```
                .REM    &

                                IDENTIFICATION
                                - ------

                        PRODUCT CODE:   AC   9451H - MC

                        PRODUCT TITLE:  CZTUBH0 TM02   TU16/TE16 BSC FC

                        DATE CREATED:   15 AUGUST 1977
                        REVISED:        11 NOV    1977  BY CLEM WALSH
                                        26 SEP    1983  BY B.T. LEBLANC

                        MAINTAINER:     DIAGNOSTIC ENGINEERING
```

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51
52                              1.      ABSTRACT
53                                      --------
54
55                                      THIS PROGRAM IS INTENDED TO TEST ALL OF THE BASIC
56                                      FUNCTIONAL LEVEL OPERATIONS OF THE TM02 TU16/TE16 MAG
57                                      TAPE SYSTEM.  ALL FUNCTIONS; WRITE, READ, SPACE,
58                                      ERASE, REWIND, ETC; WILL BE TESTED.  IN ADDITION TO THE
59                                      TM02-TU16/TE16 TESTS, THE RH WILL BE TESTED SEPARATELY IN
60                                      SO FAR AS IT IS POSSIBLE TO SEPARATE THE RH FROM THE
61                                      TM02-TU16/TE16 ITSELF.
62
63                              2.      REQUIREMENTS (HARDWARE)
64                                      ------------
65
66                                      A.  ANY PDP-11 PROCESSOR - WITH OR WITHOUT A HARDWARE SWITCH REGISTER
67                                      B.  8K OF CORE
68                                      C.  CONSOLE TTY
69                                      D.  TM02 MAGTAPE CONTROLLER
70                                      E.  MASS BUS CONTROLLER
71                                      F.  TU16 OR TE16 MAG TAPE TRANSPORT
72
73                              3.      LOADING PROCEEDURE
74                                      ------------------
75
76                                      USE STANDARD BINARY LOADING PROCEEDURE
77
78                              4.      STARTING PROCEEDURE
79                                      -------------- ----
80
81                                      ****SOFTWARE SWITCH REGISTER IS LOCATED AT LOC. 176(REFER TO SECTION 5 FOR MORE
82
83                                      THERE ARE TWO (2) STARTING ADDRESSES THAT MAYBE USED: 200(8) AND 210(8)
84
85                                      A.  200(8):     STARTING AT THIS ADDRESS WILL CAUSE THE PROGRAM
86                                                      IDENTIFICATION TO BE PRINTED FOLLOWED BY
87                                                      REQUESTS FOR THE VARIOUS PARAMETERS NEEDED
88                                                      BY THE PROGRAM.
89
90                                      B.  210(8):     THIS ADDRESS IS INTENDED FOR USE AS A RESTART ONLY
91                                                      AND WILL USE THE CURRENT PARAMETER VALUES.
92
```

```
                                4.1     SAMPLE START AT 200(8): OPERATOR RESPONSES ARE IN PARENS.

                                        ***SWR=XXXXXX NEW=    WILL BE PRINTED FIRST IF SOFTWARE SWITCH REGISTER IS SELEC
                                              (REFER TO SECTION 5 FOR OPERATOR ACTION)
                                        TM02 TU16/TE16 BASIC FUNCTION TEST
                                        ENTER CONDITIONS IN OCTAL

                                        REGISTER START: 172440 (CR)
                                        VECTOR: 224 (CR)
                                        DRIVE NUMBER: 0 (3)
                                        SLAVE NUMBER: 0 (6) SERIAL NO: 200
                                        RH11 OR RH70: (0)
                                        RH ONLY: (0)
                                        NRZ ONLY: (1) -NRZ (NON-RETURN-TO ZERO) IS THE METHOD OF RECORDING
                                                      ON MAGNETIC TAPE.

                                              THIS EXAMPLE SLOWS THE PROGRAM START USING THE RH11
                                              ADDRESS (CS1) OF 172440, AN INTERRUPT VECTOR OF 224,
                                              DRIVE NUMBER 3, AND SLAVE NUMBER 6, NRZ ONLY.
                                              NOTE THAT THE CURRENT VALUES FOR EACH PARAMETER IS
                                              PRINTED AND MAY OR NOT BE CHANGED.

                                        ***IF THE SOFTWARE SWITCH REGISTER IS SELECTED THE FIRST TYPE OUT WILL BE
                                           AS FOLLOWS:  SWR=XXXXXX NEW=
                                           THIS WILL BE TYPED OUT BEFORE THE HEADER MESSAGE (REFER TO SECTION 5 FOR
                                           A MORE DETAIL DESCRIPTION FOR OPERATOR ACTION.)
```

5. CONSOLE SWITCH SETTING

IF THE DIAGNOSTIC IS RUN ON A CPU WITHOUT A SWITCH REGISTER THEN A SOFTWARE SWITCH REGISTER IS USED WHICH ALLOWS THE USER THE SAME SWITCH OPTIONS AS THE HARDWARE SWITCH REGISTER. IF THE HARDWARE SWITCH REGISTER DOES NOT EXIST OR IF ONE DOES AND IT CONTAINS ALL ONES (177777) THEN THE SOFTWARE SWITCH REGISTER (LOC. 176) IS USED.

CONTROL:

THIS PROGRAM ALSO SUPPORTS THE DYNAMIC LOADING OF THE SOFTWARE SWITCH REGISTER (LOC. 176) FROM THE TTY. THIS CAN BE ACCOMPLISHED BY DOING THE FOLLOWING:

1) TYPE CONTROL G <↑G>; THIS WILL ALLOW THE TTY TO ENTER DATA INTO LOC. 176 AT SELECTED POINTS WITHIN THE PROGRAM; I.E. SCOPE ROUTINE AND AFTER

2) THE MACHINE WILL THEN TYPE: SWR=XXXXXXNEW= (XXXXXX IS THE OCTAL CONTENTS OF THE SOFTWARE SWITCH REGISTER.)

3) AFTER THE ''NEW='' HAS BEEN TYPED THEN THE OPERATOR CAN DO ONE OF THE FOLLOWING AT THE TTY:

   A) TYPE A NUMBER TO BE LOADED INTO LOC. 176 FOLLOWED BY A <CR>. (ONLY NUMBERS BETWEEN 0-7 WILL BE ACCEPTED AND ONLY 6 NUMBERS WILL BE ALLOWED)
   IF A <CR> IS THE FIRST KEY DEPRESSED THE SOFTWARE SWITCH REGISTER CONTENTS WILL NOT BE CHANGED.

   B) IF A CONTROL U <↑U> IS DEPRESSED THEN THE PROGRAM WILL SEND YOU BACK TO STEP 2.

```
157                             ALL SWITCHES EXCEPT 5-9 ARE USED AND THE NORMAL, OR DEFAULT,
158                             RUN IS DONE WITH ALL SWITCHES SET TO ZERO (0).
159                             ALL HARDWARE SWITCHES ARE DYNAMIC, AND MAY BE CHANGED AT ANY TIME.
160                             ***BUT, THE SOFTWARE SWITCH REGISTER CAN ONLY BE  LOADED DYNAMICALLY
161                                AS STATED ABOVE UNDER CONTROL HEADING.
162
163
164                             SW15(100000):   1=HALT ON ERROR
165                                             0=CONTINUE
166                             SW14(040000):   1=LOOP ON ERROR (SCOPE: RH TESTS ONLY)
167                                             0=CONTINUE
168                             SW13(020000):   1=DO NOT PRINT ERRORS
169                                             0=PRINT ALL ERRORS
170                             SW12(010000):   1=INHIBIT ITERATION
171                                             0=DO ALL ITERATIONS PER TEST
172                             SW11(004000):   1=CONTINUOUS CYCLE
173                                             0=HALT AT END OF PASS
174                             SW10(002000):   1=HALT AT END OF CURRENT TEST
175                                             0=CONTNUE
176                             SW9-5:          N/A
177                             SW4-0:          SELECT TEST NUMBER::00=ALL TESTS
178
179                             THE USE OF SW0-4 IS TO ALLOW SELECTION AND CONTINUOUS
180                             EXECUTION OF ANY TEST. THE TEST SELECTION MAY BE CHANGED AT
181                             ANY TIME, HOWEVER IT IS ADVISABLE TO USE SW10 TO STOP THE
182                             PROGRAM AT THE END OF THE CURRENT TEST BEFORE CHANGING NUMBER.
```

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 PROCEEDURES FOR OPERATING THIS PROGRAM ARE QUITE SIMPLE
AND REQUIRE ONLY A FEW STEP:

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 START
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 (1-24). IF SW0-4 IS
SET TO SOME SPECIFIC TEST NUMBER (1-24) 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.

RH11 OR RH70 OPTION:

A ONE RESPONSE IS FOR THE RH70;
A ZERO RESPONSE IS FOR THE RH11.

RH ONLY OPTION:

BY RESPONDING TO THE REQUEST (RH ONLY:) WITH
A ONE (1), ONLY THE TESTS WHICH ARE POINTED TO
THE RH (TESTS 1 - 10) WILL BE EXECUTED IN
EACH PASS.

```
261
262                                 8.      TEST DESCRIPTION
263                                         ---------   ----
264
265                                         THE FOLLOWING IS A LIST OF ALL TESTS IN THEIR PROPER SEQUENCE.
266                                         A BASIC DESCRIPTION OF EACH TEST IS PROVIDED TO AID IN UNDERSTANDING
267                                         OF THE ERROR MESSAGES ASSOCIATED WITH EACH ONE.
268
269                                         A.  RH TESTS: THE FIRST TEN (10) TESTS WILL PERFORM BASIC RH
270                                                       OPERATIONS AS FAR AS IS POSSIBLE WITHOUT REQUIRING
271                                                       THE TM02-TU16/TE16 ITSELF. (SEE RH ONLY OPTION; PAR 7)
272
273                                          FT1: RH ADDRESSING: THIS TEST WILL ASSURE THAT THE
274                                                              RH WILL RESPOND WITHOUT CAUSING A BUS
275                                                              TRAP TO ALL TM02 REGISTER ADDRESS
276                                                              IN SEQUENCE STARTING AT THE ADDRESS
277                                                              OF CS1 ENTERED BY THE OPERATOR.
278
279                                          FT2: RH REGISTER BITS READ/WRITE: THIS TEST WILL ASSURE THAT
280                                                              ALL BITS OF THE RH WRITE/READ REGISTERS
281                                                              CAN BE SET AND RESET.
282
283                                          FT3: RH INITIALIZE: THIS TEST WILL ASSURE THAT A RH INITIALIZE
284                                                              (BIT 5 OF CS2=1) WILL INDEED CLEAR
285                                                              THE RH ERRORS.
286
287                                         * FT4: SILO TEST 1:      THIS TEST WILL ASSURE THAT A READ FROM
288                                                                  AN EMPTY SILO WILL CAUSE DLT TO SET.
289
290                                         * FT5: SILO TEST 2:      THIS TEST WILL ASSURE THAT BOTH THE
291                                                                  IR AND OR BITS WILL CORRECTLY RESPOND
292                                                                  TO LOADING OF THE SILO WITH ALL ZEROS
293                                                                  AND THEN A WORD OF ALL ONES.
294
295                                         * FT6: SILO TEST 3:      THIS TEST WILL WRITE AND THEN READ
296                                                                  THE ENTIRE SILO TO ASSURE THAT DATA CAN
297                                                                  BE PROPERLY FILLED AND READ.  ALSO THE
298                                                                  PROPER STATUS OF IR AND OR ARE CHECKED.
299
300                                         * FT7: SILO TEST 4:      THIS TEST WILL ASSURE PROPER RH11
301                                                                  RESPONSE TO SILO OVERFLOW.
302
303                                         * FT10: SILO TEST 5:     THIS TEST WILL ASSURE SILO RESET
304                                                                  BY RH11 INITIALIZE.
305
306                                         **** NOTE: SILO TESTS (FT4-FT10) ARE FOR THE RH11 ONLY. *****
```

```
308
309                          8. TM02 TU16/TE16 BASIC FUNCTIONS: THE FOLLOWING FOURTEEN (14)
310                                                 TESTS WILL ASSURE OPERATION OF THE
311                                                 MAG TAPE BASIC FUNCTIONS.
312
313                           FT11: NOP TEST:       THIS TEST WILL ASSURE THAT THE NOP
314                                                 FUNCTION EXFCUTES WITH NO ERROR.
315
316                           FT12: REWIND TEST:    THIS TEST WILL ASSURE THAT THE REWIND
317                                                 FUNCTION WILL POSITION THE TAPE TO
318                                                 BOT WITH NO ERROR.
319
320                                                 1. ISSUE A REWIND COMMAND
321                                                 2. AWAIT PIP RESET (MOTION STOPPED)
322                                                 3. ASSURE THAT NO ERROR OCCURED
323                                                 4. END
324
325                           FT13: WRITE/READ TEST: THIS TEST WILL ASSURE THAT
326                                                 THE UNIT UNDER TEST CAN WRITE AND
327                                                 READ IN ALL DENSITIES (FOR BOTH PE AND NRZ).
328
329                                                 1. REWIND TO BOT
330                                                 2. WRITE 100 RECORDS
331                                                       A. ALL ONES DATA
332                                                       B. 200 FRAMES
333                                                       C. 200 BPI; ODD
334                                                 3. CHECK FOR ERRORS ON EACH RECORD
335                                                 4. READ REVERSE THEN FORWARD ALL 100 RECORDS
336                                                 5. CHECK FOR ERRORS ON EACH RECORD
337                                                 6. REPEAT STEPS 2 THRU 5 FOR 556,800,1600 BPI
338                                                 7. END.
339
340                                           DATA RELATED ERRORS (PARITY ERROR, CRC ERROR, ETC) ARE IGNORED.T
341                                           DATA READ IS NOT CHECKED; ONLY THE FUNCTION IS TESTED, NOT THE M
342
343                           FT14: SPACE TEST:     THIS TEST WILL ASSURE THAT PROPER
344                                                 POSITIONING IS MAINTAINED BY BOTH
345                                                 SPACE FORWARD AND REVERSE.
346
347                                                 1. REWIND TO BOT
348                                                 2. WRITE 100 RECORDS
349                                                       A. EACH RECORD IS ONE FRAME LARGER THAN THE LAST
350                                                          THIS WILL ALLOW FOR POSITION CHECKING BY RECO
351                                                 3. EACH RECORD IS ERROR CHECKED.
352                                                 4. DATA RELATED ERRORS ARE IGNORED.
353                                                 5. NOW SPACE REVERSE 77 RECORDS AND
354                                                    READ REVERSE 1, THE FRAME COUNT
355                                                    SHOULD BE 100.
356                                                    THIS IS THE SIZE OF THE FIRST RECORD.
357                                                 6. NOW SPACE FORWARD 76 RECORDS AND READ
358                                                    FORWARD 1, THE FRAME COUNT SHOULD BE 177.
359                                                    THIS IS THE SIZE OF THE NEXT TO LAST RECORD.
360                                                 7. CONTINUE THE SPACE AND READ (DECREMENTING THE RECORD
361                                                    UNTIL ALL POSITIONS HAVE BEEN CHECKED. IF POSITION IS
362                                                 8. REPEAT STEPS 1 THRU 7 FOR PE.
363                                                 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 TOO 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
```

```
478
479
480                                   FT23: READ IN PRESET:  THIS TEST WILL ASSURE THAT UNIT 0
481                                                          IS REWOUND AND SET TO 800 BPI NORMAL.
482                                                          (ONLY IF SLAVE 0 IS SELECTED).
483
484                                                          1. ISSUE A WRITE COMMAND TO ASSURE
485                                                             BEING OFF BOT.
486                                                          2. ISSUE THE READ-IN PRESET COMMAND.
487                                                          3. AWAIT MOTION STOP.
488                                                          4. ASSURE THAT BOT WAS REACHED.
489                                                          5. ASSURE THAT THE TAPE CONTROL REGISTER
490                                                             IS SET TO 800 BPI,NORMAL,ODD.
491                                                          6. END
492
493                                                 (THIS TEST IS ONLY PERFORMED IF THE SELECTED SLAVE IS ZERO (0).
494
495                                   FT24: REWIND: OFF LINE THIS TEST WILL ASSURE
496                                                          THAT THE UNIT WILL REWIND AND
497                                                          GO OFF LINE. (NOT IF IN CONTINUOUS CYCLE)
498
499                                                          1. ISSUE THE REWIND OFF-LINE COMMAND.
500                                                          2. ASSURE THAT MOL (BIT 12 OF DRIVE STATUS)
501                                                             IS RESET INDICATING THE UNIT WENT OFF LINE.
502                                                          3. END
503
504                                                 (THIS TEST IS NOT PERFORMED WHEN CONTINUOUS CYCLE OPERATION IS S
```

```
                        9.      LISTING
                        --- -
                        E


                        .TITLE CZTUBH0 TM02   TU16/TE16 BSC FC
                        ;ZZ - CZTUB-H-0
                        ;15 AUGUST 1983
                        ;R. BARNES
                        ;REVISED APRIL ,1976 BY S. CARPENTER
                        ;REVISED NOV   ,1977 BY CLEM WALSH
                        ;       1) SUPPORTS SOFTWARE SWITCH REGISTER
                        ;       2) SUPPORTS THE DYNAMIC LOADING OF THE SOFTWARE SWITCH REGISTER
                        ;REVISED SEP   ,1983 BY B.T. LEBLANC
                        ;       1) TEST FOR ATA SET IN DS AFTER NON-TRANSFER OPERATION CC0001619

                        ;CONSOLE SWITCHES*********
                        ;
                        ;SW1(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=INHIBIT ITERATIONS
                        ;               0=DO ITERATIONS
                        ;SW11(004000):  1=CONTINUOUS CYCLE
                        ;               0=HALT AT END OF PASS
                        ;SW10(002000):  1=HALT AT END OF EACH TEST
                        ;               0=CONTINUE
                        ;SW0 4:         SELECT TEST NUMBER :: 00=ALL TESTS
```

```
                        ;TU16/TE16 REGISTER BITS**********

                        ;15 ;14 ;13 ;12 ;11 ;10 ;09 ;08 ;07 ;06 ;05 ;04 ;03 ;02 ;01 ;00 ;
                        ;XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX/
;CS1:                   ;SC ;TRE;MCP;SPR;DNA;PSL;A17;A16;RDY;IE ;FUN;FUN;FUN;FUN;FUN;GO ;
                        ;   ;   ;   ;   ;   ;   ;   ;   ;   ;   ;   ;   ;   ;   ;   ;
                        ;XXXXXXXXXXXXXX/  ·XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
;WC:                    ; WORD                                                         ;
                        ; COUNT                                                        ;
                        ;XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
;BA:                    ; BUS                                                          ;
                        ; ADDRESS                                                      ;
                        ;·XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
;FC:                    ; FRAME                                                        ;
                        ; COUNT                                                        ;
                        ;XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
;CS2:                   ;DLT;WCE;UPE;NED;NEM;PGE;MXF;MDP;OR ;IR ;CLR;PAT;BAI;U2 ;U1 ;U0 ;
                        ;   ;   ;   ;   ;   ;   ;   ;ERR;   ;   ;   ;   ;   ;   ;   ;
                        ;XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
;DS:                    ;ATA;ERR;PIP;MOL;WRL;EOT;SPR;DPR;DRY;SSC;PES;SDN;IDP;TMK;BOT;SLA;
                        ;   ;   ;   ;   ;   ;   ;   ;   ;   ;   ;   ;   ;   ;   ;   ;
                        ;XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
;ER:                    ;CDE;UNS;OPI;DTE;NEF;CS ;FCE;NSG;PEF;INC;DAT;FMT;CNT;RMR;ILR;ILF;
                        ;CRC;   ;   ;   ;ITM;   ;   ;LRC;VPE;BPE;   ;BPE;   ;   ;   ;
                        ;XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
;ATS:                   ; ATTENTION                                                    ;
                        ; SUMMARY                                                      ;
                        ;XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
;CC:                    ; CHECK                                                        ;
                        ; CHARACTER                                                    ;
                        ;XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
;DB:                    ; DATA                                                         ;
                        ; BUFFER                                                       ;
                        ;XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
;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 ;
                        ;XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
;DT:                    ; DRIVE      ; 7 ;   ;SLV;                                    ;
                        ; TYPE       ;CH ;   ;PR ;                                    ;
                        ;XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
;SN·                    ; SERIAL                                                       ;
                        ; NUMBER                                                       ;
                        ;XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
;TC:                    ;ACL;FCS;TCW;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 ;
                        ;XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
```

```
                                .ENABL ABS
                                       ;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

                                       ;TRAP CATCHERS**********

000000                                 . = 0
000200                                 .REPT 200
                                       .+2
                                       HALT
                                       .ENDR

                                ;      ************************************************************
                                ;              ACT11 HOOKS
                                ;      ************************************************************

001000                                        $SVPC=.

000040                                        . = 40
000040  000                    DRIVE:  .BYTE   0       ;DRIVE # FOR XXDP LOAD MEDIUM
                                                       ;ASSEMBLE AS A 0

000041                                        . = 41
000041  000                    MEDIUM: .BYTE   0       ;XXDP LOAD MEDIUM
                                                       ;ASSEMBLE AS A 0

000042                                        . = 42
000042  000000                        .WORD   0       ;LOCATION INDICATOR - AUTOM/MAN MODE
                                                       ;ASSEMBLE AS A 0

000046                                        . = 46
000046  003334                        .WORD   $ENDAD  ;SET TO $ENDAD IN .$EOP

000052                                        . = 52
000052  000000                        .WORD   0       ;CHARACTERISTICS OF PROGRAM
                                                       ;SET TO 0

001000                                        .=$SVPC         ;RESTORE PC

                                ;      ************************************************************


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

000060                                 . = 60
000060  012630                 TTINT          ;TTY INTERRUPT HEADER ADDRESS
000062  000000                 0
```

```
                                        ;SOFTWARE SWITCH REGISTER**********

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

                                        ;******************************************************************************

                                        ;THIS PROGRAM SUPPORTS THE SOFTWARE SWITCH REGISTER LOC.176.
                                        ;REFER TO SECTION 5 OF DOCUMENT FOR DESCRIPTION

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

            000200                      . = 200
000200  005000                          CLR     R0
000202  000167  001372                  JMP     START   ;PROGRAM START

            000210                      . = 210
000210  000240                          NOP
000212  012700  000001                  MOV     #1,R0   ;SET NO HEADER FLAG
000216  000167  001356                  JMP     START

                                        ;TM02 INTERRUPT VECTOR**********

            000224                      . = 224
000224  012614                          MTINT           ;TAPE INTERRUPT HANDLER ADDRESS
000226  000340                          340

            000600                      . = 600
                                        ;MASS BUS REGISTER EQUIVS**********

000600  172440              C1:         172440
000602  172442              WC:         172442
000604  172444              BA:         172444
000606  172446              FC:         172446
000610  172450              CS:         172450
000612  172452              DS:         172452
000614  172454              ER:         172454
000616  172456              AS:         172456
000620  172460              CC:         172460
000622  172462              DB:         172462
000624  172464              MR:         172464
000626  172466              DT:         172466
000630  172470              SN:         172470
000632  172472              TC:         172472
000634  172474              BAE:        172474

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

000636  177776              PSW:        177776          ;PROCESSOR STATUS
000640  177570              SWR:        177570          ;SWITCH REGISTER
000642  177560              TKS:        177560          ;TTY READER STATUS
000644  177562              TKB:        177562          ;TTY READ BUFFER
000646  177564              TPS:        177564          ;TTY PUNCH STATUS
```

```
696  000650  177566                  TPB:    177566          ;TTY PUNCH BUFFER
697  000652  177777                  SERNUM: 177777          ;SERIAL NUMBER
698  000654  000011                  DRVTP:  011             ;DRIVE TYPE
699  000656  000010                  ITAMT:  10              ;ITERATION AMOUNT
700  000660  000224                  VECT:   224             ;INTERRUPT VECTOR(RH)
701  000662  172440                  REGS:   172440          ;STARTING REGISTER ADDRESS
702  000664  000004                  BTRP:   4               ;BUS TRAP ADDRESS
703  000666  000006                  BTRP2:  6               ;BUS TRAP PRIORITY LEVEL 7
704
705
706                                  ;       ************************************************************
707                                  ;               ACT11   MODE INDICATORS
708                                  ;       ************************************************************
709
710  000670  000000                          AUTOM:  .WORD   0       ;AUTOMATIC MODE INDICATOR
711  000672     000                  ACT11M: .BYTE   0       ;ACT11 AUTO MODE INDICATOR
712  000673     000                  XXDPM:  .BYTE   0       ;XXDP AUTO MODE INDICATOR
713  000674     000                  ADUMPM: .BYTE   0       ;ACT11 DUMPM INDICATOR
714  000675     000                  XDUMPM: .BYTE   0       ;XXDP DUMP MODE INDICATOR
715
716                                  ;       ************************************************************
```

