TM02 TU16/TE16

BASIC FUNCTION TEST
CZTUBG0

AH-9452G-MC

FICHE 1 OF 1

JAN 1978
digital
MADE IN USA

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                                REM     &

                                                        IDENTIFICATION
                                                        --------------

                                                PRODUCT CODE:   AC-9451G-MC

                                                PRODUCT TITLE   CZTUBGO TM02 - TU16/TE16 BSC FC

                                                DATE CREATED    15 AUGUST 1977
                                                REVISED         11 NOV    1977  BY CLEM WALSH

                                                MAINTAINER      DIAGNOSTIC ENGINEERING


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1 ABSTRACT

THIS PROGRAM IS INTENDED TO TEST ALL OF THE BASIC
FUNCTIONAL LEVEL OPERATIONS OF THE TM02-TU16/TE16 MAG
TAPE SYSTEM ALL FUNCTIONS, WRITE, READ, SPACE,
ERASE, REWIND, ETC; WILL BE TESTED IN ADDITION TO THE
TM02-TU16/TE16 TESTS, THE RH WILL BE TESTED SEPARATELY IN
SO FAR AS IT IS POSSIBLE TO SEPARATE THE RH FROM THE
TM02-TU16/TE16 ITSELF

2 REQUIREMENTS (HARDWARE)

A ANY PDP-11 PROCESSOR - WITH OR WITHOUT A HARDWARE SWITCH REGISTER
B 8K OF CORE
C. CONSOLE TTY
D TM02 MAGTAPE CONTROLLER
E MASS BUS CONTROLLER
F TU16 OR TE16 MAG TAPE TRANSPORT

3 LOADING PROCEEDURE

USE STANDARD BINARY LOADING PROCEEDURE

4 STARTING PROCEEDURE

****SOFTWARE SWITCH REGISTER IS LOCATED AT LOC 176(REFER TO SECTION 5 FOR MORE

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

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

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

```
                                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 )
```

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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

```
                        ALL SWITCHES EXCEPT 5-9 ARE USED AND THE NORMAL, OR DEFAULT,
                        RUN IS DONE WITH ALL SWITCHES SET TO ZERO (0)
                        ALL HARDWARE SWITCHES ARE DYNAMIC, AND MAY BE CHANGED AT ANY TIME
                        ***BUT, THE SOFTWARE SWITCH REGISTER CAN ONLY BE  LOADED DYNAMICALLY
                           AS STATED ABOVE UNDER CONTROL HEADING


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

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

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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) W LL BE EXECUTED IN
EACH PASS

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8 TEST DESCRIPTION

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

A RH TESTS· THE FIRST TEN (10) TESTS WILL PERFORM BASIC RH
OPERATIONS AS FAR AS IS POSSIBLE WITHOUT REQUIRING
THE TM02-TU16/TE16 ITSELF. (SEE RH ONLY OPTION, PAR 7)

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

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

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

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

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

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

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

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

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

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                                        (PAGE 6)

                                B  TM02-TU16/TE16 BASIC FUNCTIONS: THE FOLLOWING FOURTEEN (14)
                                   TESTS WILL ASSURE OPERATION OF THE
                                   MAG TAPE BASIC FUNCTIONS.

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

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

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

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

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

                                DATA RELATED ERRORS (PARITY ERROR, CRC ERROR, ETC) ARE IGNORED T
                                DATA READ IS NOT CHECKED, ONLY THE FUNCTION IS TESTED, NOT THE M

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

                                                         1  REWIND TO BOT
                                                         2  WRITE 100 RECORDS
                                                               A  EACH RECORD IS ONE FRAME LARGER THAN THE LAST
                                                                  THIS WILL ALLOW FOR POSITION CHECKING BY RECO
                                                         3  EACH RECORD IS ERROR CHECKED
                                                         4  DATA RELATED ERRORS ARE IGNORED
                                                         5  NOW SPACE REVERSE 77 RECORDS AND
                                                            READ REVERSE 1, THE FRAME COUNT
                                                            SHOULD BE 100
                                                            THIS IS THE SIZE OF THE FIRST RECORD
                                                         6  NOW SPACE FORWARD 76 RECORDS AND READ
                                                            FORWARD 1, THE FRAME COUNT SHOULD BE 177
                                                            THIS IS THE SIZE OF THE NEXT TO LAST RECORD
                                                         7  CONTINUE THE SPACE AND READ (DECREMENTING THE RECORD
                                                            UNTIL ALL POSITIONS HAVE BEEN CHECKED  IF POSITION IS
                                                         8  REPEAT STEPS 1 THRU 7 FOR PE
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   365                                                          9  END
   366
   367
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                                        (PAGE 7)

                        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
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                                                        10  END
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                                        (PAGE 8)

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

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

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

FT24  REWIND  OFF LINE THIS TEST WILL ASSURE
                       THAT THE UNIT WILL REWIND AND
                       GO OFF LINE  (NOT IF IN CONTINUOUS CYCLE)

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

                    (THIS TEST IS NOT PERFORMED WHEN CONTINUOUS CYCLE OPERATION IS S
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                                                                E  2
   514                                  9       LISTING
   515                                          -------
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                                    &

                                     TITLE CZTUBGO TM02 - TU16/TE16 BSC FC
                                    ,ZZ - CZTUB-G-0
                                    ,15 AUGUST 1977
                                    ,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
                                     ABS


                                    ,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 ,
                                    ,   ,   ;   ,   ,   ,   ;   ,   ,   ,   ,   ,   ,   ;   ;   ;   ;
                                    ,XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
                          ,WC       , WORD                                                          ;
                                    ; COUNT                                                         ,
                                    ,XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
                          ,BA       , BUS                                                           ,
                                    , ADDRESS                                                       ,
                                    ;XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
                          ,FC       ; FRAME                                                         ,
                                    , COUNT                                                         ;
                                    ,XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
                          ,CS2      ,DLT,WCE;UPE,NED,NEM,PGE,MXF,MDP;OR ,IR ,CLR,PAT,BAI,U2 ,U1 ,U0 ,
                                    ,   ,   ,   ,   ,   ,   ,   ,ERR,   ;   ,   ,   ,   ,   ,   ,   ,
                                    ,XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
                          ,DS       ,ATA,ERR,PIP,MOL;WRL,EOT,SPR,DPR,DRY,SSC,PES,SDN,IDB,TMK,BOT,SLA,
                                    ,   ,   ,   ,   ,   ;   ;   ,   ;   ,   ,   ,   ,   ,   ,   ,   ,
                                    ,XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
                           ER       ,CDE,UNS,OPI,DTE,NEF,CS ,FCE,NSG,PEF,INC,DAT,FMT,CNT,RMR,ILR,ILF,
                                    ,CRC,   ,   ,   ,   ,ITM,   ;   ,LRC,VPE,BPE,   ,BPE,   ,   ,   ,
                                    ;XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
                           ATS      , ATTENTION                                                     ,
                                    , SUMMARY                                                       ,
                                    ,XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
```

```
                                        ,CC    , CHECK                                                                  ;
                                               , CHARACTER                                                              ;
                                               ,XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
                                        ,DB    , DATA                                                                   ;
                                               , BUFFER                                                                 ,
                                               ,XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
                                        ,MR    ,DB ,DB ;DB ;DB ;DB ;DB ;DB ;DB ;WRT;MM ;OP ;OP ;OP ;OP ;MM ;
                                               ;    1 ; 2 ; 3 ; 4 ; 5 ; 6 , 7 ; P ;CLK;CLK, 4 , 3 ; 2 ; 1 ;GO ;
                                               ,XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
                                        ,DT    , DRIVE     ; 7 ;   ,SLV;                                                ,
                                               , TYPE      ,CH ,   ;PR ,                                                ,
                                               ,XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
                                        ,SN    , SERIAL                                                                 ,
                                               , NUMBER                                                                 ,
                                               ,XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
                                        ,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 ,
                                               ,XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
```

```
                                        ;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
                            ;           ************************************************************

                                                $SVPC=

                                                 =40
            000040
000040      000                         DRIVE    BYTE   0       ;DRIVE # FOR XXDP LOAD MED UM
                                                                ;ASSEMBLE AS A 0

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

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

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

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

                                                 =$SVPC         ;RESTORE PC

                                        ************************************************************


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

                                         =60
            000060
000060      012570                      TTINT                  ;TTY INTERRUPT HEADER ADDRESS
000062      000000                      0

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

```
                                                        =176
000176  000176                                    SWREG   0               ;SOFTWARE SWITCH REGISTER

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

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

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

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

                                                        =210
000210  000210  000240                            NOP
000212  000212  012700  000C01                    MOV     #1,R0   ;SET NO HEADER FLAG
000216  000216  000167  001356                    JMP     START

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

                                                        =224
000224  000224  012554                            MTINT           ;TAPE INTERRUPT HANDLER ADDRESS
000226  000226  000340                            340

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

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

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

000636  000636  177776                    PSW     177776          ;PROCESSOR STATUS
000640  000640  177570                    SWR     177570          ;SWITCH REGISTER
000642  000642  177560                    TKS     177560          ;TTY READER STATUS
000644  000644  177562                    TKB     177562          ;TTY READ BUFFER
000646  000646  177564                    TPS     177564          ;TTY PUNCH STATUS
000650  000650  177566                    TPB     177566          ;TTY PUNCH BUFFER
```

```
   702  000652  177777                SERNUM  177777          ;SERIAL NUMBER
   703  000654  000011                DRVTP   011             ;DRIVE TYPE
   704  000656  000010                ITAMT   10              ;ITERATION AMOUNT
   705  000660  000224                VECT    224             ;INTERRUPT VECTOR(RH)
   706  000662  172440                REGS    172440          ;STARTING REGISTER ADDRESS
   707  000664  000004                BTRP    4               ;BUS TRAP ADDRESS
   708  000666  000006                BTRP2   6               ;BUS TRAP PRIORITY LEVEL 7
```

```
                                ;       ************************************************************
                                ;               ACT11   MODE INDICATORS
                                ;       ************************************************************

000670  000000                          AUTOM    WORD   0       ;AUTOMATIC MODE INDICATOR
000672     000                          ACT11M   BYTE   0       ;ACT11 AUTO MODE INDICATOR
000673     000                          XXDPM    BYTE   0       ;XXDP AUTO MODE INDICATOR
000674     000                          ADUMPM   BYTE   0       ;ACT11 DUMPM INDICATOR
000675     000                          XDUMPM   BYTE   0       ;XXDP DUMP MODE INDICATOR

                                ;       ************************************************************
```

```
721                                         ;FLAGS AND COUNTERS**********
722
723  000676  000000                 TOB     0
724  000700  000000                 TIB     0
725  000702  000000                 RH17F   0
726  000704  000000                 HDRFL   0
727  000706  000000                 EMADDR  0
728  000710  000000                 DRVN    0
729  000712  000000                 SLVN    0
730  000714  000000                 BADDR   0
731  000716  000000                 FCNT    0
732  000720  000000                 WCNT    0
733  000722  000000                 RCNT    0
734  000724  000000                 ERRP    0
735  000726  000000                 ERRP1   0
736  000730  000000                 RRD     0
737  000732  000000                 RFD     0
738  000734  000000                 RDYDX   0
739  000736  000000                 OPDYX   0
740  000740  000000                 SCNT    0
741  000742  000000                 PFLG    0
742  000744  000000                 RTRN    0
743  000746  000000                 ERADD   0
744  000750  000000                 TEMP1   0
745  000752  000000                 TEMP2   0
746  000754  000000                 TEMP3   0
747  000756  000000                 STMSK   0
748  000760  000000                 ITCNT   0
749  000762  000000                 DSAV.   0
750  000764  000000                 SAV1    0
751  000766  000000                 SAV2    0
752  000770  000000                 SAV3    0
753  000772  000000                 SCOLP   0
754  000774  000000                 ITRLP   0
755  000776  000000                 EXFL.   0
756  001000  000000                 PEXFL   0
757  001002  000000                 STFLG   0
758  001004  000000                 LTADD   0
759  001006  000000                 FUN     0
760  001010  000000                 SERFL   0
761  001012  000000                 CRCNT   0
762  001014  000000                 UDES    0
763  001016  000000                 PATRN   0
764  001020  000000                 RHTF    0
765  001022  000000                 NRZOF   0
766  001024  000000                 RHOF    0
767  001026  000000                 PCNTR   0
768  001030  000000                 TEMPST  0
769  001032  000000                 COUNT   0
770  001034  000000                 RDSW    0
771  001036  000000                 PAFLG   0
772
773                                         ;DATA PATTERN GENERATORS*****
774
775  001040  000000                 DATBL   0
776  001042  012324                 DATAO   DAT1    ;ALL ONE BITS
```

```
   777  001044  012346                DATA1.   DAT2    ,ALL ZERO BITS
   778  001046  012354                DATA2    DAT3.   ,ALTERNATING ONE/ZERO BITS
   779  001050  012364                DATA3    DAT4    ,ALL BITS 0-377
```

