TEMP1    ;CHECK FOR PIP
1555  007130  001420                          BEQ     FT15XX          ;BRANCH IF NOT SET
1556  007132  052737  000001  007202          BIS     #1,TAG          ;SET FLAG FOR ERROR
1557  007140  012704  016213                  MOV     #MSG15B,R4
1558  007144  004737  014316                  JSR     PC,TTOUT
1559  007150  010703                          MOV     PC,R3
1560  007152  062703  000010                  ADD     #10,R3
1561  007156  004737  014434                  JSR     PC,OCTPE
1562
1563  007162  004737  012726                  JSR     PC,ERPTB1       ;GO PRINT ERROR
1564                                                                   ;DS REG REPORTED IS ITS CONTENTS
1565                                                                   ;AT THE TIME OF THE ERROR  (5 LINES OF CODE BACK)
1566  007166  005037  007202                  CLR     TAG             ;CLEAR FLAG
1567  007172  004737  013324          FT15XX: JSR     PC,ITER         ;CHECK FOR ITERATIONS
1568  007176  000137  003070                  JMP     TSCD2           ;GO TO  SCHEDULAR
1569
1570  007202  000000          TAG:    .WORD   0               ;++C  FLAG FOR ERROR ROUTINE
```

```
1571                                        ;TAPE MARK WRITE/READ TEST*****
1572
1573  007204  000240                FT16:   NOP
1574  007206  012737  000001  000636        MOV     #1,RDYDX
1575  007214  012737  001000  000640        MOV     #1000,OPDYX
1576  007222  012737  020571  000610        MOV     #MSFT16,EMADDR  ;SET HEADER
1577  007230  012737  001700  000716        MOV     #1700,UDES      ;SET TO NRZ,NORMAL,ODD
1578  007236  004737  012436        FT16A:  JSR     PC,RWND         ;INIT AND REWIND SLAVE
1579  007242  012737  177760  000620  FT16B: MOV     #-20,FCNT       ;FC=20
1580  007250  012737  177770  000622        MOV     #-10,WCNT       ;WC=10
1581  007256  012737  000027  000710        MOV     #27,FUN         ;SET WRITE TAPE MARK OP-CODE
1582  007264  004737  012304                JSR     PC,EXEC         ;GO EXECUTE COMMAND
1583  007270  012737  001000  000660        MOV     #1000,STMSK     ;SET FOR FCE MASK
1584  007276  012737  016133  000626        MOV     #MSG15,ERRP     ;SET ERROR CODE
1585  007304  004737  012504                JSR     PC,ERCHK        ;GO CHECK ERROR
1586  007310  004737  013120                JSR     PC,TMCHK        ;GO SEE IF TM SET
1587  007314  012737  000077  000710        MOV     #77,FUN         ;SET READ REVERSE OP-CODE
1588  007322  004737  012304                JSR     PC,EXEC         ;GO EXECUTE COMMAND
1589  007326  012737  001000  000660        MOV     #1000,STMSK     ;SET FCE ERROR MASK
1590  007334  012737  016061  000626        MOV     #MSG13,ERRP     ;SET ERROR CODE
1591  007342  004737  012504                JSR     PC,ERCHK        ;GO CHECK ERRORS
1592  007346  004737  013120                JSR     PC,TMCHK        ;GO SEE IF TM SET
1593  007352  012737  000071  000710        MOV     #71,FUN         ;SET READ  FORWARD OP-CODE
1594  007360  004737  012304                JSR     PC,EXEC         ;GO EXECUTE COMMAND
1595  007364  012737  016106  000626        MOV     #MSG14,ERRP     ;SET ERROR CODE
1596  007372  004737  012504                JSR     PC,ERCHK        ;TO CHECK ERRORS
1597  007376  004737  013120                JSR     PC,TMCHK        ;GO SEE IF TM SET
1598  007402  032737  002000  000716        BIT     #2000,UDES      ;SEE IF DONE PE
1599  007410  001004                        BNE     FT16X           ;IF SO: BR
1600  007412  012737  002300  000716        MOV     #2300,UDES      ;SET PE, NORMAL
1601  007420  000706                        BR      FT16A           ;DO IN PE
1602  007422  004737  013324        FT16X:  JSR     PC,ITER         ;DO ITERATIONS
1603  007426  000137  003070                JMP     TSCD2           ;RETURN TO SCHEDULAR
1604
```

```
1605
1606                                        ;TAPE MARK SPACE TEST**********
1607
1608  007432  005037  000624        FT17:   CLR     RCNT
1609  007436  012737  020632  000610        MOV     #MSFT17,EMADDR  ;SET HEADER
1610  007444  012737  001700  000716        MOV     #1700,UDES      ;SET TO NRZ
1611  007452  004737  012436        FT17A:  JSR     PC,RWND         ;REWIND TAPE
1612  007456  012737  000027  000710  FT17B: MOV     #27,FUN
1613  007464  012737  040000  000636        MOV     #40000,RDYDX    ;SET DRY DELAY
1614  007472  012737  040000  000640        MOV     #40000,OPDYX    ;SET OP DELAY
1615  007500  004737  012304               JSR     PC,EXEC         ;GO WRITE TM
1616  007504  012737  102300  000660        MOV     #102300,STMSK   ;MASK DATA RELATED ERRORS
1617  007512  012737  016133  000626        MOV     #MSG15,ERRP     ;SET ERROR TYPE
1618  007520  004737  012504               JSR     PC,ERCHK        ;GO CHECK ERROR
1619  007524  005737  000712               TST     SERFL           ;SEE IF ERROR
1620  007530  001137                       BNE     FT17X           ;IF SO: BR
1621  007532  004737  013120               JSR     PC,TMCHK        ;GO SEE IF TM SET
1622  007536  000240                       NOP
1623  007540  000240                       NOP
1624  007542  032737  000100  000624        BIT     #100,RCNT       ;SEE IF DONE PATTERN
1625  007550  001045                       BNE     FT17D           ;IF SO: BR
1626  007552  062737  000020  000624        ADD     #20,RCNT        ;ADD 20 TO RECORD COUNT
1627  007560  013737  000624  000652        MOV     RCNT,TEMP1      ;SAVE RECORD COUNT
1628  007566  012737  177600  000622        MOV     #-200,WCNT      ;WC=128
1629  007574  012737  177400  000620        MOV     #-400,FCNT      ;FC=256
1630  007602  012737  021310  000616        MOV     #WDATA,BADDR    ;BA=WRITE BUFFER
1631  007610  012737  000061  000710        MOV     #61,FUN         ;SET WRITE OP CODE
1632  007616  000240                FT17C:  NOP
1633  007620  000240                       NOP
1634  007622  004737  012304               JSR     PC,EXEC         ;GO WRITE
1635  007626  012737  016043  000626        MOV     #MSG12,ERRP     ;SET ERROR CODE
1636  007634  012737  102300  000660        MOV     #102300,STMSK   ;MASK DATA RELATED ERRORS
1637  007642  004737  012504               JSR     PC,ERCHK        ;GO CHECK ERROR
1638  007646  005737  000712               TST     SERFL           ;SEE IF ERROR
1639  007652  001066                       BNE     FT17X           ;IF SO: BR
1640  007654  005337  000652               DEC     TEMP1           ;SEE IF DONE ALL
1641  007660  001356                       BNE     FT17C           ;IF NOT: BR
1642  007662  000675                       BR      FT17B           ;ELSE GO DO TM
1643  007664  000240                FT17D:  NOP
1644  007666  012737  000033  000710        MOV     #33,FUN         ;SET SPACE REVERSE
1645  007674  012737  016221  000626        MOV     #MSG16,ERRP     ;SET ERROR CODE
1646  007702  012737  177600  000642  FT17D1: MOV    #-200,SCNT      ;SET TO 200 RECORDS
1647  007710  012737  000005  000624        MOV     #5,RCNT         ;SET NUMBER OF OPS TO DO
1648  007716  004737  013474        FT17E:  JSR     PC,INIT1        ;GO INIT
1649  007722  004737  012304               JSR     PC,EXEC         ;GO SPACE
1650  007726  012737  001000  000660        MOV     #1000,STMSK     ;SET ERROR MASK
1651  007734  004737  012504               JSR     PC,ERCHK        ;GO CHECK ERROR
1652  007740  005737  000712               TST     SERFL           ;SEE IF ERROR
1653  007744  001031                       BNE     FT17X           ;IF SO: BR
1654  007746  004737  013120               JSR     PC,TMCHK        ;GO SEE IF TM SET
1655  007752  005337  000624               DEC     RCNT            ;SEE IF DONE SPACES
1656  007756  001357                       BNE     FT17E           ;IF NOT: BR
1657  007760  022737  000031  000710        CMP     #31,FUN         ;SEE IF DONE FORWARD
1658  007766  001407                       BEQ     FT17F           ;IF SO: BR
1659  007770  012737  016241  000626        MOV     #MSG17,ERRP     ;SET ERROR CODE
1660  007776  012737  000031  000710        MOV     #31,FUN         ;SET TO SPACE FORWARD
```

```
 1661  010004  000736                          BR      FT17D1          ;DO FORWARD
 1662  010006  032737  002000  000716  FT17F:  BIT     #2000,UDES      ;SEE IF DONE PF
 1663  010014  001005                          BNE     FT17X           ;IF SO: BR
 1664  010016  012737  002300  000716          MOV     #2300,UDES      ;SET TO PE
 1665  010024  000137  007452                  JMP     FT17A           ;GO PE
 1666  010030  000137  003070          FT17X:  JMP      SCD2           ;RETURN  TO SCHEDULAR
```

```
1667
1668                                        ;WRITE CHECK TEST**********
1669
1670  010034  000240                FT20:   NOP
1671  010036  012737  020660  000610        MOV     #MSFT20,EMADDR  ;SET HEADER
1672  010044  012737  001700  000716        MOV     #1700,UDES      ;SET UNIT DESCRIPTION
1673  010052  004737  012436        FT20A:  JSR     PC,RWND         ;INIT AND REWIND SLAVE
1674  010056  012737  000003  000720        MOV     #3,PATRN
1675  010064  004737  013156                JSR     PC,DSUP         ;GO SET PATTERN 3
1676  010070  012737  021310  000616        MOV     #WDATA,BADDR    ;SET BA
1677  010076  012737  177400  000620        MOV     #-400,FCNT      ;SET FC
1678  010104  012737  177600  000622        MOV     #-200,WCNT      ;SET WC
1679  010112  012737  000061  000710        MOV     #61,FUN         ;SET WRITE OP CODE
1680  010120  004737  012304                JSR     PC,EXEC         ;GO WRITE RECORD
1681  010124  012737  017166  000626        MOV     #MSG46,ERRP     ;SET ERROR CODE
1682  010132  004737  012504                JSR     PC,ERCHK        ;GO CHECK ERROR
1683  010136  005737  000712                TST     SERFL           ;SEE IF ERORR
1684  010142  001042                        BNE     FT20X           ;IF SO: BR
1685  010144  012737  016221  000626        MOV     #MSG16,ERRP     ;SET REVERSE ERROR TAG
1686  010152  012737  000057  000710        MOV     #57,FUN         ;SET REVERSE WRITE CHECK OP-CODE
1687  010160  062737  000376  000616        ADD     #376,BADDR      ;SET BA FOR REVERSE CHECK
1688  010166  004737  012304                JSR     PC,EXEC         ;GO DO REVERSE CHECK
1689  010172  004737  012504                JSR     PC,ERCHK        ;GO CHECK ERROR
1690  010176  012737  016241  000626  FT20B: MOV     #MSG17,ERRP     ;SET FORWARD TAG
1691  010204  012737  000051  000710        MOV     #51,FUN         ;SET FORWARD CHECK OP CODE
1692  010212  162737  000376  000616        SUB     #376,BADDR      ;SET BA FOR FORWARD CHECK
1693  010220  004737  012304                JSR     PC,EXEC         ;GO DO FORWARD CHECK
1694  010224  004737  012504                JSR     PC,ERCHK        ;GO CHECK ERROR
1695  010230  032737  002000  000716  FT20C: BIT     #2000,UDES      ;SEE IF DONE PE
1696  010236  001004                        BNF     FT20X           ;IF SO: BR
1697  010240  012737  002300  000716        MOV     #2300,UDES      ;ELSE SET PE
1698  010246  000701                        BR      FT20A           ;DO IN PE
1699  010250  004737  013324        FT20X:  JSR     PC,ITER         ;DO ITERATIONS
1700  010254  000137  003070                JMP     TSCD2           ;RETURN TO SCHEDULAR
```