```
718                                         ;FLAGS AND COUNTERS**********
719
720  000676  000000                TOB:    0
721  000700  000000                TIB:    0
722  000702  000000                RH17F:  0
723  000704  000000                MDRFL:  0
724  000706  000000                EMADDR: 0
725  000710  000000                DRVN:   0
726  000712  000000                SLVN:   0
727  000714  000000                BADDR:  0
728  000716  000000                FCNT:   0
729  000720  000000                WCNT:   0
730  000722  000000                RCNT:   0
731  000724  000000                ERRP:   0
732  000726  000000                ERRP1:  0
733  000730  000000                RRD:    0
734  000732  000000                RFD:    0
735  000734  000000                RDYDX:  0
736  000736  000000                OPDYX:  0
737  000740  000000                SCNT:   0
738  000742  000000                PFLG:   0
739  000744  000000                RTRN:   0
740  000746  000000                ERADD:  0
741  000750  000000                TEMP1:  0
742  000752  000000                TEMP2:  0
743  000754  000000                TEMP3:  0
744  000756  000000                STMSK:  0
745  000760  000000                ITCNT:  0
746  000762  000000                DSAV:   0
747  000764  000000                SAV1:   0
748  000766  000000                SAV2:   0
749  000770  000000                SAV3:   0
750  000772  000000                SCOLP:  0
751  000774  000000                ITRLP:  0
752  000776  000000                EXFL:   0
753  001000  000000                PEXFL:  0
754  001002  000000                STFLG:  0
755  001004  000000                LTADD:  0
756  001006  000000                FUN:    0
757  001010  000000                SERFL:  0
758  001012  000000                CRCNT:  0
759  001014  000000                UDES:   0
760  001016  000000                PATRN:  0
761  001020  000000                RHTF:   0
762  001022  000000                NRZOF:  0
763  001024  000000                RHOF:   0
764  001026  000000                PCNTR:  0
765  001030  000000                TEMPST: 0
766  001032  000000                COUNT:  0
767  001034  000000                RDSW:   0
768  001036  000000                PAFLG:  0
769
```

```
                                        ;DATA PATTERN GENERATORS*****
                
001040  000000                DATBL:  0
001042  012364                DATA0:  DAT1    ;ALL ONE BITS
001044  012406                DATA1:  DAT2    ;ALL ZERO BITS
001046  012414                DATA2:  DAT3    ;ALTERNATING ONE/ZERO BITS
001050  012424                DATA3:  DAT4    ;ALL BITS 0-377
```

```
779
780                                         ;LOGIC TEST ENTRY TABLE**********
781
782  001052  000000                 TSTTBL: 0
783  001054  000000                         0
784  001056  003412                         FT1
785  001060  003412                         FT1
786  001062  003512                         FT2
787  001064  003512                         FT2
788  001066  004036                         FT3
789  001070  004036                         FT3
790  001072  004254                         FT4
791  001074  004254                         FT4
792  001076  004402                         FT5
793  001100  004402                         FT5
794  001102  004604                         FT6
795  001104  004604                         FT6
796  001106  005072                         FT7
797  001110  005072                         FT7
798  001112  005166                         FT10
799  001114  005166                         FT10
800  001116  005322                         FT11
801  001120  005322                         FT11
802  001122  005440                         FT12
803  001124  005440                         FT12
804  001126  005552                         FT13
805  001130  005552                         FT13
806  001132  006104                         FT14
807  001134  006104                         FT14
808  001136  007000                         FT15
809  001140  007000                         FT15
810  001142  007200                         FT16
811  001144  007200                         FT16
812  001146  007442                         FT17
813  001150  007442                         FT17
814  001152  010056                         FT20
815  001154  010056                         FT20
816  001156  010316                         FT21
817  001160  010316                         FT21
818  001162  010646                         FT22
819  001164  010646                         FT22
820  001166  011052                         FT23
821  001170  011052                         FT23
822  001172  011272                         FT24
823  001174  011272                         FT24
824  001176  000000                         0
825  001200  000000                         0
826  001202  000000                         0
827  001204  000000                         0
```

```
829          001600                          . = 1600
830                                          ;PROGRAM START AND HOUSEKEEPING**********
831
832  001600  000240                 START:  NOP
833  001602  005067  177230                 CLR     PAFLG           ;INIT PASS FLAG
834  001606  005067  177214                 CLR     PCNTR           ;INIT PASS COUNTER
835  001612  012777  000340  17/016 RESTRT: MOV     #340,@PSW       ;SET PRIORITY
836  001620  012706  000500                 MOV     #500,SP         ;SET STACK POINTER
837
838                                  ;       ************************************************************
839                                  ;               DIAGNOSTIC SETUP FOR EXECUTION
840                                  ;               UNDER ACT11.
841                                  ;       ************************************************************
842
843  001624  004767  012474                 JSR     PC,CKMODE               ;CHECK FOR MODE OF OPERATION
844  001630  005767  177034                 TST     AUTOM                   ;IS IT AUTOMATIC MODE
845  001634  001001                         BNE     1$                      ;BRANCH - IF YES
846  001636  000412                         BR      SUSWR                   ;CHECK SWR IN DUMPM - IF NOT
847  001640  032737  020000  000052 1$:     BIT     #20000,@#52             ;SET UP FOR MANUAL INTERVENTION?
848  001646  001406                         BEQ     SUSWR                   ;BRANCH - IF NO
849  001650  012704  014460                 MOV     #MSGC,R4                ;GET MESSAGE
850  001654  004767  011334                 JSR     PC,TTOUT                ;TYPE MESSAGE
851  001660  000167  012540                 JMP     ABORT                   ;AND ABORT THE PROGRAM
852
853                                  ;       ************************************************************
854
855  001664  013746  000006         SUSWR:  MOV     @#6,-(SP)               ;SAVE VECTORS
856  001670  013746  000004                 MOV     @#4,-(SP)
857  001674  012737  001714  000004         MOV     #1$,@#4                 ;SET UP FOR TIMEOUT
858  001702  022777  177777  176730         CMP     #-1,@SWR                ;REFERENCE HARDWARE SWITCH REGISTER
859  001710  001402                         BEQ     2$
860  001712  000404                         BR      3$
861  001714  022626                 1$:     CMP     (SP)+,(SP)+             ;ADJUST STACK
862  001716  012767  000176  176714 2$:     MOV     #SWREG,SWR              ;POINT TO SOFTWARE SWITCH REG
863  001724  012637  000004         3$:     MOV     (SP)+,@#4               ;RESTORE VECTORS
864  001730  012637  000006                 MOV     (SP)+,@#6
865  001734  023727  000640  000176         CMP     @#SWR,#SWREG            ;IS SOFTWARE REG USED
866  001742  001002                         BNE     4$                      ;BRANCH IF NO
867  001744  004767  012112                 JSR     PC,CNTLU                ;ALLOW SOFTARE SWITCH REGISTER TO BE CHANGED
868
869  001750                          4$:
870
871                                  ;       ************************************************************
872                                  ;               IF IN ACT11 MODE INHIBIT TYPING PROGRAM
873                                  ;               IDENTIFICATION AND MANUAL INTERVENTION
874                                  ;       ************************************************************
875
876  001750  005767  176716                 TST     ACT11M                  ;CHECK FOR ACT11 MODE
877  001754  001104                         BNE     ST                      ;BRANCH - IF ACT11
878                                  ;       ************************************************************
879
880  001756  005700                         TST     R0              ;SEE IF PRINT HEADER
881  001760  001402                         BEQ     STOA            ;IF SO: BR
882  001762  000167  000764                 JMP     ST4             ;ELSE SKIP
883  001766  012704  014664         STOA:   MOV     #MSG3,R4
884  001772  004767  011216                 JSR     PC,TTOUT        ;PRINT TITLE
```

```
   885  001776  012704  014766           STOB:   MOV     #MSG4,R4
   886  002002  004767  011206                   JSR     PC,TTOUT        ;REQUEST REGISTER ADDRESS
   887  002006  016703  176650                   MOV     REGS,R3
   888  002012  004767  011342                   JSR     PC,OCTP         ;PRINT CURRENT ADDRESS
   889  002016  012705  000662                   MOV     #REGS,R5        ;SET ADDRESS SAVE LOC
   890  002022  012701  000006                   MOV     #6,R1           ;SET SIZE OF RESPONSE
   891  002026  012702  176400                   MOV     #176400,R2      ;SET UPPER LIMIT
   892  002032  012703  172300                   MOV     #172300,R3      ;SET LOWER LIMIT
   893  002036  004767  010716                   JSR     PC,TTR          ;GO GET RESPONSE
   894  002042  012704  015011                   MOV     #MSG5,R4
   895  002046  004767  011142                   JSR     PC,TTOUT        ;REQUEST VECTOR
   896  002052  016703  176602                   MOV     VECT,R3
   897  002056  004767  011276                   JSR     PC,OCTP         ;PRINT CURRENT VECTOR
   898  002062  012705  000660                   MOV     #VECT,R5        ;SET ADDRESS SAVE LOC
   899  002066  012701  000003                   MOV     #3,R1           ;SET SIZE OF RESPONSE
   900  002072  012702  000224                   MOV     #224,R2         ;SET UPPER LIMIT
   901  002076  012703  000150                   MOV     #150,R3         ;SET LOWER LIMIT
   902  002102  004767  010652                   JSR     PC,TTR          ;GO GET RESPONSE
   903  002106  016700  176546                   MOV     VECT,R0         ;GET VECTOR
   904  002112  012720  012614                   MOV     #MTINT,(R0)+    ;LOAD INTERRUPT ADDRESS IN VECTOR
   905  002116  012710  000340                   MOV     #340,(R0)       ;LOAD PRIORITY
   906  002122  016700  176534                   MOV     REGS,R0         ;GET START OF REGS
   907  002126  012701  000016                   MOV     #16,R1          ;SET NUMBER OF REGS
   908  002132  012702  000600                   MOV     #C1,R2          ;GET START OF TABLE
   909  002136  010022                   STO:    MOV     R0,(R2)+        ;BUILD TABLE
   910  002140  062700  000002                   ADD     #2,R0           ;BUMP ADDRESS
   911  002144  005301                           DEC     R1              ;SEE IF DONE
   912  002146  001373                           BNE     STO             ;IF NOT: BR
   913  002150  012702  000676                   MOV     #TOB,R2
   914  002154  012700  000054                   MOV     #54,R0
   915  002160  005022                   ST1:    CLR     (R2)+           ;CLEAR FLAGS + COUNTERS
   916  002162  005300                           DEC     R0
   917  002164  001375                           BNE     ST1
   918  002166  012767  000001  176624   ST:     MOV     #1,RHTF         ;SET ADDRESS TEST FLAG
   919  002174  000167  000650                   JMP     TSRH            ;GO DO INITIAL ADDRESS TEST PASS
   920
   921  002200                           ST1A:
   922
   923                                   ;       ****************************************************************
   924  002200  005767  176464                   TST     AUTOM           ;CHECK FOR AUTOMATIC MODE
   925  002204  001017                           BNE     1$              ;BRANCH - IF YES
   926                                   ;       ****************************************************************
   927
   928  002206  012704  015072                   MOV     #MSG10,R4
   929  002212  004767  010776                   JSR     PC,TTOUT        ;REQUEST DRIVE NUMBER
   930  002216  012705  000710                   MOV     #DRVN,R5        ;SET ADDRESS OF DRIVE NUMBER SAVE
   931  002222  012701  000001                   MOV     #1,R1           ;SET SIZE OF RESPONSE
   932  002226  012702  000007                   MOV     #7,R2           ;SET UPPER LIMIT
   933  002232  012703  000000                   MOV     #0,R3           ;SET LOWER LIMIT
   934  002236  004767  010516                   JSR     PC,TTR          ;GO GET RESPONSE
   935  002242  000434                           BR      CONT1           ;EXIT
   936
   937                                   ;       ****************************************************************
   938                                   ;               AUTOMATICALLY SIZE FOR DRIVES
   939                                   ;       ****************************************************************
   940  002244                           1$:
```

```
941  002244  012767  177777  176436          MOV     #-1,DRVN                ;INIT DRIVE #
942  002252  012767  177777  176432  NXTDRV: MOV     #-1,SLVN                ;INIT SLAVE #
943  002260  012777  000040  176322  1$:     MOV     #40,@CS                 ;INIT CONTROLLER
944  002266  005267  176416                  INC     DRVN                    ;STEP DRIVE #
945  002272  022767  000010  176410          CMP     #10,DRVN                ;ALL DRIVES TESTED?
946  002300  001002                          BNE     2$                      ;BRANCH - IF NOT
947  002302  000167  000764                  JMP     TENDO                   ;EXIT
948  002306  016777  176376  176274  2$:     MOV     DRVN,@CS                ;LOAD DRIVE #
949  002314  005777  176260                  TST     @C1                     ;ACESS DRIVE
950  002320  032777  010000  176262          BIT     #10000,@CS              ;NON-EXISTANT DRIVE?
951  002326  001354                          BNE     1$                      ;BRANCH - IF YES (NED=1)
952  002330  000167  000106                  JMP     NXTSLV                  ;EXIT TO SIZE FOR SLAVES
953
954                          ;       ************************************************************
955
956  002334  012777  000040  176246  CONT1:  MOV     #40,@CS         ;SET INIT
957  002342  056777  176342  176240          BIS     DRVN,@CS        ;SET DRIVE NUMBER
958  002350  005777  176224                  TST     @C1             ;ACCESS DRIVE
959  002354  032777  010000  176226          BIT     #10000,@CS      ;SEE IF NED
960  002362  001405                          BEQ     ST2             ;IF NOT: BR
961  002364  012704  016024                  MOV     #MSG41,R4
962  002370  004767  010620                  JSR     PC,TTOUT        ;PRINT NOT AVAIL
963  002374  000701                          BR      ST1A            ;REDO DRIVE REQUEST
964
965  002376                          ST2:
966
967                          ;       ************************************************************
968  002376  005767  176266                  TST     AUTOM                   ;CHECK FOR AUTOMATIC MODE
969  002402  001017                          BNE     1$                      ;BRANCH - IF YES
970                          ;       ************************************************************
971
972  002404  012704  015112                  MOV     #MSG11,R4
973  002410  004767  010600                  JSR     PC,TTOUT        ;REQUEST SLAVE NUMBER
974  002414  012705  000712                  MOV     #SLVN,R5        ;SET ADDRESS OF SLAVE SAVE
975  002420  012701  000001                  MOV     #1,R1           ;SET SIZE OF RESPONSE
976  002424  012702  000007                  MOV     #7,R2           ;SET UPPER LIMIT
977  002430  012703  000000                  MOV     #0,R3           ;SET LOWER LIMIT
978  002434  004767  010320                  JSR     PC,TTR          ;GO GET RESPONSE
979  002440  000432                          BR      CONT2           ;AND EXIT
980
981                          ;       ************************************************************
982                          ;               AUTOMATICALLY SIZE FOR SLAVES
983                          ;       ************************************************************
984  002442                          1$:
985  002442  005267  176244          NXTSLV: INC     SLVN                    ;STEP SLAVE #
986  002446  001010                          BNE     1$                      ;BRANCH - IF NOT SLAVE 0
987  002450  005767  176234                  TST     DRVN                    ;DRIVE 0?
988  002454  001005                          BNE     1$                      ;BRANCH - IF NOT
989  002456  105767  176211                  TSTB    XXDPM                   ;CHAIN MODE?
990  002462  001402                          BEQ     1$                      ;BRANCH - IF NOT
991  002464  005267  176222                  INC     SLVN                    ;STEP TO NEXT SLAVE
992  002470  022767  000010  176214  1$:     CMP     #10,SLVN                ;ALL SLAVES TESTED?
993  002476  001665                          BEQ     NXTDRV                  ;BRANCH - IF YES
994  002500  016777  176206  176124          MOV     SLVN,@TC                ;LOAD SLAVE UNIT #
995  002506  032777  002000  176112          BIT     #2000,@DT               ;SLAVE PRESENT
996  002514  001752                          BEQ     NXTSLV                  ;BRANCH - IF NOT (SPR=0)
```

```
  997  002516  032777  140000  176102          BIT     #140000,@DT     ;IS DRIVE A TAPE UNIT
  998  002524  001746                          BEQ     NXTSLV          ;BRANCH   IF NOT
  999
 1000                                  ;       ************************************************************
 1001
 1002  002526  012777  000040  176054  CONT2:  MOV     #40,@CS         ;INIT
 1003  002534  056777  176150  176046          BIS     DRVN,@CS        ;SET DRIVE NUMBER
 1004  002542  016777  176144  176062          MOV     SLVN,@TC        ;LOAD SLAVE NUMBER
 1005  002550  032777  002000  176050          BIT     #2000,@DT       ;SEE IF SLAVE PRESENT
 1006  002556  001005                          BNE     ST3             ;IF SO: BR
 1007  002560  012704  016045                  MOV     #MSG42,R4
 1008  002564  004767  010424                  JSR     PC,TTOUT        ;PRINT NON-EXIST SLAVE
 1009  002570  000702                          BR      ST2             ;REDO SLAVE REQUEST
 1010  002572  012704  016066          ST3:    MOV     #MSG43,R4
 1011  002576  004767  010412                  JSR     PC,TTOUT        ;PRINT SERIAL NUMBER TAG
 1012  002602  017703  176022                  MOV     @SN,R3
 1013  002606  004767  011074                  JSR     PC,SNPT         ;PRINT SERIAL NUMBER
 1014
 1015                                  ;       ************************************************************
 1016  002612  005767  176052                  TST     AUTOM           ;CHECK FOR AUTOMATIC MODE
 1017  002616  001057                          BNE     TSCD            ;BRANCH - IF YES
 1018                                  ;       ************************************************************
 1019
 1020  002620  012704  016650                  MOV     #MSG61,R4
 1021  002624  004767  010364                  JSR     PC,TTOUT        ;REQUEST RH11 OR RH70
 1022  002630  012705  000702                  MOV     #RH17F,R5       ;GET ADDRESS OF FLAG
 1023  002634  012701  000001                  MOV     #1,R1           ;SET SIZE OF RESPONSE
 1024  002640  012702  000001                  MOV     #1,R2           ;SET UPPER LIMIT
 1025  002644  012703  000000                  MOV     #0,R3           ;SET LOWER LIMIT
 1026  002650  004767  010104                  JSR     PC,TTR          ;GET RESPONSE
 1027  002654  012704  016670                  MOV     #MSG62,R4
 1028  002660  004767  010330                  JSR     PC,TTOUT        ;REQUEST RH11 ONLY RESPONSE
 1029  002664  012705  001024                  MOV     #RH0F,R5        ;SET FLAG ADDRESS
 1030  002670  012701  000001                  MOV     #1,R1           ;SET SIZE OF RESPONSE
 1031  002674  012702  000001                  MOV     #1,R2           ;SET UPPER LIMIT
 1032  002700  012703  000000                  MOV     #0,R3           ;SET LOWER LIMIT
 1033  002704  004767  010050                  JSR     PC,TTR          ;GO GET RESPONSE
 1034  002710  005767  176110                  TST     RH0F            ;SEE IF RH11 ONLY
 1035  002714  001016                          BNE     ST4             ;IF SO: BR
 1036  002716  012704  016541                  MOV     #MSG55,R4
 1037  002722  004767  010266                  JSR     PC,TTOUT        ;REQUEST NRZ ONLY RESPONSE
 1038  002726  012705  001022                  MOV     #NRZ0F,R5       ;SET FLAG ADDRESS
 1039  002732  012701  000001                  MOV     #1,R1           ;SET SIZE OF RESPONSE
 1040  002736  012702  000001                  MOV     #1,R2           ;SET UPPER LIMIT
 1041  002742  012703  000000                  MOV     #0,R3           ;SET LOWER LIMIT
 1042  002746  004767  010006                  JSR     PC,TTR          ;GO GET RESPONSE
 1043  002752  005067  176050          ST4:    CLR     PCNTR           ;CLEAR PASS COUNTER
```

```
1045                                        ;TEST SCHEDULAR**********
1046
1047  002756  000240                TSCD:   NOP
1048  002760  005067  176016              CLR     STFLG           ;CLEAR SINGLE TEST FLAG
1049
1050                                  ;     ************************************************************
1051
1052  002764  005067  175712              CLR     RH17F           ;SET RH11 INDICATOR
1053  002770  013746  000004              MOV     @#4,-(SP)       ;SAVE ERROR TRAP AND VECTORS
1054  002774  013746  000006              MOV     @#6,-(SP)       ;SAVE PRIORITY
1055  003000  012737  003024  000004      MOV     #1$,@#4         ;SET TIME OUT
1056  003006  005037  000006              CLR     @#6             ;SET LOW PRIORITY
1057  003012  005777  175616              TST     @#BAE           ;REFERENCE BAE REGISTER
1058  003016  012767  000001  175656      MOV     #1,RH17F        ;SET RH70 INDICATOR
1059  003024  012637  000006        1$:   MOV     (SP)+,@#6       ;RESTORE ERROR TYPE
1060  003030  012637  000004              MOV     (SP)+,@#4
1061
1062                                  ;     ************************************************************
1063
1064  003034  017700  175600              MOV     @SWR,R0
1065  003040  042700  177740              BIC     #177740,R0
1066  003044  005700                      TST     R0
1067  003046  001055                      BNE     STSCD           ;GO SELECT SINGLE TEST
1068  003050  012767  001052  175726 TSRH: MOV     #TSTTBL,LTADD
1069  003056  062767  000004  175720 TSCD0: ADD    #4,LTADD
1070  003064  016767  175714  175702      MOV     LTADD,ITRLP
1071  003072  062767  000002  175674      ADD     #2,ITRLP        ;SET ITERATION ADDRESS
1072  003100  005777  175700              TST     @LTADD
1073  003104  001002                      BNE     TSCD1
1074  003106  000167  000144              JMP     TEND            ;GO TO END ROUTINE
1075  003112  000240                TSCD1:  NOP
1076  003114  005067  175636              CLR     STMSK
1077  003120  005067  175600              CLR     ERRP
1078  003124  005067  175554              CLR     HDRFL           ;CLEAR PRINT HEADER FLAG
1079  003130  017700  175650              MOV     @LTADD,R0       ;SET POINTER TO TEST
1080  003134  000110                      JMP     (R0)            ;GO TO TEST
1081  003136  000240                TSCD2:  NOP
1082  003140  032777  002000  175472      BIT     #2000,@SWR      ;SEE IF HALT ON TEST
1083  003146  001401                      BEQ     TSCD3           ;IF NOT: BR
1084  003150  000000                      HALT
1085  003152  004767  010632        TSCD3: JSR     PC,CKSWR                ;CHECK FOR CNTL G
1086  003156  000240                      NOP
1087  003160  005767  175616              TST     STFLG           ;SE IF SINGLE TEST
1088  003164  001734                      BEQ     TSCD0           ;IF NOT: BR
1089  003166  017700  175446              MOV     @SWR,R0
1090  003172  042700  177740              BIC     #177740,R0      ;MASK TEST NUMBER
1091  003176  005700                      TST     R0              ;SEE IF RETURN TO ALL
1092  003200  001666                      BEQ     TSCD            ;IF SO: BR
1093  003202  000240                STSCD:  NOP
1094  003204  012767  000001  175570      MOV     #1,STFLG        ;SET SINGLE TEST FLAG
1095  003212  022700  000025              CMP     #25,R0          ;SEE IF EXCEEDED TESTS
1096  003216  003417                      BLE     TEND            ;IF SO: BR
1097  003220  000241                      CLC
1098  003222  006100                      ROL     R0
1099  003224  006100                      ROL     R0              ;SET TABLE MODIFIER
1100  003226  012767  001052  175550      MOV     #TSTTBL,LTADD
```