```
                                                    N 2
   780
   781                                      ;LOGIC TEST ENTRY TABLE**********
   782
   783  001052  000000                TSTTBL  0
   784  001054  000000                        0
   785  001056  003412                        FT1
   786  001060  003412                        FT1
   787  001062  003512                        FT2
   788  001064  003512                        FT2
   789  001066  004036                        FT3
   790  001070  004036                        FT3
   791  001072  004254                        FT4
   792  001074  004254                        FT4
   793  001076  004402                        FT5
   794  001100  004402                        FT5
   795  001102  004604                        FT6
   796  001104  004604                        FT6
   797  001106  005072                        FT7
   798  001110  005072                        FT7
   799  001112  005166                        FT10
   800  001114  005166                        FT10
   801  001116  005322                        FT11
   802  001120  005322                        FT11
   803  001122  005440                        FT12
   804  001124  005440                        FT12
   805  001126  005552                        FT13
   806  001130  005552                        FT13
   807  001132  006104                        FT14
   808  001134  006104                        FT14
   809  001136  007000                        FT15
   810  001140  007000                        FT15
   811  001142  007200                        FT16
   812  001144  007200                        FT16
   813  001146  007442                        FT17
   814  001150  007442                        FT17
   815  001152  010056                        FT20
   816  001154  010056                        FT20
   817  001156  010316                        FT21
   818  001160  010316                        FT21
   819  001162  010646                        FT22
   820  001164  010646                        FT22
   821  001166  011052                        FT23
   822  001170  011052                        FT23
   823  001172  011272                        FT24
   824  001174  011272                        FT24
   825  001176  000000                        0
   826  001200  000000                        0
   827  001202  000000                        0
   828  001204  000000                        0
```

```
                        001600                          .=1600
                                                        ;PROGRAM START AND HOUSEKEEPING**********

001600  000240                        START   NOP
001602  005067  177230                        CLR     PAFLG           ;INIT PASS FLAG
001606  005067  177214                        CLR     PCNTR           ;INIT PASS COUNTER
001612  012777  000340  177016              MOV     #340,@PSW       ;SET PRIORITY
001620  012706  000500                        MOV     #500,SP         ;SET STACK POINTER

                                        ;       ************************************************************
                                        ;               DIAGNOSTIC SETUP FOR EXECUTION
                                        ;               UNDER ACT11.
                                        ;       ************************************************************

001624  004767  012434                        JSR     PC,CKMODE               ;CHECK FOR MODE OF OPERATION
001630  005767  177034                        TST     AUTOM                   ;IS IT AUTOMATIC MODE
001634  001001                              BNE     1$                      ;BRANCH - IF YES
001636  000412                              BR      SUSWR                   ;CHECK SWR IN DUMPM - IF NOT
001640  032737  020000  000052      1$      BIT     #20000,@#52             ;SET UP FOR MANUAL INTERVENTION?
001646  001406                              BEQ     SUSWR                   ;BRANCH - IF NO
001650  012704  014420                        MOV     #MSGC,R4                ;GET MESSAGE
001654  004767  011274                        JSR     PC,TTOUT                ;TYPE MESSAGE
001660  000167  012500                        JMP     ABORT                   ;AND ABORT THE PROGRAM

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

001664  013746  000006              SUSWR   MOV     @#6,-(SP)               ;SAVE VECTORS
001670  013746  000004                      MOV     @#4,-(SP)
001674  012737  001714  000004              MOV     #1$,@#4                 ;SET UP FOR TIMEOUT
001702  022777  177777  176730              CMP     #-1,@SWR                ;REFERENCE HARDWARE SW TCH REGISTER
001710  001402                              BEQ     2$
001712  000404                              BR      3$
001714  022626                      1$      CMP     (SP)+,(SP)+             ;ADJUST STACK
001716  012767  000176  176714      2$      MOV     #SWREG,SWR              ;POINT TO SOFTWARE SWITCH REG
001724  012637  000004              3$      MOV     (SP)+,@#4               ;RESTORE VECTORS
001730  012637  000006                      MOV     (SP)+,@#6
001734  023727  000640  000176              CMP     @#SWR,#SWREG            ;IS SOFTWARE REG USED
001742  001002                              BNE     4$                      ;BRANCH IF NO
001744  004767  012052                        JSR     PC,CNTLU                ;ALLOW SOFTARE SWITCH REGISTER TO BE CHANGED

001750                              4$

                                        ;       ************************************************************
                                        ;               IF IN ACT11 MODE INHIBIT TYPING PROGRAM
                                        ;               IDENTIFICATION AND MANUAL INTERVENTION
                                        ;       ************************************************************

001750  005767  176716                        TST     ACT11M                  ;CHECK FOR ACT11 MODE
001754  001104                              BNE     ST                      ;BRANCH - IF ACT11
                                        ;       ************************************************************

001756  005700                              TST     R0                      ;SEE IF PRINT HEADER
001760  001402                              BEQ     STOA                    ;IF SO  BR
001762  000167  000764                      JMP     ST4                     ;ELSE SKIP
001766  012704  014624              STOA    MOV     #MSG3,R4
001772  004767  011156                        JSR     PC,TTOUT                ;PRINT TITLE
```

```
885  001776  012704  014726          STOB    MOV     #MSG4,R4
886  002002  004767  011146                  JSR     PC,TTOUT        ;REQUEST REGISTER ADDRESS
887  002006  016703  176650                  MOV     REGS,R3
888  002012  004767  011302                  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  010656                  JSR     PC,TTR          ,GO GET RESPONSE
894  002042  012704  014751                  MOV     #MSG5,R4
895  002046  004767  011102                  JSR     PC,TTOUT        ;REQUEST VECTOR
896  002052  016703  176602                  MOV     VECT,R3
897  002056  004767  011236                  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  010612                  JSR     PC,TTR          ;GO GET RESPONSE
903  002106  016700  176546                  MOV     VECT,R0         ;GET VECTOR
904  002112  012720  012554                  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  015032                  MOV     #MSG10,R4
929  002212  004767  010736                  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  010456                  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  015764                  MOV     #MSG41,R4
962  002370  004767  010560                  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  015052                  MOV     #MSG11,R4
973  002410  004767  010540                  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  010260                  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  016005                  MOV     #MSG42,R4
 1008  002564  004767  010364                  JSR     PC,TTOUT        ;PRINT NON-EXIST SLAVE
 1009  002570  000702                          BR      ST2             ;REDO SLAVE REQUEST
 1010  002572  012704  016026          ST3     MOV     #MSG43,R4
 1011  002576  004767  010352                  JSR     PC,TTOUT        ;PRINT SERIAL NUMBER TAG
 1012  002602  017703  176022                  MOV     @SN,R3
 1013  002606  004767  011034                  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  016610                  MOV     #MSG61,R4
 1021  002624  004767  010324                  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  010044                  JSR     PC,TTR          ;GET RESPONSE
 1027  002654  012704  016630                  MOV     #MSG62,R4
 1028  002660  004767  010270                  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  010010                  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  016501                  MOV     #MSG55,R4
 1037  002722  004767  010226                  JSR     PC,TTOUT        ;REQUEST NRZ ONLY RESPONSE
 1038  002726  012705  001022                  MOV     #NRZOF,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  007746                  JSR     PC,TTR          ;GO GET RESPONSE
 1043  002752  005067  176050          ST4     CLR     PCNTR           ;CLEAR PASS COUNTER
```

```
1044                                            ;TEST SCHEDULAR**********
1045
1046  002756  000240                    TSCD    NOP
1047  002760  005067  176016                    CLR     STFLG           ;CLEAR SINGLE TEST FLAG
1048
1049                                    ;       ********************************************************************
1050
1051  002764  005067  175712                    CLR     RH17F           ;SET RH11 INDICATOR
1052  002770  013746  000004                    MOV     @#4,-(SP)       ;SAVE ERROR TRAP AND VECTORS
1053  002774  013746  000006                    MOV     @#6,-(SP)       ;SAVE PRIORITY
1054  003000  016737  000020  000004            MOV     1$,@#4          ;SET TIME OUT
1055  003006  005037  000006                    CLR     @#6             ;SET LOW PRIORITY
1056  003012  005777  175616                    TST     @BAE            ;REFERENCE BAE REGISTER
1057  003016  012767  000001  175656            MOV     #1,RH17F        ;SET RH70 INDICATOR
1058  003024  012637  000006          1$        MOV     (SP)+,@#6       ;RESTORE ERROR TYPE
1059  003030  012637  000004                    MOV     (SP)+,@#4
1060
1061                                    ;       ********************************************************************
1062
1063  003034  017700  175600                    MOV     @SWR,R0
1064  003040  042700  177740                    BIC     #177740,R0
1065  003044  005700                            TST     R0
1066  003046  001055                            BNE     STSCD           ;GO SELECT SINGLE TEST
1067  003050  012767  001052  175726  TSRH      MOV     #TSTTBL,LTADD
1068  003056  062767  000004  175720  TSCD0     ADD     #4,LTADD
1069  003064  016767  175714  175702            MOV     LTADD,ITRLP
1070  003072  062767  000002  175674            ADD     #2,ITRLP        ;SET ITERATION ADDRESS
1071  003100  005777  175700                    TST     @LTADD
1072  003104  001002                            BNE     TSCD1
1073  003106  000167  000144                    JMP     TEND            ;GO TO END ROUTINE
1074  003112  000240                  TSCD1     NOP
1075  003114  005067  175636                    CLR     STMSK
1076  003120  005067  175600                    CLR     ERRP
1077  003124  005067  175554                    CLR     HDRFL           ;CLEAR PRINT HEADER FLAG
1078  003130  017700  175650                    MOV     @LTADD,R0       ;SET POINTER TO TEST
1079  003134  000110                            JMP     (R0)            ;GO TO TEST
1080  003136  000240                  TSCD2     NOP
1081  003140  032777  002000  175472            BIT     #2000,@SWR      ;SEE IF HALT ON TEST
1082  003146  001401                            BEQ     TSCD3           ;IF NOT  BR
1083  003150  000000                            HALT
1084  003152  004767  010572          TSCD3     JSR     PC,CKSWR                ;CHECK FOR CNTL G
1085  003156  000240                            NOP
1086  003160  005767  175616                    TST     STFLG           ;SE IF SINGLE TEST
1087  003164  001734                            BEQ     TSCD0           ;IF NOT  BR
1088  003166  017700  175446                    MOV     @SWR,R0
1089  003172  042700  177740                    BIC     #177740,R0      ;MASK TEST NUMBER
1090  003176  005700                            TST     R0              ;SEE IF RETURN TO ALL
1091  003200  001666                            BEQ     TSCD            ;IF SO  BR
1092  003202  000240                  STSCD     NOP
1093  003204  012767  000001  175570            MOV     #1,STFLG        ;SET SINGLE TEST FLAG
1094  003212  022700  000025                    CMP     #25,R0          ;SEE IF EXCEEDED TESTS
1095  003216  003417                            BLE     TEND            ;IF SO  BR
1096  003220  000241                            CLC
1097  003222  006100                            ROL     R0
1098  003224  006100                            ROL     R0              ;SET TABLE MODIFIER
1099  003226  012767  001052  175550            MOV     #TSTTBL,LTADD
```

```
1100  003234  060067  175544                  ADD     R0,LTADD        ;SET TEST POINTER
1101  003240  016767  175540  175526          MOV     LTADD,ITRLP
1102  003246  062767  000002  175520          ADD     #2,ITRLP        ;SET ITERATION POINTER
1103  003254  000716                          BR      TSCD1
1104
1105                            ;       ********************************************************************
1106
1107  003256  000240                  TEND    NOP
1108  003260  005767  175404                  TST     AUTOM                   ;CHECK FOR AUTO MODE
1109  003264  001402                          BEQ     TENDO                   ;BRANCH - IF NOT
1110  003266  000167  177150                  JMP     NXTSLV                  ;GET ANOTHER SLAVE DEVICE
1111  003272                          TENDO
1112
1113                            ;       ********************************************************************
1114
1115  003272  012704  014764                  MOV     #MSG6,R4
1116  003276  004767  007652                  JSR     PC,TTOUT        ;PRINT END OF PASS
1117  003302  016703  175520                  MOV     PCNTR,R3
1118  003306  004767  010006                  JSR     PC,OCTP         ;PRINT PASS NUMBER
1119
1120                            ;       ************************************************************
1121                            ;               AUTOMATIC MODE END OF PASS
1122                            ;       ************************************************************
1123
1124  003312  005767  175520                  TST     PAFLG           ;PASS INDICATOR SET?
1125  003316  001002                          BNE     3$              ;BRANCH - IF SET
1126  003320  005267  175512                  INC     PAFLG           ;SET PASS INDICATOR
1127  003324  013704  000042          3$      MOV     @#42,R4         ;CONTENTS OF 42 TO R4
1128  003330  001405                          BEQ     HERE            ;BRANCH - IF NOT AUTO MODE
1129  003332  000005                          RESET                   ;CLEAR THE WORLD
1130  003334  004714                  $ENDAD  JSR     PC (R4)         ;RETURN TO MONITOR
1131  003336  000240                          NOP
1132  003340  000240                          NOP
1133  003342  000240                          NOP
1134  003344                          HERE
1135  003344  005767  175320                  TST     AUTOM           ;CHECK FOR AUTOMATIC MODE
1136  003350  001005                          BNE     TENDX           ;BRANCH - IF YES
1137  003352  032777  004000  175260          BIT     #4000,@SWR      ;SEE IF HALT ON PASS
1138  003360  001001                          BNE     TENDX           ;IF NOT  BR
1139  003362  000000                          HALT
1140  003364                          TENDX
1141  003364  005767  175300                  TST     AUTOM           ;CHECK FOR AUTO MODE
1142  003370  001402                          BEQ     1$              ;BRANCH - IF NOT
1143  003372  000167  000004                  JMP     EXIT            ;RESTART
1144  003376  004767  010346          1$      JSR     PC,CKSWR        ;CHECK FOR CNTL G
1145  003402  005267  175420          EXIT    INC     PCNTR           ;BUMP PASS COUNTER
1146  003406  000167  177344                  JMP     TSCD            ;RESTART
1147
1148                            ;       ********************************************************************
```