```
1701
1702                                        ;ERASE HEAD TEST*****
1703
1704  010260  012737  020711  000610  FT21:   MOV     #MSFT21,EMADDR  ;SET TEST HEADER
1705  010266  004737  012436          FT21A:  JSR     PC,RWND         ;GO REWIND
1706  010272  012737  000003  000720          MOV     #3,PATRN
1707  010300  004737  013156                  JSR     PC,DSUP         ;GO SET PATTERN 3
1708  010304  012737  021310  000616          MOV     #WDATA,BADDR    ;SET BA=WRITE BUFFER
1709  010312  012737  176340  000620          MOV     #-800.,FCNT     ;SET FC=800(10)
1710  010320  012737  177160  000622          MOV     #-400.,WCNT     ;SET WC=400(10)
1711  010326  012737  001700  000716          MOV     #1700,UDES      ;SET NRZ, NORMAL
1712  010334  012737  000061  000710          MOV     #61,FUN         ;SET WRITE OP-CODE
1713  010342  004737  012304                  JSR     PC,EXEC         ;GO DO WRITE 1
1714  010346  012737  016043  000626          MOV     #MSG12,ERRP     ;SET ERROR CODE
1715  010354  004737  012504                  JSR     PC,ERCHK        ;GO CHECK FOR ERROR
1716  010360  004737  012304                  JSR     PC,EXEC         ;YES DO WRITE 2
1717  010364  004737  012504                  JSR     PC,ERCHK        ;YES CHECK FOR ERROR
1718  010370  000240                          NOP
1719  010372  004737  012436                  JSR     PC,RWND         ;GO REWIND
1720  010376  012737  177160  000620          MOV     #-400.,FCNT     ;SET FC=400(10)
1721  010404  012737  177470  000622          MOV     #-200.,WCNT     ;SET WC=200(10)
1722  010412  004737  012304                  JSR     PC,EXEC         ;GO REWRITE RECORD 1-WH TO EH
1723  010416  000240                  FT21SCP:NOP
1724  010420  004737  012436                  JSR     PC,RWND         ;REWIND
1725  010424  012737  023022  000616          MOV     #RDATA,BADDR    ;SET BA=READ BUFFER
1726  010432  012737  177160  000620          MOV     #-400.,FCNT     ;SET FC=400
1727  010440  012737  177470  000622          MOV     #-200.,WCNT     ;SET WC=200
1728  010446  012737  000071  000710          MOV     #71,FUN         ;SET READ OP-CODE
1729  010454  004737  012304                  JSR     PC,EXEC         ;GO READ RECORD 1
1730  010460  012737  016106  000626          MOV     #MSG14,ERRP     ;SET FRROR CODE
1731  010466  004737  012504                  JSR     PC,ERCHK        ;GO CHECK FOR ERROR
1732  010472  000240                          NOP
1733  010474  052777  000010  170016          BIS     #10,@CS         ;INHIBIT BA INCREMENT
1734  010502  012737  176340  000620          MOV     #-800.,FCNT     ;SET FC=800(10)
1735  010510  012737  177160  000622          MOV     #-400.,WCNT     ;SET WC=400(10)
1736  010516  004737  012304                  JSR     PC,EXEC         ;GO READ RECORD 2
1737  010522  022777  001440  167766          CMP     #800.,@FC       ;SEE IF READ RECORD 2 OK
1738  010530  001424                          BEQ     FT21X           ;IF SO: BR
1739  010532  022777  001441  167756          CMP     #801.,@FC       ;BRANCH IF IN GREY AREA
1740  010540  001420                          BEQ     FT21X
1741  010542  022777  001440  167746  1$:     CMP     #800.,@FC       ;BRANCH IF ERASE HEAD REVERSED
1742  010550  101404                          BLOS    FT21B           ;IF SO: BR
1743  010552  012737  017061  000650          MOV     #MSG44,ERADD    ;SET ERASE HEAD INOPERATIVE ERROR CODE
1744  010560  000403                          BR      FT21C
1745  010562  012737  017111  000650  FT21B:  MOV     #MSG45,ERADD    ;SET ERASE HEAD REVERSED ERROR CODE
1746  010570  012737  010416  000674  FT21C:  MOV     #FT21SCP,SCOLP  ;SET SCOPE ADDRESS
1747  010576  004737  004050                  JSR     PC,FT3ER        ;GO PRINT ERROR
1748  010602  004737  013324          FT21X:  JSR     PC,ITER         ;GO SEE IF ITERATION
1749  010606  000137  003070                  JMP     TSCD2           ;RETURN TO SCHEDULAR
1750
1751
```

```
1752                                            ;BUFFERED COMMAND TEST*****
1753
1754  010612  012737  020740  000610  FT22:   MOV     #MSFT22,EMADDR  ;SET TEST HEADER
1755  010620  004737  012436                  JSR     PC,RWND         ;GO REWIND
1756  010624  012700  000003                  MOV     #3,R0           ;SET NUMBER OF WRITES
1757  010630  012737  001700  000716          MOV     #1700,UDES      ;SET TO NRZ NORMAL
1758  010636  012737  021310  000616          MOV     #WDATA,BADDR    ;SET BA=WRITE BUFFER
1759  010644  012737  177000  000620          MOV     #-1000,FCNT     ;SET FC=1000
1760  010652  012737  177400  000622          MOV     #-400,WCNT      ;SET WC=400
1761  010660  012737  000061  000710          MOV     #61,FUN         ;SET WRITE OP-CODE
1762  010666  004737  012304          FT22A:  JSR     PC,EXEC         ;GO DO WRITE
1763  010672  005300                          DEC     R0              ;SEE IF DONE ALL
1764  010674  001374                          BNE     FT22A           ;IF NOT: BR
1765  010676  000240                          NOP
1766  010700  012777  000007  167602          MOV     #7,@C1          ;START REWIND
1767  010706  032777  000200  167606  FT22B:  BIT     #200,@DS
1768  010714  001774                          BEQ     FT22B
1769  010716  004737  013474                  JSR     PC,INIT1        ;INITIALIZE
1770  010722  012737  000010  000636          MOV     #10,RDYDX       ;SET LONG READY DELAY
1771  010730  004737  012304                  JSR     PC,EXEC         ;ISSUE BUFFERED WRITE
1772  010734  000240                          NOP
1773  010736  012737  017264  000626          MOV     #MSG49,ERRP     ;SET ERROR CODE
1774  010744  012737  102300  000660          MOV     #102300,STMSK   ;MARK DATA ERROR
1775  010752  004737  012504                  JSR     PC,ERCHK        ;GO CHECK ERROR
1776  010756  032777  000002  167536          BIT     #2,@DS          ;SEE IF BOT IS SET
1777  010764  001410                          BEQ     FT22X           ;IF NOT: BR
1778  010766  012737  017312  000650          MOV     #MSG50,ERADD    ;SET ERROR CODE
1779  010774  012737  010612  000674          MOV     #FT22,SCOLP
1780  011002  004737  004050                  JSR     PC,FT3ER        ;GO DO ERROR
1781  011006  004737  013324          FT22X:  JSR     PC,ITER         ;GO SEE IF ITERATION
1782  011012  000137  003070                  JMP     TSCD2           ;RETURN TO SCHEDULAR
1783
1784
```

```
1785                                        ;READ-IN PRESET TEST*****
1786
1787  011016  005737  000614        FT23:   TST     SLVN            ;SEE IF SLAVE SELECT=0
1788  011022  001103                         BNE     FT23X           ;IF NOT:BR
1789  011024  012737  020775  000610        MOV     #MSFT23,EMADDR  ;SET TEST HEADER
1790  011032  004737  013474                JSR     PC,INIT1        ;GO INIT
1791  011036  012737  001700  000716        MOV     #1700,UDES      ;SET TO NRZ NORMAL
1792  011044  012737  021310  000616        MOV     #WDATA,BADDR    ;SET BA=WRITE BUFFER
1793  011052  012737  177400  000620        MOV     #-400,FCNT      ;SET FC=400
1794  011060  012737  177600  000622        MOV     #-200,WCNT      ;SET WC=200
1795  011066  012737  000061  000710        MOV     #61,FUN         ;SET WRITE OP-CODE
1796  011074  004737  012304                JSR     PC,EXEC         ;GO DO WRITE
1797  011100  000240                         NOP
1798  011102  004737  013474                JSR     PC,INIT1        ;INITIALIZE
1799  011106  012737  000021  000710        MOV     #21,FUN         ;SET READ-IN PRESET OP CODE
1800  011114  004737  012304                JSR     PC,EXEC         ;GO DO COMMAND
1801  011120  005000                         CLR     R0
1802  011122  012703  000004                MOV     #4,R3           ;SET MULT
1803  011126  032777  020000  167366  FT23A: BIT     #20000,@DS      ;SEE IF PIP RESET
1804  011134  001404                         BEQ     FT23B           ;IF SO: BR
1805  011136  005300                         DEC     R0
1806  011140  001372                         BNE     FT23A           ;AWAIT PIP RESET
1807  011142  005303                         DEC     R3
1808  011144  001370                         BNE     FT23A           ;DELAY
1809  011146  032777  000002  167346  FT23B: BIT     #2,@DS          ;SEE IF BOT
1810  011154  001010                         BNE     FT23C           ;IF SO: BR
1811  011156  012737  017350  000650        MOV     #MSG51,ERADD    ;SET ERROR CODE
1812  011164  012737  011016  000674        MOV     #FT23,SCOLP
1813  011172  004737  004050                JSR     PC,FT3ER        ;GO DO ERROR
1814  011176  012701  141000        FT23C:  MOV     #141000,R1      ;SET EXPT TC
1815  011202  013700  000542                MOV     TC,R0           ;SET TC ADDRESS
1816  011206  020110                         CMP     R1,(R0)         ;SEE IF EXPT=RCVD
1817  011210  001410                         BEQ     FT23X           ;IF SO: BR
1818  011212  012737  017404  000650        MOV     #MSG52,ERADD    ;SET ERROR CODE
1819  011220  012737  011016  000674        MOV     #FT23,SCOLP     ;CLEAR SCOPE ADDRESS
1820  011226  004737  003560                JSR     PC,FT2ER        ;GO DO ERROR
1821  011232  000137  003070        FT23X:  JMP     TSCD2           ;RETURN TO SCHEDULAR
1822
1823
```

```
1824
1825                                    ;AUTO-DENSITY SELECT TEST: WRITE-NRZ,READ-PE
1826
1827  011236  012737  021030  000610  FT24:   MOV     #MSFT24,EMADDR  ;SET ERROR MSG HEADER
1828  011244  004737  012436                  JSR     PC,RWND         ;REWIND SLAVE
1829  011250  012737  000001  000720          MOV     #1,PATRN        ;SELECT PATTERN
1830  011256  004737  013156                  JSR     PC,DSUP         ;GO DO DATA SETUP
1831  011262  012737  021310  000616          MOV     #WDATA,BADDR    ;SET BUS ADDRESS,
1832  011270  012737  177400  000620          MOV     #-400,FCNT      ;FRAME COUNT,
1833  011276  012737  177600  000622          MOV     #-200,WCNT      ;WORD COUNT,
1834  011304  012737  001700  000716          MOV     #1700,UDES      ;& SLAVE DESC = NRZ NORMAL
1835  011312  012737  000061  00071C          MOV     #61,FUN         ;LOAD OP CODE WRITE FWD
1836  011320  004737  012304                  JSR     PC,EXEC         ;GO EXECUTE COMMAND
1837  011324  012737  017166  000626          MOV     #MSG46,ERRP     ;SET ERROR MSG ADDRESS
1838  011332  004737  012504                  JSR     PC,ERCHK        ;GO CHECK ERRORS
1839  011336  005737  000712                  TST     SERFL           ;BRANCH IF AN ERROR OCCURRED
1840  011342  001026                          BNE     FT24X
1841  011344  004737  012436                  JSR     PC,RWND         ;REWIND SLAVE
1842  011350  012737  023022  000616          MOV     #RDATA,BADDR    ;SET BUS ADDRESS FOR READ
1843  011356  012737  002300  000716          MOV     #2300,UDES      ;SET SLAVE DESC = PE,NORMAL
1844  011364  012737  000071  000710          MOV     #71,FUN         ;SET OP CODE = READ FWD
1845  011372  004737  012304                  JSR     PC,EXEC         ;GO READ RECORD
1846  011376  032777  000040  167116          BIT     #40,@DS         ;BRANCH ID PES BIT CLEARED
1847  011404  001405                          BEQ     FT24X
1848  011406  012737  017737  000650          MOV     #MSG63,ERADD
1849  011414  004737  004050                  JSR     PC,FT3ER        ;GO PROCESS ERROR
1850  011420  004737  013324          FT24X:  JSR     PC,ITER
1851  011424  000137  003070                  JMP     TSCD2           ;RETURN TO SCHEDULER
1852
```

```
1853
1854                                        ;AUTO-DENSITY SELECT TEST: WRITE-PE,READ-NRZ
1855  011430  012737  021106  000610  FT25:  MOV   #MSFT25,EMADDR  ;SET ERROR MESSAGE ADDRESS
1856  011436  004737  012436                JSR   PC,RWND         ;REWIND SLAVE
1857  011442  012737  000001  000720        MOV   #1,PATRN        ;SELECT PATTERN
1858  011450  004737  013156                JSR   PC,DSUP         ;GO DO DATA SETUP
1859  011454  012737  021310  000616        MOV   #WDATA,BADDR    ;SET BUS ADDRESS
1860  011462  012737  177400  000620        MOV   #-400,FCNT      ;FRAME COUNT,
1861  011470  012737  177600  000622        MOV   #-200,WCNT      ;WORD COUNT,
1862  011476  012737  002300  000716        MOV   #2300,UDES      ;& SLAVE DESC = PE,NORMAL
1863  011504  012737  000061  000710        MOV   #61,FUN         ;LOAD WRITE OP CODE
1864  011512  004737  012304                JSR   PC,EXEC         ;GO EXECUTE WRITE
1865  011516  012737  017166  000626        MOV   #MSG46,ERRP     ;SET ERROR MSG HDR
1866  011524  004737  012504                JSR   PC,ERCHK        ;GO CHECK FOR ERRORS
1867  011530  005737  000712                TST   SERFL           ;BRANCH IF ERROR OCURRED
1868  011534  001026                        BNE   FT25X
1869  011536  004737  012436                JSR   PC,RWND         ;REWIND SLAVE
1870  011542  012737  023022  000616        MOV   #RDATA,BADDR    ;SET BUS ADDRESS FOR READ
1871  011550  012737  001700  000716        MOV   #1700,UDES      ;SET SLAVE DESC = NRZ,NORMAL
1872  011556  012737  000071  000710        MOV   #71,FUN         ;SET READ FWD OP CODE
1873  011564  004737  012304                JSR   PC,EXEC         ;GO EXECUTE
1874  011570  032777  000040  166724        BIT   #40,@DS         ;BRANCH ID PES BIT GOT SET
1875  011576  001005                        BNE   FT25X
1876  011600  012737  017770  000650        MOV   #MSG64,ERADD
1877  011606  004737  004050                JSR   PC,FT3ER        ;GO PROCESS ERROR
1878  011612  004737  013324        FT25X:  JSR   PC,ITER         ;ITERATION LOOP
1879  011616  000137  003070                JMP   TSCD2           ;RETURN TO SCHEDULER
1880
```