```
1101  003234  060067  175544              ADD     R0,LTADD        ;SET TEST POINTER
1102  003240  016767  175540  175526      MOV     LTADD,ITRLP
1103  003246  062767  000002  175520      ADD     #2,ITRLP        ;SET ITERATION POINTER
1104  003254  000716                      BR      TSCD1
1105
1106                                ;     ********************************************************************
1107
1108  003256  000240                TEND: NOP
1109  003260  005767  175404              TST     AUTOM                   ;CHECK FOR AUTO MODE
1110  003264  001402                      BEQ     TENDO                   ;BRANCH - IF NOT
1111  003266  000167  177150              JMP     NXTSLV                  ;GET ANOTHER SLAVE DEVICE
1112  003272                        TENDO:
1113
1114                                ;     ********************************************************************
1115
1116  003272  012704  015024              MOV     #MSG6,R4
1117  003276  004767  007712              JSR     PC,TTOUT        ;PRINT END OF PASS
1118  003302  016703  175520              MOV     PCNTR,R3
1119  003306  004767  010046              JSR     PC,OCTP         ;PRINT PASS NUMBER
1120
1121                                ;     ************************************************************
1122                                ;             AUTOMATIC MODE END OF PASS
1123                                ;     ************************************************************
1124
1125  003312  005767  175520              TST     PAFLG           ;PASS INDICATOR SET?
1126  003316  001002                      BNE     3$              ;BRANCH - IF SET
1127  003320  005267  175512              INC     PAFLG           ;SET PASS INDICATOR
1128  003324  013704  000042        3$:   MOV     @#42,R4         ;CONTENTS OF 42 TO R4
1129  003330  001405                      BEQ     HERE            ;BRANCH - IF NOT AUTO MODE
1130  003332  000005                      RESET                   ;CLEAR THE WORLD
1131  003334  004714                $ENDAD: JSR     PC,(R4)         ;RETURN TO MONITOR
1132  003336  000240                      NOP
1133  003340  000240                      NOP
1134  003342  000240                      NOP
1135  003344                        HERE:
1136  003344  005767  175320              TST     AUTOM           ;CHECK FOR AUTOMATIC MODE
1137  003350  001005                      BNE     TENDX           ;BRANCH - IF YES
1138  003352  032777  004000  175260      BIT     #4000,@SWR      ;SEE IF HALT ON PASS
1139  003360  001001                      BNE     TENDX           ;IF NOT: BR
1140  003362  000000                      HALT
1141  003364                        TENDX:
1142  003364  005767  175300              TST     AUTOM           ;CHECK FOR AUTO MODE
1143  003370  001402                      BEQ     1$              ;BRANCH - IF NOT
1144  003372  000167  000004              JMP     EXIT            ;RESTART
1145  003376  004767  010406        1$:   JSR     PC,CKSWR        ;CHECK FOR CNTL G
1146  003402  005267  175420        EXIT: INC     PCNTR           ;BUMP PASS COUNTER
1147  003406  000167  176200              JMP     RESTRT          ;RESTART
1148
1149                                ;     ********************************************************************
```

```
1151
1152                                                ;RH ADDRESSING TEST**********
1153
1154  003412  012767  016755  175266  FT1:    MOV     #MSFT1,EMADDR   ;SET HEADER
1155  003420  012777  012640  175236          MOV     #TRAP,@BTRP     ;SET TRAP HANDLER ADDRESS
1156  003426  012777  000340  175232          MOV     #340,@BTRP2
1157  003434  012700  000016                  MOV     #16,R0          ;SET NUMBER OF REGISTER
1158  003440  016701  175134                  MOV     C1,R1           ;GET FIRST ADDRESS (CS1)
1159  003444  005711                  FT1A:   TST     (R1)            ;REFERENCE REGISTER
1160  003446  000240                          NOP                     ;IF ADDRESS IS BAD, BUS TRAP WILL OCCUR
1161  003450  005300                  FT1B:   DEC     R0              ;SEE IF DONE ALL
1162  003452  001403                          BEQ     FT1X            ;IF SO: BR
1163  003454  062701  000002                  ADD     #2,R1           ;BUMP ADDRESS POINTER
1164  003460  000771                          BR      FT1A            ;CONTINUE
1165  003462  012777  000006  175174  FT1X:   MOV     #6,@BTRP        ;RESET TRAP CATCHER
1166  003470  005767  175324                  TST     RHTF            ;SEE IF INITIAL ADDRESS TEST PASS
1167  003474  001404                          BEQ     FT1XX           ;IF NOT: BR
1168  003476  005067  175316                  CLR     RHTF            ;CLEAR FLAG
1169  003502  000167  176472                  JMP     ST1A            ;RETURN
1170  003506  000167  177424          FT1XX:  JMP     TSCD2           ;RETURN TO SCHEDULAR
```

```
1172
1173                                                ;RH REGISTER BITS READ/WRITE**********
1174
1175  003512  012767  017002  175166  FT2:    MOV     #MSFT2,EMADDR   ;SET TEST HEADER
1176  003520  012701  177777                  MOV     #-1,R1          ;SET ALL ONES PATTERN
1177  003524  004767  007036          FT2A:   JSR     PC,INIT1        ;GO INIT
1178  003530  016700  17504E                  MOV     WC,R0           ;GET ADDRESS OF WORD COUNT
1179  003534  010102                          MOV     R1,R2           ;SET EXPT REGISTER BIT PATTERN
1180  003536  010110                          MOV     R1,(R0)         ;LOAD PATTERN
1181  003540  021002                          CMP     (R0),R2         ;SEE IF EXPT=RCVD
1182  003542  001410                          BEQ     FT2B            ;IF SO: BR
1183  003544  012767  015352  175174          MOV     #MSG25,ERADD    ;SET CODE
1184  003552  012767  003524  175212          MOV     #FT2A,SCOLP     ;SET SCOPE
1185  003560  004767  000116                  JSR     PC,FT2ER        ;GO DO ERROR
1186  003564  016700  175014          FT2B:   MOV     BA,R0           ;GET ADDRESS OF BUS ADDRESS
1187  003570  010102                          MOV     R1,R2
1188  003572  042702  000001                  BIC     #1,R2           ;SET EXPT PATTERN
1189  003576  010110                          MOV     R1,(R0)         ;LOAD PATTERN
1190  003600  020210                          CMP     R2,(R0)         ;SEE IF EXPT=RCVD
1191  003602  001410                          BEQ     FT2C            ;IF SO:BR
1192  003604  012767  015360  175134          MOV     #MSG26,ERADD    ;SET ERROR CODE
1193  003612  012767  003564  175152          MOV     #FT2B,SCOLP     ;SET SCOPE ADDRESS
1194  003620  004767  000056                  JSR     PC,FT2ER        ;GO DO ERROR
1195  003624  016700  174772          FT2C:   MOV     DB,R0           ;GET ADDRESS OF DATA BUFFER
1196  003630  010102                          MOV     R1,R2
1197  003632  010110                          MOV     R1,(R0)         ;LOAD PATTERN
1198  003634  012703  004000                  MOV     #4000,R3
1199  003640  005303                  FT2D:   DEC     R3              ;DELAY
1200  003642  001376                          BNE     FT2D
1201  003644  020210                          CMP     R2,(R0)         ;SEE IF EXPT=RCVD
1202  003646  001410                          BEQ     FT2E            ;IF SO: BR
1203  003650  012767  015366  175070          MOV     #MSG27,ERADD    ;SET ERROR CODE
1204  003656  012767  003624  175106          MOV     #FT2C,SCOLP     ;SET SCOPE ADDRESS
1205  003664  004767  000012                  JSR     PC,FT2ER        ;GO DO ERROR
1206  003670  005701                  FT2E:   TST     R1              ;SEE IF DONE RESET
1207  003672  001454                          BEQ     FT2X            ;IF SO: BR
1208  003674  005001                          CLR     R1              ;SET ZERO PATTERN
1209  003676  000167  177622                  JMP     FT2A            ;DO ZERO BITS
1210  003702  000240                  FT2ER:  NOP
1211  003704  032777  020000  174726          BIT     #20000,@SWR     ;SEE IF PRINT ERROR
1212  003712  001034                          BNE     FT2ERB          ;IF NOT: BR
1213  003714  005767  174764                  TST     HDRFL           ;SEE ID DONE HEADER
1214  003720  001004                          BNE     FT2ERA          ;IF SO: BR
1215  003722  016704  174760                  MOV     EMADDR,R4
1216  003726  004767  007262                  JSR     PC,TTOUT        ;DO HEADER
1217  003732  012767  000001  174744  FT2ERA: MOV     #1,HDRFL        ;SET FLAG
1218  003740  016704  175002                  MOV     ERADD,R4
1219  003744  004767  007244                  JSR     PC,TTOUT        ;PRINT ERROR CODE
1220  003750  012704  015316                  MOV     #MSG22,R4
1221  003754  004767  007234                  JSR     PC,TTOUT        ;PRINT EXPT TAG
1222  003760  010103                          MOV     R1,R3
1223  003762  004767  007360                  JSR     PC,OCTPE        ;PRINT EXPT
1224  003766  012704  015326                  MOV     #MSG23,R4
1225  003772  004767  007216                  JSR     PC,TTOUT        ;PRINT RCVD TAG
1226  003776  011003                          MOV     (R0),R3
1227  004000  004767  007342                  JSR     PC,OCTPE        ;PRINT RCVD
```

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CZTUBM0 TM02   TU16/TE16 BSC FC MAC:11 30(1046)  26 SEP 83  12:01  PAGE 23 1
CZTUBM.P11    26-SEP 83 12:04                                          SEQ 0030

  1228  004004  005777  174630          FT2ERB: TST     @SWR            ;SEE IF HALT ON ERROR
  1229  004010  100001                          BPL     FT2ERC          ;IF NOT: BR
  1230  004012  000000                          HALT
  1231  004014  004767  006426          FT2ERC: JSR     PC,SCOPE        ;GO SEE IF SCOPE ON ERROR
  1232  004020  000240                          NOP
  1233  004022  000207                          RTS     PC              ;IF NO SCOPE: CONTINUE TEST
  1234  004024  000240                  FT2X:   NOP
  1235  004026  004767  006456                  JSR     PC,ITER         ;GO SEE IF ITERATIONS
  1236  004032  000167  177100                  JMP     TSCD2           ;RETURN TO SCHEDULAR
```

```
1238
1239                                                    ;RH INITIALIZE TEST**********
1240
1241  004036  012767  017037  174642  FT3:    MOV     #MSFT3,EMADDR   ;SET TEST HEADER
1242  004044  012767  004036  174720          MOV     #FT3,SCOLP
1243  004052  004767  006510                  JSR     PC,INIT1        ;GO INIT
1244  004056  052777  020000  174524          BIS     #20000,@CS      ;FORCE UPE =1
1245  004064  000240                          NOP
1246  004066  004767  006474                  JSR     PC,INIT1        ;GO INIT
1247  004072  005777  174502                  TST     @C1             ;SEE IF SC IS RESET
1248  004076  100005                          BPL     FT3A            ;IF SO: BR
1249  004100  012767  015424  174640          MOV     #MSG29,ERADD    ;SET ERROR CODE
1250  004106  004767  000060                  JSR     PC,FT3ER        ;GO DO ERROR
1251  004112  032777  040000  174460  FT3A:   BIT     #40000,@C1      ;SEE IF TRE IS RESET
1252  004120  001405                          BEQ     FT3B            ;IF SO: BR
1253  004122  012767  015453  174616          MOV     #MSG30,ERADD    ;SET ERROR CODE.
1254  004130  004767  000036                  JSR     PC,FT3ER        ;GO DO ERROR
1255  004134  017701  174450          FT3B:   MOV     @CS,R1          ;GET CS2
1256  004140  042701  000307                  BIC     #307,R1         ;MARK IR/OR
1257  004144  005701                          TST     R1              ;SEE IF RESET
1258  004146  001405                          BEQ     FT3X            ;IF SO: BR
1259  004150  012767  015503  174570          MOV     #MSG31,ERADD    ;SET ERROR CODE
1260  004156  004767  000010                  JSR     PC,FT3ER        ;GO DO ERROR
1261  004162  004767  006322          FT3X:   JSR     PC,ITER         ;GO SEE IF ITERATION
1262  004166  000167  176744                  JMP     TSCD2           ;RETURN TO SCHEDULAR
1263  004172  032777  020000  174440  FT3ER:  BIT     #20000,@SWR     ;SEE IF PRINT ERROR
1264  004200  001015                          BNE     FT3ERB          ;IF NOT: BR
1265  004202  005767  174476                  TST     HDRFL           ;SEE IF DONE HEADER
1266  004206  001006                          BNE     FT3ERA          ;IF SO: BR
1267  004210  016704  174472                  MOV     EMADDR,R4
1268  004214  004767  006774                  JSR     PC,TTOUT        ;PRINT HEADER
1269  004220  005267  174460                  INC     HDRFL
1270  004224  016704  174516          FT3ERA: MOV     ERADD,R4
1271  004230  004767  006760                  JSR     PC,TTOUT        ;PRINT ERROR CODE
1272  004234  005777  174400          FT3ERB: TST     @SWR            ;SEE IF HALT ON ERROR
1273  004240  100001                          BPL     FT3ERC          ;IF NOT: BR
1274  004242  000000                          HALT
1275  004244  000240          FT3ERC: NOP
1276  004246  004767  006174                  JSR     PC,SCOPE        ;GO SEE IF SCOPE
1277  004252  000207                          RTS     PC              ;IF NOT: BR
```

```
1279
1280                                            ;RH11 SILO TEST 1: EPMTY SILO READ**********
1281
1282  004254  005767  174422          FT4:      TST     RH17F
1283  004260  001141                            BNE     FT5X            ;IF RH70: BR
1284  004262  012767  017071  174416            MOV     #MSFT4,EMADDR   ;SET TEST TEST HEADER
1285  004270  012777  000040  174312            MOV     #40,@CS         ;INIT
1286  004276  017700  174320                    MOV     @DB,R0          ;READ DB
1287  004302  005777  174302                    TST     @CS             ;SEE IF DLT IS SET
1288  004306  100013                            BPL     FT4ER           ;IF NOT: BR
1289  004310  005777  174264                    TST     @C1             ;SEE IF SC IS SET
1290  004314  100014                            BPL     FT4ERA          ;IF NOT: BR
1291  004316  032777  040000  174254            BIT     #40000,@C1      ;SEE IF TRE IS SET
1292  004324  001414                            BEQ     FT4ERB          ;IF NOT: BR
1293  004326  004767  006156          FT4X:     JSR     PC,ITER         ;GO SEE IF ITERATION
1294  004332  000167  176600                    JMP     TSCD2           ;RETURN TO SCHEDULAR
1295  004336  012767  015533  174402  FT4ER:    MOV     #MSG32,ERADD    ;SET ERROR CODE
1296  004344  000407                            BR      FT4ERC
1297  004346  012767  015551  174372  FT4ERA:   MOV     #MSG33,ERADD    ;SET ERROR CODE
1298  004354  000403                            BR      FT4ERC
1299  004356  012767  015566  174362  FT4ERB:   MOV     #MSG34,ERADD    ;SET ERROR CODE.
1300  004364  000240                  FT4ERC:   NOP
1301  004366  012767  004254  174376            MOV     #FT4,SCOLP      ;SET SCOPE ADDRESS
1302  004374  004767  177572                    JSR     PC,FT3ER        ;GO PRINT ERROR
1303  004400  000752                            BR      FT4X
```

```
1305
1306                                                ;RH11 SILO TEST 2: IR/OR CHECK**********
1307
1308  004402  005767  174274          FT5:    TST     RH17F           ;SEE IF RH70
1309  004406  001066                           BNE     FT5X            ;IF SO: BR
1310  004410  012767  017121  174270          MOV     #MSFT5,EMADDR   ;SET TEST HEADER
1311  004416  012767  004424  174346          MOV     #FT5A,SCOLP     ;SET SCOPE ADDRESS
1312  004424  004767  006136          FT5A:   JSR     PC,INIT1        ;GO INIT
1313  004430  032777  000100  174152          BIT     #100,@CS        ;SEE IF IR IS SET
1314  004436  001005                           BNE     FT5B            ;IF SO: BR
1315  004440  012767  015604  174300          MOV     #MSG35,ERADD    ;SET ERROR CODE
1316  004446  004767  000122                  JSR     PC,FT5ER        ;GO DO ERROR
1317  004452  032777  000200  174130  FT5B:   BIT     #200,@CS        ;SEE IF OR IS RESET
1318  004460  001405                           BEQ     FT5C            ;IF SO: BR
1319  004462  012767  015631  174256          MOV     #MSG36,ERADD    ;SET ERROR CODE
1320  004470  004767  000100                  JSR     PC,FT5ER        ;GO DO ERROR
1321  004474  012777  000000  174120  FT5C:   MOV     #0,@DB          ;LOAD ZERO INTO SILO
1322  004502  032777  000200  174100          BIT     #200,@CS        ;SEE THAT OR RESET
1323  004510  001405                           BEQ     FT5D            ;IF IT DOES: BR
1324  004512  012767  015660  174226          MOV     #MSG37,ERADD    ;SET ERROR CODE
1325  004520  004767  000050                  JSR     PC,FT5ER        ;GO DO ERROR
1326  004524  012777  177777  174070  FT5D:   MOV     #-1,@DB         ;LOAD SILO WITH -1
1327  004532  012700  004000                  MOV     #4000,R0
1328  004536  032777  000200  174044  FT5E:   BIT     #200,@CS        ;SEE IF OR IS SET
1329  004544  001007                           BNE     FT5X            ;IF SO: BR
1330  004546  005300                           DEC     R0
1331  004550  001372                           BNE     FT5E            ;AWAIT OR
1332  004552  012767  015660  174166          MOV     #MSG37,ERADD    ;SET ERROR CODE
1333  004560  004767  000010                  JSR     PC,FT5ER        ;GO DO ERROR
1334  004564  004767  005720          FT5X:   JSR     PC,ITER         ;GO SEE IF ITERATION
1335  004570  000167  176342                  JMP     TSCD2           ;RETURN TO SCHEDULAR
1336  004574  004767  177372          FT5ER:  JSR     PC,FT3ER        ;GO PRINT ERROR
1337  004600  000240                           NOP
1338  004602  000207                           RTS     PC              ;CONTINUE TEST
```

```
1340
1341                                        ;RH11 SILO TEST 3: SILO DATA TEST**********
1342
1343  004604  005767  174072        FT6:    TST     RH17F
1344  004610  001052                        BNE     FT6X            ;IF RH70: BR
1345  004612  012767  017151  174066        MOV     #MSFT6,EMADDR   ;SET TEST HEADER
1346  004620  012767  004626  174144        MOV     #FT6A,SCOLP     ;SET SCOPE ADDRESS
1347  004626  004767  005734        FT6A:   JSR     PC,INIT1        ;GO INIT
1348  004632  005000                        CLR     R0              ;PRESET DATA
1349  004634  010077  173762        FT6B:   MOV     R0,@DB          ;LOAD SILO
1350  004640  005200                        INC     R0              ;BUMP DATA
1351  004642  022700  000102                CMP     #102,R0         ;SEE IF FILLED ALL
1352  004646  001372                        BNE     FT6B            ;IF NOT: BR
1353  004650  032777  000100  173732        BIT     #100,@CS        ;SEE IF IR IS RESET.
1354  004656  001405                        BEQ     FT6C            ;IF SO: BR
1355  004660  012767  015771  174060        MOV     #MSG40,ERADD    ;SET ERROR CODE
1356  004666  004767  000054                JSR     PC,FT6ER        ;GO DO ERROR
1357  004672  032777  000200  173710  FT6C:  BIT     #200,@CS        ;SEE IF OR IS SET
1358  004700  001005                        BNE     FT6D            ;IF SO: BR
1359  004702  012767  015717  174036        MOV     #MSG38,ERADD    ;SET ERROR CODE
1360  004710  004767  000032                JSR     PC,FT6ER        ;GO DO ERROR
1361  004714  005000                FT6D:   CLR     R0              ;PRESET DATA
1362  004716  017701  173700        FT6E:   MOV     @DB,R1          ;READ SILO
1363  004722  020001                        CMP     R0,R1           ;SEE IF EXPT=RCVD
1364  004724  001014                        BNE     FT6DE           ;IF NOT: BR
1365  004726  005200                        INC     R0              ;BUMP DATA
1366  004730  022700  000102                CMP     #102,R0         ;SEE IF DONE ALL
1367  004734  001370                        BNE     FT6E            ;IF NOT: BR
1368  004736  004767  005546        FT6X:   JSR     PC,ITER         ;GO SEE IF ITERATION
1369  004742  000167  176170                JMP     TSCD2           ;RETURN TO SCHEDULAR
1370  004746  000240                FT6ER:  NOP
1371  004750  004767  177216                JSR     PC,FT3ER        ;GO PRINT ERROR
1372  004754  000207                        RTS     PC              ;RETURN
1373  004756  000240                FT6DE:  NOP
1374  004760  032777  020000  173652        BIT     #20000,@SWR     ;SEE IF PRINT ERROR
1375  004766  001032                        BNE     FT6DEB          ;IF NOT: BR
1376  004770  005767  173710                TST     HDRFL           ;SEE IF DONE HEADER
1377  004774  016701  173706                MOV     EMADDR,R1
1378  005000  004767  006210                JSR     PC,TTOUT        ;PRINT HEADER
1379  005004  005267  173674                INC     HDRFL           ;SET FLAG
1380  005010  012704  015751        FT6DEA: MOV     #MSG39,R4
1381  005014  004767  006174                JSR     PC,TTOUT        ;PRINT SILO READ ERROR
1382  005020  012704  015316                MOV     #MSG22,R4
1383  005024  004767  006164                JSR     PC,TTOUT        ;PRINT EXPT TAG
1384  005030  010003                        MOV     R0,R3
1385  005032  004767  006322                JSR     PC,OCTP         ;PRINT EXPT
1386  005036  012704  015326                MOV     #MSG23,R4
1387  005042  004767  006146                JSR     PC,TTOUT        ;PRINT RCVD TAG
1388  005046  010103                        MOV     R1,R3
1389  005050  004767  006304                JSR     PC,OCTP         ;PRINT RCVD
1390  005054  005777  173560        FT6DEB: TST     @SWR            ;SEE IF HALT ON ERROR
1391  005060  100001                        BPL     FT6DEX          ;IF NOT: BR
1392  005062  000000                        HALT
1393  005064  004767  006720        FT6DEX: JSR     PC,CKSWR                ;CHECK FOR CNTL G
1394  005070  000207                        RTS     PC              ;RETURN TO TEST
```

```
 1396
 1397                                          ;RH11 SILO TEST 4: SILO OVERFLOW**********
 1398
 1399  005072  005767  173604          FT7:    TST     RH17F
 1400  005076  001021                          BNE     FT7X            ;IF RH70: BR
 1401  005100  012767  017201  173600          MOV     #MSFT7,EMADDR   ;SET TEST HEADER
 1402  005106  012767  005072  173656          MOV     #FT7,SCOLP      ;SET SCOPE ADDRESS
 1403  005114  004767  005446                  JSR     PC,INIT1        ;GO INIT
 1404  005120  012700  000103                  MOV     #103,R0         ;SET SIZE OF SILO +1
 1405  005124  010077  173472          FT7A:   MOV     R0,@DB          ;LOAD SILO
 1406  005130  005300                          DEC     R0              ;SEE IF DONE
 1407  005132  001374                          BNE     FT7A            ;IF NOT: BR
 1408  005134  005777  173450                  TST     @CS             ;SEE IF DLT IS SET
 1409  005140  100004                          BPL     FT7ER           ;IF NOT: BR
 1410  005142  004767  005342          FT7X:   JSR     PC,ITER         ;GO SEE IF ITERATION
 1411  005146  000167  175764                  JMP     TSCD2           ;RETURN TO SCHEDULAR
 1412  005152  012767  015533  173566  FT7ER:  MOV     #MSG32,ERADD    ;SET ERROR CODE
 1413  005160  004767  177006                  JSR     PC,FT3ER        ;GO DO ERROR
 1414  005164  000766                          BR      FT7X
```

```
1416
1417                                            ;RH11 SILO TEST 5: SILO RESET**********
1418
1419  005166  005767  173510          FT10:   TST     RH17F
1420  005172  001034                         BNE     FT10X           ;IF RH70: BR
1421  005174  012767  017231  173504          MOV     #MSFT10,EMADDR  ;SET TEST HEADER
1422  005202  012767  005166  173562          MOV     #FT10,SCOLP     ;SET SCOPE ADDRESS
1423  005210  012777  000040  173372          MOV     #40,@CS         ;INITIALIZE
1424  005216  012700  000004                  MOV     #4,R0           ;SET NUMBER OF SILO WRITER
1425  005222  010077  173374          FT10A:  MOV     R0,@DB          ;WRITE SILO
1426  005226  005300                         DEC     R0              ;SEE IF DONE
1427  005230  001374                         BNE     FT10A           ;IF NOT: BR
1428  005232  052777  000040  173350          BIS     #40,@CS         ;INITIALIZE
1429  005240  012777  177777  173354          MOV     #-1,@DB         ;WRITE SILO
1430  005246  017701  173350                  MOV     @DB,R1          ;READ SILO 1
1431  005252  017701  173344                  MOV     @DB,R1          ;READ SILO 2
1432  005256  005777  173326                  TST     @CS             ;SEE IF DLT IS SET
1433  005262  100011                         BPL     FT10ER          ;IF NOT: BR
1434  005264  004767  005220          FT10X:  JSR     PC,ITER         ;GO SEE IF ITERATION
1435  005270  005767  173530                  TST     RH0F            ;SEE IF RH11 ONLY
1436  005274  001402                         BEQ     FT10XX          ;IF NOT: BR
1437  005276  000167  175754                  JMP     TEND            ;ELSE GO TO END
1438  005302  000167  175630          FT10XX: JMP     TSCD2           ;RETURN TO SCHEDULAR
1439  005306  012767  015533  173432  FT10ER: MOV     #MSG32,ERADD    ;SET ERROR CODE
1440  005314  004767  176652                  JSR     PC,FT3ER        ;GO DO ERROR
1441  005320  000761                         BR      FT10X
```