```
1149
1150                                            ;RH ADDRESSING TEST**********
1151
1152  003412  012767  016643  175266  FT1       MOV     #MSFT1,EMADDR   ;SET HEADER
1153  003420  012777  012600  175236            MOV     #TRAP,@BTRP     ;SET TRAP HANDLER ADDRESS
1154  003426  012777  000340  175232            MOV     #340,@BTRP2
1155  003434  012700  000016                    MOV     #16,R0          ;SET NUMBER OF REGISTER
1156  003440  016701  175134                    MOV     C1,R1           ;GET FIRST ADDRESS (CS1)
1157  003444  005711                  FT1A      TST     (R1)            ;REFERENCE REGISTER
1158  003446  000240                            NOP                     ;IF ADDRESS IS BAD, BUS TRAP WILL OCCUR
1159  003450  005300                  FT1B      DEC     R0              ;SEE IF DONE ALL
1160  003452  001403                            BEQ     FT1X            ;IF SO  BR
1161  003454  062701  000002                    ADD     #2,R1           ;BUMP ADDRESS POINTER
1162  003460  000771                            BR      FT1A            ;CONTINUE
1163  003462  012777  000006  175174  FT1X      MOV     #6,@BTRP        ;RESET TRAP CATCHER
1164  003470  005767  175324                    TST     RHTF            ;SEE IF INITIAL ADDRESS TEST PASS
1165  003474  001404                            BEQ     FT1XX           ;IF NOT  BR
1166  003476  005067  175316                    CLR     RHTF            ;CLEAR FLAG
1167  003502  000167  176472                    JMP     ST1A            ;RETURN
1168  003506  000167  177424          FT1XX     JMP     TSCD2           ;RETURN TO SCHEDULAR
```

```
1169
1170                                        .RH REGISTER BITS READ/WRITE**********
1171
1172  003512  012767  016670  175166  FT2   MOV   #MSFT2,EMADDR   ,SET TEST HEADER
1173  003520  012701  177777              MOV   #-1,R1            ;SET ALL ONES PATTERN
1174  003524  004767  006776        FT2A  JSR   PC,INIT1          ,GO INIT
1175  003530  016700  175046              MOV   WC,R0             ,GET ADDRESS OF WORD COUNT
1176  003534  010102                      MOV   R1,R2             ,SET EXPT REGISTER BIT PATTERN
1177  003536  010110                      MOV   R1,(R0)           ,LOAD PATTERN
1178  003540  021002                      CMP   (R0),R2           ;SEE IF EXPT=RCVD
1179  003542  001410                      BEQ   FT2B              ,IF SO  BR
1180  003544  012767  015312  175174      MOV   #MSG25,ERADD      ,SET CODE
1181  003552  012767  003524  175212      MOV   #FT2A,SCOLP       ,SET SCOPE
1182  003560  004767  000116              JSR   PC,FT2ER          ,GO DO ERROR
1183  003564  016700  175014        FT2B  MOV   BA,R0             ;GET ADDRESS OF BUS ADDRESS
1184  003570  010102                      MOV   R1,R2
1185  003572  042702  000001              BIC   #1,R2             ,SET EXPT PATTERN
1186  003576  010110                      MOV   R1,(R0)           ,LOAD PATTERN
1187  003600  020210                      CMP   R2,(R0)           ,SEE IF EXPT=RCVD
1188  003602  001410                      BEQ   FT2C              ,IF SO BR
1189  003604  012767  015320  175134      MOV   #MSG26,ERADD      ,SET ERROR CODE
1190  003612  012767  003564  175152      MOV   #FT2B,SCOLP       ,SET SCOPE ADDRESS
1191  003620  004767  000056              JSR   PC,FT2ER          ,GO DO ERROR
1192  003624  016700  174772        FT2C  MOV   DB R0             ,GET ADDRESS OF DATA BUFFER
1193  003630  010102                      MOV   R1,R2
1194  003632  010110                      MOV   R1,(R0)           .LOAD PATTERN
1195  003634  012703  004000              MOV   #4000,R3
1196  003640  005303                FT2D  DEC   R3                ,DELAY
1197  003642  001376                      BNE   FT2D
1198  003644  020210                      CMP   R2,(R0)           ,SEE IF EXPT=RCVD
1199  003646  001410                      BEQ   FT2E              ,IF SO  BR
1200  003650  012767  015326  175070      MOV   #MSG27,ERADD      ,SET ERROR CODE
1201  003656  012767  003624  175106      MOV   #FT2C,SCOLP       ,SET SCOPE ADDRESS
1202  003664  004767  000012              JSR   PC,FT2ER          ,GO DO ERROR
1203  003670  005701                FT2E  TST   R1                ,SEE IF DONE RESET
1204  003672  001454                      BEQ   FT2X              ,IF SO  BR
1205  003674  005001                      CLR   R1                ,SET ZERO PATTERN
1206  003676  000167  177622              JMP   FT2A              ,DO ZERO BITS
1207  003702  000240              FT2ER   NOP
1208  003704  032777  020000  174726      BIT   #20000,@SWR       ;SEE IF PRINT ERROR
1209  003712  001034                      BNE   FT2ERB            ,IF NOT  BR
1210  003714  005767  174764              TST   HDRFL             ,SEE ID DONE HEADER
1211  003720  001004                      BNE   FT2ERA            ,IF SO  BR
1212  003722  016704  174760              MOV   EMADDR,R4
1213  003726  004767  007222              JSR   PC,TTOUT          ,DO HEADER
1214  003732  012767  000001  174744  FT2ERA MOV  #1,HDRFL        ,SET FLAG
1215  003740  016704  175002              MOV   ERADD,R4
1216  003744  004767  007204              JSR   PC,TTOUT          ,PRINT ERROR CODE
1217  003750  012704  015256              MOV   #MSG22,R4
1218  003754  004767  007174              JSR   PC,TTOUT          ,PRINT EXPT TAG
1219  003760  010103                      MOV   R1,R3
1220  003762  004767  007320              JSR   PC,OCTPE          ,PRINT EXPT
1221  003766  012704  015266              MOV   #MSG23,R4
1222  003772  004767  007156              JSR   PC,TTOUT          ,PRINT RCVD TAG
1223  003776  011003                      MOV   (R0),R3
1224  004000  004767  007302              JSR   PC,OCTPE          ,PRINT RCVD
```

```
 1225  004004  005777  174630          FT2ERB  TST     @SWR            ,SEE IF HALT ON ERROR
 1226  004010  100001                          BPL     FT2ERC          ,IF NOT  BR
 1227  004012  000000                          HALT
 1228  004014  004767  006366          FT2ERC  JSR     PC,SCOPE        ,GO SEE IF SCOPE ON ERROR
 1229  004020  000240                          NOP
 1230  004022  000207                          RTS     PC              ,IF NO SCOPE. CONTINUE TEST
 1231  004024  000240                  FT2X    NOP
 1232  004026  004767  006416                  JSR     PC,ITER         ,GC SEE IF ITERATIONS
 1233  004032  000167  177100                  JMP     TSCD2           ,RETURN TO SCHEDULAR
```

```
1234
1235                                        ;RH INITIALIZE TEST**********
1236
1237  004036  012767  016725  174642  FT3:  MOV   #MSFT3,EMADDR   ;SET TEST HEADER
1238  004044  012767  004036  174720        MOV   #FT3,SCOLP
1239  004052  004767  006450               JSR   PC,INIT1        ;GO INIT
1240  004056  052777  020000  174524        BIS   #20000,@CS      ;FORCE UPE =1
1241  004064  000240                       NOP
1242  004066  004767  006434               JSR   PC,INIT1        ;GO INIT
1243  004072  005777  174502               TST   @C1             ;SEE IF SC IS RESET
1244  004076  100005                       BPL   FT3A            ;IF SO: BR
1245  004100  012767  015364  174640        MOV   #MSG29,ERADD    ;SET ERROR CODE
1246  004106  004767  000060               JSR   PC,FT3ER        ;GO DO ERROR
1247  004112  032777  040000  174460  FT3A  BIT   #40000,@C1     ;SEE IF TRE IS RESET
1248  004120  001405                       BEQ   FT3B            ;IF SO: BR
1249  004122  012767  015413  174616        MOV   #MSG30,ERADD    ;SET ERROR CODE.
1250  004130  004767  000036               JSR   PC,FT3ER        ;GO DO ERROR
1251  004134  017701  174450        FT3B   MOV   @CS,R1          ;GET CS2
1252  004140  042701  000307               BIC   #307,R1         ;MARK IR/OR
1253  004144  005701                       TST   R1              ;SEE IF RESET
1254  004146  001405                       BEQ   FT3X            ;IF SO. BR
1255  004150  012767  015443  174570        MOV   #MSG31,ERADD    ;SET ERROR CODE
1256  004156  004767  000010               JSR   PC,FT3ER        ;GO DO ERROR
1257  004162  004767  006262        FT3X   JSR   PC,ITER         ;GO SEE IF ITERATION
1258  004166  000167  176744               JMP   TSCD2           ;RETURN TO SCHEDULAR
1259  004172  032777  020000  174440  FT3ER BIT   #20000,@SWR     ;SEE IF PRINT ERROR
1260  004200  001015                       BNE   FT3ERB          ;IF NOT  BR
1261  004202  005767  174476               TST   HDRFL           ;SEE IF DONE HEADER
1262  004206  001006                       BNE   FT3ERA          ;IF SO  BR
1263  004210  016704  174472               MOV   EMADDR,R4
1264  004214  004767  006734               JSR   PC,TTOUT        ;PRINT HEADER
1265  004220  005267  174460               INC   HDRFL
1266  004224  016704  174516  FT3ERA MOV   ERADD,R4
1267  004230  004767  006720               JSR   PC,TTOUT        ;PRINT ERROR CODE
1268  004234  005777  174400  FT3ERB TST   @SWR             ;SEE IF HALT ON ERROR
1269  004240  100001                       BPL   FT3ERC          ;IF NOT  BR
1270  004242  000000                       HALT
1271  004244  000240        FT3ERC NOP
1272  004246  004767  006134               JSR   PC,SCOPE        ;GO SEE iF SCOPE
1273  004252  000207                       RTS   PC              ;IF NOT  BR
```

```
1274
1275                                        ;RH11 SILO TEST 1:  EPMTY SILO READ**********
1276
1277  004254  005767  174422        FT4:  TST     RH17F
1278  004260  001141                BNE     FT5X              ;IF RH70. BR
1279  004262  012767  016757  174416      MOV     #MSFT4,EMADDR     ;SET TEST TEST HEADER
1280  004270  012777  000040  174312      MOV     #40,@CS           ;INIT
1281  004276  017700  174320             MOV     @DB,R0            ;READ DB
1282  004302  005777  174302             TST     @CS               ;SEE IF DLT IS SET
1283  004306  100013                     BPL     FT4ER             ;IF NOT. BR
1284  004310  005777  174264             TST     @C1               ;SEE IF SC IS SET
1285  004314  100014                     BPL     FT4ERA            ;IF NOT. BR
1286  004316  032777  040000  174254     BIT     #40000,@C1        ;SEE IF TRE IS SET
1287  004324  001414                     BEQ     FT4ERB            ;IF NOT: BR
1288  004326  004767  006116        FT4X JSR     PC,ITER           ;GO SEE IF ITERATION
1289  004332  000167  176600             JMP     TSCD2             ;RETURN TO SCHEDULAR
1290  004336  012767  015473  174402 FT4ER  MOV     #MSG32,ERADD      ;SET ERROR CODE
1291  004344  000407                     BR      FT4ERC
1292  004346  012767  015511  174372 FT4ERA. MOV     #MSG33,ERADD      ;SET ERROR CODE
1293  004354  000403                     BR      FT4ERC
1294  004356  012767  015526  174362 FT4ERB MOV     #MSG34.ERADD      ;SET ERROR CODE
1295  004364  000240                FT4ERC NOP
1296  004366  012767  004254  174376     MOV     #FT4,SCOLP        ;SET SCOPE ADDRESS
1297  004374  004767  177572             JSR     PC FT3ER          ;GO PRINT ERROR
1298  004400  000752                     BR      FT4X
```