```
 1881                                          ;++B SEQUENTIAL TAPE MARK TEST
 1882
 1883  011622  000240                  FT26:   NOP
 1884  011624  012737  021164  000610          MOV     #MSFT26,EMADDR  ;SET TEST ERROR MSG HEADER
 1885  011632  012737  001700  000716          MOV     #1700,UDES      ;SET NRZ
 1886  011640  004737  012436              1$: JSR     PC,RWND         ;REWIND SLAVE
 1887  011644  012737  000027  000710          MOV     #27,FUN         ;SET WRITE TAPE MARK FUNCTION CODE
 1888  011652  004737  012304                  JSR     PC,EXEC         ;GO DO TAPE MARK
 1889  011656  005037  000660                  CLR     STMSK           ;CLEAR EXPECTED ERROR MASK
 1890  011662  012737  016133  000626          MOV     #MSG15,ERRP     ;SET ERROR MESSAGE
 1891  011670  004737  012504                  JSR     PC,ERCHK        ;GO CHECK FOR ERRORS
 1892  011674  004737  013120                  JSR     PC,TMCHK        ;GO CHECK FOR TAPE MARK
 1893  011700  005737  000712                  TST     SERFL           ;EXIT TEST IF ERROR DETECTED
 1894  011704  001061                          BNE     FT26X
 1895  011706  004737  012304                  JSR     PC,EXEC         ;WRITE SECOND TAPE MARK
 1896  011712  012737  016154  000626          MOV     #MSG15A,ERRP    ;SET ERROR MESSAGE
 1897  011720  004737  012504                  JSR     PC,ERCHK        ;GO CHECK ERROR
 1898  011724  004737  013120                  JSR     PC,TMCHK
 1899  011730  005737  000712                  TST     SERFL           ;EXIT TEST IF ERROR DETECTED
 1900  011734  001045                          BNE     FT26X
 1901  011736  004737  012436                  JSR     PC,RWND         ;REWIND
 1902  011742  012737  000031  000710          MOV     #31,FUN         ;SET SPACE FORWARD OP CODE
 1903  011750  012737  177777  000642          MOV     #-1,SCNT        ;SET # OF RECORDS TO SPACE
 1904  011756  004737  012304                  JSR     PC,EXEC         ;GO SPACE FORWARD
 1905  011762  012737  017212  000626          MOV     #MSG47,ERRP     ;SET SPACE FORWARD ERROR
 1906  011770  004737  012504                  JSR     PC,ERCHK        ;GO CHECK ERROR BITS
 1907  011774  004737  013120                  JSR     PC,TMCHK        ;GO CHECK IF TAPE MARK DETECTED
 1908  012000  005737  000712                  TST     SERFL           ;EXIT TEST IF ERROR DETECTED
 1909  012004  001021                          BNE     FT26X
 1910  012006  004737  012304                  JSR     PC,EXEC         ;SPACE TO SECOND TAPE MARK
 1911  012012  004737  012504                  JSR     PC,ERCHK        ;GO CHECK ERROR BITS
 1912  012016  004737  013120                  JSR     PC,TMCHK        ;CHECK IF TAPE MARK DETECTED
 1913  012022  005737  000712                  TST     SERFL           ;EXIT TEST IF ERROR DETECTED
 1914  012026  001010                          BNE     FT26X
 1915  012030  032737  002000  000716          BIT     #2000,UDES      ;EXIT TEST IF PE COMPLETED
 1916  012036  001004                          BNE     FT26X
 1917  012040  012737  002300  000716          MOV     #2300,UDES      ;SET PE MODE
 1918  012046  000674                          BR      1$
 1919  012050  004737  013324          FT26X:  JSR     PC,ITER
 1920  012054  000137  003070                  JMP     TSCD2
```

```
                                                ;REWIND: OFF LINE TEST*****
                                                
012060  032777  010000  166462  FT27:   BIT     #10000,@SWR     ;SEE IF IN CONTINUOUS MODE
012066  001104                        BNE     FT27XX          ;IF SO: BR
012070  005737  001662                TST     CHNFLG          ;BRANCH IF CHAIN MODE
012074  001101                        BNE     FT27XX
012076  012737  021225  000610        MOV     #MSFT27,EMADDR  ;SET TEST HEADER
012104  004737  012436                JSR     PC,RWND         ;REWIND & SELECT SLAVE
012110  012737  000001  000720        MOV     #1,PATRN        ;SELECT PATTERN (ALL 1'S)
012116  004737  013156                JSR     PC,DSUP         ;FILL WRITE BUFFER
012122  012737  021310  000616        MOV     #WDATA,BADDR    ;SET WRITE BUFFER BUS ADDRESS
012130  012737  177400  000620        MOV     #-400,FCNT      ;SET FRAME COUNT
012136  012737  177600  000622        MOV     #-200,WCNT      ;SET WORD COUNT
012144  012737  001700  000716        MOV     #1700,UDES      ;SET UNIT DESCRIPTION   NRZ
012152  012737  000061  000710        MOV     #61,FUN         ;SET WRITE COMMAND
012160  004737  012304                JSR     PC,EXEC         ;GO WRITE A RECORD
012164  004737  013474                JSR     PC,INIT1        ;++B CLEAR ANY ERROR BITS
012170  012777  000003  166312        MOV     #3,@C1          ;ISSUE REWIND: OFF LINE COMMAND
012176  005037  000674                CLR     SCOLP           ;CLEAR SCOPE LOOP
012202  012700  000042                MOV     #42,R0
012206  005001                1$:     CLR     R1              ;CLEAR TIMER
012210  005301                2$:     DEC     R1
012212  001376                        BNE     2$              ;IF NOT TIMED OUT: BR
012214  005300                        DEC     R0
012216  001373                        BNE     1$              ;IF NOT ALL TIMED OUT: BR
012220  032777  010000  166274        BIT     #10000,@DS      ;SEE IF MOL IS RESET
012226  001406                        BEQ     3$              ;IF SO: BR
012230  012737  017423  000650        MOV     #MSG53,ERADD    ;SET ERROR CODE
012236  004737  004050                JSR     PC,FT3ER        ;GO DO ERROR
012242  000412                        BR      FT27X
012244  013700  000524        3$:     MOV     ER,R0           ;GET ADDRESS OF ERROR REG
012250  005001                        CLR     R1              ;RESULT SHOULD BE 0
012252  020110                        CMP     R1,(R0)         ;BRANCH IF ERROR REG = 0
012254  001405                        BEQ     FT27X
012256  012737  020024  000650        MOV     #MSG67,ERADD    ;SET ERROR MSG HEADER
012264  004737  003560                JSR     PC,FT2ER        ;GO TYPE ERROR
012270  012704  017450        FT27X:  MOV     #MSG54,R4
012274  004737  014316                JSR     PC,TTOUT        ;PRINT ON LINE REQUEST
012300  000137  003070        FT27XX: JMP     TSCD2           ;RETURN TO SCHEDULER
```

```
1960
1961                                        ;COMMAND EXECUTE SUBROUTINE*****
1962
1963  012304  000240                EXEC:   NOP
1964  012306  053777  000716  166226        BIS     UDES,@TC        ;LOAD TAPE CONT
1965  012314  013777  000622  166170        MOV     WCNT,@WC        ;LOAD WC
1966  012322  013777  000620  166166        MOV     FCNT,@FC        ;LOAD FC
1967  012330  013777  000616  166156        MOV     BADDR,@BA       ;LOAD BA
1968  012336  022737  000031  000710        CMP     #31,FUN         ;SEE IF SPACE FORWARD
1969  012344  001404                        BEQ     EXECA           ;IF SO: BR
1970  012346  022737  000033  000710        CMP     #33,FUN         ;SEE IF SPACE REVERSE
1971  012354  001003                        BNE     EXECB           ;IF NOT: BR
1972  012356  013777  000642  166132  EXECA: MOV     SCNT,@FC        ;SET SPACE COUNT
1973  012364  000240                EXECB:  NOP
1974  012366  013777  000710  166114        MOV     FUN,@C1         ;LOAD OP-CODE + GO
1975  012374  000240                        NOP
1976  012376  013703  000636                MOV     RDYDX,R3        ;SET DELAY
1977  012402  005004                        CLR     R4
1978  012404  032777  000200  166110  EXECC: BIT     #200,@DS        ;SEE IF DRY
1979  012412  001004                        BNE     EXECX           ;IF SO: BR
1980  012414  005304                        DEC     R4
1981  012416  001372                        BNE     EXECC
1982  012420  005303                        DEC     R3              ;DELAY FOR DRY
1983  012422  001370                        BNE     EXECC
1984  012424  013703  000640        EXECX:  MOV     OPDYX,R3
1985  012430  005303                EXECXA: DEC     R3              ;DELAY
1986  012432  001376                        BNE     EXECXA
1987  012434  000207                EXECXX: RTS     PC              ;RETURN TO CALLER
1988
```

```
 1989                                                ;REWIND SUBROUTINE*****
 1990
 1991  012436  004737  013474          RWND:   JSR     PC,INIT1        ;INIT SLAVE
 1992  012442  012777  000007  166040          MOV     #7,@C1          ;START REWIND
 1993  012450  032777  000002  166044  1$:     BIT     #2,@DS          ;WAIT FOR BOT TO SET
 1994  012456  001774                        BEQ     1$
 1995  012460  032777  020000  166034  2$:     BIT     #20000,@DS      ;WAIT FOR PIP TO CLEAR
 1996  012466  001374                        BNE     2$
 1997  012470  105777  166026          3$:     TSTB    @DS             ;++B WAIT FOR DRY
 1998  012474  100375                        BPL     3$              ;++B
 1999  012476  004737  013474                JSR     PC,INIT1        ;INIT
 2000  012502  000207                        RTS     PC              ;RETURN TO CALLER
 2001
```

```
2002                                        ;ERROR CHECK SUBROUTINE*****
2003
2004  012504  005037  000712          ERCHK:  CLR     SERFL           ;CLEAR FLAG
2005  012510  017737  166006  000664          MOV     @DS,DSAV        ;SAVE DRIVE STATUS REGISTER
2006  012516  032777  040000  165776          BIT     #40000,@DS      ;SEE IF ERROR
2007  012524  001001                          BNE     ERPT            ;IF SO: BR
2008  012526  000207                          RTS     PC              ;RETURN
2009  012530  017704  165770          ERPT:   MOV     @ER,R4          ;GET ERROR REGISTER
2010  012534  032737  002000  000716        BIT     #2000,UDES      ;SEE IF PE
2011  012542  001403                          BEQ     2$              ;IF SO: BR
2012  012544  042737  000200  000660        BIC     #200,STMSK      ;RESET PEF MASK
2013  012552  022737  000003  000742  2$:     CMP     #3,JUMPER       ;+TEST FOR NON-STANDARD JUMPER
2014  012560  001413                          BEQ     ERPTA1          ;+BRANCH IF STANDARD
2015  012562  022777  011236  166716        CMP     #FT24,@LTADD    ;+CHECK FOR TEST 24
2016  012570  001404                          BEQ     1$              ;+BRANCH IF TST24
2017  012572  022777  011430  166106        CMP     #FT25,@LTADD    ;+CHECK FOR TEST 25
2018  012600  001003                          BNE     ERPTA1
2019  012602  052737  020000  000660  1$:     BIS     #20000,STMSK    ;+SET OPI BIT IN ERROR MASK
2020  012610  043704  000660          ERPTA1: BIC     STMSK,R4        ;MASK DONT CARE BITS
2021  012614  001536                          BEQ     ERPTX           ;IF NO UNEXPECTED ERRORS: BR
2022  012616  012737  000001  000712  ERPTG:  MOV     #1,SERFL        ;SET FLAG
2023  012624  032777  020000  165716        BIT     #20000,@SWR     ;SEE IF SHOULD PRINT ERRORS
2024  012632  001123                          BNE     ERPTD           ;IF NOT: BR
2025  012634  005737  000606                  TST     HDRFL           ;SEE IF DONE HEADER
2026  012640  001006                          BNE     ERPTA           ;IF SO: BR
2027  012642  005237  000606                  INC     HDRFL           ;SET HEADER FLAG
2028  012646  013704  000610                  MOV     EMADDR,R4
2029  012652  004737  014316                  JSR     PC,TTOUT        ;PRINT HEADER
2030  012656  013704  000626          ERPTA:  MOV     ERRP,R4         ;GET ERROR CODE
2031  012662  001414                          BEQ     ERPTB           ;IF NONE: BR
2032  012664  004737  014316                  JSR     PC,TTOUT        ;PRINT ERROR CODE
2033  012670  012704  016261                  MOV     #MSG20,R4       ;SET NRZ TAG
2034  012674  032777  002000  165640        BIT     #2000,@TC       ;SEE IF PE
2035  012702  001402                          BEQ     ERPT1A          ;IF NOT: BR
2036  012704  012704  016267                  MOV     #MSG21,R4       ;ELSE SET PE TAG
2037  012710  004737  014316          ERPT1A: JSR     PC,TTOUT        ;PRINT TAG
2038  012714  013704  000630          ERPTB:  MOV     ERRP1,R4        ;SEE IF CODE 2
2039  012720  001402                          BEQ     ERPTB1          ;IF NOT: BR
2040  012722  004737  014316                  JSR     PC,TTOUT        ;PRINT CODE 2
2041  012726  032777  004000  165614  ERPTB1: BIT     #4000,@SWR      ;SEE IF ITERATION
2042  012734  001010                          BNE     ERPTC           ;IF NOT: BR
2043  012736  012704  017614                  MOV     #MSG56,R4
2044  012742  004737  014316                  JSR     PC,TTOUT        ;PRINT ITER TAG
2045  012746  013703  000662                  MOV     ITCNT,R3
2046  012752  004737  014446                  JSR     PC,OCTP         ;PRINT ITERATION
2047  012756  012704  015240          ERPTC:  MOV     #MSG1,R4
2048  012762  004737  014316                  JSR     PC,TTOUT        ;PRINT REGISTER TAG
2049  012766  017703  165516                  MOV     @C1,R3
2050  012772  004737  014434                  JSR     PC,OCTPE        ;PRINT CS1
2051  012776  017703  165510                  MOV     @WC,R3
2052  013002  004737  014434                  JSR     PC,OCTPE        ;PRINT WC
2053  013006  017703  165502                  MOV     @BA,R3
2054  013012  004737  014434                  JSR     PC,OCTPE        ;PRINT BA
2055  013016  017703  165474                  MOV     @FC,R3
2056  013022  004737  014434                  JSR     PC,OCTPE        ;PRINT FC
2057  013026  017703  165466                  MOV     @CS,R3
```

```
 2058  013032  004737  014434                  JSR     PC,OCTPE        ;PRINT CS2
 2059  013036  005737  007202                  TST     TAG             ;++C  CHECK FOR SPECIAL DS
 2060  013042  001403                          BEQ     1$
 2061  013044  013703  000652                  MOV     TEMP1,R3        ;++C PRINT DS READ INTO TEMP1 AT CRITICAL TIME
 2062  013050  000402                          BR      2$
 2063  013052  017703  165444          1$:     MOV     @DS,R3
 2064  013056  004737  014434          2$:     JSR     PC,OCTPE        ;PRINT DS
 2065  013062  017703  165436                  MOV     @ER,R3
 2066  013066  004737  014434                  JSR     PC,OCTPE        ;PRINT ER
 2067  013072  017703  165444                  MOV     @TC,R3
 2068  013076  004737  014434                  JSR     PC,OCTPE        ;PRINT TC
 2069  013102  005777  165442          ERPTD:  TST     @SWR            ;SEE IF HALT ON ERROR
 2070  013106  100001                          BPL     ERPTX           ;IF NOT: BR
 2071  013110  000000                          HALT
 2072  013112  004737  013474          ERPTX:  JSR     PC,INIT1        ;INIT
 2073  013116  000207                  ERPTXX: RTS     PC              ;RETURN
 2074
 2075
```