SEQ 0037

```
 1443                                                ;NOP TEST*****
 1444
 1445  005322  000240                        FT11:   NOP
 1446  005324  012767  005322  173440                MOV     @FT11,SCOLP     ;SET SCOPE ADDRESS
 1447  005332  004767  005230                        JSR     PC,INIT1
 1448  005336  012767  000300  173450                MOV     @300,UDES       ;SET TC= ALL NRZ,NORM,ODD
 1449  005344  012767  177777  173344                MOV     @-1,FCNT        ;SET FC= ALL OVER
 1450  005352  012767  177777  173340                MOV     @-1,WCNT        ;SET WC= ALL OVER
 1451  005360  012767  177777  173326                MOV     @-1,BADDR       ;SET BA= ALL OVER
 1452  005366  012767  000001  173340                MOV     @1,RDYDX        ;SET DELAY
 1453  005374  012767  000001  173334                MOV     @1,OPDYX        ;SET OP DELAY
 1454  005402  012767  000001  173376                MOV     @1,FUN          ;SET NOP FUNCTIONS CODE
 1455  005410  004767  003760                        JSR     PC,EXEC         ;GO EXECUTE COMMAND
 1456  005414  000240                                NOP
 1457  005416  012767  017262  173262                MOV     @MSFT11,EMADDR
 1458  005424  004767  004174                        JSR     PC,ERCHK        ;GO CHECK REGISTER
 1459  005430  004767  005054                        JSR     PC,ITER         ;GO SEE IF ITERATIONS
 1460  005434  000167  175476                        JMP     TSCD2           ;RETURN TO SCHEDULAR
```

```
1462                                                ;REWIND TEST*****
1463
1464  005440  000240                        FT12:   NOP
1465  005442  012767  005440  173322                MOV     @FT12,SCOLP
1466  005450  004767  005112                        JSR     PC,INIT1        ;GO INITIALIZE
1467  005454  052777  001700  173150                BIS     @1700,@TC       ;SET TO NRZ,NORMAL
1468  005462  012767  177760  173226                MOV     @-20,FCNT       ;SET FC=20
1469  005470  012767  177770  173222                MOV     @-10,WCNT       ;SET WC=10
1470  005476  012767  017742  173210                MOV     @WDATA,BADDR    ;SET BA=WRITE BUFFER
1471  005504  012767  000007  173274                MOV     @7,FUN          ;SET REWIND OP CODE
1472  005512  004767  003656                        JSR     PC,EXEC         ;GO EXECUTE COMMAND
1473  005516  000240                                NOP
1474  005520  032777  020000  173064  FT12A:  BIT     @20000,@DS
1475  005526  001374                                BNE     FT12A           ;AWAIT PIP
1476  005530  012767  017302  173150                MOV     @MSFT12,EMADDR
1477  005536  004767  004062                        JSR     PC,ERCHK        ;GO CHECK FOR ERROR
1478  005542  004767  004742                        JSR     PC,ITER         ;GO SEE IF ITERATION
1479  005546  000167  175364                        JMP     TSCD2           ;RETURN TO SCHEDULAR
1480
```

```
1482                                                ;WRITE/READ TEST*****
1483
1484  005552  000240                        FT13:   NOP
1485  005554  012767  000001  173152                MOV     #1,RDYDX
1486  005562  012767  000001  173146                MOV     #1,OPDYX
1487  005570  012767  000100  173124                MOV     #100,RCNT       ;SET RECORD COUNT
1488  005576  012767  017325  173102                MOV     #MSFT13,EMADDR  ;SET TEST HEADER
1489  005604  012767  000001  173204                MOV     #1,PATRN
1490  005612  004767  004454                       JSR     PC,DSUP         ;SET UP ALL ONES DATA PATTERN
1491  005616  012767  000300  173170                MOV     #300,UDES       ;REWIND TO BOT
1492  005624  004767  003676              FT13A:    JSR     PC,RWND         ;SET 200 BPI, NORMAL
1493  005630  012767  177600  173060                MOV     #-200,FCNT      ;SET FC
1494  005636  012767  177700  173054                MOV     #-100,WCNT      ;SET WC
1495  005644  012767  017742  173042                MOV     #WDATA,BADDR    ;SET BA
1496  005652  012767  000061  173126                MOV     #61,FUN         ;SET WRITE OP-CODE
1497  005660  012767  015132  173036                MOV     #MSG12,ERRP
1498  005666  004767  003502              FT13B:    JSR     PC,EXEC         ;GO EXECUTE COMMAND
1499  005672  005067  173074                       CLR     SCOLP           ;NO SCOPE LOOP
1500  005676  004767  003722                       JSR     PC,ERCHK        ;GO CHECK ERROR
1501  005702  005367  173014                       DEC     RCNT            ;SEE IF DONE ALL
1502  005706  001367                             BNE     FT13B           ;IF NOT: BR
1503  005710  012767  000100  173004                MOV     #100,RCNT       ;SET RECORD COUNT
1504  005716  012767  021454  172770                MOV     #RDATA,BADDR
1505  005724  062767  000200  172762                ADD     #200,BADDR      ;SET BA
1506  005732  012767  000077  173046                MOV     #77,FUN         ;SET READ REVERSE OP-CPDE
1507  005740  012767  015150  172756                MOV     #MSG13,ERRP
1508  005746  004767  003422              FT13C:    JSR     PC,EXEC         ;GO EXECUTE COMMAND
1509  005752  004767  003646                       JSR     PC,ERCHK        ;GO CHECK ERROR
1510  005756  005367  172740                       DEC     RCNT            ;SEE IF READ ALL
1511  005762  001371                             BNE     FT13C           ;IF NOT:BR
1512  005764  162767  000200  172722                SUB     #200,BADDR      ;SET BA
1513  005772  012767  000071  173006                MOV     #71,FUN         ;SET READ FORWARD OP-CODE
1514  006000  012767  015175  172716                MOV     #MSG14,ERRP
1515  006006  012767  000100  172706                MOV     #100,RCNT       ;SET RECORD COUNT
1516  006014  004767  003354              FT13D:    JSR     PC,EXEC         ;GO EXECUTE COMMAND
1517  006020  004767  003600                       JSR     PC,ERCHK        ;GO CHECK ERRORS
1518  006024  005367  172672                       DEC     RCNT            ;SEE IF DONE ALL
1519  006030  001371                             BNE     FT13D           ;IF NOT:BR
1520  006032  032767  002000  172754                BIT     #2000,UDES      ;SEE IF DONE PF
1521  006040  001017                             BNE     FT13X           ;IF SO: BR
1522  006042  062767  000400  172744                ADD     #400,UDES       ;SELECT NEXT DENSITY
1523  006050  032767  002000  172736                BIT     #2000,UDES      ;SEE IF PE
1524  006056  001403                             BEQ     FT13E           ;IF NOT: BR
1525  006060  005767  172736                       TST     NRZOF           ;SEE IF NRZ ONLY
1526  006064  001005                             BNE     FT13X           ;IF SO: BR
1527  006066  012767  000100  172626  FT13E:    MOV     #100,RCNT       ;RESET RECORD COUNT
1528  006074  000167  177524                       JMP     FT13A           ;GO DO NEXT DENSITY
1529  006100  000167  175032              FT13X:    JMP     TSCD2           ;RETURN TO SCHEDULAR
```

```
1531                                                ;SPACE TEST*****
1532  006104  000240                        FT14:   NOP
1533  006106  012767  017354  172572               MOV     @MSFT14,EMADDR  ;SET TEST HEADER
1534  006114  012767  001700  172672               MOV     #1700,UDES      ;SET NRZ,NORMAL
1535  006122  004767  003400              FT14A1: JSR     PC,RWND         ;GO INITIALIZE
1536  006126  012767  000100  172566               MOV     #100,RCNT       ;SET NUMBER OF RECORDER
1537  006134  012767  177777  011600               MOV     #-1,WDATA       ;SET DATA PATTERN
1538  006142  012767  177700  172546               MOV     #-100,FCNT      ;PRESET FRAME CNT
1539  006150  012767  177740  172542               MOV     #-40,WCNT       ;PRESET WORD CNT
1540  006156  004767  004404              FT14A:  JSR     PC,INIT1        ;GO REWIND
1541  006162  012767  001000  172546               MOV     #1000,OPDYX
1542  006170  012767  040000  172536               MOV     #40000,RDYDX
1543  006176  012767  000061  172602               MOV     #61,FUN         ;SET WRITE OP-CODE
1544  006204  012767  102300  172544               MOV     #102300,STMSK   ;MASK DATA RELATED ERRORS
1545  006212  052777  000010  172370               BIS     #10,@CS         ;INHIBIT BUS ADDRESS INCREMENT
1546  006220  004767  003150                       JSR     PC,EXEC         ;GO EXECUTE COMMAND
1547  006224  000240                               NOP
1548  006226  012767  016205  172470               MOV     @MSG46,ERRP     ;SET ERROR CODE
1549  006234  004767  003364                       JSR     PC,ERCHK        ;GO CHECK ERRORS
1550  006240  005767  172544                       TST     SERFL           ;SEE IF ERROR
1551  006244  001402                               BEQ     FT14A2          ;IF NOT: BR
1552  006246  000167  000466                       JMP     FT14X           ;ELSE EXIT
1553  006252  162767  000001  172436  FT14A2: SUB     #1,FCNT         ;BUMP FC
1554  006260  032767  000001  172430               BIT     #1,FCNT         ;SEE IF SHOULD BUMP WC
1555  006266  001403                               BEQ     FT14A3          ;IF NOT: BR
1556  006270  162767  000001  172422               SUB     #1,WCNT         ;BUMP WC
1557  006276  005367  172420              FT14A3: DEC     RCNT            ;SEE IF DONE ALL
1558  006302  001325                               BNE     FT14A           ;WRITE ALL RECORDS
1559  006304  000240                               NOP
1560  006306  012767  000100  172414               MOV     #100,RRD        ;PRESET RECORD POSITION
1561  006314  012767  000176  172410               MOV     #176,RFD
1562  006322  000240                               NOP
1563  006324  012767  177701  172406               MOV     #-77,SCNT       ;SET SPACE AMOUNT
1564  006332  012767  000033  172446  FT14B:  MOV     #33,FUN         ;SET OP-CODE SPACE REVERSE
1565  006340  004767  003030                       JSR     PC,EXEC         ;GO EXECUTE COMMAND
1566  006344  012767  016256  172352               MOV     @MSG48,ERRP     ;SET ERROR CODE
1567  006352  004767  003246                       JSR     PC,ERCHK        ;GO CHECK ERRORS
1568  006356  005767  172426                       TST     SERFL           ;SEE IF ERROR
1569  006362  001166                               BNE     FT14X           ;IF SO: BR
1570  006364  004767  000070                       JSR     PC,FT14RR       ;GO READ REVERSE + CHECK DATA
1571  006370  000240                               NOP
1572  006372  012767  000031  172406               MOV     #31,FUN         ;SET SPACE FORWARD OP-CODE
1573  006400  005267  172334                       INC     SCNT            ;SET SPACE AMOUNT
1574  006404  001555                               BEQ     FT14X           ;IF DONE: BR
1575  006406  004767  002762                       JSR     PC,EXEC         ;GO EXECUTE COMMAND
1576  006412  012767  016231  172304               MOV     @MSG47,ERRP     ;SET ERROR CODE
1577  006420  004767  003200                       JSR     PC,ERCHK        ;GO CHECK ERROR
1578  006424  005767  172360                       TST     SERFL           ;SEE IF ERROR FLAG
1579  006430  001143                               BNE     FT14X           ;IF NO: BR
1580  006432  004767  000064                       JSR     PC,FT14RF       ;GO READ FORWARD FOR POSITION CHECK
1581  006436  000240                               NOP
1582  006440  005267  172274                       INC     SCNT            ;DECREMENT SPACE AMOUNT
1583  006444  001535                               BEQ     FT14X           ;IF DONE: BR
1584  006446  005267  172256                       INC     RRD             ;BUMP DATA EXPT
1585  006452  005367  172254                       DEC     RFD             ;BUMP DATA EXPT
1586  006456  000725                               BR      FT14B
```

```
1587  006460  000240                  FT14RR: NOP
1588  006462  012767  021454  172224          MOV     @RDATA,@ADDR    ;SET BA
1589  006470  012767  000077  172310          MOV     #77,FUN         ;SET READ REVERSE OP CODE
1590  006476  004767  002672                  JSR     PC,EXEC         ;GO EXECUTE COMMAND
1591  006502  000240                          NOP
1592  006504  016705  172220                  MOV     RRD,R5
1593  006510  020577  172072                  CMP     R5,@FC          ;SEE IF CORRECT RECORD
1594  006514  001020                          BNE     FT14RER         ;IF NOT: BR
1595  006516  000167  000026                  JMP     FT14EC          ;GO CLEAR RH11 ERROR BIT
1596  006522  000240                  FT14RF: NOP
1597  006524  012767  000071  172254          MOV     #71,FUN         ;SET READ FORWARD OP-CODE
1598  006532  004767  002636                  JSR     PC,EXEC         ;GO EXECUTE COMMAND
1599  006536  016705  172170                  MOV     RFD,R5
1600  006542  020577  172040                  CMP     R5,@FC          ;SEE IF CORRECT RECORD
1601  006546  001003                          BNE     FT14RER         ;IF NOT: BR
1602  006550  004767  004012          FT14EC: JSR     PC,INIT1        ;CLEAR RH
1603  006554  000207                          RTS     PC              ;RETURN
1604  006556  000240                  FT14RER: NOP
1605  006560  032777  020000  172052          BIT     #20000,@SWR     ;SEE IF PRINT INHIBITED
1606  006566  001060                          BNE     FT14R3          ;IF SO: BR
1607  006570  012704  017354                  MOV     #MSFT14,R4
1608  006574  004767  004414                  JSR     PC,TTOUT        ;PRINT HEADER
1609  006600  012704  015050                  MOV     #MSG9,R4
1610  006604  004767  004404                  JSR     PC,TTOUT        ;PRINT ERROR TYPE
1611  006610  012704  015303                  MOV     #MSG20,R4       ;SET NRZ TAG POINTER
1612  006614  032767  002000  172172          BIT     #2000,UDES      ;SEE IF PE
1613  006622  001402                          BEQ     FT14R0          ;IF NOT: BR
1614  006624  012704  015311                  MOV     #MSG21,R4       ;ELSE SET PE TAG POINTER
1615  006630  004767  004360          FT14R0: JSR     PC,TTOUT        ;PRINT TAG
1616  006634  032767  000002  172144          BIT     #2,FUN          ;SEE IF READ REVERSE
1617  006642  001003                          BNE     FT14R1          ;IF SO: BR
1618  006644  012704  015263                  MOV     #MSG17,R4
1619  006650  000402                          BR      FT14R2          ;GO PRINT
1620  006652  012704  015243          FT14R1: MOV     #MSG16,R4
1621  006656  004767  004332          FT14R2: JSR     PC,TTOUT        ;PRINT FRWD/REV
1622  006662  012704  015316                  MOV     #MSG22,R4
1623  006666  004767  004322                  JSR     PC,TTOUT        ;PRINT EXPT TAG
1624  006672  010503                          MOV     R5,R3
1625  006674  042703  177700                  BIC     #177700,R3      ;MASK RECORD NUMBER
1626  006700  004767  004454                  JSR     PC,OCTP         ;PRINT EXPT RECORD NUMBER
1627  006704  012704  015326                  MOV     #MSG23,R4
1628  006710  004767  004300                  JSR     PC,TTOUT        ;PRINT RCVD TAG
1629  006714  017703  171660                  MOV     @FC,R3
1630  006720  042703  177700                  BIC     #177700,R3      ;MASK RECORD NUMBER
1631  006724  004767  004430                  JSR     PC,OCTP         ;PRINT ACTUAL RECORD NUMBER
1632  006730  005777  171704          FT14R3: TST     @SWR            ;SEE IF HALT ON ERROR
1633  006734  100001                          BPL     FT14X           ;IF NOT: BR
1634  006736  000000                          HALT
1635  006740  004767  005044          FT14X:  JSR     PC,CKSWR                ;CHECK FOR CNTL G
1636  006744  005767  172052                  TST     NRZOF           ;SEE IF NRZ ONLY
1637  006750  001011                          BNE     FT14XX          ;IF SO: BR
1638  006752  032767  002000  172034          BIT     #2000,UDES      ;SEE IF DONE PE
1639  006760  001005                          BNE     FT14XX          ;IF SO: BR
1640  006762  012767  002300  172024          MOV     #2300,UDES      ;SET TO PE
1641  006770  000167  177126                  JMP     FT14A1          ;DO IN PE
1642  006774  000167  174136          FT14XX: JMP     TSCD2           ;RETURN TO SCHEDULAR
```

```
1644                                                ;ERASE TEST*****
1645
1646  007000  000240                        FT15:   NOP
1647  007002  005067  171750                        CLR     STMSK
1648  007006  012767  000100  171720                MOV     #100,RDYDX
1649  007014  012767  000010  171714                MOV     #10,OPDYX
1650  007022  012767  017376  171656                MOV     #MSFT15,EMADDR  ;SET TEST HEADER
1651  007030  004767  002472                        JSR     PC,RWND         ;REWIND
1652  007034  012767  021454  171652                MOV     #RDATA,BADDR    ;SET BA
1653  007042  012767  001700  171744                MOV     #1700,UDES      ;SET NRZ, NORMAL
1654  007050  012767  000025  171730  FT15A:        MOV     #25,FUN         ;SET ERASE OP-CODE
1655  007056  012767  000200  171636                MOV     #200,RCNT       ;SET TO ERASE 128 TIMES
1656  007064  004767  002304                FT15B:  JSR     PC,EXEC         ;GO EXECUTE COMMAND
1657  007070  012767  016205  171626                MOV     #MSG46,ERRP     ;SET ERROR CODE
1658  007076  004767  002322                        JSR     PC,ERCHK        ;GO CHECK ERRORS
1659  007102  005767  171702                        TST     SERFL           ;SEE IF ANY ERRORS
1660  007106  001032                                BNE     FT15X           ;IF SO EXIT
1661  007110  005367  171606                        DEC     RCNT            ;SEE IF DONE ERASING
1662  007114  001363                                BNE     FT15B           ;IF NOT- BR
1663  007116  000240                                NOP
1664  007120  004767  002402                        JSR     PC,RWND         ;REWIND
1665  007124  012767  177600  171566                MOV     #-200,WCNT      ;SET WC
1666  007132  012767  000071  171646                MOV     #71,FUN         ;SET READ FORWARD OP-CODE
1667  007140  012767  000040  171566                MOV     #40,RDYDX       ;SET DELAY
1668  007146  004767  002222                        JSR     PC,EXEC         ;GO EXECUTE COMMAND
1669  007152  000240                                NOP
1670  007154  012767  016601  171542                MOV     #MSG60,ERRP     ;SET ERROR CODE
1671  007162  012767  020000  171566                MOV     #20000,STMSK
1672  007170  004767  002430                        JSR     PC,ERCHK        ;GO CHECK ERRORS
1673  007174  000167  173736                FT15X:  JMP     TSCD2           ;RETURN TO SCHEDULAR
```

```
1675                                                ;TAPE MARK WRITE/READ TEST*****
1676
1677  007200  000240                      FT16:    NOP
1678  007202  012767  000001  171524              MOV     #1,RDYDX
1679  007210  012767  001000  171520              MOV     #1000,OPDYX
1680  007216  012767  017420  171462              MOV     #MSFT16,EMADDR  ;SET HEADER
1681  007224  012767  001700  171562              MOV     #1700,UDES      ;SET TO NRZ NORMAL,ODD
1682  007232  004767  002270              FT16A:  JSR     PC,RWND         ;REWIND
1683  007236  012767  177760  171452      FT16B:  MOV     #-20,FCNT       ;FC=20
1684  007244  012767  177770  171446              MOV     #-10,WCNT       ;WC=10
1685  007252  012767  000027  171526              MOV     #27,FUN         ;SET WRITE TAPE MARK OP-CODE
1686  007260  004767  002110                      JSR     PC,EXEC         ;GO EXECUTE COMMAND
1687  007264  012767  001000  171464              MOV     #1000,STMSK     ;SET FOR FCE MASK
1688  007272  012767  015132  171424              MOV     #MSG12,ERRP     ;SET ERROR CODE
1689  007300  004767  002320                      JSR     PC,ERCHK        ;GO CHECK ERROR
1690  007304  004767  002722                      JSR     PC,TMCHK        ;GO SEE IF TM SET
1691  007310  012767  000077  171470              MOV     #77,FUN         ;SET USED REVERSE OP-CODE
1692  007316  004767  002052                      JSR     PC,EXEC         ;GO EXECUTE COMMAND
1693  007322  012767  001000  171426              MOV     #1000,STMSK     ;SET FCE ERROR MASK
1694  007330  012767  015150  171366              MOV     #MSG13,ERRP     ;SET ERROR CODE
1695  007336  004767  002262                      JSR     PC,ERCHK        ;GO CHECK ERRORS
1696  007342  004767  002664                      JSR     PC,TMCHK        ;GO SEE IF TM SET
1697  007346  012767  000071  171432              MOV     #71,FUN         ;SET READ  FORWARD OP-CODE
1698  007354  004767  002014                      JSR     PC,EXEC         ;GO EXECUTE COMMAND
1699  007360  012767  015175  171336              MOV     #MSG14,ERRP     ;SET ERROR CODE
1700  007366  004767  002232                      JSR     PC,ERCHK        ;TO CHECK ERRORS
1701  007372  004767  002634                      JSR     PC,TMCHK        ;GO SEE IF TM SET
1702  007376  032767  002000  171410              BIT     #2000,UDES      ;SEE IF DONE PE
1703  007404  001012                              BNE     FT16X           ;IF SO: BR
1704  007406  005767  171410                      TST     NRZOF           ;SEE IF NRZ ONLY
1705  007412  001007                              BNE     FT16X           ;IF SO: BR
1706  007414  012767  002300  171372              MOV     #2300,UDES      ;SET PE, NORMAL
1707  007422  004767  003140                      JSR     PC,INIT1        ;INITIALIZE
1708  007426  000167  177604                      JMP     FT16B           ;DO IN PE
1709  007432  004767  003052              FT16X:  JSR     PC,ITER         ;DO ITERATIONS
1710  007436  000167  173474                      JMP     TSCD2           ;RETURN TO SCHEDULAR
1711
```

```
1713
1714                                        ;TAPE MARK SPACE TEST**********
1715
1716  007442  005067  171254        FT17:   CLR     RCNT
1717  007446  012767  017461  171232        MOV     #MSFT17,EMADDR  ;SET HEADER
1718  007454  012767  001700  171332        MOV     #1700,UDES      ;SET TO NRZ
1719  007462  004767  002040        FT17A:  JSR     PC,RWND         ;REWIND TAPE
1720  007466  012767  000027  171312  FT17B: MOV     #27,FUN
1721  007474  012767  040000  171232        MOV     #40000,RDYDX    ;SET DRY DELAY
1722  007502  012767  040000  171226        MOV     #40000,OPDYX    ;SET OP DELAY
1723  007510  004767  001660                JSR     PC,EXEC         ;GO WRITE TM
1724  007514  012767  102300  171234        MOV     #102300,STMSK   ;MASK DATA RELATED ERRORS
1725  007522  012767  015222  171174        MOV     #MSG15,ERRP     ;SET ERROR TYPE
1726  007530  004767  002070                JSR     PC,ERCHK        ;GO CHECK ERROR
1727  007534  005767  171250                TST     SERFL           ;SEE IF ERROR
1728  007540  001144                        BNE     FT17X           ;IF SO: BR
1729  007542  004767  002464                JSR     PC,TMCHK        ;GO SEE IF TM SET
1730  007546  000240                        NOP
1731  007550  000240                        NOP
1732  007552  032767  000100  171142        BIT     #100,RCNT       ;SEE IF DONE PATTERN
1733  007560  001046                        BNE     FT17D           ;IF SO: BR
1734  007562  062767  000020  171132        ADD     #20,RCNT        ;ADD 20 TO RECORD COUNT
1735  007570  016767  171126  171152        MOV     RCNT,TEMP1      ;SAVE RECORD COUNT
1736  007576  012767  177600  171114        MOV     #-200,WCNT      ;WC=128
1737  007604  012767  177400  171104        MOV     #-400,FCNT      ;FC=256
1738  007612  012767  017742  171074        MOV     #WDATA,BADDR    ;BA=WRITE BUFFER
1739  007620  012767  000061  171160        MOV     #61,FUN         ;SET WRITE OP CODE
1740  007626  000240                FT17C:  NOP
1741  007630  000240                        NOP
1742  007632  004767  001536                JSR     PC,EXEC         ;GO WRITE
1743  007636  012767  015132  171060        MOV     #MSG12,ERRP     ;SET ERROR CODE
1744  007644  012767  102300  171104        MOV     #102300,STMSK   ;MASK DATA RELATED ERRORS
1745  007652  004767  001746                JSR     PC,ERCHK        ;GO CHECK ERROR
1746  007656  005767  171126                TST     SERFL           ;SEE IF ERROR
1747  007662  001073                        BNE     FT17X           ;IF SO: BR
1748  007664  005367  171060                DEC     TEMP1           ;SEE IF DONE ALL
1749  007670  001356                        BNE     FT17C           ;IF NOT: BR
1750  007672  000167  177570                JMP     FT17B           ;ELSE GO DO TM
1751  007676  000240                FT17D:  NOP
1752  007700  012767  000033  171100        MOV     #33,FUN         ;SET SPACE REVERSE
1753  007706  012767  015243  171010        MOV     #MSG16,ERRP     ;SET ERROR CODE
1754  007714  012767  177600  171016  FT17D1: MOV    #-200,SCNT      ;SET TO 200 RECORDS
1755  007722  012767  000005  170772        MOV     #5,RCNT         ;SET NUMBER OF OPS TO DO
1756  007730  004767  002632        FT17E:  JSR     PC,INIT1        ;GO INIT
1757  007734  004767  001434                JSR     PC,EXEC         ;GO SPACE
1758  007740  012767  001000  171010        MOV     #1000,STMSK     ;SET ERROR MASK
1759  007746  004767  001652                JSR     PC,ERCHK        ;GO CHECK ERROR
1760  007752  005767  171032                TST     SERFL           ;SEE IF ERROR
1761  007756  001035                        BNE     FT17X           ;IF SO: BR
1762  007760  004767  002246                JSR     PC,TMCHK        ;GO SEE IF TM SET
1763  007764  005367  170732                DEC     RCNT            ;SEE IF DONE SPACES
1764  007770  001357                        BNE     FT17E           ;IF NOT: BR
1765  007772  022767  000031  171006        CMP     #31,FUN         ;SEE IF DONE FORWARD
1766  010000  001410                        BEQ     FT17F           ;IF SO: BR
1767  010002  012767  015263  170714        MOV     #MSG17,ERRP     ;SET ERROR CODE
1768  010010  012767  000031  170770        MOV     #31,FUN         ;SET TO SPACE FORWARD
```