```
 1299
 1300                                          ;RH11 SILO TEST 2:  IR/OR CHECK**********
 1301
 1302  004402  005767  174274          FT5     TST     RH17F           ;SEE IF RH70
 1303  004406  001066                          BNE     FT5X            ;IF SO: BR
 1304  004410  012767  017007  174270          MOV     #MSFT5,EMADDR   ;SET TEST HEADER
 1305  004416  012767  004424  174346          MOV     #FT5A,SCOLP     ;SET SCOPE ADDRESS
 1306  004424  004767  006076          FT5A    JSR     PC,INIT1        ;GO INIT
 1307  004430  032777  000100  174152          BIT     #100,@CS        ;SEE IF IR IS SET
 1308  004436  001005                          BNE     FT5B            ;IF SO- BR
 1309  004440  012767  015544  174300          MOV     #MSG35,ERADD    ;SET ERROR CODE
 1310  004446  004767  000122                  JSR     PC,FT5ER        ;GO DO ERROR
 1311  004452  032777  000200  174130  FT5B    BIT     #200,@CS        ;SEE IF OR IS RESET
 1312  004460  001405                          BEQ     FT5C            ;IF SO  BR
 1313  004462  012767  015571  174256          MOV     #MSG36,ERADD    ;SET ERROR CODE
 1314  004470  004767  000100                  JSR     PC,FT5ER        ;GO DO ERROR
 1315  004474  012777  000000  174120  FT5C    MOV     #0,@DB          ;LOAD ZERO INTO SILO
 1316  004502  032777  000200  174100          BIT     #200,@CS        ;SEE THAT OR RESET
 1317  004510  001405                          BEQ     FT5D            ;IF IT DOES  BR
 1318  004512  012767  015620  174226          MOV     #MSG37,ERADD    ;SET ERROR CODE
 1319  004520  004767  000050                  JSR     PC,FT5ER        ;GO DO ERROR
 1320  004524  012777  177777  174070  FT5D    MOV     #-1,@DB         ;LOAD SILO WITH -1
 1321  004532  012700  004000                  MOV     #4000,R0
 1322  004536  032777  000200  174044  FT5E    BIT     #200,@CS        ;SEE IF OR IS SET
 1323  004544  001007                          BNE     FT5X            ;IF SO.  BR
 1324  004546  005300                          DEC     R0
 1325  004550  001372                          BNE     FT5E            ;AWAIT OR
 1326  004552  012767  015620  174166          MOV     #MSG37,ERADD    ;SET ERROR CODE
 1327  004560  004767  000010                  JSR     PC,FT5ER        ;GO DO ERROR
 1328  004564  004767  005660          FT5X    JSR     PC,ITER         ;GO SEE IF ITERATION
 1329  004570  000167  176342                  JMP     TSCD2           ;RETURN TO SCHEDULAR
 1330  004574  004767  177372          FT5ER   JSR     PC,FT3ER        ;GO PRINT ERROR
 1331  004600  000240                          NOP
 1332  004602  000207                          RTS     PC              ;CONTINUE TEST
```

```
1333
1334                                                    ;RH11 SILO TEST 3: SILO DATA TEST**********
1335
1336  004604  005767  174072          FT6     TST     RH17F
1337  004610  001052                          BNE     FT6X            ;IF RH70: BR
1338  004612  012767  017037  174066          MOV     #MSFT6,EMADDR   ;SET TEST HEADER
1339  004620  012767  004626  174144          MOV     #FT6A,SCOLP     ;SET SCOPE ADDRESS
1340  004626  004767  005674          FT6A    JSR     PC,INIT1        ;GO INIT
1341  004632  005000                          CLR     R0              ;PRESET DATA
1342  004634  010077  173762          FT6B    MOV     R0,@DB          ;LOAD SILO
1343  004640  005200                          INC     R0              ;BUMP DATA
1344  004642  022700  000102                  CMP     #102,R0         ;SEE IF FILLED ALL
1345  004646  001372                          BNE     FT6B            ;IF NOT: BR
1346  004650  032777  000100  173732          BIT     #100,@CS        ;SEE IF IR IS RESET
1347  004656  001405                          BEQ     FT6C            ;IF SO: BR
1348  004660  012767  015731  174060          MOV     #MSG40,ERADD    ;SET ERROR CODE
1349  004666  004767  000054                  JSR     PC,FT6ER        ;GO DO ERROR
1350  004672  032777  000200  173710  FT6C    BIT     #200,@CS        ;SEE IF OR IS SET
1351  004700  001005                          BNE     FT6D            ;IF SO. BR
1352  004702  012767  015657  174036          MOV     #MSG38,ERADD    ;SET ERROR CODE
1353  004710  004767  000032                  JSR     PC,FT6ER        ;GO DO ERROR
1354  004714  005000                  FT6D    CLR     R0              ;PRESET DATA
1355  004716  017701  173700          FT6E    MOV     @DB,R1          ;READ SILO
1356  004722  020001                          CMP     R0 R1           ;SEE IF EXPT=RCVD
1357  004724  001014                          BNE     FT6DE           ;IF NOT  BR
1358  004726  005200                          INC     R0              ;BUMP DATA
1359  004730  022700  000102                  CMP     #102,R0         ;SEE IF DONE ALL
1360  004734  001370                          BNE     FT6E            ;IF NOT  BR
1361  004736  004767  005506          FT6X    JSR     PC,ITER         ;GO SEE IF ITERATION
1362  004742  000167  176170                  JMP     TSCD2           ;RETURN TO SCHEDULAR
1363  004746  000240                  FT6ER   NOP
1364  004750  004767  177216                  JSR     PC,FT3ER        ;GO PRINT ERROR
1365  004754  000207                          RTS     PC              ;RETURN
1366  004756  000240                  FT6DE   NOP
1367  004760  032777  020000  173652          BIT     #20000,@SWR     ;SEE IF PRINT ERROR
1368  004766  001032                          BNE     FT6DEB          ;IF NOT  BR
1369  004770  005767  173710                  TST     HDRFL           ;SEE IF DONE HEADER
1370  004774  016701  173706                  MOV     EMADDR,R1
1371  005000  004767  006150                  JSR     PC,TTOUT        ;PRINT HEADER
1372  005004  005267  173674                  INC     HDRFL           ;SET FLAG
1373  005010  012704  015711          FT6DEA  MOV     #MSG39,R4
1374  005014  004767  006134                  JSR     PC,TTOUT        ;PRINT SILO READ ERROR
1375  005020  012704  015256                  MOV     #MSG22,R4
1376  005024  004767  006124                  JSR     PC,TTOUT        ;PRINT EXPT TAG
1377  005030  010003                          MOV     R0,R3
1378  005032  004767  006262                  JSR     PC,OCTP         ;PRINT EXPT
1379  005036  012704  015266                  MOV     #MSG23,R4
1380  005042  004767  006106                  JSR     PC,TTOUT        ;PRINT RCVD TAG
1381  005046  010103                          MOV     R1,R3
1382  005050  004767  006244                  JSR     PC,OCTP         ;PRINT RCVD
1383  005054  005777  173560          FT6DEB  TST     @SWR            ;SEE IF HALT ON ERROR
1384  005060  100001                          BPL     FT6DEX          ;IF NOT. BR
1385  005062  000000                          HALT
1386  005064  004767  006660          FT6DEX  JSR     PC,CKSWR                ;CHECK FOR CNTL G
1387  005070  000207                          RTS     PC              ;RETURN TO TEST
```

```
 1388
 1389                                          ;RH11 SILO TEST 4:  SILO OVERFLOW**********
 1390
 1391  005072  005767  173604          FT7     TST     RH17F
 1392  005076  001021                          BNE     FT7X            ;IF RH70. BR
 1393  005100  012767  017067  173600          MOV     #MSFT7,EMADDR   ;SET TEST HEADER
 1394  005106  012767  005072  173656          MOV     #FT7,SCOLP      ;SET SCOPE ADDRESS
 1395  005114  004767  005406                  JSR     PC,INIT1        ;GO INIT
 1396  005120  012700  000103                  MOV     #103,R0         ;SET SIZE OF SILO +1
 1397  005124  010077  173472          FT7A    MOV     R0,@DB          ;LOAD SILO
 1398  005130  005300                          DEC     R0              ;SEE IF DONE
 1399  005132  001374                          BNE     FT7A            ;IF NOT BR
 1400  005134  005777  173450                  TST     @CS             ;SEE IF DLT IS SET
 1401  005140  100004                          BPL     FT7ER           ;IF NOT  BR
 1402  005142  004767  005302          FT7X    JSR     PC,ITER         ;GO SEE IF ITERATION
 1403  005146  000167  175764                  JMP     TSCD2           ;RETURN TO SCHEDULAR
 1404  005152  012767  015473  173566  FT7ER   MOV     #MSG32,ERADD    ;SET ERROR CODE
 1405  005160  004767  177006                  JSR     PC,FT3ER        ;GO DO ERROR
 1406  005164  000766                          BR      FT7X
```

```
1407
1408                                        ;RH11 SILO TEST 5:  SILO RESET**********
1409
1410  005166  005767  173510          FT10    TST     RH17F
1411  005172  001034                          BNE     FT10X           ;IF RH70:  BR
1412  005174  012767  017117  173504          MOV     #MSFT10,EMADDR  ;SET TEST HEADER
1413  005202  012767  005166  173562          MOV     #FT10,SCOLP     ;SET SCOPE ADDRESS
1414  005210  012777  000040  173372          MOV     #40,@CS         ;INITIALIZE
1415  005216  012700  000004                  MOV     #4,R0           ;SET NUMBER OF SILO WRITER
1416  005222  010077  173374          FT10A   MOV     R0,@DB          ;WRITE SILO
1417  005226  005300                          DEC     R0              ;SEE IF DONE
1418  005230  001374                          BNE     FT10A           ;IF NOT.  BR
1419  005232  052777  000040  173350          BIS     #40,@CS         ;INITIALIZE
1420  005240  012777  177777  173354          MOV     #-1,@DB         ;WRITE SILO
1421  005246  017701  173350                  MOV     @DB,R1          ;READ SILO 1
1422  005252  017701  173344                  MOV     @DB,R1          ;READ SILO 2
1423  005256  005777  173326                  TST     @CS             ;SEE IF DLT IS SET
1424  005262  100011                          BPL     FT10ER          ;IF NOT:  BR
1425  005264  004767  005160          FT10X   JSR     PC,ITER         ;GO SEE IF ITERATION
1426  005270  005767  173530                  TST     RH0F            ;SEE IF RH11 ONLY
1427  005274  001402                  .       BEQ     FT10XX          ;IF NOT  BR
1428  005276  000167  175754                  JMP     TEND            ;ELSE GO TO END
1429  005302  000167  175630          FT10XX  JMP     TSCD2           ;RETURN TO SCHEDULAR
1430  005306  012767  015473  173432  FT10ER  MOV     #MSG32,ERADD    ;SET ERROR CODE
1431  005314  004767  176652                  JSR     PC,FT3ER        ;GO DO ERROR
1432  005320  000761                          BR      FT10X
```

```
                                                ;NOP TEST*****
                                        FT11    NOP
005322  000240                                    NOP
005324  012767  005322  173440                    MOV     #FT11,SCOLP     ;SET SCOPE ADDRESS
005332  004767  005170                            JSR     PC,INIT1
005336  012767  000300  173450                    MOV     #300,UDES       ;SET TC= ALL NRZ,NORM,ODD
005344  012767  177777  173344                    MOV     #-1,FCNT        ;SET FC= ALL OVER
005352  012767  177777  173340                    MOV     #-1,WCNT        ;SET WC= ALL OVER
005360  012767  177777  173326                    MOV     #-1,BADDR       ;SET BA= ALL OVER
005366  012767  000001  173340                    MOV     #1,RDYDX        ;SET DELAY
005374  012767  000001  173334                    MOV     #1,OPDYX        ;SET OP DELAY
005402  012767  000001  173376                    MOV     #1,FUN          ;SET NOP FUNCTIONS CODE
005410  004767  003760                            JSR     PC,EXEC         ;GO EXECUTE COMMAND
005414  000240                                    NOP
005416  012767  017150  173262                    MOV     #MSFT11,EMADDR
005424  004767  004174                            JSR     PC,ERCHK        ;GO CHECK REGISTER
005430  004767  005014                            JSR     PC,ITER         ;GO SEE IF ITERATIONS
005434  000167  175476                            JMP     TSCD2           ;RETURN TO SCHEDULAR
```

```
1451                                                ,REWIND TEST*****
1452
1453  005440  000240                        FT12    NOP
1454  005442  012767  005440  173322                MOV     #FT12,SCOLP
1455  005450  004767  005052                        JSR     PC,INIT1        ;GO INITIALIZE
1456  005454  052777  001700  173150                BIS     #1700,@TC       ,SET TO NRZ,NORMAL
1457  005462  012767  177760  173226                MOV     #-20,FCNT       ;SET FC=20
1458  005470  012767  177770  173222                MOV     #-10,WCNT       ;SET WC=10
1459  005476  012767  017630  173210                MOV     #WDATA,BADDR    ;SET BA=WRITE BUFFER
1460  005504  012767  000007  173274                MOV     #7,FUN          ;SET REWIND OP CODE
1461  005512  004767  003656                        JSR     PC,EXEC         ,GO EXECUTE COMMAND
1462  005516  000240                                NOP
1463  005520  032777  020000  173064  FT12A         BIT     #20000,@DS
1464  005526  001374                                BNE     FT12A           ,AWAIT PIP
1465  005530  012767  017170  173150                MOV     #MSFT12,EMADDR
1466  005536  004767  004062                        JSR     PC,ERCHK        ,GO CHECK FOR ERROR
1467  005542  004767  004702                        JSR     PC,ITER         ,GO SEE IF ITERATION
1468  005546  000167  175364                        JMP     TSCD2           ,RETURN TO SCHEDULAR
1469
```