```
2076                                        ;TAPE MARK STATUS CHECK**********
2077
2078  013120  032737  000004  000664  TMCHK:  BIT     #4,DSAV         ;BRANCH IF TM SET
2079  013126  001012                          BNE     1$
2080  013130  005737  000712                  TST     SERFL           ;SEE IF HAD ERROR
2081  013134  001007                          BNE     1$              ;IF SO: BR
2082  013136  012737  017624  000630          MOV     #MSG57,ERRP1    ;SET ERROR CODE 2
2083  013144  004737  012616                  JSR     PC,ERPTG        ;GO PRINT TM ERROR
2084  013150  005037  000630                  CLR     ERRP1           ;CLEAR CODE 2 FLAG
2085  013154  000207                  1$:     RTS     PC              ;RETURN
2086
2087                                        ;DATA SETUP ROUTINE**********
2088
2089  013156  000240                  DSUP:   NOP
2090  013160  012703  021310          DS0:    MOV     #WDATA,R3       ;R3 = ADDRS OF WRITE BUFFER
2091  013164  013701  000720                  MOV     PATRN,R1        ;R1 = PATTERN SELECTOR
2092  013170  006301                          ASL     R1              ;MAKE PATTERN SELECTOR EVEN
2093  013172  004771  000744                  JSR     PC,@DATBL(R1)   ;GO GENERATE PATTERN
2094  013176  012702  000640                  MOV     #640,R2         ;R2=BUFFER SIZE +2
2095  013202  012701  023022                  MOV     #RDATA,R1       ;R1=READ DATA START
2096  013206  005021                  1$:     CLR     (R1)+           ;CLEAR BUFFER
2097  013210  005302                          DEC     R2              ;SEE IF DONE ALL
2098  013212  001375                          BNE     1$              ;IF NOT: BR
2099  013214  000207                          RTS     PC              ;EXIT
2100
2101                                        ;ALL ONES**********
2102
2103  013216  012701  177777          DAT1:   MOV     #-1,R1          ;R1=DATA
2104  013222  012702  000640          DAT1A:  MOV     #640,R2         ;R2=WORD COUNT +2
2105  013226  010123                  1$:     MOV     R1,(R3)+        ;LOAD BUFFER
2106  013230  005302                          DEC     R2              ;SEE IF DONE
2107  013232  001375                          BNE     1$              ;IF NOT: BR
2108  013234  000207                          RTS     PC
2109
2110                                        ;ALL ZEROS**********
2111
2112  013236  005001                  DAT2:   CLR     R1              ;R1=DATA
2113  013240  000770                          BR      DAT1A           ;LOAD BUFFER
2114
2115                                        ;ONE/ZERO IN ALTERNATING CHARACTERS**********
2116
2117  013242  012701  125125          DAT3:   MOV     #125125,R1      ;R1=DATA
2118  013246  000765                          BR      DAT1A           ;LOAD BUFFER
2119
2120                                        ;ALL BITS 0-377**********
2121
2122  013250  005001                  DAT4:   CLR     R1              ;R1=STARTING DATA
2123  013252  012702  001500                  MOV     #1500,R2        ;R2=CHARACTER COUNT
2124  013256  110123                  1$:     MOVB    R1,(R3)+        ;LOAD BUFFER
2125  013260  105201                          INCB    R1              ;BUMP DATA
2126  013262  005302                          DEC     R2              ;SEE IF DONE
2127  013264  001374                          BNE     1$              ;IF NOT: BR
2128  013266  000207                          RTS     PC
2129
```

```
2130
2131
2132
2133                                        ;SCOPE LOOP ON ERROR SUBROUTINE**********
2134
2135  013270  000240                SCOPE:  NOP
2136  013272  032777  040000  165250        BIT     #40000,@SWR     ;SEE IF LOOP ON ERROR
2137  013300  001001                        BNE     1$              ;IF SO: BR
2138  013302  000207                        RTS     PC              ;ELSE EXIT
2139  013304  000240                1$:     NOP
2140  013306  005737  000674              TST     SCOLP           ;SEE IF SCOPE ADDRESS
2141  013312  001001                        BNE     2$              ;IF NOT: BR
2142  013314  000207                        RTS     PC              ;ELSE EXIT
2143  013316  022626                2$:     CMP     (SP)+,(SP)+     ;RESET STACK
2144  013320  000177  165350               JMP     @SCOLP          ;LOOP ON ERROR
2145
2146                                        ;TEST ITERATION SUBROUTINE**********
2147
2148  013324  000240                ITER:   NOP
2149  013326  032777  004000  165214        BIT     #4000,@SWR      ;SEE IF ITERATIONS
2150  013334  001403                        BEQ     2$              ;IF SO: BR
2151  013336  005037  000662          1$:   CLR     ITCNT           ;CLEAR ITERATION COUNTER
2152  013342  000207                        RTS     PC              ;ELSE EXIT
2153  013344  005737  000730          2$:   TST     PCNTR           ;DO SINGLE SUBTEST ITERATION
2154  013350  001772                        BEQ     1$              ;ON FIRST PASS
2155  013352  005237  000662              INC     ITCNT           ;BUMP COUNTER
2156  013356  023737  000662  000566        CMP     ITCNT,ITAMT     ;SEE IF DONE ALL
2157  013364  001764                        BEQ     1$              ;IF SO: BR
2158  013366  005726                        TST     (SP)+           ;RESET STACK
2159  013370  017700  165302               MOV     @ITRLP,R0       ;SET ITERATION POINTER
2160  013374  000110                        JMP     (R0)            ;GO ITERATE
2161
2162
2163
2164                                        ;NON-STANDARD JUMPER HANDLER SUBROUTINE**********
2165
2166  013376  010046                NOST:   MOV     R0,-(SP)        ;+SAVE R0
2167  013400  012700  000120               MOV     #120,R0         ;+SET UP INDEX
2168  013404  012760  011622  000756        MOV     #FT26,TSTTBL(R0);+ADJUST SCHEDULAR TEST TABLE
2169  013412  005720                        TST     (R0)+
2170  013414  012760  011622  000756        MOV     #FT26,TSTTBL(R0)        ;+OVERLAY TEST LIST
2171
2172  013422  005720                        TST     (R0)+
2173  013424  012760  012060  000756        MOV     #FT27,TSTTBL(R0)
2174  013432  005720                        TST     (R0)+
2175  013434  012760  012060  000756        MOV     #FT27,TSTTBL(R0)
2176  013442  005720                        TST     (R0)+
2177  013444  012760  003156  000756        MOV     #TEND,TSTTBL(R0)
2178  013452  005720                        TST     (R0)+
2179  013454  012760  000027  000756        MOV     #27,TSTTBL(R0)
2180  013462  012737  000027  001120        MOV     #27,TLAST
2181  013470  012600                        MOV     (SP)+,R0        ;RESTO R0
2182  013472  000207                        RTS     PC
2183
2184                                        ;INITIALIZE SUBROUTINE**********
2185
```

```
2186  013474  000240                    INIT1:  NOP
2187  013476  012777  000040  165014            MOV     #40,@CS         ;INIT
2188  013504  013777  000612  165006    INIT2:  MOV     DRVN,@CS        ;SELECT DRIVE
2189  013512  013777  000614  165022            MOV     SLVN,@TC        ;SELECT SLAVE
2190  013520  000207                            RTS     PC              ;RETURN
2191
2192                                      ;MAG TAPE INTERRUPT HANDLER**********
2193
2194  013522  000240                    MTINT:  NOP
2195  013524  013716  000646                    MOV     RTRN,(SP)       ;RETURN TO (RTRN)
2196  013530  000002                            RTI                     ;RETURN
2197
```

```
2198
2199                                        ;TTY INTERRUPT HANDLER**********
2200
2201  013532  017746  165016        TTINT:  MOV     @TKB,-(SP)      ;GET CHARACTER
2202  013536  042716  000200                BIC     #200,(SP)       ;CLEAR PARITY BIT
2203  013542  122716  000003                CMPB    #3,(SP)         ;BRANCH IF NOT CONTROL C
2204  013546  001010                        BNE     1$
2205  013550  005737  001662                TST     CHNFLG          ;INHIBIT ^C IF CHAIN MODE
2206  013554  001005                        BNE     1$
2207  013556  005077  164764                CLR     @PSW
2208  013562  000005                        RESET
2209  013564  000137  000200                JMP     @#200           ;RESTART PROGRAM
2210  013570  122716  000001        1$:     CMPB    #1,(SP)         ;BRANCH IF NOT ^A
2211  013574  001017                        BNE     2$
2212  013576  022737  000176  000550        CMP     #SWREG,SWR      ;BRANCH IF HARDWARE SWR IS INVOKED
2213  013604  001016                        BNE     3$
2214  013606  012737  177570  000550        MOV     #177570,SWR     ;INVOKE HARDWARE SWR
2215  013614  004737  015174                JSR     PC,.SAVE        ;SAVE REGISTERS ON THE STACK
2216  013620  012704  020100                MOV     #MSG70,R4       ;TYPE 'HARDWARE SWR IN USE'
2217  013624  004737  014316                JSR     PC,TTOUT
2218  013630  004737  015216                JSR     PC,.RESTORE
2219  013634  122716  000007        2$:     CMPB    #7,(SP)         ;BRANCH IF NOT ^G
2220  013640  001005                        BNE     4$
2221  013642  012737  000176  000550  3$:     MOV     #SWREG,SWR      ;INVOKE SOFTWARE SWR
2222  013650  004737  015076                JSR     PC,GTSWR        ;GET SOFTWARE SWITCHES
2223  013654  005726                4$:     TST     (SP)+           ;POP CHARACTER OFF THE STACK
2224  013656  000002                        RTI
2225
2226                                        ;BUS ADDRESS TRAP HANDLER**********
2227
2228  013660  000240                TRAP:   NOP
2229  013662  032777  020000  164660        BIT     #20000,@SWR     ;SEE IF SHOULD PRINT ERRORS
2230  013670  001020                        BNE     TRAP2           ;IF NOT: BR
2231  013672  005737  000606                TST     HDRFL           ;SEE IF DONE HEADER
2232  013676  001006                        BNE     TRAP1           ;IF SO: BR
2233  013700  005237  000606                INC     HDRFL           ;ELSE SET HEADER FLAG
2234  013704  013704  000610                MOV     EMADDR,R4
2235  013710  004737  014316                JSR     PC,TTOUT        ;PRINT HEADER
2236  013714  012704  016314        TRAP1:  MOV     #MSG24,R4
2237  013720  004737  014316                JSR     PC,TTOUT        ;PRINT ERROR
2238  013724  010103                        MOV     R1,R3           ;GET ADDRESS THAT CAUSED THE TRAP
2239  013726  004737  014446                JSR     PC,OCTP         ;PRINT ADDRESS OF TRAP
2240  013732  005777  164612        TRAP2:  TST     @SWR            ;SEE IF HALT ON ERROR
2241  013736  100001                        BPL     TRAPX           ;IF NOT: BR
2242  013740  000000                        HALT
2243  013742  022626                TRAPX:  CMP     (SP)+,(SP)+     ;RESET STACK
2244  013744  012737  003316  000674        MOV     #FT1A,SCOLP     ;SET SCOPE ADDRESS
2245  013752  004737  013270                JSR     PC,SCOPE        ;GO SEE IF SCOPE LOOP
2246  013756  005737  000722                TST     RHTF            ;SEE IF INITIAL ADDRESS TEST
2247  013762  001402                        BEQ     TRAPXX          ;IF NOT: BR
2248  013764  000137  001764                JMP     ST0B            ;ELSE REDO ADDRESS REQUEST
2249  013770  000137  003322        TRAPXX: JMP     FT1B            ;RETURN TO TEST 1
2250
```

```
2251                                    ;*************************************************************
2252                                    ;TTY ENTRY SUBROUTINE:
2253                                    ;
2254                                    ;THIS SUBROUTINE IS USED BY THE TEST CONDITION
2255                                    ;ENTRY ROUTINE TO READ THE RESPONSE ENTERED
2256                                    ;AT THE TTY AND CHECK THEM FOR LEGALITY AND
2257                                    ;LIMITS.  ALL RESPONSE MUST BE TYPED IN OCTAL
2258                                    ;(0-7) AND MUST FALL WITHIN THE LIMITS SET BY
2259                                    ;THE CALLING ROUTINE.
2260                                    ;IF AN ENTRY IS ILLEGAL OR OUTSIDE THE LIMITS,
2261                                    ;A QUESTION MARK IS TYPED (?) AND THE RESPONSE
2262                                    ;MAY BE REENTERED.
2263                                    ;ENTRIES MAY NOT EXCEED SIX (6) CHARACTERS AND
2264                                    ;MAY BE TERMINATED AT LESS THAN SIX BY TYPING A
2265                                    ;CARRIAGE RETURN
2266                                    ;*************************************************************
2267
2268  013774  010146          TTR:    MOV     R1,-(SP)        ;SAVE CHAR COUNT ON STACK
2269  013776  011601          10$:    MOV     (SP),R1         ;RESTORE CHAR COUNT (FOR ^U)
2270  014000  005037  000652          CLR     TEMP1           ;CLEAR FIRST CHARACTER FLAG
2271  014004  005000                  CLR     R0
2272  014006  004737  014254  1$:     JSR     PC,TTIN         ;GO READ CHARACTER
2273  014012  122737  000003  000602  CMPB    #3,TIB          ;BRANCH IF NOT ^C
2274  014020  001003                  BNE     11$
2275  014022  000005                  RESET                   ;RESET
2276  014024  000137  000200          JMP     @#200           ;RESTART
2277  014030  122737  000015  000602  11$:    CMPB    #15,TIB         ;SEE IF CR
2278  014036  001004                  BNE     2$              ;IF NOT: BR
2279  014040  005737  000652          TST     TEMP1           ;SEE IF FIRST CHARACTER
2280  014044  001471                  BEQ     9$              ;IF SO: BR
2281  014046  000457                  BR      6$              ;ELSE GO LOAD VALUE
2282  014050  122737  000025  000602  2$:     CMPB    #25,TIB         ;BRANCH IF NOT CONTROL U
2283  014056  001005                  BNE     21$
2284  014060  012704  020020          MOV     #MSG65,R4       ;TYPE <CR><LF>
2285  014064  004737  014316          JSR     PC,TTOUT
2286  014070  000742                  BR      10$             ,RESTART
2287  014072  122737  000177  000602  21$:    CMPB    #177,TIB        ;BRANCH IF NOT 'RUBOUT'
2288  014100  001012                  BNE     3$
2289  014102  000241                  CLC                     ;REMOVE LAST CHARACTER
2290  014104  006000                  ROR     R0
2291  014106  006200                  ASR     R0
2292  014110  006200                  ASR     R0
2293  014112  012704  020022          MOV     #MSG66,R4       ;TYPE '\'
2294  014116  004737  0143 6          JSR     PC,TTOUT
2295  014122  005201                  INC     R1              ;DECREMENT CHAR RECEIVED COUNT
2296  014124  000730                  BR      1$              ;GET NEXT CHARACTER
2297  014126  122737  000060  000602  3$:     CMPB    #60,TIB         ;SEE IF CHAR IS LESS THAN 0
2298  014134  101402                  BLOS    4$              ;IF NOT: BR
2299  014136  000137  014234          JMP     TINER           ;ELSE GO TO ERROR
2300  014142  122737  000070  000602  4$:     CMPB    #70,TIB         ;SEE IF CHAR IS GREATER THAN 7
2301  014150  101002                  BHI     5$              ;IF NOT: BR
2302  014152  000137  014234          JMP     TINER           ;ELSE GO TO ERROR
2303  014156  005237  000652          5$:     INC     TEMP1           ;SET FIRST CHARACTER FLAG
2304  014162  006300                  ASL     R0
2305  014164  006300                  ASL     R0              ;SHIFT 3 LEFT
2306  014166  006300                  ASL     R0
```