SEQ 0045

```
 1769  010016  000167  177672                    JMP     FT17D1          ;DO FORWARD
 1770  010022  032767  002000  170764  FT17F:    BIT     #2000,UDES      ;SEE IF DONE PE
 1771  010030  001010                            BNE     FT17X           ;IF SO: BR
 1772  010032  005767  170764                    TST     NRZOF           ;SEE IF NRZ ONLT
 1773  010036  001005                            BNE     FT17X           ;IF SO: BR
 1774  010040  012767  002300  170746            MOV     #2300,UDES      ;SET TO PE
 1775  010046  000167  177410                    JMP     FT17A           ;GO PE
 1776  010052  000167  173060          FT17X:    JMP     TSCD2           ;RETURN  TO SCHEDULAR
```

```
1778
1779                                        ;WRITE CHECK TEST**********
1780
1781  010056  000240                FT20:   NOP
1782  010060  012767  017507  170620        MOV     #MSFT20,EMADDR  ;SET HEADER
1783  010066  004767  001434               JSR     PC,RWND         ;REWIND
1784  010072  012767  000003  170716        MOV     #3,PATRN
1785  010100  004767  002166               JSR     PC,DSUP         ;GO SET PATTERN 3
1786  010104  012767  017742  170602        MOV     #WDATA,BADDR    ;SET BA
1787  010112  012767  177400  170576        MOV     #-400,FCNT      ;SET FC
1788  010120  012767  177600  170572        MOV     #-200,WCNT      ;SET WC
1789  010126  012767  001700  170660        MOV     #1700,UDES      ;SET NRZ NORMAL
1790  010134  012767  000061  170644  FT20A: MOV     #61,FUN         ;SET WRITE OP CODE
1791  010142  004767  001226               JSR     PC,EXEC         ;GO WRITE RECORD
1792  010146  012767  016205  170550        MOV     #MSG46,ERRP     ;SET ERROR CODE
1793  010154  004767  001444               JSR     PC,ERCHK        ;GO CHECK ERROR
1794  010160  005767  170624               TST     SERFL           ;SEE IF ERORR
1795  010164  001050                       BNE     FT20X           ;IF SO: BR
1796  010166  012767  015243  170530        MOV     #MSG16,ERRP     ;SET REVERSE ERROR TAG
1797  010174  012767  000057  170604        MOV     #57,FUN         ;SET REVERSE WRITE CHECK OP-CODE
1798  010202  062767  000376  170504        ADD     #376,BADDR      ;SET BA FOR REVERSE CHECK
1799  010210  004767  001160               JSR     PC,EXEC         ;GO DO REVERSE CHECK
1800  010214  004767  001404               JSR     PC,ERCHK        ;GO CHECK ERROR
1801  010220  012767  015263  170476  FT20B: MOV     #MSG17,ERRP     ;SET FORWARD TAG
1802  010226  012767  000051  170552        MOV     #51,FUN         ;SET FORWARD CHECK OP CODE
1803  010234  162767  000376  170452        SUB     #376,BADDR      ;SET BA FOR FORWARD CHECK
1804  010242  004767  001126               JSR     PC,EXEC         ;GO DO FORWARD CHECK
1805  010246  004767  001352               JSR     PC,ERCHK        ;GO CHECK ERROR
1806  010252  032767  002000  170534  FT20C: BIT     #2000,UDES      ;SEE IF DONE PE
1807  010260  001012                       BNE     FT20X           ;IF SO: BR
1808  010262  005767  170534               TST     NRZOF           ;SEE IF NRZ ONLY
1809  010266  001007                       BNE     FT20X           ;IF SO: BR
1810  010270  012767  002300  170516        MOV     #2300,UDES      ;ELSE SET PE
1811  010276  004767  002264               JSR     PC,INIT1        ;GO INIT
1812  010302  000167  177626               JMP     FT20A           ;DO IN PE
1813  010306  004767  002176        FT20X: JSR     PC,ITER         ;DO ITERATIONS
1814  010312  000167  172620               JMP     TSCD2           ;RETURN TO SCHEDULAR
```

```
1816
1817                                                ;ERASE HEAD TEST*****
1818
1819  010316  012767  017540  170362  FT21:   MOV     #MSFT21,EMADDR  ;SET TEST HEADER
1820  010324  004767  001176                  JSR     PC,RWND         ;GO REWIND
1821  010330  012767  000003  170460          MOV     #3,PATRN
1822  010336  004767  001730                  JSR     PC,DSUP         ;GO SET PATTERN 3
1823  010342  012767  017742  170344          MOV     #WDATA,BADDR    ;SET BA=WRITE BUFFER
1824  010350  012767  176340  170340          MOV     #-1440,FCNT     ;SET FC=800
1825  010356  012767  177160  170334          MOV     #-620,WCNT      ;SET WC=400
1826  010364  012767  001700  170422          MOV     #1700,UDES      ;SET NRZ, NORMAL
1827  010372  012767  000061  170406          MOV     #61,FUN         ;SET WRITE OP-CODE
1828  010400  004767  000770                  JSR     PC,EXEC         ;GO DO WRITE 1
1829  010404  012767  015132  170312          MOV     #MSG12,ERRP     ;SET ERROR CODE
1830  010412  004767  001206                  JSR     PC,ERCHK        ;GO CHECK FOR ERROR
1831  010416  004767  000752                  JSR     PC,EXEC         ;YES DO WRITE 2
1832  010422  004767  001176                  JSR     PC,ERCHK        ;YES CHECK FOR ERROR
1833  010426  000240                          NOP
1834  010430  004767  001072                  JSR     PC,RWND         ;GO REWIND
1835  010434  012767  177160  170254          MOV     #-620,FCNT      ;SET FC=400
1836  010442  012767  177470  170250          MOV     #-310,WCNT      ;SET WC=200
1837  010450  004767  000720                  JSR     PC,EXEC         ;GO REWRITE RECORD 1-WM TO EM
1838  010454  000240                  FT21A:  NOP
1839  010456  004767  001044                  JSR     PC,RWND         ;REWIND
1840  010462  012767  021454  170224          MOV     #RDATA,BADDR    ;SET BA=READ BUFFER
1841  010470  012767  177160  170220          MOV     #-620,FCNT      ;SET FC=400
1842  010476  012767  177470  170214          MOV     #-310,WCNT      ;SET WC=200
1843  010504  012767  000071  170274          MOV     #71,FUN         ;SET READ OP-CODE
1844  010512  004767  000656                  JSR     PC,EXEC         ;GO READ RECORD 1
1845  010516  012767  015175  170200          MOV     #MSG14,ERRP     ;SET ERROR CODE
1846  010524  004767  001074                  JSR     PC,ERCHK        ;GO CHECK FOR ERROR
1847  010530  000240                          NOP
1848  010532  052777  000010  170050          BIS     #10,@CS         ;INHIBIT BA INCREMENT
1849  010540  012767  176340  170150          MOV     #-1440,FCNT     ;SET FC=800
1850  010546  012767  177160  170144          MOV     #-620,WCNT      ;SET WC=400
1851  010554  004767  000614                  JSR     PC,EXEC         ;GO READ RECORD 2
1852  010560  022777  001440  170020          CMP     #1440,@FC       ;SEE IF READ RECORD 2
1853  010566  001423                          BEQ     FT21X           ;IF SO: BR
1854  010570  022777  001441  170010          CMP     #1441,@FC       ;++F CHECK FOR 801 FRAMES
1855  010576  001417                          BEQ     FT21X           ;++F IF SO: BR
1856  010600  012767  016152  170140          MOV     #MSG45,ERADD    ;++F SET ERROR CODE
1857  010606  022777  001440  167772          CMP     #1440,@FC       ;++F MORE THAN 801 FRAMES ?
1858  010614  101403                          BLOS    1$              ;++F IF SO: BR
1859  010616  012767  016103  170122          MOV     #MSG44,ERADD    ;++F SET ERROR CODE
1860  010624  012767  010454  170140  1$:     MOV     #FT21A,SCOLP    ;SET SCOPE ADDRESS
1861  010632  004767  173334                  JSR     PC,FT3ER        ;GO PRINT ERROR
1862  010636  004767  001646          FT21X:  JSR     PC,ITER         ;GO SEE IF ITERATION
1863  010642  000167  172270                  JMP     TSCD2           ;RETURN TO SCHEDULAR
1864
1865
```

```
1867                                            ;BUFFERED COMMAND TEST*****
1868
1869  010646  012767  017567  170032  FT22:     MOV     #MSFT22,EMADDR  ;SET TEST HEADER
1870  010654  004767  000646                   JSR     PC,RWND         ;GO REWIND
1871  010660  012700  000003                   MOV     #3,R0           ;SET NUMBER OF WRITES
1872  010664  012767  001700  170122           MOV     #1700,UDES      ;SET TO NRZ NORMAL
1873  010672  012767  017742  170014           MOV     #WDATA,BADDR    ;SET BA=WRITE BUFFER
1874  010700  012767  177000  170010           MOV     #-1000,FCNT     ;SET FC=1000
1875  010706  012767  177400  170004           MOV     #-400,WCNT      ;SET WC=400
1876  010714  012767  000061  170064           MOV     #61,FUN         ;SET WRITE OP-CODE
1877  010722  004767  000446           FT22A:   JSR     PC,EXEC         ;GO DO WRITE
1878  010726  005300                           DEC     R0              ;SEE IF DONE ALL
1879  010730  001374                           BNE     FT22A           ;IF NOT: BR
1880  010732  000240                           NOP
1881  010734  012777  000007  167636           MOV     #7,@C1          ;START REWIND
1882  010742  032777  000200  167642  FT22B:   BIT     #200,@DS
1883  010750  001774                           BEQ     FT22B
1884  010752  004767  001610                   JSR     PC,INIT1        ;INITIALIZE
1885  010756  012767  000010  167750           MOV     #10,RDYDX       ;SET LONG READY DELAY
1886  010764  004767  000404                   JSR     PC,EXEC         ;ISSUE BUFFERED WRITE
1887  010770  000240                           NOP
1888  010772  012767  016303  167724           MOV     #MSG49,ERRP     ;SET ERROR CODE
1889  011000  012767  102300  167750           MOV     #102300,STMSK   ;MARK DATA ERROR
1890  011006  004767  000612                   JSR     PC,ERCHK        ;GO CHECK ERROR
1891  011012  032777  000002  167572           BIT     #2,@DS          ;SEE IF BOT IS SET
1892  011020  001410                           BEQ     FT22X           ;IF NOT: BR
1893  011022  012767  016331  167716           MOV     #MSG50,ERADD    ;SET ERROR CODE
1894  011030  012767  010646  167734           MOV     #FT22,SCOLP
1895  011036  004767  173130                   JSR     PC,FT3ER        ;GO DO ERROR
1896  011042  004767  001442           FT22X:   JSR     PC,ITER         ;GO SEE IF ITERATION
1897  011046  000167  172064                   JMP     TSCD2           ;RETURN TO SCHEDULAR
1898
1899
```

```
1901                                                ;READ-IN PRESET TEST*****
1902
1903  011052  005767  167634          FT23:   TST     SLVN            ;SEE IF SLAVE SELECT=0
1904  011056  001103                          BNE     FT23X           ;IF NOT:BR
1905  011060  012767  017624  167620          MOV     #MSFT23,EMADDR  ;SET TEST HEADER
1906  011066  004767  001474                  JSR     PC,INIT1        ;GO INIT
1907  011072  012767  001700  167714          MOV     #1700,UDES      ;SET TO NRZ NORMAL
1908  011100  012767  017742  167606          MOV     #WDATA,BADDR    ;SET BA=WRITE BUFFER
1909  011106  012767  177400  167602          MOV     #-400,FCNT      ;SET FC=400
1910  011114  012767  177600  167576          MOV     #-200,WCNT      ;SET WC=200
1911  011122  012767  000061  167656          MOV     #61,FUN         ;SET WRITE OP-CODE
1912  011130  004767  000240                  JSR     PC,EXEC         ;GO DO WRITE
1913  011134  000240                          NOP
1914  011136  004767  001424                  JSR     PC,INIT1        ;INITIALIZE
1915  011142  012767  000021  167636          MOV     #21,FUN         ;SET READ-IN PRESFT OP CODE
1916  011150  004767  000220                  JSR     PC,EXEC         ;GO DO COMMAND
1917  011154  005000                          CLR     R0
1918  011156  012703  000004                  MOV     #4,R3           ;SET MULT
1919  011162  032777  020000  167422  FT23A:  BIT     #20000,@DS      ;SEE IF PIP RESET
1920  011170  001404                          BEQ     FT23B           ;IF SO: BR
1921  011172  005300                          DEC     R0
1922  011174  001372                          BNE     FT23A           ;AWAIT PIP RESET
1923  011176  005303                          DEC     R3
1924  011200  001370                          BNE     FT23A           ;DELAY
1925  011202  032777  000002  167402  FT23B:  BIT     #2,@DS          ;SEE IF BOT
1926  011210  001010                          BNE     FT23C           ;IF SO: BR
1927  011212  012767  016367  167526          MOV     #MSG51,ERADD    ;SET ERROR CODE
1928  011220  012767  011052  167544          MOV     #FT23,SCOLP
1929  011226  004767  172740                  JSR     PC,FT3ER        ;GO DO ERROR
1930  011232  012701  141000          FT23C:  MOV     #141000,R1      ;SET EXPT TC
1931  011236  016700  167370                  MOV     TC,R0           ;SET TC ADDRESS
1932  011242  020110                          CMP     R1,(R0)         ;SEE IF EXPT=RCVD
1933  011244  001410                          BEQ     FT23X           ;IF SO: BR
1934  011246  012767  016423  167472          MOV     #MSG52,ERADD    ;SET ERROR CODE
1935  011254  012767  011052  167510          MOV     #FT23,SCOLP     ;CLEAR SCOPE ADDRESS
1936  011262  004767  172414                  JSR     PC,FT2ER        ;GO DO ERROR
1937  011266  000167  171644          FT23X:  JMP     TSCD2           ;RETURN TO SCHEDULAR
1938
1939
```

SEQ 0050

```
1941                                                ;REWIND: OFF LINE TEST*****
1942
1943  011272  032777  000000  167340  FT24:   BIT     @0,@SWR         ;SEE IF IN CONTINUOUS MODE
1944  011300  001433                          BEQ     FT24XX          ;IF SO: BR
1945  011302  012767  017657  167376          MOV     @#SFT24,EMADDR  ;SET TEST HEADER
1946  011310  004767  001252                  JSR     PC,INIT1        ;GO INITIAIZE
1947  011314  012777  000003  167256          MOV     @3,@C1          ;ISSUE REWIND: OFF LINE COMMAND
1948  011322  012700  004000                  MOV     @4000,R0
1949  011326  005300                  FT24A:  DEC     R0              ;DELAY
1950  011330  001376                          BNE     FT24A
1951  011332  032777  010000  167252          BIT     @10000,@DS      ;SEE IF MOL IS RESET
1952  011340  001407                          BEQ     FT24X           ;IF SO: BR
1953  011342  005067  167424                  CLR     SCOLP           ;ASSURE NO SCOPE
1954  011346  012767  016442  167372          MOV     @#MSG53,ERADD   ;SET ERROR CODE
1955  011354  004767  172612                  JSR     PC,FT3ER        ;GO DO ERROR
1956  011360  012704  016466          FT24X:  MOV     @#MSG54,R4
1957  011364  004767  001624                  JSR     PC,TTOUT        ;PRINT ON LINE REQUEST
1958  011370  000167  171542          FT24XX: JMP     TSCD2           ;RETURN TO SCHEDULAR
1959
1960
```