```
1470                                            ;WRITE/READ TEST*****
1471
1472  005552  000240                    FT13    NOP
1473  005554  012767  000001  173152            MOV     #1,RDYDX
1474  005562  012767  000001  173146            MOV     #1,OPDYX
1475  005570  012767  000100  173124            MOV     #100,RCNT       ;SET RECORD COUNT
1476  005576  012767  017213  173102            MOV     #MSFT13,EMADDR  ;SET TEST HEADER
1477  005604  012767  000001  173204            MOV     #1,PATRN
1478  005612  004767  004414                    JSR     PC,DSUP         ;SET UP ALL ONES DATA PATTERN
1479  005616  012767  000300  173170            MOV     #300,UDES       ;REWIND TO BOT
1480  005624  004767  003676            FT13A   JSR     PC,RWND         ;SET 200 BPI, NORMAL
1481  005630  012767  177600  173060            MOV     #-200,FCNT      ;SET FC
1482  005636  012767  177700  173054            MOV     #-100,WCNT      ;SET WC
1483  005644  012767  017630  173042            MOV     #WDATA,BADDR    ,SET BA
1484  005652  012767  000061  173126            MOV     #61,FUN         ,SET WRITE OP-CODE
1485  005660  012767  015072  173036            MOV     #MSG12,ERRP
1486  005666  004767  003502            FT13B   JSR     PC,EXEC         ,GO EXECUTE COMMAND
1487  005672  005067  173074                    CLR     SCOLP           ;NO SCOPE LOOP
1488  005676  004767  003722                    JSR     PC,ERCHK        ,GO CHECK ERROR
1489  005702  005367  173014                    DEC     RCNT            ,SEE IF DONE ALL
1490  005706  001367                            BNE     FT13B           ,IF NOT: BR
1491  005710  012767  000100  173004            MOV     #100,RCNT       ,SET RECORD COUNT
1492  005716  012767  021342  172770            MOV     #RDATA,BADDR
1493  005724  062767  000200  172762            ADD     #200,BADDR      ,SET BA
1494  005732  012767  000077  173046            MOV     #77,FUN         ,SET READ REVERSE OP-CPDE
1495  005740  012767  015110  172756            MOV     #MSG13,ERRP
1496  005746  004767  003422            FT13C   JSR     PC,EXEC         ,GO EXECUTE COMMAND
1497  005752  004767  003646                    JSR     PC,ERCHK        ,GO CHECK ERROR
1498  005756  005367  172740                    DEC     RCNT            ,SEE IF READ ALL
1499  005762  001371                            BNE     FT13C           ,IF NOT BR
1500  005764  162767  000200  172722            SUB     #200,BADDR      ,SET BA
1501  005772  012767  000071  173006            MOV     #71,FUN         ,SET READ FORWARD OP-CODE
1502  006000  012767  015135  172716            MOV     #MSG14,ERRP
1503  006006  012767  000100  172706            MOV     #100,RCNT       ,SET RECORD COUNT
1504  006014  004767  003354            FT13D   JSR     PC,EXEC         ,GO EXECUTE COMMAND
1505  006020  004767  003600                    JSR     PC,ERCHK        ,GO CHECK ERRORS
1506  006024  005367  172672                    DEC     RCNT            ,SEE IF DONE ALL
1507  006030  001371                            BNE     FT13D           ,IF NOT BR
1508  006032  032767  002000  172754            BIT     #2000,UDES      ,SEE IF DONE PE
1509  006040  001017                            BNE     FT13X           ,IF SO: BR
1510  006042  062767  000400  172744            ADD     #400,UDES       ,SELECT NEXT DENSITY
1511  006050  032767  002000  172736            BIT     #2000,UDES      ,SEE IF PE
1512  006056  001403                            BEQ     FT13E           ,IF NOT  BR
1513  006060  005767  172736                    TST     NRZOF           ,SEE IF NRZ ONLY
1514  006064  001005                            BNE     FT13X           ,IF SO. BR
1515  006066  012767  000100  172626    FT13E   MOV     #100,RCNT       ,RESET RECORD COUNT
1516  006074  000167  177524                    JMP     FT13A           ,GO DO NEXT DENSITY
1517  006100  000167  175032            FT13X   JMP     TSCD2           ,RETURN TO SCHEDULAR
```

```
                                                        ;SPACE TEST*****
                                                FT14    NOP
006104  000240                                        
006106  012767  017242  172572                        MOV     #MSFT14,EMADDR  ;SET TEST HEADER
006114  012767  001700  172672                        MOV     #1700,UDES      ;SET NRZ,NORMAL
006122  004767  003400                        FT14A1  JSR     PC,RWND         ;GO INITIALIZE
006126  012767  000100  172566                        MOV     #100,RCNT       ;SET NUMBER OF RECORDER
006134  012767  177777  011466                        MOV     #-1,WDATA       ;SET DATA PATTERN
006142  012767  177700  172546                        MOV     #-100,FCNT      ;PRESET FRAME CNT
006150  012767  177740  172542                        MOV     #-40,WCNT       ;PRESET WORD CNT
006156  004767  004344                        FT14A   JSR     PC,INIT1        ;GO REWIND
006162  012767  001000  172546                        MOV     #1000,OPDYX
006170  012767  040000  172536                        MOV     #40000,RDYDX
006176  012767  000061  172602                        MOV     #61,FUN         ;SET WRITE OP-CODE
006204  012767  102300  172544                        MOV     #102300,STMSK   ;MASK DATA RELATED ERRORS
006212  052777  000010  172370                        BIS     #10,@CS         ;INHIBIT BUS ADDRESS INCREMENT
006220  004767  003150                                JSR     PC,EXEC         ;GO EXECUTE COMMAND
006224  000240                                        NOP
006226  012767  016145  172470                        MOV     #MSG46,ERRP     ;SET ERROR CODE
006234  004767  003364                                JSR     PC,ERCHK        ;GO CHECK ERRORS
006240  005767  172544                                TST     SERFL           ;SEE IF ERROR
006244  001402                                        BEQ     FT14A2          ;IF NOT  BR
006246  000167  000466                                JMP     FT14X           ;ELSE EXIT
006252  162767  000001  172436                FT14A2  SUB     #1 FCNT         ;BUMP FC
006260  032767  000001  172430                        BIT     #1,FCNT         ;SEE IF SHOULD BUMP WC
006266  001403                                        BEQ     FT14A3          ;IF NOT  BR
006270  162767  000001  172422                        SUB     #1,WCNT         ;BUMP WC
006276  005367  172420                        FT14A3  DEC     RCNT            ;SEE IF DONE ALL
006302  001325                                        BNE     FT14A           ;WRITE ALL RECORDS
006304  000240                                        NOP
006306  012767  000100  172414                        MOV     #100,RRD        ;PRESET RECORD POSITION
006314  012767  000176  172410                        MOV     #176,RFD
006322  000240                                        NOP
006324  012767  177701  172406                        MOV     #-77,SCNT       ;SET SPACE AMOUNT
006332  012767  000033  172446                FT14B   MOV     #33,FUN         ;SET OP-CODE SPACE REVERSE
006340  004767  003030                                JSR     PC,EXEC         ;GO EXECUTE COMMAND
006344  012767  016216  172352                        MOV     #MSG48,ERRP     ;SET ERROR CODE
006352  004767  003246                                JSR     PC,ERCHK        ;GO CHECK ERRORS
006356  005767  172426                                TST     SERFL           ;SEE IF ERROR
006362  001166                                        BNE     FT14X           ;IF SO  BR
006364  004767  000070                                JSR     PC,FT14RR       ;GO READ REVERSE + CHECK DATA
006370  000240                                        NOP
006372  012767  000031  172406                        MOV     #31,FUN         ;SET SPACE FORWARD OP-CODE
006400  005267  172334                                INC     SCNT            ;SET SPACE AMOUNT
006404  001555                                        BEQ     FT14X           ;IF DONE  BR
006406  004767  002762                                JSR     PC,EXEC         ;GO EXECUTE COMMAND
006412  012767  016171  172304                        MOV     #MSG47,ERRP     ;SET ERROR CODE
006420  004767  003200                                JSR     PC,ERCHK        ;GO CHECK ERROR
006424  005767  172360                                TST     SERFL           ;SEE IF ERROR FLAG
006430  001143                                        BNE     FT14X           ;IF NO  BR
006432  004767  000064                                JSR     PC,FT14RF       ;GO READ FORWARD FOR POSITION CHECK
006436  000240                                        NOP
006440  005267  172274                                INC     SCNT            ;DECREMENT SPACE AMOUNT
006444  001535                                        BEQ     FT14X           ;IF DONE  BR
006446  005267  172256                                INC     RRD             ;BUMP DATA EXPT
006452  005367  172254                                DEC     RFD             ;BUMP DATA EXPT
```

```
 1574  006456  000725                        BR      FT14B
 1575  006460  000240                FT14RR  NOP
 1576  006462  012767  021342  172224        MOV     #RDATA,@BADDR   ;SET BA
 1577  006470  012767  000077  172310        MOV     #77,FUN         ;SET READ REVERSE OP-CODE
 1578  006476  004767  002672                JSR     PC,EXEC         ;GO EXECUTE COMMAND
 1579  006502  000240                        NOP
 1580  006504  016705  172220                MOV     RRD,R5
 1581  006510  020577  172072                CMP     R5,@FC          ;SEE IF CORRECT RECORD
 1582  006514  001020                        BNE     FT14RER         ;IF NOT  BR
 1583  006516  000167  000026                JMP     FT14EC          ;GO CLEAR RH11 ERROR BIT
 1584  006522  000240                FT14RF  NOP
 1585  006524  012767  000071  172254        MOV     #71,FUN         ;SET READ FORWARD OP-CODE
 1586  006532  004767  002636                JSR     PC,EXEC         ;GO EXECUTE COMMAND
 1587  006536  016705  172170                MOV     RFD,R5
 1588  006542  020577  172040                CMP     R5,@FC          ;SEE IF CORRECT RECORD
 1589  006546  001003                        BNE     FT14RER         ;IF NOT  BR
 1590  006550  004767  003752        FT14EC  JSR     PC,INIT1        ;CLEAR RH
 1591  006554  000207                        RTS     PC              ;RETURN
 1592  006556  000240                FT14RER  NOP
 1593  006560  032777  020000  172052        BIT     #20000,@SWR     ;SEE IF PRINT INHIBITED
 1594  006566  001060                        BNE     FT14R3          ;IF SO  BR
 1595  006570  012704  017242                MOV     #MSFT14,R4
 1596  006574  004767  004354                JSR     PC,TTOUT        ;PRINT HEADER
 1597  006600  012704  015010                MOV     #MSG9,R4
 1598  006604  004767  004344                JSR     PC,TTOUT        ;PRINT ERROR TYPE
 1599  006610  012704  015243                MOV     #MSG20,R4       ;SET NRZ TAG POINTER
 1600  006614  032767  002000  172172        BIT     #2000,UDES      ;SEE IF PE
 1601  006622  001402                        BEQ     FT14R0          ;IF NOT  BR
 1602  006624  012704  015251                MOV     #MSG21,R4       ;ELSE SET PE TAG POINTER
 1603  006630  004767  004320        FT14R0  JSR     PC,TTOUT        ;PRINT TAG
 1604  006634  032767  000002  172144        BIT     #2,FUN          ;SEE IF READ REVERSE
 1605  006642  001003                        BNE     FT14R1          ;IF SO  BR
 1606  006644  012704  015223                MOV     #MSG17,R4
 1607  006650  000402                        BR      FT14R2          ;GO PRINT
 1608  006652  012704  015203        FT14R1  MOV     #MSG16,R4
 1609  006656  004767  004272        FT14R2  JSR     PC,TTOUT        ;PRINT FRWD/REV
 1610  006662  012704  015256                MOV     #MSG22,R4
 1611  006666  004767  004262                JSR     PC,TTOUT        ;PRINT EXPT TAG
 1612  006672  010503                        MOV     R5,R3
 1613  006674  042703  177700                BIC     #177700,R3      ;MASK RECORD NUMBER
 1614  006700  004767  004414                JSR     PC,OCTP         ;PRINT EXPT RECORD NUMBER
 1615  006704  012704  015266                MOV     #MSG23,R4
 1616  006710  004767  004240                JSR     PC,TTOUT        ;PRINT RCVD TAG
 1617  006714  017703  171666                MOV     @FC,R3
 1618  006720  042703  177700                BIC     #177700,R3      ;MASK RECORD NUMBER
 1619  006724  004767  004370                JSR     PC,OCTP         ;PRINT ACTUAL RECORD NUMBER
 1620  006730  005777  171704        FT14R3  TST     @SWR            ;SEE IF HALT ON ERROR
 1621  006734  100001                        BPL     FT14X           ;IF NOT  BR
 1622  006736  000000                        HALT
 1623  006740  004767  005004        FT14X   JSR     PC,CKSWR                ;CHECK FOR CNTL G
 1624  006744  005767  172052                TST     NRZOF           ;SEE IF NRZ ONLY
 1625  006750  001011                        BNE     FT14XX          ;IF SO  BR
 1626  006752  032767  002000  172034        BIT     #2000,UDES      ;SEE IF DONE PE
 1627  006760  001005                        BNE     FT14XX          ;IF SO  BR
 1628  006762  012767  002300  172024        MOV     #2300,UDES      ;SET TO PE
 1629  006770  000167  177126                JMP     FT14A1          ;DO IN PE
```