```
2307  014170  042737  177770  000602          BIC     #177770,TIB     ;STRIP ASCII
2308  014176  053700  000602                  BIS     TIB,R0          ;LOAD CHARACTER
2309  014202  005301                          DEC     R1              ;SEE IF DONE
2310  014204  001300                          BNE     1$              ;IF NOT: BR
2311  014206  020002                  6$:     CMP     R0,R2           ;SEE IF EXCEEDED MAXIMUM LIMIT
2312  014210  101402                          BLOS    7$              ;IF NOT: BR
2313  014212  000137  014234                  JMP     TINER           ;ELSE GO TO ERROR
2314  014216  020300                  7$:     CMP     R3,R0           ;SEE IF BELOW MINIMUM LIMIT
2315  014220  101402                          BLOS    8$              ;IF NOT: BR
2316  014222  000137  014234                  JMP     TINER           ;ELSE GO TO ERROR
2317  014226  010015                  8$:     MOV     R0,(R5)         ;LOAD VALUE
2318  014230  005726                  9$:     TST     (SP)+           ;POP CHAR COUNT OFF STACK
2319  014232  000207                          RTS     PC              ;EXIT
2320
2321                                          ;TTY ENTRY ERROR SUBROUTINE**********
2322
2323  014234  012704  015615          TINER:  MOV     #MSG7,R4
2324  014240  004737  014316                  JSR     PC,TTOUT        ;PRINT?
2325  014244  005726                          TST     (SP)+           ;POP CHAR COUNT OFF STACK
2326  014246  162716  000020                  SUB     #20,(SP)        ;RESET SP TO START OF VALUE ROUTINE
2327  014252  000207                          RTS     PC              ;REDO VALUE ENTRY
2328
2329                                          ;TTY READ SUBROUTINE**********
2330
2331  014254  005277  164272          TTIN:   INC     @TKS
2332  014260  105777  164266          1$:     TSTB    @TKS
2333  014264  100375                          BPL     1$
2334  014266  117737  164262  000602          MOVB    @TKB,TIB
2335  014274  042737  000200  000602          BIC     #200,TIB        ;STRIP PARITY BIT
2336  014302  013737  000602  000600          MOV     TIB,TOB         ;MOVE CHAR TO OUTPUT BFR
2337  014310  004737  014416                  JSR     PC,TOG          ;AND TYPE IT
2338  014314  000207                          RTS     PC
2339
2340                                          ;TTY OUTPUT SUBROUTINE***********
2341
2342  014316  112437  000600          TTOUT:  MOVB    (R4)+,TOB
2343  014322  122737  000043  000600          CMPB    #43,TOB
2344  014330  001440                          BEQ     TEX
2345  014332  122737  000045  000600          CMPB    #45,TOB
2346  014340  001403                          BEQ     1$
2347  014342  004737  014416                  JSR     PC,TOG
2348  014346  000763                          BR      TTOUT
2349  014350  112737  000015  000600  1$:     MOVB    #15,TOB
2350  014356  004737  014416                  JSR     PC,TOG
2351  014362  012703  000004                  MOV     #4,R3
2352  014366  005037  000600          2$:     CLR     TOB
2353  014372  004737  014416                  JSR     PC,TOG
2354  014376  005303                          DEC     R3
2355  014400  001372                          BNE     2$              ;DO FILLERS
2356  014402  112737  000012  000600          MOVB    #12,TOB
2357  014410  004737  014416                  JSR     PC,TOG
2358  014414  000740                          BR      TTOUT
2359  014416  105777  164134          TOG:    TSTB    @TPS
2360  014422  100375                          BPL     TOG
2361  014424  113777  000600  164126          MOVB    TOB,@TPB
2362  014432  000207                  TEX:    RTS     PC
```

```
2363                                        ;OCTAL OUTPUT SUBROUTINE***********
2364
2365  014434  012737  000001  014664  OCTPE:  MOV     #1,OFL
2366  014442  010304                  MOV     R3,R4
2367  014444  000410                  BR      OCTP0
2368  014446  005037  014664          OCTP:   CLR     OFL             ;CLEAR FLAG FOR LEADING ZERO
2369  014452  010304                  OCTPE1: MOV     R3,R4           ;SEE IF NUMBER IS ZERO
2370  014454  001004                          BNE     OCTP0           ;IF NOT ZERO: BR
2371  014456  004737  014644                  JSR     PC,OCTPG1       ;ELSE PRINT ZERO
2372  014462  000137  014606                  JMP     OCTP3           ;SPACE AND EXIT
2373  014466  032704  100000          OCTP0:  BIT     #10000C,R4      ;SEE IF MSD = 1
2374  014472  001406                          BEQ     OCTP1           ;IF NOT: BR
2375  014474  012704  000001                  MOV     #1,R4
2376  014500  004737  014622                  JSR     PC,OCTPG        ;PRINT 1
2377  014504  000137  014516                  JMP     OCTP2
2378  014510  005004                  OCTP1:  CLR     R4
2379  014512  004737  014622                  JSR     PC,OCTPG        ;PRINT 0
2380  014516  010304                  OCTP2:  MOV     R3,R4
2381  014520  006004                          ROR     R4
2382  014522  006004                          ROR     R4
2383  014524  006004                          ROR     R4              ;POSITION DIGIT
2384  014526  006004                          ROR     R4
2385  014530  000304                          SWAB    R4
2386  014532  004737  014622                  JSR     PC,OCTPG        ;PRINT DIGIT 2
2387  014536  010304                  MOV     R3,R4
2388  014540  006004                  ROR     R4
2389  014542  000304                  SWAB    R4
2390  014544  004737  014622                  JSR     PC,OCTPG        ;PRINT DIGIT 3
2391  014550  010304                  MOV     R3,R4
2392  014552  006104                  ROL     R4
2393  014554  006104                  ROL     R4
2394  014556  000304                  SWAB    R4
2395  014560  004737  014622                  JSR     PC,OCTPG        ;PRINT DIGIT 4
2396  014564  010304                  MOV     R3,R4
2397  014566  006004                  ROR     R4
2398  014570  006004                  ROR     R4
2399  014572  006004                  ROR     R4
2400  014574  004737  014622                  JSR     PC,OCTPG
2401  014600  010304                  MOV     R3,R4
2402  014602  004737  014622                  JSR     PC,OCTPG        ;PRINT DIGIT 5
2403  014606  012737  000240  000600  OCTP3:  MOV     #240,TOB
2404  014614  004737  014416                  JSR     PC,TOG          ;PRINT SPACE
2405  014620  000207                          RTS     PC              ;EXIT
2406  014622  042704  177770          OCTPG:  BIC     #177770,R4
2407  014626  001004                          BNE     OCTPG0
2408  014630  005737  014664                  TST     OFL
2409  014634  001001                          BNE     OCTPG0
2410  014636  000207                          RTS     PC
2411
2412  014640  005237  014664          OCTPG0: INC     OFL
2413  014644  052704  000260          OCTPG1: BIS     #260,R4
2414  014650  010437  000600                  MOV     R4,TOB
2415  014654  004737  014416                  JSR     PC,TOG
2416  014660  010304                          MOV     R3,R4
2417  014662  000207                          RTS     PC
2418  014664  000000                  OFL:    0                       ;FIRST CHAR FLAG
```

```
2419
2420                                        ;DATA CHARACTER OUTPUT SUBROUTINE**********
2421
2422  014666  005037  000600          DOUT: CLR     TOB
2423  014672  012704  000010                MOV     #10,R4          ;SET NUMBER TO PRINT
2424  014676  110337  000600                MOVB    R3,TOB
2425  014702  105777  163650          1$:   TSTB    @TPS
2426  014706  100375                       BPL     1$
2427  014710  132737  000200  000600       BITB    #200,TOB
2428  014716  001404                       BEQ     2$
2429  014720  012777  000061  163632       MOV     #061,@TPB
2430  014726  000403                       BR      3$
2431  014730  012777  000060  163622  2$:  MOV     #060,@TPB
2432  014736  006137  000600          3$:   ROL     TOB
2433  014742  005304                       DEC     R4
2434  014744  001356                       BNE     1$
2435  014746  000207                       RTS     PC
2436
2437  014750  013703  000656          DOUTD: MOV    TEMP3,R3
2438  014754  000303                       SWAB    R3
2439  014756  004737  014666                JSR     PC,DOUT
2440  014762  013703  000656                MOV     TEMP3,R3
2441  014766  004737  014666                JSR     PC,DOUT
2442  014772  000207                       RTS     PC
2443
2444                                        ;SERIAL NUMBER PRINT SUBROUTINE**********
2445
2446  014774  010304                SNPT:  MOV     R3,R4
2447  014776  000304                       SWAB    R4
2448  015000  006004                       ROR     R4
2449  015002  006004                       ROR     R4
2450  015004  006004                       ROR     R4
2451  015006  006004                       ROR     R4              ;GET FIRST DIGIT
2452  015010  004737  015052                JSR     PC,SNPG         ;GO PRINT
2453  015014  010304                       MOV     R3,R4
2454  015016  000304                       SWAB    R4              ;GET SECOND DIGIT
2455  015020  004737  015052                JSR     PC,SNPG         ;GO PRINT
2456  015024  010304                       MOV     R3,R4
2457  015026  006004                       ROR     R4
2458  015030  006004                       ROR     R4
2459  015032  006004                       ROR     R4
2460  015034  006004                       ROR     R4              ;GET THIRD DIGIT
2461  015036  004737  015052                JSR     PC,SNPG         ;GO PRINT
2462  015042  010304                       MOV     R3,R4           ;GET FOURTH DIGIT
2463  015044  004737  015052                JSR     PC,SNPG         ;GO PRINT
2464  015050  000207                       RTS     PC              ;EXIT
2465  015052  012737  000260  000600 SNPG: MOV     #260,TOB        ;SET BASE = 0
2466  015060  042704  177760                BIC     #177760,R4      ;MASK DIGIT
2467  015064  050437  000600                BIS     R4,TOB          ;SET ASCII
2468  015070  004737  014416                JSR     PC,TOG          ;TYPE DIGIT
2469  015074  000207                       RTS     PC              ;RETURN
2470
```

```
2471
2472                                        ;ROUTINE TO LOAD NEW VALUE INTO SWITCHES
2473  015076  022737  000176  000550  GTSWR:  CMP     #SWREG,SWR      ;BRANCH IF SOFTWARE SWR
2474  015104  001032                        BNE     1$              ;NOT INVOKED
2475  015106  004737  015174                JSR     PC,..SAVE       ;SAVE REGISTERS ON THE STACK
2476  015112  012704  021265                MOV     #$MSWR,R4
2477  015116  004737  014316                JSR     PC,TTOUT
2478  015122  017703  163422                MOV     @SWR,R3
2479  015126  004737  014434                JSR     PC,OCTPE
2480  015132  012704  021274                MOV     #$MNEW,R4
2481  015136  004737  014316                JSR     PC,TTOUT
2482  015142  013705  000550                MOV     SWR,R5          ;TTR ROUTINE RETURNS NEW VALUE TO (R5)
2483  015146  012701  000007                MOV     #7,R1           ;LIMIT RESPONSE TO 7 CHARS
2484  015152  012702  177777                MOV     #177777,R2      ;BETWEEN 0 AND 177777
2485  015156  012703  000000                MOV     #0,R3
2486  015162  004737  013774                JSR     PC,TTR
2487  015166  004737  015216                JSR     PC,..RESTORE    ;RESTORE REGISTERS
2488  015172  000207                  1$:   RTS     PC
2489
2490                                        ;;ROUTINE TO SAVE REGISTERS ON THE STACK
2491  015174  010546                  .SAVE:  MOV     %5,-(SP)        ;;R5 IS SAVED AT 12(SP)
2492  015176  010446                          MOV     %4,-(SP)        ;;R4 IS SAVED AT 10(SP)
2493  015200  010346                          MOV     %3,-(SP)        ;;R3 IS SAVED AT 6(SP)
2494  015202  010246                          MOV     %2,-(SP)        ;;R2 IS SAVED AT 4(SP)
2495  015204  010146                          MOV     %1,-(SP)        ;;R1 IS SAVED AT 2(SP)
2496  015206  010046                          MOV     %0,-(SP)        ;;R0 IS SAVED AT (SP)
2497  015210  016646  000014                  MOV     14(SP),-(SP)    ;;PUSH RETURN PC ON THE STACK
2498  015214  000207                          RTS     PC              ;;RETURN TO CALLER
2499
2500                                        ;;ROUTINE TO RESTORE REGISTERS SAVED ON THE STACK
2501  015216  012666  000014            .RESTORE:MOV    (SP)+,14(SP)    ;;STORE RETURN PC ON STACK
2502  015222  012600                          MOV     (SP)+,%0
2503  015224  012601                          MOV     (SP)+,%1
2504  015226  012602                          MOV     (SP)+,%2
2505  015230  012603                          MOV     (SP)+,%3
2506  015232  012604                          MOV     (SP)+,%4
2507  015234  012605                          MOV     (SP)+,%5
2508  015236  000207                          RTS     PC              ;;RETURN
2509
2510
```