SEQ 0051

```
1962                                            ;COMMAND EXECUTE SUBROUTINE*****
1963
1964  011374  000240                  EXEC:     NOP
1965  011376  056777  167412  167226            BIS     UDES,@TC        ;LOAD TAPE CONT
1966  011404  016777  167310  167170            MOV     WCNT,@WC        ;LOAD WC
1967  011412  016777  167300  167166            MOV     FCNT,@FC        ;LOAD FC
1968  011420  016777  167270  167156            MOV     BADDR,@BA       ;LOAD BA
1969  011426  022767  000031  167352            CMP     #31,FUN         ;SEE IF SPACE FORWARD
1970  011434  001404                            BEQ     EXECA           ;IF SO: BR
1971  011436  022767  000033  167342            CMP     #33,FUN         ;SEE IF SPACE REVERSE
1972  011444  001003                            BNE     EXECB           ;IF NOT: BR
1973  011446  016777  167266  167132  EXECA:    MOV     SCNT,@FC        ;SET SPACE COUNT
1974  011454  000240                  EXECB:    NOP
1975  011456  016777  167324  167114            MOV     FUN,@C1         ;LOAD OP-CODE + GO
1976  011464  000240                            NOP
1977  011466  016703  167242                    MOV     RDYDX,R3        ;SET DELAY
1978  011472  005004                            CLR     R4
1979  011474  032777  000200  167110  EXECC:    BIT     #200,@DS        ;SEE IF DRY
1980  011502  001004                            BNE     EXECX           ;IF SO: BR
1981  011504  005304                            DEC     R4
1982  011506  001372                            BNE     EXECC
1983  011510  005303                            DEC     R3              ;DELAY FOR DRY
1984  011512  001370                            BNE     EXECC
1985  011514  016703  167216          EXECX:    MOV     OPDYX,R3
1986  011520  005303                  EXECXA:   DEC     R3              ;DELAY
1987  011522  001376                            BNE     EXECXA
1988  011524  000207                  EXECXX:   RTS     PC              ;RETURN TO CALLER
1989
```

```
1991                                        ;REWIND SUBROUTINE*****
1992
1993  011526  000240                RWND:   NOP
1994  011530  004767  001032              JSR     PC,INIT1        ;INIT
1995  011534  012777  000007  167036      MOV     #7,@C1          ;START REWIND
1996  011542  012700  040000              MOV     #40000,R0
1997  011546  005300                RWNDA:  DEC     R0
1998  011550  001376                      BNE     RWNDA           ;DELAY
1999  011552  032777  020000  167032 RWNDB: BIT     #20000,@DS
2000  011560  001374                      BNE     RWNDB           ;AWAIT PIP
2001  011562  032777  000002  167022      BIT     #2,@DS          ;SEE IF BOT
2002  011570  001012                      BNE     RWNDX           ;IF SO: BR
2003  011572  016704  167110              MOV     EMADDR,R4
2004  011576  004767  001412              JSR     PC,TTOUT        ;PRINT HEADER
2005  011602  012704  014646              MOV     #MSG2,R4
2006  011606  004767  001402              JSR     PC,TTOUT        ;PRINT REWIND ERROR
2007  011612  000167  171320              JMP     TSCD2           ;RETURN TO SECHEDULAR
2008  011616  004767  000744        RWNDX:  JSR     PC,INIT1        ;INIT
2009  011622  000207                      RTS     PC              ;RETURN TO CALLER
2010
```

```
2012                                                ;ERROR CHECK SUBROUTINE*****
2013
2014  011624  005067  167160          ERCHK:  CLR     SERFL           ;CLEAR FLAG
2015  011630  017767  166756  167124          MOV     @DS,DSAV        ;SAVE DRIVE STATUS REGISTER
2016  011636  032777  040000  166746          BIT     #40000,@DS      ;SEE IF ERROR
2017  011644  001021                          BNE     ERPT            ;IF SO: BR
2018  011646  022777  007000  167130          CMP     @#T15,@LTADD    ;.CHECK FOR TEST 15
2019  011654  001404                          BEQ     1$              ;;BRANCH IF TEST 15
2020  011656  022777  007200  167120          CMP     @#T16,@LTADD    ;;CHECK FOR TEST 16
2021  011664  001010                          BNE     2$              ;;BRANCH IF NOT TEST 16
2022  011666  032777  100000  166716  1$:     BIT     #100000,@DS     ;;TEST FOR ATA
2023  011674  001004                          BNE     2$              ;;EXIT IF ATA IS SET
2024  011676  012767  016703  167020          MOV     #MSG63,ERRP     ;;SET UP ERROR CODE
2025  011704  000415                          BR      ERPTG           ;;GO REPORT ERROR
2026  011706  000207                  2$:     RTS     PC              ;RETURN
2027  011710  017704  166700          ERPT:   MOV     @ER,R4          ;GET ERROR REGISTER
2028  011714  032767  002000  167072          BIT     #2000,UDES      ;SEE IF PE
2029  011722  001403                          BEQ     ERPTA1          ;IF SO: BR
2030  011724  042767  000200  167024          BIC     #200,STMSK      ;RESET PEF MASK
2031  011732  046704  167020          ERPTA1: BIC     STMSK,R4        ;MASK DONT CARE BITS
2032  011736  001530                          BEQ     ERPTX           ;IF NO UNEXPECTED ERRORS: BR
2033  011740  012767  000001  167042  ERPTG:  MOV     #1,SERFL        ;SET FLAG
2034  011746  032777  020000  166664          BIT     #20000,@SWR     ;SEE IF SHOULD PRINT ERRORS
2035  011754  001115                          BNE     ERPTD           ;IF NOT: BR
2036  011756  005767  166722                  TST     HDRFL           ;SEE IF DONE HEADER
2037  011762  001006                          BNE     ERPTA           ;IF SO: BR
2038  011764  005267  166714                  INC     HDRFL           ;SET HEADER FLAG
2039  011770  016704  166712                  MOV     EMADDR,R4
2040  011774  004767  001214                  JSR     PC,TTOUT        ;PRINT HEADER
2041  012000  016704  166720          ERPTA:  MOV     ERRP,R4         ;GET ERROR CODE
2042  012004  001414                          BEQ     ERPTB           ;IF NONE: BR
2043  012006  004767  001202                  JSR     PC,TTOUT        ;PRINT ERROR CODE
2044  012012  012704  015303                  MOV     #MSG20,R4       ;SET NRZ TAG
2045  012016  032777  002000  166606          BIT     #2000,@TC       ;SEE IF PE
2046  012024  001402                          BEQ     ERPT1A          ;IF NOT: BR
2047  012026  012704  015311                  MOV     #MSG21,R4       ;ELSE SET PE TAG
2048  012032  004767  001156          ERPT1A: JSR     PC,TTOUT        ;PRINT TAG
2049  012036  016704  166664          ERPTB:  MOV     ERRP1,R4        ;SEE IF CODE 2
2050  012042  001402                          BEQ     ERPTB1          ;IF NOT: BR
2051  012044  004767  001144                  JSR     PC,TTOUT        ;PRINT CODE 2
2052  012050  032777  010000  166562  ERPTB1: BIT     #10000,@SWR     ;SEE IF ITERATION
2053  012056  001010                          BNE     ERPTC           ;IF NOT: BR
2054  012060  012704  016555                  MOV     #MSG56,R4
2055  012064  004767  001124                  JSR     PC,TTOUT        ;PRINT ITER TAG
2056  012070  016703  166664                  MOV     ITCNT,R3
2057  012074  004767  001260                  JSR     PC,OCTP         ;PRINT ITERATION
2058  012100  012704  014560          ERPTC:  MOV     #MSG1,R4
2059  012104  004767  001104                  JSR     PC,TTOUT        ;PRINT REGISTER TAG
2060  012110  017703  166464                  MOV     @C1,R3
2061  012114  004767  001226                  JSR     PC,OCTPE        ;PRINT CS1
2062  012120  017703  166456                  MOV     @WC,R3
2063  012124  004767  001216                  JSR     PC,OCTPE        ;PRINT WC
2064  012130  017703  166450                  MOV     @BA,R3
2065  012134  004767  001206                  JSR     PC,OCTPE        ;PRINT BA
2066  012140  017703  166442                  MOV     @FC,R3
2067  012144  004767  001176                  JSR     PC,OCTPE        ;PRINT FC
```

```
2068  012150  017703  166434                MOV     @CS,R3
2069  012154  004767  001166                JSR     PC,OCTPE        ;PRINT CS
2070  012160  017703  166426                MOV     @DS,R3
2071  012164  004767  001156                JSR     PC,OCTPE        ;PRINT DS
2072  012170  017703  166420                MOV     @ER,R3
2073  012174  004767  001146                JSR     PC,OCTPE        ;PRINT ER
2074  012200  017703  166426                MOV     @TC,R3
2075  012204  004767  001136                JSR     PC,OCTPE        ;PRINT TC
2076  012210  005777  166424        ERPTD:  TST     @SWR            ;SEE IF HALT ON ERROR
2077  012214  100001                        BPL     ERPTX           ;IF NOT: BR
2078  012216  000000                        HALT
2079  012220  004767  001564        ERPTX:  JSR     PC,CKSWR                ;CHECK FOR CNTL G
2080  012224  004767  000336                JSR     PC,INIT1        ;INIT
2081  012230  000207                ERPTXX: RTS     PC              ;RETURN
2082
2083
```

```
2085                                        ;TAPE MARK STATUS CHECK**********
2086
2087  012232  032767  000004  166522  TMCHK:  BIT     #4,DSAV         ;SEE IF TM SET
2088  012240  001401                  TMCHK1: BEQ     TMCHK1          ;IF NOT: BR
2089  012242  000207                  TMCHK0: RTS     PC              ;ELSE RETURN
2090  012244  005767  166540          TMCHK1: TST     SERFL           ;SEE IF HAD ERROR
2091  012250  001374                          BNE     TMCHK0          ;IF SO: BR
2092  012252  012767  016565  166446          MOV     #MSG57,ERRP1    ;SET ERROR CODE 2
2093  012260  004767  177454                  JSR     PC,ERPTG        ;GO PRINT TM ERROR
2094  012264  005067  166436                  CLR     ERRP1           ;CLEAR CODE 2 FLAG
2095  012270  000207                          RTS     PC              ;RETURN
2096
2097                                        ;DATA SETUP ROUTINE**********
2098
2099  012272  000240                  DSUP:   NOP
2100  012274  012703  017742          DS0:    MOV     #WDATA,R3       ;R3 = ADDRS OF WRITE BUFFER
2101  012300  016701  166512                  MOV     PATRN,R1        ;R1 = PATTERN SELECTOR
2102  012304  000241                          CLC
2103  012306  006101                          ROL     R1              ;MAKE PATTERN SELECTOR EVEN
2104  012310  000171  001040                  JMP     @DATBL(R1)      ;GO GENERATE PATTERN
2105  012314  032777  010000  166304  DS1:    BIT     #10000,@DT      ;SEE IF SEVEN TRACK
2106  012322  001410                          BEQ     DS3             ;IF NOT: BR
2107  012324  012702  000640                  MOV     #640,R2         ;SET BUFFER SIZE
2108  012330  012701  017742                  MOV     #WDATA,R1       ;SET START OF BUFFER
2109  012334  042721  140300          DS2:    BIC     #140300,(R1)+   ;MASK FOR 7 CH
2110  012340  005302                          DEC     R2              ;SEE IF DONE
2111  012342  001374                          BNE     DS2             ;IF NOT: BR
2112  012344  012702  000640          DS3:    MOV     #640,R2         ;R2=BUFFER SIZE *2
2113  012350  012701  021454                  MOV     #RDATA,R1       ;R1=READ DATA START
2114  012354  005021                  DS4:    CLR     (R1)+           ;CLEAR BUFFER
2115  012356  005302                          DEC     R2              ;SEE IF DONE ALL
2116  012360  001375                          BNE     DS4             ;IF NOT: BR
2117  012362  000207                          RTS     PC              ;EXIT
2118
2119                                        ;ALL ONES**********
2120
2121  012364  012701  177777          DAT1:   MOV     #-1,R1          ;R1=DATA
2122  012370  012702  000640          DAT1A:  MOV     #640,R2         ;R2=WORD COUNT *2
2123  012374  010123                  DAT1B:  MOV     R1,(R3)+        ;LOAD BUFFER
2124  012376  005302                          DEC     R2              ;SEE IF DONE
2125  012400  001375                          BNE     DAT1B           ;IF NOT: BR
2126  012402  000167  177706                  JMP     DS1             ;RETURN
2127
2128                                        ;ALL ZEROS**********
2129
2130  012406  005001                  DAT2:   CLR     R1              ;R1=DATA
2131  012410  000167  177754                  JMP     DAT1A           ;LOAD BUFFER
2132
```

```
                                        ;ONE/ZERO IN ALTERNATING CHARACTERS**********

012414  012701  125125          DAT3:   MOV     #125125,R1      ;R1=DATA
012420  000167  177744                  JMP     DAT1A           ;LOAD BUFFER

                                        ;ALL BITS 0-377**********

012424  005001                  DAT4:   CLR     R1              ;R1=STARTING DATA
012426  012702  001500                  MOV     #1500,R2        ;R2=CHARACTER COUNT
012432  110123                  DAT4A:  MOVB    R1,(R3)+        ;LOAD BUFFER
012434  105201                  INCB    R1                      ;BUMP DATA
012436  005302                  DEC     R2                      ;SEE IF DONE
012440  001374                  BNE     DAT4A                   ;IF NOT: BR
012442  000167  177646                  JMP     DS1             ;RETURN


                                        ;SCOPE LOOP ON ERROR SUBROUTINE**********

012446  004767  001336          SCOPE:  JSR     PC,CKSWR                ;CHECK FOR CNTL G
012452  000240                  NOP
012454  032777  040000  166156          BIT     @#40000,@SWR    ;SEE IF LOOP ON ERROR
012462  001001                  BNE     SCOPE1                  ;IF SO: BR
012464  000207                  RTS     PC                      ;ELSE EXIT
012466  000240          SCOPE1: NOP
012470  005767  166276                  TST     SCOLP           ;SEE IF SCOPE ADDRESS
012474  001001                  BNE     SCOPE2                  ;IF NOT: BR
012476  000207                  RTS     PC                      ;ELSE EXIT
012500  005726          SCOPE2: TST     (SP)+                   ;RESET STACK
012502  005726                  TST     (SP)+
012504  000177  166262                  JMP     @SCOLP          ;LOOP ON ERROR

                                        ;TEST ITERATION SUBROUTINE**********

012510  004767  001274          ITER:   JSR     PC,CKSWR                ;CHECK FOR CNTL G
012514  000240                  NOP

                                ;       ************************************************************
                                ;               CHECK FOR END OF PASS INDICATOR
                                ;               SET FOR QUICK VERIFY

012516  005767  166314                  TST     PAFLG                   ;PASS FLAG SET?
012522  001404                  BEQ     ITER0                   ;BRANCH - IF NO
                                ;       ************************************************************

012524  032777  010000  166106          BIT     #10000,@SWR     ;SEE IF ITERATIONS
012532  001403                  BEQ     ITER1                   ;IF SO: BR
012534  005067  166220          ITER0:  CLR     ITCNT           ;CLEAR ITERATION COUNTER
012540  000207                  RTS     PC                      ;ELSE EXIT
012542  005267  166212          ITER1:  INC     ITCNT           ;BUMP COUNTER
012546  026767  166206  166102          CMP     ITCNT,ITAMT     ;SEE IF DONE ALL
012554  001767                  BEQ     ITER0                   ;IF SO: BR
012556  005726                  TST     (SP)+                   ;RESET STACK
012560  017700  166210                  MOV     @ITRLP,R0       ;SET ITERATION POINTER
012564  000110                  JMP     (R0)            ;GO ITERATE


                                        ;INITIALIZE SUBROUTINE**********
```

```
 2190
 2191  012566  000240                    INIT1:  NOP
 2192  012570  012777  000040  166012            MOV     #40,@CS         ;INIT
 2193  012576  016777  166106  166004  INIT2:    MOV     DRVN,@CS        ;SELECT DRIVE
 2194  012604  016777  166102  166020            MOV     SLVN,@TC        ;SELECT SLAVE
 2195  012612  000207                            RTS     PC              ;RETURN
 2196
```

```
2198                                        ;MAG TAPE INTERRUPT HANDLER**********
2199
2200  012614  000240              MTINT:    NOP
2201  012616  022626                        CMP     (SP)+,(SP)+     ;RESET STACK POINTER
2202  012620  000240                        NOP
2203  012622  000240                        NOP
2204  012624  000177  166114                JMP     @RTRN           ;RETURN TO CALLER
2205
2206                                        ;TTY INTERRUPT HANDLER**********
2207
2208  012630  000240              TTINT:    NOP
2209  012632  000240                        NOP
2210  012634  000240                        NOP
2211  012636  000002                        RTI
2212
2213                                        ;BUS ADDRESS TRAP HANDLER**********
2214
2215  012640  000240              TRAP:     NOP
2216  012642  032777  020000  165770        BIT     #20000,@SWR     ;SEE IF SHOULD PRINT ERRORS
2217  012650  001020                        BNE     TRAP2           ;IF NOT: BR
2218  012652  005767  166026                TST     HDRFL           ;SEE IF DONE HEADER
2219  012656  001006                        BNE     TRAP1           ;IF SO: BR
2220  012660  005267  166020                INC     HDRFL           ;ELSE SET HEADER FLAG
2221  012664  016704  166016                MOV     EMADDR,R4
2222  012670  004767  000320                JSR     PC,TTOUT        ;PRINT HEADER
2223  012674  012704  015336      TRAP1:    MOV     #MSG24,R4
2224  012700  004767  000310                JSR     PC,TTOUT        ;PRINT ERROR
2225  012704  010103                        MOV     R1,R3
2226  012706  004767  000446                JSR     PC,OCTP         ;PRINT ADDRESS OF TRAP
2227  012712  005777  165722      TRAP2:    TST     @SWR            ;SEE IF HALT ON ERROR
2228  012716  100001                        BPL     TRAPX           ;IF NOT: BR
2229  012720  000000                        HALT
2230  012722  004767  001062      TRAPX:    JSR     PC,CKSWR                ;CHECK FOR CNTL G
2231  012726  022626                        CMP     (SP)+,(SP)+     ;RESET STACK
2232  012730  012767  003444  166034        MOV     #FT1A,SCOLP     ;SET SCOPE ADDRESS
2233  012736  004767  177504                JSR     PC,SCOPE        ;GO SEE IF SCOPE LOOP
2234  012742  005767  166052                TST     RHTF            ;SEE IF INITIAL ADDRESS TEST
2235  012746  001402                        BEQ     TRAPXX          ;IF NOT: BR
2236  012750  000167  167022                JMP     ST08            ;ELSE REDO ADDRESS REQUEST
2237  012754  000167  170470      TRAPXX:   JMP     FT1B            ;RETURN TO TEST 1
2238
```

```
2240                                    ;*****************************************************
2241                                    ;TTY ENTRY SUBROUTINE:
2242                                    ;
2243                                    ;THIS SUBROUTINE IS USED BY THE TEST CONDITION
2244                                    ;ENTRY ROUTINE TO READ THE RESPONSE ENTERED
2245                                    ;AT THE TTY AND CHECK THEM FOR LEGALITY AND
2246                                    ;LIMITS.  ALL RESPONSE MUST BE TYPED IN OCTAL
2247                                    ;(0-7) AND MUST FALL WITHIN THE LIMITS SET BY
2248                                    ;THE CALLING ROUTINE.
2249                                    ;IF AN ENTRY IS ILLEGAL OR OUTSIDE THE LIMITS,
2250                                    ;A QUESTION MARK IS TYPED (?) AND THE RESPONSE
2251                                    ;MAY BE REENTERED.
2252                                    ;ENTRIES MAY NOT EXCEED SIX (6) CHARACTERS AND
2253                                    ;MAY BE TERMINATED AT LESS THAN SIX BY TYPING A
2254                                    ;CARRIAGE RETURN
2255                                    ;*****************************************************
2256
2257  012760  005067  165764       TTR:    CLR     TEMP1           ;CLEAR FIRST CHARACTER FLAG
2258  012764  005000                        CLR     R0
2259  012766  004767  000152       TTR0:   JSR     PC,TTIN         ;GO READ CHARACTER
2260  012772  122767  000015  165700       CMPB    #15,TIB         ;SEE IF CR
2261  013000  001005                        BNE     TTR1            ;IF NOT: BR
2262  013002  005767  165742                TST     TEMP1           ;SEE IF FIRST CHARACTER
2263  013006  001446                        BEQ     TTR5            ;IF SO: BR
2264  013010  000167  000066                JMP     TTR2            ;ELSE GO LOAD VALUE
2265  013014  122767  000060  165656 TTR1:   CMPB    #60,TIB         ;SEE IF CHAR IS LESS THAN 0
2266  013022  101402                        BLOS    TTR1A           ;IF NOT: BR
2267  013024  000167  000076                JMP     TINER           ;ELSE GO TO ERROR
2268  013030  122767  000070  165642 TTR1A:  CMPB    #70,TIB         ;SEE IF CHAR IS GREATER THAN 7
2269  013036  101002                        BHI     TTR1B           ;IF NOT: BR
2270  013040  000167  000062                JMP     TINER           ;ELSE GO TO ERROR
2271  013044  005267  165700       TTR1B:  INC     TEMP1           ;SET FIRST CHARACTER FLAG
2272  013050  000241                        CLC
2273  013052  006100                        ROL     R0
2274  013054  000241                        CLC
2275  013056  006100                        ROL     R0              ;SHIFT 3 LEFT
2276  013060  000241                        CLC
2277  013062  006100                        ROL     R0
2278  013064  042767  177770  165606        BIC     #177770,TIB     ;STRIP ASCII
2279  013072  056700  165602                BIS     TIB,R0          ;LOAD CHARACTER
2280  013076  005301                        DEC     R1              ;SEE IF DONE
2281  013100  001332                        BNE     TTR0            ;IF NOT: BR
2282  013102  020002       TTR2:   CMP     R0,R2           ;SEE IF EXCEEDED MAXIMUM LIMIT
2283  013104  101402                        BLOS    TTR3            ;IF NOT: BR
2284  013106  000167  000014                JMP     TINER           ;ELSE GO TO ERROR
2285  013112  020300       TTR3:   CMP     R3,R0           ;SEE IF BELOW MINIMUM LIMIT
2286  013114  101402                        BLOS    TTR4            ;IF NOT: BR
2287  013116  000167  000004                JMP     TINER           ;ELSE GO TO ERROR
2288  013122  010015       TTR4:   MOV     R0,(R5)         ;LOAD VALUE
2289  013124  000207       TTR5:   RTS     PC              ;EXIT
2290
```

```
2292                                            ;TTY ENTRY ERROR SUBROUTINE**********
2293
2294  013126  012704  015042          TINER:  MOV     #MSG7,R4
2295  013132  004767  000056                  JSR     PC,TTOUT        ;PRINT?
2296  013136  162716  000020                  SUB     #20,(SP)        ;RESET SP TO START OF VALUE ROUTINE
2297  013142  000207                          RTS     PC              ;REDO VALUE ENTRY
2298
2299                                            ;TTY READ SUBROUTINE**********
2300
2301  013144  005077  165472          TTIN:   CLR     @TKS
2302  013150  005077  165470                  CLR     @TKB
2303  013154  105777  165462                  TSTB    @TKS
2304  013160  100375                          BPL     .-4
2305  013162  017767  165456  165510        MOV     @TKB,TIB
2306  013170  042767  177600  165502        BIC     #177600,TIB
2307  013176  105777  165444          TTIN2:  TSTB    @TPS
2308  013202  100375                          BPL     TTIN2
2309  013204  116777  165470  165436        MOVB    TIB,@TPB
2310  013212  000207                          RTS     PC
2311
2312                                            ;TTY OUTPUT SUBROUTINE***********
2313
2314  013214  112467  165456          TTOUT:  MOVB    (R4)+,TOB
2315  013220  122767  000043  165450        CMPB    #43,TOB
2316  013226  001446                          BEQ     TEX
2317  013230  122767  000045  165440        CMPB    #45,TOB
2318  013236  001403                          BEQ     TCRLF
2319  013240  004767  000064                  JSR     PC,TOG
2320  013244  000763                          BR      TTOUT
2321  013246  112767  000015  165422  TCRLF:  MOVB    #15,TOB
2322  013254  004767  000050                  JSR     PC,TOG
2323  013260  012703  000004                  MOV     #4,R3
2324  013264  005067  165406          TCRLFA: CLR     TOB
2325  013270  004767  000034                  JSR     PC,TOG
2326  013274  005303                          DEC     R3
2327  013276  001372                          BNE     TCRLFA          ;DO FILLERS
2328  013300  112767  000012  165370        MOVB    #12,TOB
2329  013306  004767  000016                  JSR     PC,TOG
2330  013312  105767  165516                  TSTB    RDSW
2331  013316  100401                          BMI     1$
2332  013320  000735                          BR      TTOUT
2333  013322  005067  165506          1$:     CLR     RDSW
2334  013326  000406                          BR      TEX
2335  013330  105777  165312          TOG:    TSTB    @TPS
2336  013334  100375                          BPL     TOG
2337  013336  116777  165334  165304        MOVB    TOB,@TPB
2338  013344  000207                  TEX:    RTS     PC
2339
2340
```

```
2342                                            ;OCTAL OUTPUT SUBROUTINE**********
2343
2344  013346  012767  000001  000222  OCTP:.  MOV     #1,OFL
2345  013354  010304                  MOV     R3,R4
2346  013356  000410                  BR      OCTPO
2347  013360  005067  000212          OCTP.   CLR     OFL             ;CLEAR FLAG FOR LEADING ZERO
2348  013364  010304                  OCTPe1: MOV     R3,R4           ;SEE IF NUMBER IS ZERO
2349  013366  001004                  BNE     OCTPO           ;IF NOT ZERO: BR
2350  013370  004767  000162                  JSR     PC,OCTPG1       ;ELSE PRINT ZERO
2351  013374  000167  000120                  JMP     OCTP3           ;SPACE AND EXIT
2352  013400  032704  100000          OCTPO:  BIT     #100000,R4      ;SEE IF MSD = 1
2353  013404  001406                  BEQ     OCTP1           ;IF NOT: BR
2354  013406  012704  000001                  MOV     #1,R4
2355  013412  004767  000116                  JSR     PC,OCTPG        ;PRINT 1
2356  013416  000167  000006                  JMP     OCTP2
2357  013422  005004                  OCTP1:  CLR     R4
2358  013424  004767  000104                  JSR     PC,OCTPG        ;PRINT 0
2359  013430  010304                  OCTP2:  MOV     R3,R4
2360  013432  006004                  ROR     R4
2361  013434  006004                  ROR     R4
2362  013436  006004                  ROR     R4              ;POSITION DIGIT
2363  013440  006004                  ROR     R4
2364  013442  000304                  SWAB    R4
2365  013444  004767  000064                  JSR     PC,OCTPG        ;PRINT DIGIT 2
2366  013450  010304                  MOV     R3,R4
2367  013452  006004                  ROR     R4
2368  013454  000304                  SWAB    R4
2369  013456  004767  000052                  JSR     PC,OCTPG        ;PRINT DIGIT 3
2370  013462  010304                  MOV     R3,R4
2371  013464  006104                  ROL     R4
2372  013466  006104                  ROL     R4
2373  013470  000304                  SWAB    R4
2374  013472  004767  000036                  JSR     PC,OCTPG        ;PRINT DIGIT 4
2375  013476  010304                  MOV     R3,R4
2376  013500  006004                  ROR     R4
2377  013502  006004                  ROR     R4
2378  013504  006004                  ROR     R4
2379  013506  004767  000022                  JSR     PC,OCTPG
2380  013512  010304                  MOV     R3,R4
2381  013514  004767  000014                  JSR     PC,OCTPG        ;PRINT DIGIT 5
2382  013520  012767  000240  165150  OCTP3:  MOV     #240,TOB
2383  013526  004767  177576                  JSR     PC,TOG          ;PRINT SPACE
2384  013532  000207                  RTS     PC              ;EXIT
2385  013534  042704  177770          OCTPG:  BIC     #177770,R4
2386  013540  001004                  BNE     OCTPGO
2387  013542  005767  000030                  TST     OFL
2388  013546  001001                  BNE     OCTPGO
2389  013550  000207                  RTS     PC
2390  013552  005267  000020          OCTPGO: INC     OFL
2391  013556  052704  000260          OCTPG1: BIS     #260,R4
2392  013562  010467  165110                  MOV     R4,TOB
2393  013566  004767  177536                  JSR     PC,TOG
2394  013572  010304                  MOV     R3,R4
2395  013574  000207                  RTS     PC
2396  013576  000000                  OFL:    0               ;FIRST CHAR FLAG
2397
```