```
  1630  006774  000167  174136          FT14XX  JMP     TSCD2           ;RETURN TO SCHEDULAR
```

```
1631                                            ;ERASE TEST*****
1632
1633  007000  000240                    FT15    NOP
1634  007002  005067  171750                    CLR     STMSK
1635  007006  012767  000100  171720            MOV     #100,RDYDX
1636  007014  012767  000010  171714            MOV     #10,OPDYX
1637  007022  012767  017264  171656            MOV     #MSFT15,EMADDR  ;SET TEST HEADER
1638  007030  004767  002472                    JSR     PC,RWND         ;REWIND
1639  007034  012767  021342  171652            MOV     #RDATA,BADDR    ;SET BA
1640  007042  012767  001700  171744            MOV     #1700,UDES      ;SET NRZ, NORMAL
1641  007050  012767  000025  171730  FT15A     MOV     #25,FUN         ;SET ERASE OP-CODE
1642  007056  012767  000200  171636            MOV     #200,RCNT       ;SET TO ERASE 128 TIMES
1643  007064  004767  002304          FT15B     JSR     PC,EXEC         ;GO EXECUTE COMMAND
1644  007070  012767  016145  171626            MOV     #MSG46,ERRP     ;SET ERROR CODE
1645  007076  004767  002522                    JSR     PC,ERCHK        ;GO CHECK ERRORS
1646  007102  005767  171702                    TST     SERFL           ;SEE IF ANY ERRORS
1647  007106  001032                            BNE     FT15X           ;IF SO EXIT
1648  007110  005367  171606                    DEC     RCNT            ;SEE IF DONE ERASING
1649  007114  001363                            BNE     FT15B           ;IF NOT  BR
1650  007116  000240                            NOP
1651  007120  004767  002402                    JSR     PC,RWND         ;REWIND
1652  007124  012767  177600  171566            MOV     #-200,WCNT      ;SET WC
1653  007132  012767  000071  171646            MOV     #71,FUN         ;SET READ FORWARD OP-CODE
1654  007140  012767  000040  171566            MOV     #40,RDYDX       ;SET DELAY
1655  007146  004767  002222                    JSR     PC,EXEC         ;GO EXECUTE COMMAND
1656  007152  000240                            NOP
1657  007154  012767  016541  171542            MOV     #MSG60,ERRP     ;SET ERROR CODE
1658  007162  012767  020000  171566            MOV     #20000,STMSK
1659  007170  004767  002430                    JSR     PC,ERCHK        ;GO CHECK ERRORS
1660  007174  000167  173736          FT15X     JMP     TSCD2           ;RETURN TO SCHEDULAR
```

```
1661                                            ;TAPE MARK WRITE/READ TEST*****
1662
1663  007200  000240                    FT16    NOP
1664  007202  012767  000001  171524            MOV     #1,RDYDX
1665  007210  012767  001000  171520            MOV     #1000,OPDYX
1666  007216  012767  017306  171462            MOV     #MSFT16,EMADDR  ;SET HEADER
1667  007224  012767  001700  171562            MOV     #1700,UDES      ;SET TO NRZ,NORMAL,ODD
1668  007232  004767  002270            FT16A:  JSR     PC,RWND         ;REWIND
1669  007236  012767  177760  171452  FT16B     MOV     #-20,FCNT       ;FC=20
1670  007244  012767  177770  171446            MOV     #-10,WCNT       ;WC=10
1671  007252  012767  000027  171526            MOV     #27,FUN         ;SET WRITE TAPE MARK OP-CODE
1672  007260  004767  002110                    JSR     PC,EXEC         ;GO EXECUTE COMMAND
1673  007264  012767  001000  171464            MOV     #1000,STMSK     ;SET FOR FCE MASK
1674  007272  012767  015072  171424            MOV     #MSG12,ERRP     ;SET ERROR CODE
1675  007300  004767  002320                    JSR     PC,ERCHK        ;GO CHECK ERROR
1676  007304  004767  002662                    JSR     PC,TMCHK        ;GO SEE IF TM SET
1677  007310  012767  000077  171470            MOV     #77,FUN         ;SET USED REVERSE OP-CODE
1678  007316  004767  002052                    JSR     PC,EXEC         ;GO EXECUTE COMMAND
1679  007322  012767  001000  171426            MOV     #1000,STMSK     ;SET FCE ERROR MASK
1680  007330  012767  015110  171366            MOV     #MSG13,ERRP     ;SET ERROR CODE
1681  007336  004767  002262                    JSR     PC,ERCHK        ;GO CHECK ERRORS
1682  007342  004767  002624                    JSR     PC TMCHK        ;GO SEE IF TM SET
1683  007346  012767  000071  171432            MOV     #71,FUN         ;SET READ  FORWARD OP-CODE
1684  007354  004767  002014                    JSR     PC EXEC         ;GO EXECUTE COMMAND
1685  007360  012767  015135  171336            MOV     #MSG14,ERRP     ;SET ERROR CODE
1686  007366  004767  002232                    JSR     PC,ERCHK        ;TO CHECK ERRORS
1687  007372  004767  002574                    JSR     PC,TMCHK        ;GO SEE IF TM SET
1688  007376  032767  002000  171410            BIT     #2000,UDES      ;SEE IF DONE PE
1689  007404  001012                            BNE     FT16X           ;IF SO  BR
1690  007406  005767  171410                    TST     NRZOF           ;SEE IF NRZ ONLY
1691  007412  001007                            BNE     FT16X           ;IF SO  BR
1692  007414  012767  002300  171372            MOV     #2300,UDES      ;SET PE, NORMAL
1693  007422  004767  003100                    JSR     PC,INIT1        ;INITIALIZE
1694  007426  000167  177604                    JMP     FT16B           ;DO IN PE
1695  007432  004767  003012            FT16X   JSR     PC,ITER         ;DO ITERATIONS
1696  007436  000167  173474                    JMP     TSCD2           ;RETURN TO SCHEDULAR
1697
```

```
1698
1699                                        ;TAPE MARK SPACE TEST**********
1700
1701  007442  005067  171254          FT17:   CLR     RCNT
1702  007446  012767  017347  171232          MOV     #MSFT17,EMADDR  ;SET HEADER
1703  007454  012767  001700  171332          MOV     #1700,UDES      ;SET TO NRZ
1704  007462  004767  002040          FT17A   JSR     PC,RWND         ;REWIND TAPE
1705  007466  012767  000027  171312  FT17B   MOV     #27,FUN
1706  007474  012767  040000  171232          MOV     #40000,RDYDX    ;SET DRY DELAY
1707  007502  012767  040000  171226          MOV     #40000,OPDYX    ;SET OP DELAY
1708  007510  004767  001660                  JSR     PC,EXEC         ;GO WRITE TM
1709  007514  012767  102300  171234          MOV     #102300,STMSK   ;MASK DATA RELATED ERRORS
1710  007522  012767  015162  171174          MOV     #MSG15,ERRP     ;SET ERROR TYPE
1711  007530  004767  002070                  JSR     PC,ERCHK        ;GO CHECK ERROR
1712  007534  005767  171250                  TST     SERFL           ;SEE IF ERROR
1713  007540  001144                          BNE     FT17X           ;IF SO. BR
1714  007542  004767  002424                  JSR     PC,TMCHK        ;GO SEE IF TM SET
1715  007546  000240                          NOP
1716  007550  000240                          NOP
1717  007552  032767  000100  171142          BIT     #100,RCNT       ;SEE IF DONE PATTERN
1718  007560  001046                          BNE     FT17D           ;IF SO: BR
1719  007562  062767  000020  171132          ADD     #20,RCNT        ;ADD 20 TO RECORD COUNT
1720  007570  016767  171126  171152          MOV     RCNT,TEMP1      ;SAVE RECORD COUNT
1721  007576  012767  177600  171114          MOV     #-200,WCNT      ;WC=128
1722  007604  012767  177400  171104          MOV     #-400,FCNT      ;FC=256
1723  007612  012767  017630  171074          MOV     #WDATA,BADDR    ;BA=WRITE BUFFER
1724  007620  012767  000061  171160          MOV     #61,FUN         ;SET WRITE OP CODE
1725  007626  000240                  FT17C   NOP
1726  007630  000240                          NOP
1727  007632  004767  001536                  JSR     PC,EXEC         ;GO WRITE
1728  007636  012767  015072  171060          MOV     #MSG12,ERRP     ;SET ERROR CODE
1729  007644  012767  102300  171104          MOV     #102300,STMSK   ;MASK DATA RELATED ERRORS
1730  007652  004767  001746                  JSR     PC,ERCHK        ;GO CHECK ERROR
1731  007656  005767  171126                  TST     SERFL           ;SEE IF ERROR
1732  007662  001073                          BNE     FT17X           ;IF SO: BR
1733  007664  005367  171060                  DEC     TEMP1           ;SEE IF DONE ALL
1734  007670  001356                          BNE     FT17C           ;IF NOT  BR
1735  007672  000167  177570                  JMP     FT17B           ;ELSE GO DO TM
1736  007676  000240                  FT17D   NOP
1737  007700  012767  000033  171100          MOV     #33,FUN         ;SET SPACE REVERSE
1738  007706  012767  015203  171010          MOV     #MSG16,ERRP     ;SET ERROR CODE
1739  007714  012767  177600  171016  FT17D1  MOV     #-200,SCNT      ;SET TO 200 RECORDS
1740  007722  012767  000005  170772          MOV     #5,RCNT         ;SET NUMBER OF OPS TO DO
1741  007730  004767  002572          FT17E   JSR     PC,INIT1        ;GO INIT
1742  007734  004767  001434                  JSR     PC,EXEC         ;GO SPACE
1743  007740  012767  001000  171010          MOV     #1000,STMSK     ;SET ERROR MASK
1744  007746  004767  001652                  JSR     PC,ERCHK        ;GO CHECK ERROR
1745  007752  005767  171032                  TST     SERFL           ;SEE IF ERROR
1746  007756  001035                          BNE     FT17X           ;IF SO: BR
1747  007760  004767  002206                  JSR     PC,TMCHK        ;GO SEE IF TM SET
1748  007764  005367  170732                  DEC     RCNT            ;SEE IF DONE SPACES
1749  007770  001357                          BNE     FT17E           ;IF NOT  BR
1750  007772  022767  000031  171006          CMP     #31,FUN         ;SEE IF DONE FORWARD
1751  010000  001410                          BEQ     FT17F           ;IF SO  BR
1752  010002  012767  015223  170714          MOV     #MSG17,ERRP     ;SET ERROR CODE
1753  010010  012767  000031  170770          MOV     #31,FUN         ;SET TO SPACE FORWARD
```

```
 1754  010016  000167  177672                    JMP     FT17D1          ,DO FORWARD
 1755  010022  032767  002000  170764  FT17F     BIT     #2000,UDES      ,SEE IF DONE PE
 1756  010030  001010                            BNE     FT17X           ,IF SO. BR
 1757  010032  005767  170764                    TST     NRZOF           ,SEE IF NRZ ONLT
 1758  010036  001005                            BNE     FT17X           ,IF SO  BR
 1759  010040  012767  002300  170746            MOV     #2300,UDES      ,SET TO PE
 1760  010046  000167  177410                    JMP     FT17A           ,GO PE
 1761  010052  000167  173060          FT17X     JMP     TSCD2           ,RETURN  TO SCHEDULAR
```