```
2511                                                    ;MESSAGE TABLE*****
2512
2513  015240  041445  030523  020040  MSG1:   .ASCII  /%CS1    WC     BA     FC     CS2    /
2514  015246  020040  041527  020040
2515  015254  020040  041040  020101
2516  015262  020040  020040  041506
2517  015270  020040  020040  041440
2518  015276  031123  020040  020040
2519  015304  051504  020040  020040          .ASCII  /DS     ER     TC%#/
2520  015312  042440  020122  020040
2521  015320  020040  041524  021445
2522  015326  051045  053505  047111  MSG2:   .ASCII  /%REWIND ERROR-BOT NOT SET WHEN PIP CLEARED#/
2523  015334  020104  051105  047522
2524  015342  026522  047502  020124
2525  015350  047516  020124  042523
2526  015356  020124  044127  047105
2527  015364  050040  050111  041440
2528  015372  042514  051101  042105
2529  015400     043
2530  015401     045  052045  030115  MSG3:   .ASCII  '%%TM03-TE16/TU77 BASIC FUNCTION TEST (CZTECC0)%';++B
2531  015406  026463  042524  033061
2532  015414  052057  033525  020067
2533  015422  040502  044523  020103
2534  015430  052506  041516  044524
2535  015436  047117  052040  051505
2536  015444  020124  041450  052132
2537  015452  041505  030103  022451
2538  015460  054524  042520  036040          .ASCII  /TYPE <CR> TO TERMINATE RESPONSE & ^C TO RESTART%#/
2539  015466  051103  020076  047524
2540  015474  052040  051105  044515
2541  015502  040516  042524  051040
2542  015510  051505  047520  051516
2543  015516  020105  020046  041536
2544  015524  052040  020117  042522
2545  015532  052123  051101  022524
2546  015540     043
2547  015541     045  042522  044507  MSG4:   .ASCII  /%REGISTER START = #/
2548  015546  052123  051105  051440
2549  015554  040524  052122  036440
2550  015562  021440
2551  015564  053045  041505  047524  MSG5:   .ASCII  /%VECTOR = #/
2552  015572  020122  020075     043
2553  015577     045  047105  020104  MSG6:   .ASCII  /%END OF PASS #/
2554  015604  043117  050040  051501
2555  015612  020123     043
2556  015615     040  020077     043  MSG7:   .ASCII  / ? #/
2557  015621     045  047520  044523  MSG9:   .ASCII  /%POSITION ERROR: #/
2558  015626  044524  047117  042440
2559  015634  051122  051117  020072
2560  015642     043
2561  015643     045  051511  041440  MSG10A: .ASCII  /%IS CONTROLLER JUMPERED IN NON-STANDARD MODE/<15><12>
2562  015650  047117  051124  046117
2563  015656  042514  020122  052512
2564  015664  050115  051105  042105
2565  015672  044440  020116  047516
2566  015700  026516  052123  047101
```

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 2567  015706  040504  042122  046440
 2568  015714  042117  006505     012
 2569  015721     124  050131  020105          .ASCII  /TYPE 2 FOR NON-STANDARD OR CR FOR STANDARD:      #/
 2570  015726  020062  047506  020122
 2571  015734  047516  026516  052123
 2572  015742  047101  040504  042122
 2573  015750  047440  020122  051103
 2574  015756  043040  051117  051440
 2575  015764  040524  042116  051101
 2576  015772  035104  020040  020040
 2577  016000  020040     043
 2578  016003     045  051104  053111  MSG10:  .ASCII  /%DRIVE NUMBER: #/
 2579  016010  020105  052516  041115
 2580  016016  051105  020072     043
 2581  016023     045  046123  053101  MSG11:  .ASCII  /%SLAVE NUMBER: #/
 2582  016030  020105  052516  041115
 2583  016036  051105  020072     043
 2584  016043     045  051127  052111  MSG12:  .ASCII  /%WRITE ERROR #/
 2585  016050  020105  051105  047522
 2586  016056  020122     043
 2587  016061     045  042522  042101  MSG13:  .ASCII  /%READ REVERSE ERROR #/
 2588  016066  051040  053105  051105
 2589  016074  042523  042440  051122
 2590  016102  051117  021440
 2591  016106  051045  040505  020104  MSG14:  .ASCII  /%READ FORWARD ERROR #/
 2592  016114  047506  053522  051101
 2593  016122  020104  051105  047522
 2594  016130  020122     043
 2595  016133     045  051127  052111  MSG15:  .ASCII  /%WRITE TM ERROR #/
 2596  016140  020105  046524  042440
 2597  016146  051122  051117  021440
 2598  016154  020045  051127  052111  MSG15A: .ASCII  /% WRITE TM ERROR ON SECOND TM #/
 2599  016162  020105  046524  042440
 2600  016170  051122  051117  047440
 2601  016176  020116  042523  047503
 2602  016204  042116  052040  020115
 2603  016212     043
 2604  016213     045  041520  020040  MSG15B: .ASCII  /%PC  #/
 2605  016220     043
 2606  016221     045  042522  042526  MSG16:  .ASCII  /%REVERSE ERROR #/
 2607  016226  051522  020105  051105
 2608  016234  047522  020122     043
 2609  016241     045  047506  053522  MSG17:  .ASCII  /%FORWARD ERROR #/
 2610  016246  051101  020104  051105
 2611  016254  047522  020122     043
 2612  016261     040  051116  020132  MSG20:  .ASCII  / NRZ #/
 2613  016266     043
 2614  016267     040  042520  021440  MSG21:  .ASCII  / PE #/
 2615  016274  042440  050130  035124  MSG22:  .ASCII  / EXPT: #/
 2616  016302  021440
 2617  016304  051040  053103  035104  MSG23:  .ASCII  / RCVD: #/
 2618  016312  021440
 2619  016314  041045  051525  052040  MSG24:  .ASCII  /%BUS TRAP: #/
 2620  016322  040522  035120  021440
 2621  016330  053445  035103  021440  MSG25:  .ASCII  /%WC: #/
 2622  016336  041045  035101  021440  MSG26:  .ASCII  /%BA: #/
```

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 2623  016344  042045  035102  021440  MSG27:  .ASCII  /%DB: #/
 2624  016352  044445  044516  020124  MSG28:  .ASCII  /%INIT DID NOT CLEAR RH #/
 2625  016360  044504  020104  047516
 2626  016366  020124  046103  040505
 2627  016374  020122  044122  021440
 2628  016402  051445  020103  047516  MSG29:  .ASCII  /%SC NOT RESET BY INIT #/
 2629  016410  020124  042522  042523
 2630  016416  020124  054502  044440
 2631  016424  044516  020124     043
 2632  016431     045  051124  020105  MSG30:  .ASCII  /%TRE NOT RESET BY INIT #/
 2633  016436  047516  020124  042522
 2634  016444  042523  020124  054502
 2635  016452  044440  044516  020124
 2636  016460     043
 2637  016461     045  051503  020062  MSG31:  .ASCII  /%CS2 NOT RESET BY INIT #/
 2638  016466  047516  020124  042522
 2639  016474  042523  020124  054502
 2640  016502  044440  044516  020124
 2641  016510     043
 2642  016511     045  046104  020124  MSG32:  .ASCII  /%DLT NOT SET #/
 2643  016516  047516  020124  042523
 2644  016524  020124     043
 2645  016527     045  041523  047040  MSG33:  .ASCII  /%SC NOT SET #/
 2646  016534  052117  051440  052105
 2647  016542  021440
 2648  016544  052045  042522  047040  MSG34:  .ASCII  /%TRE NOT SET #/
 2649  016552  052117  051440  052105
 2650  016560  021440
 2651  016562  044445  020122  047516  MSG35:  .ASCII  /%IR NOT SET BY INIT #/
 2652  016570  020124  042523  020124
 2653  016576  054502  044440  044516
 2654  016604  020124     043
 2655  016607     045  051117  047040  MSG36:  .ASCII  /%OR NOT RESET BY INIT #/
 2656  016614  052117  051040  051505
 2657  016622  052105  041040  020131
 2658  016630  047111  052111  021440
 2659  016636  047445  020122  047516  MSG37:  .ASCII  /%OR NOT RESET BY 1 SILO ENTRY #/
 2660  016644  020124  042522  042523
 2661  016652  020124  054502  030440
 2662  016660  051440  046111  020117
 2663  016666  047105  051124  020131
 2664  016674     043
 2665  016675     045  051117  047040  MSG38:  .ASCII  /%OR NOT SET BY SILO FULL #/
 2666  016702  052117  051440  052105
 2667  016710  041040  020131  044523
 2668  016716  047514  043040  046125
 2669  016724  020114     043
 2670  016727     045  040502  020104  MSG39:  .ASCII  /%BAD SILO READ #/
 2671  016734  044523  047514  051040
 2672  016742  040505  020104     043
 2673  016747     045  051111  047040  MSG40:  .ASCII  /%IR NOT RESET BY SILO FULL#/
 2674  016754  052117  051040  051505
 2675  016762  052105  041040  020131
 2676  016770  044523  047514  043040
 2677  016776  046125  021514
 2678  017002  047045  047117  042455  MSG41:  .ASCII  /%NON-EXIST DRIVE#/
```

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 2679  017010  044530  052123  042040
 2680  017016  044522  042526     043
 2681  017023     045  047516  026516  MSG42:  .ASCII  /%NON-EXIST SLAVE#/
 2682  017030  054105  051511  020124
 2683  017036  046123  053101  021505
 2684  017044  051445  051105  040511  MSG43:  .ASCII  /%SERIAL NO: #/
 2685  017052  020114  047516  020072
 2686  017060     043
 2687  017061     045  051105  051501  MSG44:  .ASCII  /%ERASE HEAD INOPERATIVE#/
 2688  017066  020105  042510  042101
 2689  017074  044440  047516  042520
 2690  017102  040522  044524  042526
 2691  017110     043
 2692  017111     045  047520  051523  MSG45:  .ASCII  /%POSSIBLE ERASE HEAD PROBLEM: /
 2693  017116  041111  042514  042440
 2694  017124  040522  042523  044040
 2695  017132  040505  020104  051120
 2696  017140  041117  042514  035115
 2697  017146     040
 2698  017147     103  042510  045503          .ASCII  /CHECK POLARITY#/
 2699  017154  050040  046117  051101
 2700  017162  052111  021531
 2701  017166  051445  052105  052455  MSG46:  .ASCII  /%SET-UP WRITE ERROR#/
 2702  017174  020120  051127  052111
 2703  017202  020105  051105  047522
 2704  017210  021522
 2705  017212  051445  040520  042503  MSG47:  .ASCII  /%SPACE FORWARD ERROR#/
 2706  017220  043040  051117  040527
 2707  017226  042122  042440  051122
 2708  017234  051117     043
 2709  017237     045  050123  041501  MSG48:  .ASCII  /%SPACE REVERSE ERROR#/
 2710  017244  020105  042522  042526
 2711  017252  051522  020105  051105
 2712  017260  047522  021522
 2713  017264  041045  043125  042506  MSG49:  .ASCII  /%BUFFERED WRITE ERROR#/
 2714  017272  042522  020104  051127
 2715  017300  052111  020105  051105
 2716  017306  047522  021522
 2717  017312  041045  052117  051440  MSG50:  .ASCII  /%BOT SET AFTER BUFFERED WRITE#/
 2718  017320  052105  040440  052106
 2719  017326  051105  041040  043125
 2720  017334  042506  042522  020104
 2721  017342  051127  052111  021505
 2722  017350  047045  020117  047502  MSG51:  .ASCII  /%NO BOT FROM READ IN PRESET#/
 2723  017356  020124  051106  046517
 2724  017364  051040  040505  020104
 2725  017372  047111  050040  042522
 2726  017400  042523  021524
 2727  017404  052045  020103  047111  MSG52:  .ASCII  /%TC INCORRECT #/
 2728  017412  047503  051122  041505
 2729  017420  020124     043
 2730  017423     045  047515  020114  MSG53:  .ASCII  /%MOL FAILED TO CLEAR#/
 2731  017430  040506  046111  042105
 2732  017436  052040  020117  046103
 2733  017444  040505  021522
 2734  017450  022445  042522  042523  MSG54:  .ASCII  /%%RESET SLAVE TO ON LINE BEFORE CONTINUING/
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2735  017456  020124  046123  053101
2736  017464  020105  047524  047440
2737  017472  020116  044514  042516
2738  017500  041040  043105  051117
2739  017506  020105  047503  052116
2740  017514  047111  044525  043516
2741  017522  051445  052105  051440          .ASCII  /%SET SW12=1 IF YOU DOT WISH TO REPEAT REWIND OFFLINE TEST#/
2742  017530  030527  036462  020061
2743  017536  043111  054440  052517
2744  017544  042040  052117  053440
2745  017552  051511  020110  047524
2746  017560  051040  050105  040505
2747  017566  020124  042522  044527
2748  017574  042116  047440  043106
2749  017602  044514  042516  052040
2750  017610  051505  021524
2751  017614  044440  042524  035122  MSG56:  .ASCII  / ITER: #/
2752  017622  021440
2753  017624  052045  020115  047516  MSG57:  .ASCII  /%TM NOT SET#/
2754  017632  020124  042523  021524
2755  017640  042445  052111  042510  MSG60:  .ASCII  /%EITHER TAPE NOT ERASED OR OPI PROBLEM#/
2756  017646  020122  040524  042520
2757  017654  047040  052117  042440
2758  017662  040522  042523  020104
2759  017670  051117  047440  044520
2760  017676  050040  047522  046102
2761  017704  046505     043
2762  017707     045  044122  047440  MSG62:  .ASCII  /%RH ONLY (NO-0,YES-1): #/
2763  017714  046116  020131  047050
2764  017722  036517  026060  042531
2765  017730  036523  024461  020072
2766  017736     043
2767  017737     045  044504  020104  MSG63:  .ASCII  /%DID NOT AUTO SELECT NRZ#/
2768  017744  047516  020124  052501
2769  017752  047524  051440  046105
2770  017760  041505  020124  051116
2771  017766  021532
2772  017770  042045  042111  047040  MSG64:  .ASCII  /%DID NOT AUTO SELECT PE#/
2773  017776  052117  040440  052125
2774  020004  020117  042523  042514
2775  020012  052103  050040  021505
2776  020020  021445                  MSG65:  .ASCII  /%#/
2777  020022  021534                  MSG66:  .ASCII  /\#/
2778  020024  042445  035122  021440  MSG67:  .ASCII  /%ER: #/
2779  020032  051045  046505  053117  MSG69:  .ASCII  /%REMOVE TMDP FROM SLAVE TO BE TESTED%#/
2780  020040  020105  046524  050104
2781  020046  043040  047522  020115
2782  020054  046123  053101  020105
2783  020062  047524  041040  020105
2784  020070  042524  052123  042105
2785  020076  021445
2786  020100  044045  051101  053504  MSG70:  .ASCII  /%HARDWARE SWR IN USE%#/
2787  020106  051101  020105  053523
2788  020114  020122  047111  052440
2789  020122  042523  021445
2790
```