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2398                                            ;DATA CHARACTER OUTPUT SUBROUTINE**********
2399
2400  013600  005067  165072          DOUT:   CLR     TOB
2401  013604  012704  000010                  MOV     #10,R4          ;SET NUMBER TO PRINT
2402  013610  110367  165062                  MOVB    R3,TOB
2403  013614  105777  165026          DOUT1:  TSTB    @TPS
2404  013620  100375                          BPL     DOUT1
2405  013622  132767  000200  165046          BITB    #200,TOB
2406  013630  001404                          BEQ     DOUT2
2407  013632  012777  000061  165010          MOV     #061,@TPB
2408  013640  000403                          BR      DOUT3
2409  013642  012777  000060  165000  DOUT2:  MOV     #060,@TPB
2410  013650  006167  165022          DOUT3:  ROL     TOB
2411  013654  005304                          DEC     R4
2412  013656  001356                          BNE     DOUT1
2413  013660  000207                          RTS     PC
2414  013662  016703  165066          DOUTD:  MOV     TEMP3,R3
2415  013666  000303                          SWAB    R3
2416  013670  004767  177704                  JSR     PC,DOUT
2417  013674  016703  165054                  MOV     TEMP3,R3
2418  013700  004767  177674                  JSR     PC,DOUT
2419  013704  000207                          RTS     PC
2420
2421                                            ;TU16/TE16 SERIAL NUMBER PRINT SUBROUTINE**********
2422
2423  013706  010304                  SNPT:   MOV     R3,R4
2424  013710  000304                          SWAB    R4
2425  013712  006004                          ROR     R4
2426  013714  006004                          ROR     R4
2427  013716  006004                          ROR     R4
2428  013720  006004                          ROR     R4              ;GET FIRST DIGIT
2429  013722  004767  000036                  JSR     PC,SNPG         ;GO PRINT
2430  013726  010304                          MOV     R3,R4
2431  013730  000304                          SWAB    R4              ;GET SECOND DIGIT
2432  013732  004767  000026                  JSR     PC,SNPG         ;GO PRINT
2433  013736  010304                          MOV     R3,R4
2434  013740  006004                          ROR     R4
2435  013742  006004                          ROR     R4
2436  013744  006004                          ROR     R4
2437  013746  006004                          ROR     R4              ;GET THIRD DIGIT
2438  013750  004767  000010                  JSR     PC,SNPG         ;GO PRINT
2439  013754  010304                          MOV     R3,R4           ;GET FOURTH DIGIT
2440  013756  004767  000002                  JSR     PC,SNPG         ;GO PRINT
2441  013762  000207                          RTS     PC              ;EXIT
2442  013764  012767  000260  164704  SNPG:   MOV     #260,TOB        ;SET BASE = 0
2443  013772  042704  177760                  BIC     #177760,R4      ;MASK DIGIT
2444  013776  050467  164674                  BIS     R4,TOB          ;SET ASCII
2445  014002  004767  177322                  JSR     PC,TOG          ;TYPE DIGIT
2446  014006  000207                          RTS     PC              ;RETURN
2447
2448                                            ;CKSWR ROUTINE THAT ALLOWS THE LOADING OF LOC.176, SWREG**********
2449                                            ;FROM THE TTY AT SELECTED POINTS WITHIN THE PROGRAM**********
2450
2451  014010  022767  000176  164622  CKSWR:  CMP     #SWREG,SWR              ;SOFTWARE SWITCH REG PRESENT
2452  014016  001041                          BNE     OUT                     ;NO, GET OUT
2453  014020  105777  164616                  TSTB    @TKS                    ;YES,WAIT FOR
```

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2454  014024  100036                        BPL     OUT                     ;READY, GET CHARACTER
2455  014026  017767  164612  164644        MOV     @TKB,TIB                ;AND STRIP OFF
2456  014034  042767  177600  164636        BIC     #177600,TIB             ;THE GARBAGE
2457  014042  022767  000007  164630        CMP     #7,TIB          ;IS IT A <↑G>
2458  014050  001024                        BNE     OUT
2459  014052  012704  017713                MOV     #$CNTG,R4
2460  014056  004767  177132                JSR     PC,TTOUT
2461  014062  012704  017717        CNTLU:  MOV     #$MSWR,R4
2462  014066  004767  177122                JSR     PC,TTOUT
2463  014072  017703  164542                MOV     @SWR,R3
2464  014076  004767  177244                JSR     PC,OCTPE
2465  014102  012704  017726                MOV     #$MNEW,R4
2466  014106  004767  177102                JSR     PC,TTOUT
2467  014112  005037  001030                CLR     @#TEMPST
2468  014116  004767  000002                JSR     PC,$READ                ;GO READ A LINE
2469  014122  000207                OUT:    RTS     PC                      ;RETURN TO MAIN BODY OF PROGRAM
2470
2471  014124  005067  164700        $READ:  CLR     TEMPST
2472  014130  012767  000007  164674        MOV     #7,COUNT
2473  014136  004767  177002        1$:     JSR     PC,TTIN         ;GO  READ A CHARACTER
2474  014142  042767  177600  164530        BIC     #177600,TIB     ;STRIP OFF GARBAGE
2475  014150  122767  000025  164522        CMPB    #25,TIB         ;IS IT A ↑U?
2476  014156  001002                        BNE     2$              ;BRANCH IF NOT
2477  014160  005726                3$:     TST     (SP)+           ;POP THE STACK
2478  014162  000737                        BR CNTLU                ;START OVER
2479  014164  122767  000015  164506  2$:     CMPB    #15,TIB         ;IS IT A <CR>?
2480  014172  001013                        BNE     4$              ;BRANCH IF NOT
2481  014174  012767  000200  164632        MOV     #200,RDSW
2482  014202  004767  177040                JSR     PC,TCRLF        ;ECHO IT WITH <LF>
2483  014206  022767  000007  164616        CMP     #7,COUNT        ;WAS IT FIRST CHARACTER
2484  014214  001037                        BNE     7$              ;CHANGE SWR IF NOT FIRST ONE
2485  014216  005726                8$:     TST     (SP)+           ;POP THE STACK
2486  014220  000740                        BR      OUT             ;GET OUT
2487  014222  122767  000060  164450  4$:     CMPB    #60,TIB
2488  014230  003004                        BGT     5$
2489  014232  122767  000067  164440        CMPB    #67,TIB
2490  014240  003005                        BGT     6$
2491  014242  012704  017736        5$:     MOV     #$QUEST,R4
2492  014246  004767  176742                JSR     PC,TTOUT
2493  014252  000742                        BR      3$              ;START OVER IF NOT LEGAL CHARACTER
2494  014254  006367  164550        6$:     ASL     TEMPST
2495  014260  006367  164544                ASL     TEMPST
2496  014264  006367  164540                ASL     TEMPST
2497  014270  142767  000060  164402        BICB    #60,TIB         ;GET NITTY-GRITTY
2498  014276  156767  164376  164524        BISB    TIB,TEMPST
2499  014304  005367  164522                DEC     COUNT           ;ONLY WANT 6   DIGITS
2500  014310  001754                        BEQ     5$
2501  014312  000711                        BR      1$
2502  014314  016777  164510  164316  7$:     MOV     TEMPST,@SWR     ;CHANGE SWITCH REGISTER CONTENTS
2503  014322  000735                        BR      8$
2504
```

```
2506
2507                                    ;       ************************************************************
2508                                    ;               CHECK FOR DUMP MODE OR AUTO MODE
2509                                    ;       ************************************************************
2510
2511  014324  005067  164340           CKMODE: CLR     AUTOM                   ;INIT AUTO MODE
2512  014330  005737  000042                   TST     @#42                    ;AUTO MODE?
2513  014334  001417                           BEQ     2$                      ;BRANCH - IF NOT
2514  014336  005267  164326                   INC     AUTOM                   ;SET AUTO MODE INDICATORE
2515  014342  023737  000042  000046         CMP     @#42,@#46               ;ACT11 MODE?
2516  014350  001403                           BEQ     1$                      ;BRANCH - IF YES
2517  014352  105267  164315                   INCB    XXDPM                   ;INDICATE XXDP AUTO MODE
2518  014356  000421                           BR      5$                      ;AND EXIT
2519  014360  105267  164306           1$:     INCB    ACT11M                  ;INDICATE ACT11 AUTO MODE
2520  014364  052777  104000  164246         BIS     #104000,@SWR            ;SET FOR CON:CYCLE  & HALT ON ERROR
2521  014372  000413                           BR      5$                      ;AND EXIT
2522  014374  105737  000041           2$:     TSTB    @#41                    ;MAN: MODE VIA ACT11/PAPER TAPE?
2523  014400  001003                           BNE     3$                      ;BRANCH - IF NOT
2524  014402  105267  164266                   INCB    ADUMPM                  ;INDICATE MAN: MODE VIA ACT11/PAPER TAPE
2525  014406  000402                           BR      4$                      ;AND EXIT THRU M.I
2526  014410  105267  164261           3$:     INCB    XDUMPM                  ;INDICATE MANUAL MODE VIA XXDP
2527  014414  052737  020000  000052   4$:     BIS     #20000,@#52             ;ALLOW MANUAL INTERVENTION
2528  014422  000207                   5$:     RTS     PC                      ;RETURN
2529
2530                                    ;       ************************************************
2531
```

```
2533
2534                                    ;       **********************************************************
2535                                    ;               DISCONTINUE TESTING FOR
2536                                    ;               ILLEGAL CONDITIONS
2537                                    ;       **********************************************************
2538
2539  014424                            ABORT:
2540  014424  000005                            RESET                   ;INITIALIZE THE WORLD
2541  014426  012704  014536                    MOV     @MSGD,R4        ;GET ABORT MESSAGE
2542  014432  004767  176556                    JSR     PC,TTOUT        ;TYPE ABORT MESSAGE
2543  014436  105767  164231                    TSTB    XXDPM           ;XXDP AUTO MODE?
2544  014442  001405                            BEQ     1$              ;BRANCH - IF NOT
2545  014444  013700  000042                    MOV     @042,R0         ;GET MONITOR EXIT ADDRESS
2546  014450  005037  000042                    CLR     @042            ;USE AS ABORT FLAG
2547  014454  004710                            JSR     PC,(R0)         ;EXIT TO XXDP MONITOR
2548  014456  000777                    1$:     BR      .               ;AND HANG
2549
2550                                    ;       **********************************************************
```

```
2552                                                    ;MESSAGE TABLE*****
2553                                                    ;*****************************************************
2554  014460  050045  047522  051107  MSGC:   .ASCII  /%PROGRAM DISABLED  ? NO MANUAL INTERVENTION.%0/
      014466  046501  042040  051511
      014474  041101  042514  020104
      014502  037440  047040  020117
      014510  040515  052516  046101
      014516  044440  052116  051105
      014524  042526  052116  047511
      014532  027116  021445
2555  014536  05  15  047522  051107  MSGD:   .ASCII  /%PROGRAM ABORTED%0/
      014544  04650.  040440  047502
      014552  052122  042105  021445
2556
2557                                                    ;*****************************************************************
2558  014560  041445  030523  020040  MSG1:   .ASCII  /%CS1    WC     BA     FC     CS2    /
      014566  020040  041527  020040
      014574  020040  041040  020101
      014602  020040  020040  041506
      014610  020040  020040  041440
      014616  031123  020040  020040
2559  014624  051504  020040  020040          .ASCII  /DS     ER     TC%0/
      014632  042440  020122  020040
      014640  020040  041524  021445
2560  014646  051045  053505  047111  MSG2:   .ASCII  /%REWIND ERROR0/
      014654  020104  051105  047522
      014662  021522
2561  014664  022445  046524  031060  MSG3:   .ASCII  /%%TM02 - TU16 - TE16 BSC FC (CZTUBM0) %/
      014672  026440  052040  030525
      014700  020066  020055  042524
      014706  033061  041040  041523
      014714  043040  020103  041450
      014722  052132  041125  030110
      014730  020051     045
2562  014733     105  052116  051105          .ASCII  /ENTER CONDITIONS IN OCTAL%0/
      014740  041440  047117  044504
      014746  044524  047117  020123
      014754  047111  047440  052103
      014762  046101  021445
2563  014766  051045  043505  051511  MSG4:   .ASCII  /%REGISTER START = 0/
      014774  042524  020122  052123
      015002  051101  020124  020075
      015010     043
2564  015011     045  042526  052103  MSG5:   .ASCII  /%VECTOR = 0/
      015016  051117  036440  021440
2565  015024  042445  042116  047440  MSG6:   .ASCII  /%END OF PASS 0/
      015C32  020106  040520  051523
      015040  021440
2566  015042  037440  021440          MSG7:   .ASCII  / ? 0/
2567  015046  021445                  MSG8:   .ASCII  /%0/
2568  015050  050045  051517  052111  MSG9:   .ASCII  /%POSITION ERROR: 0/
      015056  047511  020116  051105
      015064  047522  035122  021440
2569  015072  042045  044522  042526  MSG10:  .ASCII  /%DRIVE NUMBER: 0/
      015100  047040  046525  042502
      015106  035122  021440
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2570  015112  051445  040514  042526  MSG11:  .ASCII  /%SLAVE NUMBER: @/
      015120  047040  046525  042502
      015126  035122  021440
2571  015132  053445  044522  042524  MSG12:  .ASCII  /%WRITE ERROR @/
      015140  042440  051122  051117
      015146  021440
2572  015150  051045  040505  020104  MSG13:  .ASCII  /%READ REVERSE ERROR @/
      015156  042522  042526  051522
      015164  020105  051105  047522
      015172  020122    043
2573  015175    045   042522  042101  MSG14:  .ASCII  /%READ FORWARD ERROR @/
      015202  043040  051117  040527
      015210  042122  042440  051122
      015216  051117  021440
2574  015222  053445  044522  042524  MSG15:  .ASCII  /%WRITE TM ERROR @/
      015230  052040  020115  051105
      015236  047522  020122    043
2575  015243    045   042522  042526  MSG16:  .ASCII  /%REVERSE ERROR @/
      015250  051522  020105  051105
      015256  047522  020122    043
2576  015263    045   047506  053522  MSG17:  .ASCII  /%FORWARD ERROR @/
      015270  051101  020104  051105
      015276  047522  020122    043
2577  015303    040   051116  020132  MSG20:  .ASCII  / NRZ @/
      015310    043
2578  015311    040   042520  021440  MSG21:  .ASCII  / PE @/
2579  015316  042440  050130  035124  MSG22:  .ASCII  / EXPT: @/
      015324  021440
2580  015326  051040  05 103  035104  MSG23:  .ASCII  / RCVD: @/
      015334  021440
2581  015336  041045  051525  052040  MSG24:  .ASCII  /%BUS TRAP: @/
      015344  040522  035120  021440
2582  015352  053445  035103  021440  MSG25:  .ASCII  /%WC: @/
2583  015360  041045  035101  021440  MSG26:  .ASCII  /%BA: @/
2584  015366  042045  035102  021440  MSG27:  .ASCII  /%DB: @/
2585  015374  044445  044516  020124  MSG28:  .ASCII  /%INIT DID NOT CLEAR RH @/
      015402  044504  020104  047516
      015410  020124  046103  040505
      015416  020122  044122  021440
2586  015424  051445  020103  047516  MSG29:  .ASCII  /%SC NOT RESET BY INIT @/
      015432  020124  042522  042523
      015440  020124  054502  044440
      015446  044516  020124    043
2587  015453    045   051124  020105  MSG30:  .ASCII  /%TRE NOT RESET BY INIT @/
      015460  047516  020124  042522
      015466  042523  020124  054502
      015474  044440  044516  020124
      015502    043
2588  015503    045   051503  020062  MSG31:  .ASCII  /%CS2 NOT RESET BY INIT @/
      015510  047516  020124  042522
      015516  042523  020124  054502
      015524  044440  044516  020124
      015532    043
2589  015533    045   046104  020124  MSG32:  .ASCII  /%DLT NOT SET @/
      015540  047516  020124  042523
      015546  020124    043
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 2590  015551     045  041523  047040  MSG33:  .ASCII  /%SC NOT SET @/
       015556  052117  051440  052105
       015564  021440
 2591  015566  052045  042522  047040  MSG34:  .ASCII  /%TRE NOT SET @/
       015574  052117  051440  052105
       015602  021440
 2592  015604  044445  020122  047516  MSG35:  .ASCII  /%IR NOT SET BY INIT @/
       015612  020124  042523  020124
       015620  054502  044440  044516
       015626  020124     043
 2593  015631     045  051117  047040  MSG36:  .ASCII  /%OR NOT RESET BY INIT @/
       015636  052117  051040  051505
       015644  052105  041040  020131
       015652  047111  052111  021440
 2594  015660  047445  020122  047516  MSG37:  .ASCII  /%OR NOT RESET BY 1 SILO ENTRY @/
       015666  020124  042522  042523
       015674  020124  054502  030440
       015702  051440  046111  020117
       015710  047105  051124  020131
       015716     043
 2595  015717     045  051117  047040  MSG38:  .ASCII  /%OR NOT SET BY SILO FULL @/
       015724  052117  051440  052105
       015732  041040  020131  044523
       015740  047514  043040  046125
       015746  020114     043
 2596  015751     045  040502  020104  MSG39:  .ASCII  /%BAD SILO READ @/
       015756  044523  047514  051040
       015764  040505  020104     043
 2597  015771     045  051111  047040  MSG40:  .ASCII  /%IR NOT RESET BY SILO FULL@/
       015776  052117  051040  051505
       016004  052105  041040  020131
       016012  044523  047514  043040
       016020  046125  021514
 2598  016024  047040  047117  042455  MSG41:  .ASCII  / NON-EXIST DRIVE@/
       016032  044530  052123  042040
       016040  044522  042526     043
 2599  016045     040  047516  026516  MSG42:  .ASCII  / NON-EXIST SLAVE@/
       016052  054105  051511  020124
       016060  046123  053101  021505
 2600  016066  051440  051105  040511  MSG43:  .ASCII  / SERIAL NO: @/
       016074  020114  047516  020072
       016102     043
 2601  016103     045  051105  051501  MSG44:  .ASCII  /%ERASE HEAD INOPERATIVE/
       016110  020105  042510  042101
       016116  044440  047516  042520
       016124  040522  044524  042526
 2602  016132  041445  042510  045503          .ASCII  /%CHECK POLARITY@/
       016140  050040  046117  051101
       016146  052111  021531
 2603  016152  042445  040522  042523  MSG45:  .ASCII  /%ERASE HEAD POLARITY WRONG@/
       016160  044040  040505  020104
       016166  047520  040514  044522
       016174  054524  053440  047522
       016202  043516     043
 2604  016205     045  042523  026524  MSG46:  .ASCII  /%SET-UP WRITE ERROR@/
       016212  050125  053440  044522
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                016220  042524  042440  051122
                016226  051117     043
2605            016231     045  050123  041501  MSG47:  .ASCII  /%SPACE FORWARD ERROR@/
                016236  020105  047506  053522
                016244  051101  020104  051105
                016252  047522  021522
2606            016256  051445  040520  042503  MSG48:  .ASCII  /%SPACE REVERSE ERROR@/
                016264  051040  053105  051105
                016272  042523  042440  051122
                016300  051117     043
2607            016303     045  052502  043106  MSG49:  .ASCII  /%BUFFERED WRITE ERROR@/
                016310  051105  042105  053440
                016316  044522  042524  042440
                016324  051122  051117     043
2608            016331     045  047502  020124  MSG50:  .ASCII  /%BOT SET AFTER BUFFERED WRITE@/
                016336  042523  020124  043101
                016344  042524  020122  052502
                016352  043106  051105  042105
                016360  053440  044522  042524
                016366     043
2609            016367     045  047516  041040  MSG51:  .ASCII  /%NO BOT FROM READ IN PRESET@/
                016374  052117  043040  047522
                016402  020115  042522  042101
                016410  044440  020116  051120
                016416  051505  052105     043
2610            016423     045  041524  044440  MSG52:  .ASCII  /%TC INCORRECT @/
                016430  041516  051117  042522
                016436  052103  021440
2611            016442  051445  040514  042526  MSG53:  .ASCII  /%SLAVE NOT OFF LINE@/
                016450  047040  052117  047440
                016456  043106  046040  047111
                016464  021505
2612            016466  022445  042522  042523  MSG54:  .ASCII  /%%RESET SLAVE TO ON LINE BEFORE CONTINUING@/
                016474  020124  046123  053101
                016502  020105  047524  047440
                016510  020116  044514  042516
                016516  041040  043105  051117
                016524  020105  047503  052116
                016532  047111  044525  043516
                016540     043
2613            016541     045  051116  020132  MSG55:  .ASCII  /%NRZ ONLY: @/
                016546  047117  054514  020072
                016554     043
2614            016555     040  052111  051105  MSG56:  .ASCII  / ITER: @/
                016562  020072     043
2615            016565     045  046524  047040  MSG57:  .ASCII  /%TM NOT SET@/
                016572  052117  051440  052105
                016600     043
2616            016601     045  044505  044124  MSG60:  .ASCII  /%EITHER TAPE NOT ERASED OR OPI PROBLEM@/
                016606  051105  052040  050101
                016614  020105  047516  020124
                016622  051105  051501  042105
                016630  047440  020122  050117
                016636  020111  051120  041117
                016644  042514  021515
2617            016650  051045  030510  020061  MSG61:  .ASCII  /%RH11 OR RH70: @/
```

```
        016656  051117  051040  033510
        016664  035060  021440
  2618  016670  051045  020110  047117  MSG62:  .ASCII  /%RH ONLY: @/
        016676  054514  020072     043
  2619  016703     045  052101  020101  MSG63:  .ASCII  /%ATA NOT SET AFTER NON-TRANSFER OPERATION@/
        016710  047516  020124  042523
        016716  020124  043101  042524
        016724  020122  047516  026516
        016732  051124  047101  043123
        016740  051105  047440  042520
        016746  040522  044524  047117
        016754     043
  2620
```

```
 2622                                                ;TEST HEADERS*****
 2623
 2624  016755     045  043045  030524  MSFT1:  .ASCII  /%%FT1:RH ADDRESSING %/
       016762  05:072  020110  042101
       016770  051104  051505  044523
       016776  043516  021440
 2625  017002  022445  052106  035062  MSFT2:  .ASCII  /%%FT2:RH REGISTER BITS TEST %/
       017010  044122  051040  043505
       017016  051511  042524  020122
       017024  044502  051524  052040
       017032  051505  020124     043
 2626  017037     045  043045  031524  MSFT3:  .ASCII  /%%FT3:RH INITIALIZE TEST %/
       017044  051072  020110  047111
       017052  052111  040511  044514
       017060  042532  052040  051505
       017066  020124     043
 2627  017071     045  043045  032124  MSFT4:  .ASCII  /%%FT4:RH11 SILO TEST 1 %/
       017076  051072  030510  020061
       017104  044523  047514  052040
       017112  051505  020124  020061
       017120     043
 2628  017121     045  043045  032524  MSFT5:  .ASCII  /%%FT5:RH11 SILO TEST 2 %/
       017126  051072  030510  020061
       017134  044523  047514  052040
       017142  051505  020124  020062
       017150     043
 2629  017151     045  043045  033124  MSFT6:  .ASCII  /%%FT6:RH11 SILO TEST 3 %/
       017156  051072  030510  020061
       017164  044523  047514  052040
       017172  051505  020124  020063
       017200     043
 2630  017201     045  043045  033524  MSFT7:  .ASCII  /%%FT7:RH11 SILO TEST 4 %/
       017206  051072  030510  020061
       017214  044523  047514  052040
       017222  051505  020124  020064
       017230     043
 2631  017231     045  043045  030524  MSFT10: .ASCII  /%%FT10:RH11 SILO TEST 5 %/
       017236  035060  044122  030461
       017244  051440  046111  020117
       017252  042524  052123  032440
       017260  021440
 2632  017262  022445  052106  030461  MSFT11: .ASCII  /%%FT11:NOP TEST%/
       017270  047072  050117  052040
       017276  051505  021524
 2633  017302  022445  052106  031061  MSFT12: .ASCII  /%%FT12:REWIND TEST%/
       017310  051072  053505  047111
       017316  020104  042524  052123
       017324     043
 2634  017325     045  043045  030524  MSFT13: .ASCII  /%%FT13:WRITE-READ TEST%/
       017332  035063  051127  052111
       017340  026505  042522  042101
       017346  052040  051505  021524
 2635  017354  022445  052106  032061  MSFT14: .ASCII  /%%FT14:SPACE TEST%/
       017362  051472  040520  042503
       017370  052040  051505  021524
 2636  017376  022445  052106  032461  MSFT15: .ASCII  /%%FT15:ERASE TEST%/
```

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        017404  042472  040522  042523
        017412  052040  051505  021524
 2637   017420  022445  052106  033061  MSFT16: .ASCII  /##FT16:TAPE MARK WRITE READ TEST@/
        017426  052072  050101  020105
        017434  040515  045522  053440
        017442  044522  042524  051055
        017450  040505  020104  042524
        017456  052123     043
 2638   017461     045  043045  030524  MSFT17: .ASCII  /##FT17:TM SPACE TEST @/
        017466  035067  046524  051440
        017474  040520  042503  052040
        017502  051505  020124     043
 2639   017507     045  043045  031124  MSFT20: .ASCII  /##FT20:WRITE CHECK TEST @/
        017514  035060  051127  052111
        017522  020105  044103  041505
        017530  020113  042524  052123
        017536  021440
 2640   017540  022445  052106  030462  MSFT21: .ASCII  /##FT21:ERASE HEAD TEST@/
        017546  042472  040522  042523
        017554  044040  040505  020104
        017562  042524  052123     043
 2641   017567     045  043045  031124  MSFT22: .ASCII  /##FT22:BUFFERED COMMAND TEST@/
        017574  035062  052502  043106
        017602  051105  042105  041440
        017610  046517  040515  042116
        017616  052040  051505  021524
 2642   017624  022445  052106  031462  MSFT23: .ASCII  /##FT23:READ IN PRESET TEST@/
        017632  051072  040505  020104
        017640  047111  050040  042522
        017646  042523  020124  042524
        017654  052123     043
 2643   017657     045  043045  031124  MSFT24: .ASCII  /##FT24:REWIND-OFF LINE TEST@/
        017664  035064  042522  044527
        017672  042116  047455  043106
        017700  046040  047111  020105
        017706  042524  052123     043
 2644   017713     045  043536     043  $CNTG:  .ASCII  /#↑G@/
 2645   017717     045  053523  036522  $MSWR:  .ASCII  /#SWR= @/
        017724  021440
 2646   017726  020040  042516  036527  $MNEW:  .ASCII  /  NEW= @/
        017734  021440
 2647   017736  022477     043          $QUEST: .ASCII  /?#@/
 2648
 2649
 2650           017742                          .EVEN
 2651   017742  000000                  WDATA:  0
 2652           021454                          . = .+1510
 2653   021454  000000                  RDATA:  0
 2654
 2655           000001                          .END
```