```
1762
1763                                        ,WRITE CHECK TEST**********
1764
1765  010056  000240                  FT20:   NOP
1766  010060  012767  017375  170620          MOV     #MSFT20,EMADDR  ;SET HEADER
1767  010066  004767  001434                  JSR     PC,RWND         ;REWIND
1768  010072  012767  000003  170716          MOV     #3,PATRN
1769  010100  004767  002126                  JSR     PC,DSUP         ;GO SET PATTERN 3
1770  010104  012767  017630  170602          MOV     #WDATA,BADDR    ;SET BA
1771  010112  012767  177400  170576          MOV     #-400,FCNT      ;SET FC
1772  010120  012767  177600  170572          MOV     #-200,WCNT      ;SET WC
1773  010126  012767  001700  170660          MOV     #1700,UDES      ;SET NRZ NORMAL
1774  010134  012767  000061  170644  FT20A:  MOV     #61,FUN         ;SET WRITE OP CODE
1775  010142  004767  001226                  JSR     PC,EXEC         ,GO WRITE RECORD
1776  010146  012767  016145  170550          MOV     #MSG46,ERRP     ;SET ERROR CODE
1777  010154  004767  001444                  JSR     PC,ERCHK        ;GO CHECK ERROR
1778  010160  005767  170624                  TST     SERFL           ,SEE IF ERORR
1779  010164  001050                          BNE     FT20X           ,IF SO: BR
1780  010166  012767  015203  170530          MOV     #MSG16,ERRP     ,SET REVERSE ERROR TAG
1781  010174  012767  000057  170604          MOV     #57,FUN         ,SET REVERSE WRITE CHECK OP-CODE
1782  010202  062767  000376  170504          ADD     #376,BADDR      ;SET BA FOR REVERSE CHECK
1783  010210  004767  001160                  JSR     PC,EXEC         ;GO DO REVERSE CHECK
1784  010214  004767  001404                  JSR     PC,ERCHK        ;GO CHECK ERROR
1785  010220  012767  015223  170476  FT20B:  MOV     #MSG17,ERRP     ,SET FORWARD TAG
1786  010226  012767  000051  170552          MOV     #51,FUN         ,SET FORWARD CHECK OP CODE
1787  010234  162767  000376  170452          SUB     #376,BADDR      ,SET BA FOR FORWARD CHECK
1788  010242  004767  001126                  JSR     PC,EXEC         ,GO DO FORWARD CHECK
1789  010246  004767  001352                  JSR     PC,ERCHK        ,GO CHECK ERROR
1790  010252  032767  002000  170534  FT20C:  BIT     #2000,UDES      ,SEE IF DONE PE
1791  010260  001012                          BNE     FT20X           ,IF SO  BR
1792  010262  005767  170534                  TST     NRZOF           ,SEE IF NRZ ONLY
1793  010266  001007                          BNE     FT20X           ,IF SO  BR
1794  010270  012767  002300  170516          MOV     #2300,UDES      ,ELSE SET PE
1795  010276  004767  002224                  JSR     PC,INIT1        ,GO INIT
1796  010302  000167  177626                  JMP     FT20A           ,DO IN PE
1797  010306  004767  002136          FT20X:  JSR     PC,ITER         ,DO ITERATIONS
1798  010312  000167  172620                  JMP     TSCD2           ,RETURN TO SCHEDULAR
```

```
 1799
 1800                                          ,ERASE HEAD TEST*****
 1801
 1802  010316  012767  017426  170362  FT21.   MOV     #MSFT21,EMADDR  ;SET TEST HEADER
 1803  010324  004767  001176                  JSR     PC,RWND         ;GO REWIND
 1804  010330  012767  000003  170460          MOV     #3,PATRN
 1805  010336  004767  001670                  JSR     PC,DSUP         ;GO SET PATTERN 3
 1806  010342  012767  017630  170344          MOV     #WDATA,BADDR    ;SET BA=WRITE BUFFER
 1807  010350  012767  176340  170340          MOV     #-1440,FCNT     ;SET FC=800
 1808  010356  012767  177160  170334          MOV     #-620,WCNT      ;SET WC=400
 1809  010364  012767  001700  170422          MOV     #1700,UDES      ;SET NRZ, NORMAL
 1810  010372  012767  000061  170406          MOV     #61,FUN         ;SET WRITE OP-CODE
 1811  010400  004767  000770                  JSR     PC,EXEC         ;GO DO WRITE 1
 1812  010404  012767  015072  170312          MOV     #MSG12,ERRP     ,SET ERROR CODE
 1813  010412  004767  001206                  JSR     PC,ERCHK        ;GO CHECK FOR ERROR
 1814  010416  004767  000752                  JSR     PC,EXEC         ,YES DO WRITE 2
 1815  010422  004767  001176                  JSP     PC,ERCHK        ,YES CHECK FOR ERROR
 1816  010426  000240                          NOP
 1817  010430  004767  001072                  JSR     PC,RWND         ,GO REWIND
 1818  010434  012767  177160  170254          MOV     #-620,FCNT      ,SET FC=400
 1819  010442  012767  177470  170250          MOV     #-310,WCNT      ,SET WC=200
 1820  010450  004767  000720                  JSR     PC,EXEC         ,GO REWRITE RECORD 1-WH TO EH
 1821  010454  000240                  FT21A   NOP
 1822  010456  004767  001044                  JSR     PC RWND         ;REWIND
 1823  010462  012767  021342  170224          MOV     #RDATA,BADDR    ;SET BA=READ BUFFER
 1824  010470  012767  177160  170220          MOV     #-620,FCNT      ,SET FC=400
 1825  010476  012767  177470  170214          MOV     #-310,WCNT      ,SET WC=200
 1826  010504  012767  000071  170274          MOV     #71,FUN         ,SET READ OP-CODE
 1827  010512  004767  000656                  JSR     PC,EXEC         ,GO READ RECORD 1
 1828  010516  012767  015135  170200          MOV     #MSG14,ERRP     ,SET ERROR CODE
 1829  010524  004767  001074                  JSR     PC,ERCHK        ;GO CHECK FOR ERROR
 1830  010530  000240                          NOP
 1831  010532  052777  000010  170050          BIS     #10,@CS         ;INHIBIT BA INCREMENT
 1832  010540  012767  176340  170150          MOV     #-1440,FCNT     ,SET FC=800
 1833  010546  012767  177160  170144          MOV     #-620,WCNT      ,SET WC=400
 1834  010554  004767  000614                  JSR     PC,EXEC         ,GO READ RECORD 2
 1835  010560  022777  001440  170020          CMP     #1440,@FC       ;SEE IF READ RECORD 2
 1836  010566  001423                          BEQ     FT21X           ,IF SO  BR
 1837  010570  022777  001441  170010          CMP     #1441,@FC       ,++F CHECK FOR 801 FRAMES
 1838  010576  001417                          BEQ     FT21X           ,++F IF SO  BR
 1839  010600  012767  016112  170140          MOV     #MSG45,ERADD    ,++F SET ERROR CODE
 1840  010606  022777  001440  167772          CMP     #1440,@FC       ,++F MORE THAN 801 FRAMES ?
 1841  010614  101403                          BLOS    1$              ,++F IF SO  BR
 1842  010616  012767  016043  170122          MOV     #MSG44,ERADD    ,++F SET ERROR CODE
 1843  010624  012767  010454  170140  1$      MOV     #FT21A,SCOLP    ,SET SCOPE ADDRESS
 1844  010632  004767  173334                  JSR     PC,FT3ER        ,GO PRINT ERROR
 1845  010636  004767  001606          FT21X   JSR     PC,ITER         ,GO SEE IF ITERATION
 1846  010642  000167  172270                  JMP     TSCD2           ,RETURN TO SCHEDULAR
 1847
 1848
```

```
                                        ;BUFFERED COMMAND TEST*****
                                
010646  012767  017455  170032  FT22:   MOV     #MSFT22,EMADDR  ;SET TEST HEADER
010654  004767  000646          JSR     PC,RWND         ;GO REWIND
010660  012700  000003          MOV     #3,R0           ;SET NUMBER OF WRITES
010664  012767  001700  170122  MOV     #1700,UDES      ;SET TO NRZ NORMAL
010672  012767  017630  170014  MOV     #WDATA,BADDR    ;SET BA=WRITE BUFFER
010700  012767  177000  170010  MOV     #-1000,FCNT     ;SET FC=1000
010706  012767  177400  170004  MOV     #-400,WCNT      ;SET WC=400
010714  012767  000061  170064  MOV     #61,FUN         ;SET WRITE OP-CODE
010722  004767  000446          FT22A   JSR     PC,EXEC         ;GO DO WRITE
010726  005300                  DEC     R0              ;SEE IF DONE ALL
010730  001374                  BNE     FT22A           ;IF NOT BR
010732  000240                  NOP
010734  012777  000007  167636  MOV     #7,@C1          ;START REWIND
010742  032777  000200  167642  FT22B   BIT     #200,@DS
010750  001774                  BEQ     FT22B
010752  004767  001550          JSR     PC,INIT1        ;INITIALIZE
010756  012767  000010  167750  MOV     #10,RDYDX       ;SET LONG READY DELAY
010764  004767  000404          JSR     PC,EXEC         ;ISSUE BUFFERED WRITE
010770  000240                  NOP
010772  012767  016243  167724  MOV     #MSG49,ERRP     ;SET ERROR CODE
011000  012767  102300  167750  MOV     #102300,STMSK   ;MARK DATA ERROR
011006  004767  000612          JSR     PC ERCHK        ;GO CHECK ERROR
011012  032777  000002  167572  BIT     #2,@DS          ;SEE IF BOT IS SET
011020  001410                  BEQ     FT22X           ;IF NOT  BR
011022  012767  016271  167716  MOV     #MSG50,ERADD    ;SET ERROR CODE
011030  012767  010646  167734  MOV     #FT22,SCOLP
011036  004767  173130          JSR     PC,FT3ER        ;GO DO ERROR
011042  004767  001402          FT22X.  JSR     PC,ITER         ;GO SEE IF ITEPATION
011046  000167  172064          JMP     TSCD2           ;RETURN TO SCHEDULAR
```

```
                                        ;READ-IN PRESET TEST*****

011052  005767  167634          FT23    TST     SLVN            ;SEE IF SLAVE SELECT=0
011056  001103                          BNE     FT23X           ;IF NOT, BR
011060  012767  017512  167620          MOV     #MSFT23,EMADDR  ;SET TEST HEADER
011066  004767  001434                  JSR     PC,INIT1        ;GO INIT
011072  012767  001700  167714          MOV     #1700,UDES      ;SET TO NRZ NORMAL
011100  012767  017630  167606          MOV     #WDATA,BADDR    ;SET BA=WRITE BUFFER
011106  012767  177400  167602          MOV     #-400,FCNT      ;SET FC=400
011114  012767  177600  167576          MOV     #-200,WCNT      ;SET WC=200
011122  012767  000061  167656          MOV     #61,FUN         ;SET WRITE OP-CODE
011130  004767  000240                  JSR     PC,EXEC         ;GO DO WRITE
011134  000240                          NOP
011136  004767  001364                  JSR     PC,INIT1        ;INITIALIZE
011142  012767  000021  167636          MOV     #21,FUN         ;SET READ-IN PRESET OP CODE
011150  004767  000220                  JSR     PC,EXEC         ;GO DO COMMAND
011154  005000                          CLR     R0
011156  012703  000004                  MOV     #4,R3           ;SET MULT
011162  032777  020000  167422  FT23A   BIT     #20000,@DS      ;SEE IF PIP RESET
011170  001404                          BEQ     FT23B           ;IF SO  BR
011172  005300                          DEC     R0
011174  001372                          BNE     FT23A           ;AWAIT PIP RESET
011176  005303                          DEC     R3
011200  001370                          BNE     FT23A           ;DELAY
011202  032777  000002  167402  FT23B   BIT     #2,@DS          ;SEE IF BOT
011210  001010                          BNE     FT23C           ;IF SO  BR
011212  012767  016327  167526          MOV     #MSG51,ERADD    ;SET ERROR CODE
011220  012767  011052  167544          MOV     #FT23,SCOLP
011226  004767  172740                  JSR     PC,FT3ER        ;GO DO ERROR
011232  012701  141000          FT23C   MOV     #141000,R1      ;SET EXPT TC
011236  016700  167370                  MOV     TC,R0           ;SET TC ADDRESS
011242  020110                          CMP     R1,(R0)         ;SEE IF EXPT=PCVD
011244  001410                          BEQ     FT23X           ;IF SO  BR
011246  012767  016363  167472          MOV     #MSG52,ERADD    ;SET ERROR CODE
011254  012767  011052  167510          MOV     #FT23,SCOLP     ;CLEAR SCOPE ADDRESS
011262  004767  172414                  JSR     PC,FT2ER        ;GO DO ERROR
011266  000167  171644          FT23X   JMP     TSCD2           ;RETURN TO SCHEDULAR
```

```
1921                                            ;REWIND  OFF LINE TEST*****
1922
1923  011272  032777  004000  167340  FT24      BIT     #4000,@SWR      ;SEE IF IN CONTINUOUS MODE
1924  011300  001033                            BNE     FT24XX          ;IF SO. BR
1925  011302  012767  017545  167376            MOV     #MSFT24,EMADDR  ;SET TEST HEADER
1926  011310  004767  001212                    JSR     PC,INIT1        ;GO INITIAIZE
1927  011314  012777  000003  167256            MOV     #3,@C1          ;ISSUE REWIND  OFF LINE COMMAND
1928  011322  012700  004000                    MOV     #4000,R0
1929  011326  005300                  FT24A     DEC     R0              ;DELAY
1930  011330  001376                            BNE     FT24A
1931  011332  032777  010000  167252            BIT     #10000,@DS      ;SEE IF MOL IS RESET
1932  011340  001407                            BEQ     FT24X           ;IF SO. BR
1933  011342  005067  167424                    CLR     SCOLP           ;ASSURE NO SCOPE
1934  011346  012767  016402  167372            MOV     #MSG53,ERADD    ;SET ERROR CODE
1935  011354  004767  172612                    JSR     PC,FT3ER        ;GO DO ERROR
1936  011360  012704  016426          FT24X     MOV     #MSG54,R4
1937  011364  004767  001564                    JSR     PC,TTOUT        ;PRINT ON LINE REQUEST
1938  011370  000167  171542          FT24XX    JMP     TSCD2           ;RETURN TO SCHEDULAR
1939
1940
```