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2791                                        ;TEST HEADERS*****
2792
2793  020126  022445  052106  035061  MSFT1:  .ASCII  /%%FT1:RH ADDRESSING #/
2794  020134  044122  040440  042104
2795  020142  042522  051523  047111
2796  020150  020107    043
2797  020153    045   043045  031124  MSFT2:  .ASCII  /%%FT2:RH REGISTER BITS TEST #/
2798  020160  051072  020110  042522
2799  020166  044507  052123  051105
2800  020174  041040  052111  020123
2801  020202  042524  052123  021440
2802  020210  022445  052106  035063  MSFT3:  .ASCII  /%%FT3:RH INITIALIZE TEST #/
2803  020216  044122  044440  044516
2804  020224  044524  046101  055111
2805  020232  020105  042524  052123
2806  020240  021440
2807  020242  022445  052106  035064  MSFT4:  .ASCII  /%%FT4:RH11 SILO TEST 1 #/
2808  020250  044122  030461  051440
2809  020256  046111  020117  042524
2810  020264  052123  030440  021440
2811  020272  022445  052106  035065  MSFT5:  .ASCII  /%%FT5:RH11 SILO TEST 2 #/
2812  020300  044122  030461  051440
2813  020306  046111  020117  042524
2814  020314  052123  031040  021440
2815  020322  022445  052106  035066  MSFT6:  .ASCII  /%%FT6:RH11 SILO TEST 3 #/
2816  020330  044122  030461  051440
2817  020336  046111  020117  042524
2818  020344  052123  031440  021440
2819  020352  022445  052106  035067  MSFT7:  .ASCII  /%%FT7:RH11 SILO TEST 4 #/
2820  020360  044122  030461  051440
2821  020366  046111  020117  042524
2822  020374  052123  032040  021440
2823  020402  022445  052106  030061  MSFT10: .ASCII  /%%FT10:RH11 SILO TEST 5 #/
2824  020410  051072  030510  020061
2825  020416  044523  047514  052040
2826  020424  051505  020124  020065
2827  020432    043
2828  020433    045   043045  030524  MSFT11: .ASCII  /%%FT11:NOP TEST#/
2829  020440  035061  047516  020120
2830  020446  042524  052123    043
2831  020453    045   043045  030524  MSFT12: .ASCII  /%%FT12:REWIND TEST#/
2832  020460  035062  042522  044527
2833  020466  042116  052040  051505
2834  020474  021524
2835  020476  022445  052106  031461  MSFT13: .ASCII  /%%FT13:WRITE-READ TFST#/
2836  020504  053472  044522  042524
2837  020512  051055  040505  020104
2838  020520  042524  052123    043
2839  020525    045   043045  030524  MSFT14: .ASCII  /%%FT14:SPACE TEST#/
2840  020532  035064  050123  041501
2841  020540  020105  042524  052123
2842  020546    043
2843  020547    045   043045  030524  MSFT15: .ASCII  /%%FT15:ERASE TEST#/
2844  020554  035065  051105  051501
2845  020562  020105  042524  052123
2846  020570    043
```

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2847  020571     045  043045  030524  MSFT16: .ASCII  /%%FT16:TAPE MARK WRITE-READ TEST#/
2848  020575  035066  040524  042520
2849  020604  046440  051101  020113
2850  020612  051127  052111  026505
2851  020620  042522  042101  052040
2852  020626  051505  021524
2853  020632  022445  052106  033467  MSFT17: .ASCII  /%%FT17:TM SPACE TEST #/
2854  020640  052072  020115  050123
2855  020646  041501  020105  042524
2856  020654  052123  021440
2857  020660  022445  052106  030062  MSFT20: .ASCII  /%%FT20:WRITE CHECK TEST #/
2858  020666  053472  044522  042524
2859  020674  041440  042510  045503
2860  020702  052040  051505  020124
2861  020710     043
2862  020711     045  043045  031124  MSFT21: .ASCII  /%%FT21:ERASE HEAD TEST#/
2863  020716  035061  051105  051501
2864  020724  020105  042510  042101
2865  020732  052040  051505  021524
2866  020740  022445  052106  031062  MSFT22: .ASCII  /%%FT22:BUFFERED COMMAND TEST#/
2867  020746  041072  043125  042506
2868  020754  042522  020104  047503
2869  020762  046515  047101  020104
2870  020770  042524  052123     043
2871  020775     045  043045  031124  MSFT23: .ASCII  /%%FT23:READ IN PRESET TEST#/
2872  021002  035063  042522  042101
2873  021010  044440  020116  051120
2874  021016  051505  052105  052040
2875  021024  051505  021524
2876  021030  022445  052106  032062  MSFT24: .ASCII  /%%FT24:AUTO DENSITY SELECT: WRITE-NRZ,READ-PE#/
2877  021036  040472  052125  020117
2878  021044  042504  051516  052111
2879  021052  020131  042523  042514
2880  021060  052103  020072  051127
2881  021066  052111  026505  051116
2882  021074  026132  042522  042101
2883  021102  050055  021505
2884  021106  022445  052106  032462  MSFT25: .ASCII  /%%FT25:AUTO DENSITY SELECT: WRITE-PE,READ-NRZ#/
2885  021114  040472  052125  020117
2886  021122  042504  051516  052111
2887  021130  020131  042523  042514
2888  021136  052103  020072  051127
2889  021144  052111  026505  042520
2890  021152  051054  040505  026504
2891  021160  051116  021532
2892  021164  022445  052106  033062  MSFT26: .ASCII  /%%FT26:SEQUENTIAL TAPE MARK TEST#/
2893  021172  051472  050505  042525
2894  021200  052116  040511  020114
2895  021206  040524  042520  046440
2896  021214  051101  020113  042524
2897  021222  052123     043
2898  021225     045  043045  031124  MSFT27: .ASCII  /%%FT27:REWIND-OFF LINE TEST#/
2899  021232  035067  042522  044527
2900  021240  042116  047455  043106
2901  021246  046040  047111  020105
2902  021254  042524  052123     043
```

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 2903  021261     045  043536     043  $CNTG:  .ASCII  /%^G#/
 2904  021265     045  053523  036522  $MSWR:  .ASCII  /%SWR= #/
 2905  021272  021440
 2906  021274  020040  042516  036527  $MNEW:  .ASCII  /  NEW= #/
 2907  021302  021440
 2908  021304  022477     043          $QUEST: .ASCII  /?%#/
 2909
 2910
 2911          021310                          .EVEN
 2912  021310  000000                  WDATA:  0
 2913          023022                          .=.+1510
 2914  023022  000000                  RDATA:  0
 2915
 2916          000001                          .END
```

```
AS      000526    667#
BA      000514    662#  1063  1548*  1967*  2053
BADDR   000616    700#  1318*  1336*  1360*  1369*  1370*  1377*  1446*  1506*  1539*  1630*  1676*  1687*
                  1692*  1708*  1725*  1758*  1792*  1831*  1842*  1859*  1870*  1931*  1967
BAE     000544    674#  947
BTRP    000574    689#
BTRP2   000576    690#
CC      000530    668#
CHNFLG  001662    821#  826*  837  954  1004  1021  1925  2205
COUNT   000734    739#
CRCNT   000714    731#
CS      000520    664#  895*  896*  898  912*  913*  958*  962*  964  1120*  1131  1163*  1165
                  1190  1194  1199  1205  1226  1230  1277  1291*  1296*  1300  1406*  1733*  2057
                  2187*  2188*
C1      000510    660#  864  897  963  1035  1123  1127  1167  1169  1549*  1766*  1938*  1974*
                  1992*  2049
DATA0   000746    748#
DATA1   000750    749#
DATA2   000752    750#
DATA3   000754    751#
DATBL   000744    747#  2093
DAT1    013216    748  2103#
DAT1A   013222    2104#  2113  2118
DAT2    013236    749  2112#
DAT3    013242    750  2117#
DAT4    013250    751  2122#
DB      000532    669#  1072  1164  1198*  1203*  1222*  1235  1274*  1293*  1297*  1298  1299
DOUT    014666    2422#  2439  2441
DOUTD   014750    2437#
DRVN    000612    698#  888  890  896  913  956*  959*  960  962  968  2188
DRVTP   000564    685#
DS      000522    665#  1340  1551  1553  1767  1776  1803  1809  1846  1874  1946  1978  1993
                  1995  1997  2005  2006  2063
DSAV    000664    719#  2005*  2078
DSUP    013156    1355  1675  1707  1830  1858  1930  2089#
DSO     013160    2090#
DT      000536    671#  915  976
EMADDR  000610    697#  1031*  1052*  1092  1117*  1146  1162*  1187*  1218*  1248  1270*  1289*  1324*
                  1342*  1353*  1394*  1504*  1576*  1609*  1671*  1704*  1754*  1789*  1827*  1855*  1884*
                  1927*  2028  2234
ER      000524    666#  1951  2009  2065
ERADD   000650    713#  1060*  1069*  1080*  1095  1125*  1129*  1135*  1149  1173*  1175*  1177*  1192*
                  1196*  1201*  1209*  1228*  1232*  1281*  1307*  1743*  1745*  1778*  1811*  1818*  1848*
                  1876*  1948*  1955*
ERCHK   012504    1325  1343  1365  1374  1382  1409  1425  1435  1512  1526  1585  1591  1596
                  1618  1637  1651  1682  1689  1694  1715  1717  1731  1775  1838  1866  1891
                  1897  1906  1911  2004#
ERPT    012530    2007  2009#
ERPTA   012656    2026  2030#
ERPTA1  012610    2014  2018  2020#
ERPTB   012714    2031  2038#
ERPTB1  012726    1563  2039  2041#
ERPTC   012756    2042  2047#
ERPTD   013102    2024  2069#
ERPTG   012616    2022#  2083
ERPTX   013112    2021  2070  2072#
```

ERPTXX	013116	2073#											
ERPT1A	012710	2035	2037#										
ERRP	000626	704#	984*	1362*	1372*	1379*	1408*	1424*	1434*	1511*	1524*	1584*	1590*	1595*
		1617*	1635*	1645*	1659*	1681*	1685*	1690*	1714*	1730*	1773*	1837*	1865*	1890*
		1896*	1905*	2030										
ERRP1	000630	705#	2038	2082*	2084*									
EXEC	012304	1322	1338	1363	1373	1381	1407	1423	1433	1448	1456	1510	1522	1542
		1582	1588	1594	1615	1634	1649	1680	1688	1693	1713	1716	1722	1729
		1736	1762	1771	1796	1800	1836	1845	1864	1873	1888	1895	1904	1910
		1936	1963#											
EXECA	012356	1969	1972#											
EXECB	012364	1971	1973#											
EXECC	012404	1978#	1981	1983										
EXECX	012424	1979	1984#											
EXECXA	012430	1985#	1986											
EXECXX	012434	1987#												
EXFL	000700	725#												
FC	000516	663#	1451	1458	1487	1546*	1737	1739	1741	1966*	1972*	2055		
FCNT	000620	701#	1316*	1334*	1358*	1399*	1413*	1414	1579*	1629*	1677*	1709*	1720*	1726*
		1734*	1759*	1793*	1832*	1860*	1932*	1966						
FT1	003264	757	758	1031#										
FT1A	003316	1036#	1041	2244										
FT1B	003322	1038#	2249											
FT1X	003334	1039	1042#											
FT1XX	003366	1045	1048#											
FT10	005022	771	772	1287#	1290									
FT10A	005056	1293#	1295											
FT10ER	005142	1301	1307#											
FT10X	005120	1288	1302A	1309										
FT10XX	005136	1304	1306#											
FT11	005156	773	774	1312#	1313									
FT12	005274	775	776	1330#	1331									
FT12A	005354	1340#	1341											
FT13	005406	777	778	1349#										
FT13A	005460	1357#	1389											
FT13B	005522	1363#	1367											
FT13C	005602	1373#	1376											
FT13D	005650	1381#	1384											
FT13X	005714	1386	1390#											
FT14	005720	779	780	1393#										
FT14A	005772	1401#	1418											
FT14A1	005736	1396#	1496											
FT14A2	006064	1411	1413#											
FT14A3	006106	1415	1417#											
FT14B	006136	1422#	1444											
FT14EC	006354	1453	1460#											
FT14RE	006362	1452	1459	1462#										
FT14RF	006326	1438	1454#											
FT14RR	006264	1428	1445#											
FT14R0	006434	1471	1473#											
FT14R1	006456	1475	1478#											
FT14R2	006462	1477	1479#											
FT14R3	006534	1464	1490#											
FT14X	006544	1412	1427	1432	1437	1441	1491	1493#						
FT14XX	006566	1494	1497#											
FT15	006572	781	782	1500#										

FT15A	006642	1508#					
FT15B	006656	1510#	1516				
FT15X	006766	1514	1536#				
FT15XX	007172	1555	1567#				
FT16	007204	783	784	1573#			
FT16A	007236	1578#	1601				
FT16B	007242	1579#					
FT16X	007422	1599	1602#				
FT17	007432	785	786	1608#			
FT17A	007452	1611#	1665				
FT17B	007456	1612#	1642				
FT17C	007616	1632#	1641				
FT17D	007664	1625	1643#				
FT17D1	007702	1646#	1661				
FT17E	007716	1648#	1656				
FT17F	010006	1658	1662#				
FT17X	010030	1620	1639	1653	1663	1666#	
FT2	003372	759	760	1052#			
FT2A	003404	1054#	1061	1086			
FT2B	003444	1059	1063#	1070			
FT2C	003504	1068	1072#	1081			
FT2D	003520	1076#	1077				
FT2E	003550	1079	1083#				
FT2ER	003560	1062	1071	1082	1087#	1820	1956
FT2ERA	003610	1091	1094#				
FT2ERB	003662	1089	1105#				
FT2ERC	003672	1106	1108#				
FT2X	003702	1084	1111#				
FT20	010034	787	788	1670#			
FT20A	010052	1673#	1698				
FT20B	010176	1690#					
FT20C	010230	1695#					
FT20X	010250	1684	1696	1699#			
FT21	010260	789	790	1704#			
FT21A	010266	1705#					
FT21B	010562	1742	1745#				
FT21C	010570	1744	1746#				
FT21SC	010416	1723#	1746				
FT21X	010602	1738	1740	1748#			
FT22	010612	791	792	1754#	1779		
FT22A	010666	1762#	1764				
FT22B	010706	1767#	1768				
FT22X	011006	1777	1781#				
FT23	011016	793	794	1787#	1812	1819	
FT23A	011126	1803#	1806	1808			
FT23B	011146	1804	1809#				
FT23C	011176	1810	1814#				
FT23X	011232	1788	1817	1821#			
FT24	011236	795	796	1827#	2015		
FT24X	011420	1840	1847	1850#			
FT25	011430	797	798	1855#	2017		
FT25X	011612	1868	1875	1878#			
FT26	011622	799	800	1883#	2168	2170	
FT26X	012050	1894	1900	1909	1914	1916	1919#
FT27	012060	801	802	1923#	2173	2175	
FT27X	012270	1950	1954	1957#			

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FT27XX  012300  1924  1926  1959#
FT3     003714   761   762  1117#  1118
FT3A    003770  1124  1127#
FT3B    004012  1128  1131#
FT3ER   004050  1126  1130  1136  1141#  1180  1193  1197  1202  1210  1229  1233  1282  1308
                1747  1780  1813  1849   1877  1949
FT3X    004040  1134  1137#
FT4     004134   763   764  1160#  1179
FT4ER   004216  1166  1173#
FT4ERA  004226  1168  1175#
FT4ERB  004236  1170  1177#
FT4ERC  004244  1174  1176  1178#
FT4X    004206  1171#  1181
FT5     004262   765   766  1185#
FT5A    004304  1188  1189#
FT5B    004332  1191  1194#
FT5C    004354  1195  1198#
FT5D    0044C4  1200  1203#
FT5E    004416  1205#  1208
FT5X    004444  1161  1186  1206  1211#
FT6     004454   767   768  1216#
FT6A    004476  1219  1220#
FT6B    004504  1222#  1225
FT6C    004542  1227  1230#
FT6D    004564  1231  1234#
FT6DE   004616  1237  1244#
FT6DEA  004650  1251#
FT6DEB  004714  1246  1261#
FT6DEX  004724  1262  1264#
FT6E    004566  1235#  1240
FT6X    004606  1217  1241#
FT7     004726   769   770  1268#  1271
FT7A    004760  1274#  1276
FT7ER   005006  1278  1281#
FT7X    004776  1269  1279#  1283
FUN     000710   729#  1321*  1337*  1361*  1371*  1378*  1404*  1422*  1430*  1447*  1455*  1474  1508*
        1520*  1541*  1581*  1587*  1593*  1612*  1631*  1644*  1657  1660*  1679*  1686*  1691*
        1712*  1728*  1761*  1795*  1799*  1835*  1844*  1863*  1872*  1887*  1902*  1935*  1968
        1970  1974
GTSWR   015076   937  2222  2473#
HDRFL   000606   696#   985*  1090  1094*  1144  1148*  1247  1250*  2025  2027*  2231  2233*
HERE    003232  1014  1020#
INIT1   013474  1054  1119  1122  1189  1220  1272  1314  1332  1401  1460  1648  1769  1790
                1798  1937  1991  1999  2072  2186#
INIT2   013504  2188#
ITAMT   000566   686#  2156
ITCNT   000662   718#  2045  2151*  2155*  2156
ITER    013324  1112  1137  1171  1211  1241  1279  1302  1326  1344  1567  1602  1699  1748
                1781  1850  1878  1919  2148#
ITRLP   000676   724#   981*   982*  2159
JUMPER  000742   742#   878   883  2013
LTADD   000706   728#   979*   980*   981   986  1001*  1002*  2015  2017
MR      000534   670#
MSFT1   020126  1031  2793#
MSFT10  020402  1289  2823#
MSFT11  020433  1324  2828#
```