```
ABORT   014424   851  2539#
ACT11M  000672  711#   876  2519*
ADUMPM  000674  713#  2524*
AS      000616  680#
AUTOM   000670  710#   844   924   968  1016  1109  1136  1142  2511*  2514*
BA      000604  675#  1186  1968*  2064
BADDR   000714  727#  1451*  1470*  1495*  1504*  1505*  1512*  1518*  1652*  1738*  1786*  1798*  1803*
                1823*  1840*  1873*  1908*  1968
BAE     000634  687#  1057
BTRP    000664  702#  1155*  1165*
BTRP2   000666  703#  1156*
CC      000620  681#
CKMODE  014324   843  2511#
CKSWR   014010  1085  1145  1393  1635  2079  2152  2167  2230  2451#
CNTLU   014062   867  2461#  2478
CONT1   002334   935   956#
CONT2   002526   979  1002#
COUNT   001032  766#  2472*  2483  2499*
CRCNT   001012  758#
CS      000610  677#   943*   948*   950   956*   957*   959  1002*  1003*  1244*  1255  1285*  1287
                1313  1317  1322  1328  1353  1357  1408  1423*  1428*  1432  1545*  1848*  2068
                2192*  2193*
C1      000600  673#   908   949   958  1158  1247  1251  1289  1291  1881*  1947*  1975*  1995*
                2060
DATA0   001042  774#
DATA1   001044  775#
DATA2   001046  776#
DATA3   001050  777#
DATBL   001040  773#  2104
DAT1    012364   774  2121#
DAT1A   012370  2122#  2131  2137
DAT1B   012374  2123#  2125
DAT2    012406   775  2130#
DAT3    012414   776  2136#
DAT4    012424   777  2141#
DAT4A   012432  2143#  2146
DB      000622  682#  1195  1286  1321*  1326*  1349*  1362  1405*  1425*  1429*  1430  1431
DOUT    013600  2400#  2416  2418
DOUTD   013662  2414#
DOUT1   013614  2403#  2404  2412
DOUT2   013642  2406  2409#
DOUT3   013650  2408  2410#
DRIVE   000040  611#
DRVN    000710  725#   930   941*   944*   945   948   957   987  1003  2193
DRVTP   000654  698#
DS      000612  678#  1474  1882  1891  1919  1925  1951  1979  1999  2001  2015  2016  2022
                2070
DSAV    000762  746#  2015*  2087
DSUP    012272  1490  1785  1822  2099#
DSO     012274  2100#
DS1     012314  2105#  2126  2147
DS2     012334  2109#  2111
DS3     012344  2106  2112#
DS4     012354  2114#  2116
DT      000626  684#   995   997  1005  2105
EMADDR  000706  724#  1154*  1175*  1215  1241*  1267  1284*  1310*  1345*  1377  1401*  1421*  1457*
```

		1476#	1488#	1533#	1650#	1680#	1717#	1782#	1819#	1869#	1905#	1945#	2003	2039
		2221												
ER	000614	679#	2027	2072										
ERADD	000746	740#	1183#	1192#	1203#	1218	1249#	1253#	1259#	1270	1295#	1297#	1299#	1315#
		1319#	1324#	1332#	1355#	1359#	1412#	1439#	1856#	1859#	1893#	1927#	1934#	1954#
ERCHK	011624	1458	1477	1500	1509	1517	1549	1567	1577	1658	1672	1689	1695	1700
		1726	1745	1759	1793	1800	1805	1830	1832	1846	1890	2014#		
ERPT	011710	2017	2027#											
ERPTA	012000	2037	2041#											
ERPTA1	011732	2029	2031#											
ERPTB	012036	2042	2049#											
ERPTB1	012050	2050	2052#											
ERPTC	012100	2053	2058#											
ERPTD	012210	2035	2076#											
ERPTG	011740	2025	2033#	2093										
ERPTX	012220	2032	2077	2079#										
ERPTXX	012230	2081#												
ERPT1A	012032	2046	2048#											
ERRP	000724	731#	1077#	1497#	1507#	1514#	1548#	1566#	1576#	1657#	1670#	1688#	1694#	1699#
		1725#	1743#	1753#	1767#	1792#	1796#	1801#	1829#	1845#	1888#	2024#	2041	
ERRP1	000726	732#	2049	2092#	2094#									
EXEC	011374	1455	1472	1498	1508	1516	1546	1565	1575	1590	1598	1656	1668	1686
		1692	1698	1723	1742	1757	1791	1799	1804	1828	1831	1837	1844	1851
		1877	1886	1912	1916	1964#								
EXECA	011446	1970	1973#											
EXECB	011454	1972	1974#											
EXECC	011474	1979#	1982	1984										
EXECX	011514	1980	1985#											
EXECXA	011520	1986#	1987											
EXECXX	011524	1988#												
EXFL	000776	752#												
EXIT	003402	1144	1146#											
FC	000606	676#	1593	1600	1629	1852	1854	1857	1967#	1973#	2066			
FCNT	000716	728#	1449#	1468#	1493#	1538#	1553#	1554	1683#	1737#	1787#	1824#	1835#	1841#
		1849#	1874#	1909#	1967									
FT1	003412	784	785	1154#										
FT1A	003444	1159#	1164	2232										
FT1B	003450	1161#	2237											
FT1X	003462	1162	1165#											
FT1XX	003506	1167	1170#											
FT10	005166	798	799	1419#	1422									
FT10A	005222	1425#	1427											
FT10ER	005306	1433	1439#											
FT10X	005264	1420	1434#	1441										
FT10XX	005302	1436	1438#											
FT11	005322	800	801	1445#	1446									
FT12	005440	802	803	1464#	1465									
FT12A	005520	1474#	1475											
FT13	005552	804	805	1484#										
FT13A	005624	1492#	1528											
FT13B	005666	1498#	1502											
FT13C	005746	1508#	1511											
FT13D	006014	1516#	1519											
FT13E	006066	1524	1527#											
FT13X	006100	1521	1526	1529#										
FT14	006104	806	807	1532#										

FT14A	006156	1540#	1558					
FT14A1	006122	1535#	1641					
FT14A2	006252	1551	1553#					
FT14A3	006276	1555	1557#					
FT14B	006332	1564#	1586					
FT14EC	006550	1595	1602#					
FT14RE	006556	1594	1601	1604#				
FT14RF	006522	1580	1596#					
FT14RR	006460	1570	1587#					
FT14R0	006630	1613	1615#					
FT14R1	006652	1617	1620#					
FT14R2	006656	1619	1621#					
FT14R3	006730	1606	1632#					
FT14X	006740	1552	1569	1574	1579	1583	1633	1635#
FT14XX	006774	1637	1639	1642#				
FT15	007000	808	809	1646#	2018			
FT15A	007050	1654#						
FT15B	007064	1656#	1662					
FT15X	007174	1660	1673#					
FT16	007200	810	811	1677#	2020			
FT16A	007232	1682#						
FT16B	007236	1683#	1708					
FT16X	007432	1703	1705	1709#				
FT17	007442	812	813	1716#				
FT17A	007462	1719#	1775					
FT17B	007466	1720#	1750					
FT17C	007626	1740#	1749					
FT17D	007676	1733	1751#					
FT17D1	007714	1754#	1769					
FT17E	007730	1756#	1764					
FT17F	010022	1766	1770#					
FT17X	010052	1728	1747	1761	1771	1773	1776#	
FT2	003512	786	787	1175#				
FT2A	003524	1177#	1184	1209				
FT2B	003564	1182	1186#	1193				
FT2C	003624	1191	1195#	1204				
FT2D	003640	1199#	1200					
FT2E	003670	1202	1206#					
FT2ER	003702	1185	1194	1205	1210#	1936		
FT2ERA	003732	1214	1217#					
FT2ERB	004004	1212	1228#					
FT2ERC	004014	1229	1231#					
FT2X	004024	1207	1234#					
FT20	010056	814	815	1781#				
FT20A	010134	1790#	1812					
FT20B	010220	1801#						
FT20C	010252	1806#						
FT20X	010306	1795	1807	1809	1813#			
FT21	010316	816	817	1819#				
FT21A	010454	1838#	1860					
FT21X	010636	1853	1855	1862#				
FT22	010646	818	819	1869#	1894			
FT22A	010722	1877#	1879					
FT22B	010742	1882#	1883					
FT22X	011042	1892	1896#					
FT23	011052	820	821	1903#	1928	1935		

FT23A	011162	1919#	1922	1924										
FT23B	011202	1920	1925#											
FT23C	011232	1926	1930#											
FT23X	011266	1904	1933	1937#										
FT24	011272	822	823	1943#										
FT24A	011326	1949#	1950											
FT24X	011360	1952	1956#											
FT24XX	011370	1944	1958#											
FT3	004036	788	789	1241#	1242									
FT3A	004112	1248	1251#											
FT3B	004134	1252	1255#											
FT3ER	004172	1250	1254	1260	1263#	1302	1336	1371	1413	1440	1861	1895	1929	1955
FT3ERA	004224	1266	1270#											
FT3ERB	004234	1274	1272#											
FT3ERC	004244	1273	1275#											
FT3X	004162	1258	1261#											
FT4	004254	790	791	1282#	1301									
FT4ER	004336	1288	1295#											
FT4ERA	004346	1290	1297#											
FT4ERB	004356	1292	1299#											
FT4ERC	004364	1296	1298	1300#										
FT4X	004326	1293#	1303											
FT5	004402	792	793	1308#										
FT5A	004424	1311	1312#											
FT5B	004452	1314	1317#											
FT5C	004474	1318	1321#											
FT5D	004524	1323	1326#											
FT5E	004536	1328#	1331											
FT5ER	004574	1316	1320	1325	1333	1336#								
FT5X	004564	1283	1309	1329	1334#									
FT6	004604	794	795	1343#										
FT6A	004626	1346	1347#											
FT6B	004634	1349#	1352											
FT6C	004672	1354	1357#											
FT6D	004714	1358	1361#											
FT6DE	004756	1364	1373#											
FT6DEA	005010	1380#												
FT6DEB	005054	1375	1390#											
FT6DEX	005064	1391	1393#											
FT6E	004716	1362#	1367											
FT6ER	004746	1356	1360	1370#										
FT6X	004736	1344	1368#											
FT7	005072	796	797	1399#	1402									
FT7A	005124	1405#	1407											
FT7ER	005152	1409	1412#											
FT7X	005142	1400	1410#	1414										
FUN	001006	756#	1454*	1471*	1496*	1506*	1513*	1543*	1564*	1572*	1589*	1597*	1616	1654*
		1666*	1685*	1691*	1697*	1720*	1739*	1752*	1765	1768*	1790*	1797*	1802*	1827*
		1843*	1876*	1911*	1915*	1969	1971	1975						
HDRFL	000704	723#	1078*	1213	1217*	1265	1269*	1376	1379*	2036	2038*	2218	2220*	
HERE	003344	1129	1135#											
INIT1	012566	1177	1243	1246	1312	1347	1403	1447	1466	1540	1602	1707	1756	1811
		1884	1906	1914	1946	1994	2008	2080	2191#					
INIT2	012576	2193#												
ITAMT	000656	699#	2183											
ITCNT	000760	745#	2056	2180*	2182*	2183								

ITER	012510	1235	1261	1293	1334	1368	1410	1434	1459	1478	1709	1813	1862	1896
		2167#												
ITER0	012534	2175	2180#	2184										
ITER1	012542	2179	2182#											
ITRLP	000774	751#	1070*	1071*	1102*	1103*	2186							
LTADD	001004	755#	1068*	1069*	1070	1072	1079	1100*	1101*	1102	2018	2020		
MEDIUM	000041	615#												
MR	000624	683#												
MSFT1	016755	1154	2624#											
MSFT10	017231	1421	2631#											
MSFT11	017262	1457	2632#											
MSFT12	017302	1476	2633#											
MSFT13	017325	1488	2634#											
MSFT14	017354	1533	1607	2635#										
MSFT15	017376	1650	2636#											
MSFT16	017420	1680	2637#											
MSFT17	017461	1717	2638#											
MSFT2	017002	1175	2625#											
MSFT20	017507	1782	2639#											
MSFT21	017540	1819	2640#											
MSFT22	017567	1869	2641#											
MSFT23	017624	1905	2642#											
MSFT24	017657	1945	2643#											
MSFT3	017037	1241	2626#											
MSFT4	017071	1284	2627#											
MSFT5	017121	1310	2628#											
MSFT6	017151	1345	2629#											
MSFT7	017201	1401	2630#											
MSGC	014460	849	2554#											
MSGD	014536	2541	2555#											
MSG1	014560	2058	2558#											
MSG10	015072	928	2569#											
MSG11	015112	972	2570#											
MSG12	015132	1497	1688	1743	1829	2571#								
MSG13	015150	1507	1694	2572#										
MSG14	015175	1514	1699	1845	2573#									
MSG15	015222	1725	2574#											
MSG16	015243	1620	1753	1796	2575#									
MSG17	015263	1618	1767	1801	2576#									
MSG2	014646	2005	2560#											
MSG20	015303	1611	2044	2577#										
MSG21	015311	1614	2047	2578#										
MSG22	015316	1220	1382	1622	2579#									
MSG23	015326	1224	1386	1627	2580#									
MSG24	015336	2223	2581#											
MSG25	015352	1183	2582#											
MSG26	015360	1192	2583#											
MSG27	015366	1203	2584#											
MSG28	015374	2585#												
MSG29	015424	1249	2586#											
MSG3	014664	883	2561#											
MSG30	015453	1253	2587#											
MSG31	015503	1259	2588#											
MSG32	015533	1295	1412	1439	2589#									
MSG33	015551	1297	2590#											
MSG34	015566	1299	2591#											

MSG35	015604	1315	2592#									
MSG36	015631	1319	2593#									
MSG37	015660	1324	1332	2594#								
MSG38	015717	1359	2595#									
MSG39	015751	1380	2596#									
MSG4	014766	885	2563#									
MSG40	015771	1355	2597#									
MSG41	016024	961	2598#									
MSG42	016045	1007	2599#									
MSG43	016066	1010	2600#									
MSG44	016103	1859	2601#									
MSG45	016152	1856	2603#									
MSG46	016205	1548	1657	1792	2604#							
MSG47	016231	1576	2605#									
MSG48	016256	1566	2606#									
MSG49	016303	1888	2607#									
MSG5	015011	894	2564#									
MSG50	016331	1893	2608#									
MSG51	016367	1927	2609#									
MSG52	016423	1934	2610#									
MSG53	016442	1954	2611#									
MSG54	016466	1956	2612#									
MSG55	016541	1036	2613#									
MSG56	016555	2054	2614#									
MSG57	016565	2092	2615#									
MSG6	015024	1116	2565#									
MSG60	016601	1670	2616#									
MSG61	016650	1020	2617#									
MSG62	016670	1027	2618#									
MSG63	016703	2024	2619#									
MSG7	015042	2294	2556#									
MSG8	015046	2567#										
MSG9	015050	1609	2568#									
MTINT	012614	666	904	2200#								
NRZOF	001022	762#	1038	1525	1636	1704	1772	1808				
NXTDRV	002252	942#	993									
NXTSLV	002442	952	985#	996	998	1111						
OCTP	013360	888	897	1119	1385	1389	1626	1631	2057	2226	2347#	
OCTPE	013346	1223	1227	2061	2063	2065	2067	2069	2071	2073	2075	2344# 2464
OCTPE1	013364	2348#										
OCTPG	013534	2355	2358	2365	2369	2374	2379	2381	2385#			
OCTPG0	013552	2386	2388	2390#								
OCTPG1	013556	2350	2391#									
OCTP0	013400	2346	2349	2352#								
OCTP1	013422	2353	2357#									
OCTP2	013430	2356	2359#									
OCTP3	013520	2351	2382#									
OFL	013576	2344*	2347*	2387	2390*	2396#						
OPDYX	000736	736#	1453*	1486*	1541*	1649*	1679*	1722*	1985			
OUT	014122	2452	2454	2458	2469#	2486						
PAFLG	001036	768#	833*	1125	1127*	2174						
PATRN	001016	760#	1489*	1784*	1821*	2101						
PCNTR	001026	764#	834*	1043*	1118	1146*						
PEXFL	001000	753#										
PFLG	000742	738#										
PSW	000636	691#	835*									

CZTUBM0 TM02 TU16/TE16 BSC FC MACY11 30(1046) 26 SEP-83 12:01 PAGE 53 6
CZTUBM.P11 26-SEP 83 12:04 CROSS REFERENCE TABLE USER SYMBOLS SEQ 0079

RCNT	000722	730#	1487*	1501*	1503*	1510*	1515*	1518*	1527*	1536*	1557*	1655*	1661*	1716*
		1732	1734*	1735	1755*	1765*								
RDATA	021454	1504	1588	1652	1840	2113	2653#							
RDSW	001034	767#	2330	2333*	2481*									
RDYDX	000734	735#	1452*	1485*	1542*	1648*	1667*	1678*	1721*	1885*	1977			
REGS	000662	701#	887	889	906									
RESTRT	001612	835#	1147											
RFC	000732	734#	1561*	1585*	1599									
RHOF	001024	763#	1029	1034	1435									
RHTF	001020	761#	918*	1166	1168*	2234								
RH17F	000702	722#	1022	1052*	1058*	1282	1308	1343	1399	1419				
RRD	000730	733#	1560*	1584*	1592									
RTRN	000744	739#	2234											
RUND	011526	1492	1535	1651	1664	1682	1719	1783	1820	1834	1839	1870	1993#	
RUNDA	011546	1997#	1998											
RUNDB	011552	1999#	2000											
RUNDX	011616	2002	2008#											
SAV1	000764	747#												
SAV2	000766	748#												
SAV3	000770	749#												
SCNT	000740	737#	1563*	1573*	1582*	1754*	1973							
SCOLP	000772	750#	1184*	1193*	1204*	1242*	1301*	1311*	1346*	1402*	1422*	1446*	1465*	1499*
		1860*	1894*	1928*	1935*	1953*	2158	2163	2232*					
SCOPE	012446	1231	1276	2152#	2233									
SCOPE1	012466	2155	2157#											
SCOPE2	012500	2159	2161#											
SERFL	001010	757#	1550	1568	1578	1659	1727	1746	1760	1794	2014*	2033*	2090	
SERNUM	000652	697#												
SLVN	000712	726#	942*	974	985*	991*	992	994	1004	1903	2194			
SN	000630	685#	1012											
SNPG	013764	2429	2432	2438	2440	2442#								
SNPT	013706	1013	2423#											
ST	002166	877	918#											
START	001600	656	661	832#										
STFLG	001002	754#	1048*	1087	1094*									
STMSK	000756	744#	1076*	1544*	1647*	1671*	1687*	1693*	1724*	1744*	1758*	1889*	2030*	2031
STSCD	003202	1067	1093#											
STO	002136	909#	912											
STOA	001766	881	883#											
STOB	001776	885#	2236											
ST1	002160	915#	917											
ST1A	002200	921#	963	1169										
ST2	002376	960	965#	1009										
ST3	002572	1006	1010#											
ST4	002752	882	1035	1043#										
SUSWR	001664	846	848	855#										
SWR	000640	692#	858	862*	865	1064	1082	1089	1138	1211	1228	1263	1272	1374
		1390	1605	1632	1943	2034	2052	2076	2134	2178	2216	2227	2451	2463
		2502*	2520*											
SWREG	000176	643#	862	865	2451									
TC	000632	686#	994*	1004*	1467*	1931	1965*	2045	2074	2194*				
TCRLF	013246	2318	2321#	2482										
TCRLFA	013264	2324#	2327											
TEMPST	001030	765#	2467*	2471*	2494*	2495*	2496*	2498*	2502					
TEMP1	000750	741#	1735*	1748*	2257*	2262	2271*							
TEMP2	000752	742#												

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TEMP3   000754            743#  2?14  2417
TEND    003256           1074  1096  1108#  1437
TENDX   003364           1137  1139  1141#
TENDO   003272            947  1110  1112#
TEX     013344           2316  2334  2338#
TIB     000700            721# 2260  2265   2268  2278*  2279  2305*  2306*  2309  2455*  2456*  2457  2474*
                         2475  2479  2487   2489  2497*  2498
TINER   013126           2267  2270  2284   2287  2294#
TKB     000644            694# 2302* 2305   2455
TKS     000642            693# 2301* 2303   2453
TMCHK   012232           1690  1696  1701   1729  1762   2087#
TMCHKO  012242           2089# 2091
TMCHK1  012244           2088  2090#
TOB     000676            720# 913   2314*  2315  2317   2321*  2324*  2328*  2337  2382*  2392*  2400*  2402*
                         2405  2410* 2442*  2444*
TOG     013330           2319  2322  2325   2329  2335#  2336   2383   2393   2445
TPB     000650            696# 2309* 2337*  2407* 2409*
TPS     000646            695# 2307  2335   2403
TRAP    012640           1155  2215#
TRAPX   012722           2228  2230#
TRAPXX  012754           2235  2237#
TRAP1   012674           2219  2223#
TRAP2   012712           2217  2227#
TSCD    002756           1017  1047#  1092
TSCDO   003056           1069# 1088
TSCD1   003112           1073  1075#  1104
TSCD2   003136           1081# 1170   1236   1262  1294   1335   1369   1411  1438   1460   1479   1529   1642
                         1673  1710   1776   1814  1863   1897   1937   1958  2007
TSCD3   003152           1083  1085#
TSRH    003050            919  1068#
TSTTBL  001052            782# 1068   1100
TTIN    013144           2259  2301#  2473
TTINT   012630            637  2208#
TTIN2   013176           2307# 2308
TTOUT   013214            850   884    886    895   929    962    973   1008  1011   1021   1028   1037   1117
                         1216  1219   1221   1225  1268   1271   1378  1381  1383   1387   1608   1610   1615
                         1621  1623   1628   1957  2004   2006   2040  2043  2048   2051   2055   2059   2222
                         2?24  2295   2314#  2320  2332   2460   2462  2466  2492   2542
TTR     012760            893   902    934    978  1026   1033   1042  2257#
TTRO    012766           2259# 2281
TTR1    013014           2261  2265#
TTR1A   013030           2266  2268#
TTR1B   013044           2269  2271#
TTR2    013102           2264  2282#
TTR3    013112           2283  2285#
TTR4    013122           2286  2288#
TTR5    013124           2263  2289#
UDES    001014            759# 1448* 1491*  1520  1522*  1523   1534*  1612  1638   1640*  1653*  1681*  1702
                         1706* 1718* 1770   1774* 1789*  1806   1810*  1826* 1872*  1907*  1965   2028
VECT    000660            700# 896   898    903
WC      000602            674# 1178  1966*  2062
WCNT    000720            729# 1450* 1469*  1494* 1539*  1556*  1665*  1684* 1736*  1788*  1825*  1836*  1842*
                         1850* 1875* 1910*  1966
WDATA   017742           1470  1495  1537*  1738  1786   1823   1873   1908  2100   2108   2651#
XDUMPM  000675            714# 2526*
XXDPM   000673            712#  989  2517*  2543
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CZTUBH0 TM02   TU16/TE16 BSC FC MACY11 30(1046)  26 SEP-83  12:01  PAGE 53 8
CZTUBH.P11    26-SEP 83 12:04          CROSS REFERENCE TABLE    USER SYMBOLS                                                    SEQ 0091

$CNTG   017713           2459    2644#
$ENDAD  005334            623    1131#
$MNEW   017726           2465    2646#
$MSWR   017717           2461    2645#
$QUEST  017736           2491    2647#
$READ   014124           2468    2471#
$SVPC   * 001000          608#    629
.       * 021456          598#    602     608     610#    614#    618#    622#    625#    629#    636#    642#    654#    658#
                          665#    670#    829#   2304    2548   2650#   2652#


. ABS.  021456     000


 ERRORS DETECTED:  0

 .CZTUBH/CRF/NL:TOC=CZTUBH.P11
 RUN-TIME: 2 5 1 SECONDS
 RUN-TIME RATIO: 29/9=3.0
 CORE USED:  12K  (23 PAGES)
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