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MSFT12  020453            1342    2831#
MSFT13  020476            1353    2835#
MSFT14  020525            1394    1465    2839#
MSFT15  020547            1504    2843#
MSFT16  020571            1576    2847#
MSFT17  020632            1609    2853#
MSFT2   020153            1052    2797#
MSFT20  020660            1671    2857#
MSFT21  020711            1704    2862#
MSFT22  020740            1754    2866#
MSFT23  020775            1789    2871#
MSFT24  021030            1827    2876#
MSFT25  021106            1855    2884#
MSFT26  021164            1884    2892#
MSFT27  021225            1927    2898#
MSFT3   020210            1117    2802#
MSFT4   020242            1162    2807#
MSFT5   020272            1187    2811#
MSFT6   020322            1218    2815#
MSFT7   020352            1270    2819#
MSG1    015240            2047    2513#
MSG10   016003             886    2578#
MSG10A  015643             876    2561#
MSG11   016023             903    2581#
MSG12   016043            1362    1635    1714    2584#
MSG13   016061            1372    1590    2587#
MSG14   016106            1379    1595    1730    2591#
MSG15   016133            1584    1617    1890    2595#
MSG15A  016154            1896    2598#
MSG15B  016213            1557    2604#
MSG16   016221            1478    1645    1685    2606#
MSG17   016241            1476    1659    1690    2609#
MSG2    015326            2522#
MSG20   016261            1469    2033    2612#
MSG21   016267            1472    2036    2614#
MSG22   016274            1097    1253    1480    2615#
MSG23   016304            1101    1257    1485    2617#
MSG24   016314            2236    2619#
MSG25   016330            1060    2621#
MSG26   016336            1069    2622#
MSG27   016344            1080    2623#
MSG28   016352            2624#
MSG29   016402            1125    2628#
MSG3    015401             835     840*   2530#
MSG30   016431            1129    2632#
MSG31   016461            1135    2637#
MSG32   016511            1173    1281    1307    2642#
MSG33   016527            1175    2645#
MSG34   016544            1177    2648#
MSG35   016562            1192    2651#
MSG36   016607            1196    2655#
MSG37   016636            1201    1209    2659#
MSG38   016675            1232    2665#
MSG39   016727            1251    2670#
MSG4    015541             841    2547#
MSG40   016747            1228    2673#
```

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MSG41   017002    900   2678#
MSG42   017023    917   2681#
MSG43   017044    920   2684#
MSG44   017061   1743   2687#
MSG45   017111   1745   2692#
MSG46   017166   1408   1511   1681   1837   1865   2701#
MSG47   017212   1434   1905   2705#
MSG48   017237   1424   2709#
MSG49   017264   1773   2713#
MSG5    015564    850   2551#
MSG50   017312   1778   2717#
MSG51   017350   1811   2722#
MSG52   017404   1818   2727#
MSG53   017423   1948   2730#
MSG54   017450   1957   2734#
MSG56   017614   2043   2751#
MSG57   017624   2082   2753#
MSG6    015577   1006   2553#
MSG60   017640   1524   2755#
MSG62   017707    924   2762#
MSG63   017737   1848   2767#
MSG64   017770   1876   2772#
MSG65   020020   2284   2776#
MSG66   020022   2293   2777#
MSG67   020024   1955   2778#
MSG69   020032    832   2779#
MSG7    015615   2323   2556#
MSG70   020100   2216   2786#
MSG9    015621   1467   2557#
MTINT   013522    653    860   2194#
NONSTD  000740    741#
NOST    013376    885   2166#
NRZOF   000724    735#
NXTDRV  002664    957#   974
NXTSLV  002736    966#   977   1005
OCTP    014446    844    853    889    906    927   1009   1256   1260   1484   1489   2046   2239   2368#
OCTPE   014434   1100   1104   1561   2050   2052   2054   2056   2058   2064   2066   2068   2365#  2479
OCTPE1  014452   2369#
OCTPG   014622   2376   2379   2386   2390   2395   2400   2402   2406#
OCTPG0  014640   2407   2409   2412#
OCTPG1  014644   2371   2413#
OCTP0   014466   2367   2370   2373#
OCTP1   014510   2374   2378#
OCTP2   014516   2377   2380#
OCTP3   014606   2372   2403#
OFL     014664   2365*  2368*  2408   2412*  2418#
OPDYX   000640    709#  1320*  1351*  1402*  1503*  1537*  1575*  1614*  1984
PATRN   000720    733#  1354*  1674*  1706*  1829*  1857*  1929*  2091
PCNTR   000730    737#   936*  1008   1026*  2153
PEXFL   000702    726#
PFLG    000644    711#
PSW     000546    678#  2207*
RCNT    000624    703#  1352*  1366*  1368*  1375*  1380*  1383*  1388*  1397*  1417*  1509*  1515*  1538*
                 1543*  1608*  1624   1626*  1627   1647*  1655*
RDATA   023022   1369   1446   1506   1539   1725   1842   1870   2095   2914#
RDSW    000736    740#
```

RDYDX	000636	708#	1319*	1350*	1403*	1502*	1521*	1536*	1574*	1613*	1770*	1976	
REGS	000572	688#	843	845	862								
RFD	000634	707#	1420*	1443*	1457								
RHOF	000726	736#	926	928	1303								
RHTF	000722	734#	874*	1044	1046*	2246							
RH17F	000604	695#	942*	948*	1160	1185	1216	1268	1287				
RRD	000632	706#	1419*	1442*	1450								
RTRN	000646	712#	2195										
RWND	012436	1357	1396	1505	1518	1578	1611	1673	1705	1719	1724	1755	1828	1841
		1856	1869	1886	1901	1928	1991#							
SAV1	000666	720#											
SAV2	000670	721#											
SAV3	000672	722#											
SCHN	001710	827	829#										
SCNT	000642	710#	1421*	1431*	1440*	1646*	1903*	1972					
SCOLP	000674	723#	1061*	1070*	1081*	1118*	1179*	1188*	1219*	1271*	1290*	1313*	1331*	1364*
		1746*	1779*	1812*	1819*	1939*	2140	2144	2244*					
SCOPE	013270	1108	1155	2135#	2245									
SERFL	000712	730#	1410	1426	1436	1513	1619	1638	1652	1683	1839	1867	1893	1899
		1908	1913	2004*	2022*	2080								
SERNUM	000562	684#											
SLVN	000614	699#	905	907	914	957*	966*	972*	973	975	1787	2189		
SN	000540	672#	922											
SNPG	015052	2452	2455	2461	2463	2465#								
SNPT	014774	923	2446#											
START	001600	644	808#											
STFLG	000704	727#	941*	991	996*									
STMSK	000660	717#	983*	1405*	1501*	1525*	1583*	1589*	1616*	1636*	1650*	1774*	1889*	2012*
		2019*	2020											
STSCD	003122	953	996#											
STO	002124	865#	868											
STOB	001764	841#	2248											
ST1	002146	871#	873											
ST1A	002166	876#	902	1047										
ST2	002344	899	903#	919										
ST3	002454	916	920#											
ST4	002540	648	935#											
SWR	000550	679#	813	817*	825*	951	988	993	1023	1088	1105	1142	1151	1245
		1261	1463	1490	1923	2023	2041	2069	2136	2149	2212	2214*	2221*	2229
		2240	2473	2478	2482									
SWREG	000176	638#	817	825	2212	2221	2473							
TAG	007202	1556*	1566*	1570#	2059									
TC	000542	673#	914*	975*	1333*	1545*	1815	1964*	2034	2067	2189*			
TEMPST	000732	738#												
TEMP1	000652	714#	1553*	1554	1627*	1640*	2061	2270*	2279	2303*				
TEMP2	000654	715#												
TEMP3	000656	716#	2437	2440										
TEND	003156	803	998	1004#	1305	2177								
TENDX	003254	1022	1024	1026#										
TEX	014432	2344	2362#											
TIB	000602	694#	2273	2277	2282	2287	2297	2300	2307*	2308	2334*	2335*	2336	
TINER	014234	2299	2302	2313	2316	2323#								
TKB	000554	681#	2201	2334										
TKS	000552	680#	940*	2331*	2332									
TLAST	001120	804#	997	2180*										
TMCHK	013120	1586	1592	1597	1621	1654	1892	1898	1907	1912	2078#			

```
TOB     000600   693#  869   2336* 2342* 2343  2345  2349* 2352* 2356* 2361  2403* 2414* 2422*
                 2424* 2427  2432* 2465* 2467*
TOG     014416   2337  2347  2350  2353  2357  2359# 2360  2404  2415  2468
TPB     000560   683#  2361* 2429* 2431*
TPS     000556   682#  2359  2425
TRAP    013660  1032   2228#
TRAPX   013742  2241   2243#
TRAPXX  013770  2247   2249#
TRAP1   013714  2232   2236#
TRAP2   013732  2230   2240#
TSCD    002554   839   940#  995   1027
TSCDA   003014   955   978#
TSCD0   003024   980#  992
TSCD1   003032   981#  1003
TSCD2   003070   988#  1048  1113  1138  1172  1212  1242  1280  1306  1327  1345  1390  1497
                 1568  1603  1666  1700  1749  1782  1821  1851  1879  1920  1959
TSCD3   003102   989   991#
TSRH    003016   875   979#
TSTTBL  000756   755#  979   1001  2168* 2170* 2173* 2175* 2177* 2179*
TTIN    014254  2272   2331#
TTINT   013532   631   2201#
TTOUT   014316   833   836   842   851   877   887   901   904   918   921   925   1007  1093
                 1096  1098  1102  1147  1150  1249  1252  1254  1258  1466  1468  1473  1479
                 1481  1486  1558  1958  2029  2032  2037  2040  2044  2048  2217  2235  2237
                 2285  2294  2324  2342# 2348  2358  2477  2481
TTR     013774   849   858   882   894   911   932   2268# 2486
UDES    000716   732#  1315* 1356* 1385  1387* 1395* 1470  1493  1495* 1507* 1540* 1577* 1598
                 1600* 1610* 1662  1664* 1672* 1695  1697* 1711* 1757* 1791* 1834* 1843* 1862*
                 1871* 1885* 1915  1917* 1934* 1964  2010
VECT    000570   687#  852   854   859
WC      000512   661#  1055  1547* 1965* 2051
WCNT    000622   702#  1317* 1335* 1359* 1400* 1416* 1519* 1580* 1628* 1678* 1710* 1721* 1727*
                 1735* 1760* 1794* 1833* 1861* 1933* 1965
WDATA   021310  1336   1360  1398* 1548  1630  1676  1708  1758  1792  1831  1859  1931  2090
                2912#
$CNTG   021261  2903#
$DONE   003164   961   1006#
$ENDAD  003222   623   1016#
$MNEW   021274  2480   2906#
$MSWR   021265  2476   2904#
$QUEST  021304  2908#
$SVPC =  000764   619#  626
.     =  023024   616#  619   620#  622#  624#  626#  630#  637#  643#  647#  652#  657#  805#
                 2911#  2913#
.RESTO  015216  2218   2487  2501#
.SAVE   015174  2215   2475  2491#
```

```
$CATCH    537#    616
$CHAIN    537#    820
$CHNMO    537#    954
$RESTO    537#   2500
$SAVE     537#   2490
.$ACT1    537#    617
.$EOP     537#   1013


. ABS.  023024     000


 ERRORS DETECTED:  0

 CZTECC,CZTECC.SEQ/CRF/SOL=CZTEAC.SML/ML,CZTECC.P11
 RUN-TIME:  10 18 2 SECONDS
 RUN-TIME RATIO: 82/32 2.5
 CORE USED:  9K  (17 PAGES)
```