```
 1941                                           ;COMMAND EXECUTE SUBROUTINE*****
 1942
 1943  011374  000240                  EXEC     NOP
 1944  011376  056777  167412  167226           BIS     UDES,@TC        ,LOAD TAPE CONT
 1945  011404  016777  167310  167170           MOV     WCNT,@WC        ,LOAD WC
 1946  011412  016777  167300  167166           MOV     FCNT,@FC        ,LOAD FC
 1947  011420  016777  167270  167156           MOV     BADDR,@BA       ,LOAD BA
 1948  011426  022767  000031  167352           CMP     #31,FUN         ,SEE IF SPACE FORWARD
 1949  011434  001404                           BEQ     EXECA           ,IF SO  BR
 1950  011436  022767  000033  167342           CMP     #33,FUN         ,SEE IF SPACE REVERSE
 1951  011444  001003                           BNE     EXECB           ,IF NOT  BR
 1952  011446  016777  167266  167132  EXECA    MOV     SCNT,@FC        ;SET SPACE COUNT
 1953  011454  000240                  EXECB    NOP
 1954  011456  016777  167324  167114           MOV     FUN,@C1         ,LOAD OP-CODE + GO
 1955  011464  000240                           NOP
 1956  011466  016703  167242                   MOV     RDYDX,R3        ,SET DELAY
 1957  011472  005004                           CLR     R4
 1958  011474  032777  000200  167110  EXECC    BIT     #200,@DS        ,SEE IF DRY
 1959  011502  001004                           BNE     EXECX           ,IF SO  BR
 1960  011504  005304                           DEC     R4
 1961  011506  001372                           BNE     EXECC
 1962  011510  005303                           DEC     R3              ,DELAY FOR DRY
 1963  011512  001370                           BNE     EXECC
 1964  011514  016703  167216          EXECX    MOV     OPDYX,R3
 1965  011520  005303                  EXECXA   DEC     R3              ,DELAY
 1966  011522  001376                           BNE     EXECXA
 1967  011524  000207                  EXECXX   RTS     PC              ,RETURN TO CALLER
 1968
```

```
1969                                            ;REWIND SUBROUTINE*****
1970
1971  011526  000240                    RWND    NOP
1972  011530  004767  000772                    JSR     PC,INIT1        ;INIT
1973  011534  012777  000007  167036            MOV     #7,@C1          ;START REWIND
1974  011542  012700  040000                    MOV     #40000,R0
1975  011546  005300                    RWNDA   DEC     R0
1976  011550  001376                            BNE     RWNDA           ;DELAY
1977  011552  032777  020000  167032    RWNDB   BIT     #20000,@DS
1978  011560  001374                            BNE     RWNDB           ;AWAIT PIP
1979  011562  032777  000002  167022            BIT     #2,@DS          ;SEE IF BOT
1980  011570  001012                            BNE     RWNDX           ;IF SO  BR
1981  011572  016704  167110                    MOV     EMADDR,R4
1982  011576  004767  001352                    JSR     PC,TTOUT        ;PRINT HEADER
1983  011602  012704  014606                    MOV     #MSG2,R4
1984  011606  004767  001342                    JSR     PC,TTOUT        ;PRINT REWIND ERROR
1985  011612  000167  171320                    JMP     TSCD2           ;RETURN TO SECHEDULAR
1986  011616  004767  000704            RWNDX   JSR     PC,INIT1        ;INIT
1987  011622  000207                            RTS     PC              ;RETURN TO CALLER
1988
```

```
 1989                                          ,ERROR CHECK SUBROUTINE*****
 1990
 1991  011624  005067  167160          ERCHK   CLR     SERFL           ,CLEAR FLAG
 1992  011630  017767  166756  167124          MOV     @DS,DSAV        ,SAVE DRIVE STATUS REG STER
 1993  011636  032777  040000  166746          BIT     #40000,@DS      ,SEE IF ERROR
 1994  011644  001001                          BNE     ERPT            ,IF SO  BR
 1995  011646  000207                          RTS     PC              ,RETURN
 1996  011650  017704  166740          ERPT    MOV     @ER,R4          ,GET ERROR REGISTER
 1997  011654  032767  002000  167132          BIT     #2000,UDES      ,SEE IF PE
 1998  011662  001403                          BEQ     ERPTA1          ,IF SO  BR
 1999  011664  042767  000200  167064          BIC     #200,STMSK      ;RESET PEF MASK
 2000  011672  046704  167060          ERPTA1  BIC     STMSK,R4        ,MASK DONT CARE BITS
 2001  011676  001530                          BEQ     ERPTX           ,IF NO UNEXPECTED ERRORS  BR
 2002  011700  012767  000001  167102  ERPTG   MOV     #1,SERFL        ,SET FLAG
 2003  011706  032777  020000  166724          B T     #20000,@SWR     ,SEE IF SHOULD PRINT ERRORS
 2004  011714  001115                          BNE     ERPTD           ,IF NOT  BR
 2005  011716  005767  166762                  TST     HDRFL           ,SEE IF DONE HEADER
 2006  011722  001006                          BNE     ERPTA           ,IF SO  BR
 2007  011724  005267  166754                  INC     HDRFL           ,SET HEADER FLAG
 2008  011730  016704  166752                  MOV     EMADDR,R4
 2009  011734  004767  001214                  JSR     PC,TTOUT        ,PRINT HEADER
 2010  011740  016704  166760          ERPTA   MOV     ERRP,R4         ,GET ERROR CODE
 2011  011744  001414                          BEQ     ERPTB           ,IF NONE  BR
 2012  011746  004767  001202                  JSR     PC TTOUT        ,PRINT ERROR CODE
 2013  011752  012704  015243                  MOV     #MSG20,R4       ,SET NRZ TAG
 2014  011756  032777  002000  166646          BIT     #2000,@TC       ,SEE IF PE
 2015  011764  001402                          BEQ     ERPT1A          ,IF NOT  BR
 2016  011766  012704  015251                  MOV     #MSG21,R4       ,ELSE SET PE TAG
 2017  011772  004767  001156          ERPT1A  JSR     PC,TTOUT        ,PRINT TAG
 2018  011776  016704  166724          ERPTB   MOV     ERRP1,R4        ,SEE IF CODE 2
 2019  012002  001402                          BEQ     ERPTB1          ,IF NOT  BR
 2020  012004  004767  001144                  JSR     PC,TTOUT        ,PRINT CODE 2
 2021  012010  032777  010000  166622  ERPTB1  BIT     #10000,@SWR     ,SEE IF ITERATION
 2022  012016  001010                          BNE     ERPTC           ,IF NOT  BR
 2023  012020  012704  016515                  MOV     #MSG56,R4
 2024  012024  004767  001124                  JSR     PC,TTOUT        ,PRINT ITER TAG
 2025  012030  016703  166724                  MOV     ITCNT,R3
 2026  012034  004767  001260                  JSR     PC,OCTP         ,PRINT ITERATION
 2027  012040  012704  014520          EPPTC   MOV     #MSG1,R4
 2028  012044  004767  001104                  JSR     PC,TTOUT        ,PRINT REGISTER TAG
 2029  012050  017703  166524                  MOV     @C1,R3
 2030  012054  004767  001226                  JSR     PC,OCTPE        ,PRINT CS1
 2031  012060  017703  166516                  MOV     @WC,R3
 2032  012064  004767  001216                  JSR     PC,OCTPE        ,PRINT WC
 2033  012070  017703  166510                  MOV     @BA,R3
 2034  012074  004767  001206                  JSR     PC,OCTPE        ,PRINT BA
 2035  012100  017703  166502                  MOV     @FC,R3
 2036  012104  004767  001176                  JSR     PC,OCTPE        ,PRINT FC
 2037  012110  017703  166474                  MOV     @CS,R3
 2038  012114  004767  001166                  JSR     PC,OCTPE        ,PRINT CS2
 2039  012120  017703  166466                  MOV     @DS,R3
 2040  012124  004767  001156                  JSR     PC,OCTPE        ,PRINT DS
 2041  012130  017703  166460                  MOV     @ER,R3
 2042  012134  004767  001146                  JSR     PC,OCTPE        ,PRINT ER
 2043  012140  017703  166466                  MOV     @TC,R3
 2044  012144  004767  001136                  JSR     PC,OCTPE        ,PRINT TC
```

```
                                                                    1  5
  2045  012150  005777  166464          ERPTD   TST     @SWR            ,SEE IF HALT ON ERROR
  2046  012154  100001                          BPL     ERPTX           ,IF NOT  BR
  2047  012156  000000                          HALT
  2048  012160  004767  001564          ERPTX   JSR     PC,CKSWR                ,CHECK FOR CNTL G
  2049  012164  004767  000336                  JSR     PC,INIT1        ,INIT
  2050  012170  000207                ERPTXX  RTS     PC              ,RETURN
  2051
  2052
```

```
2053                                            ;TAPE MARK STATUS CHECK**********
2054
2055  012172  032767  000004  166562  TMCHK     BIT     #4,DSAV         ;SEE IF TM SET
2056  012200  001401                    TMCHK1  BEQ     TMCHK1          ;IF NOT BR
2057  012202  000207                    TMCHK0  RTS     PC              ;ELSE RETURN
2058  012204  005767  166600            TMCHK1  TST     SERFL           ;SEE IF HAD ERROR
2059  012210  001374                    BNE     TMCHK0          ;IF SO BR
2060  012212  012767  016525  166506            MOV     #MSG57,ERRP1    ;SET ERROR CODE 2
2061  012220  004767  177454                    JSR     PC,ERPTG        ;GO PRINT TM ERROR
2062  012224  005067  166476                    CLR     ERRP1           ;CLEAR CODE 2 FLAG
2063  012230  000207                    RTS     PC              ;RETURN
2064
2065                                            ;DATA SETUP ROUTINE**********
2066
2067  012232  000240                    DSUP    NOP
2068  012234  012703  017630            DS0     MOV     #WDATA,R3       ;R3 = ADDRS OF WRITE BUFFER
2069  012240  016701  166552                    MOV     PATRN,R1        ;R1 = PATTERN SELECTOR
2070  012244  000241                    CLC
2071  012246  006101                    ROL     R1              ;MAKE PATTERN SELECTOR EVEN
2072  012250  000171  001040                    JMP     @DATBL(R1)      ;GO GENERATE PATTERN
2073  012254  032777  010000  166344    DS1     BIT     #10000,@DT      ;SEE IF SEVEN TRACK
2074  012262  001410                    BEQ     DS3             ;IF NOT BR
2075  012264  012702  000640                    MOV     #640,R2         ;SET BUFFER SIZE
2076  012270  012701  017630                    MOV     #WDATA,R1       ;SET START OF BUFFER
2077  012274  042721  140300            DS2     BIC     #140300,(R1)+   ;MASK FOR 7 CH
2078  012300  005302                    DEC     R2              ;SEE IF DONE
2079  012302  001374                    BNE     DS2             ;IF NOT. BR
2080  012304  012702  000640            DS3     MOV     #640,R2         ;R2=BUFFER SIZE +2
2081  012310  012701  021342                    MOV     #RDATA,R1       ;R1=READ DATA START
2082  012314  005021                    DS4     CLR     (R1)+           ;CLEAR BUFFER
2083  012316  005302                    DEC     R2              ;SEE IF DONE ALL
2084  012320  001375                    BNE     DS4             ;IF NOT BR
2085  012322  000207                    RTS     PC              ;EXIT
2086
2087                                            ;ALL ONES**********
2088
2089  012324  012701  177777    DAT1    MOV     #-1,R1          ;R1=DATA
2090  012330  012702  000640    DAT1A   MOV     #640,R2         ;R2=WORD COUNT +2
2091  012334  010123            DAT1B   MOV     R1,(R3)+        ;LOAD BUFFER
2092  012336  005302                    DEC     R2              ;SEE IF DONE
2093  012340  001375                    BNE     DAT1B           ;IF NOT BR
2094  012342  000167  177706            JMP     DS1             ;RETURN
2095
2096                                            ;ALL ZEROS**********
2097
2098  012346  005001    DAT2    CLR     R1              ;R1=DATA
2099  012350  000167  177754            JMP     DAT1A           ;LOAD BUFFER
2100
```

```
2101                                            ,ONE/ZERO IN ALTERNATING CHARACTERS**********
2102
2103  012354  012701  125125          DAT3      MOV     #125125,R1        ,R1=DATA
2104  012360  000167  177744                    JMP     DAT1A             ,LOAD BUFFER
2105
2106                                            ,ALL BITS 0-377**********
2107
2108  012364  005001                  DAT4      CLR     R1                ;R1=STARTING DATA
2109  012366  012702  001500                    MOV     #1500,R2          ;R2=CHARACTER COUNT
2110  012372  110123                  DAT4A     MOVB    R1,(R3)+          ;LOAD BUFFER
2111  012374  105201                            INCB    R1                ;BUMP DATA
2112  012376  005302                            DEC     R2                ;SEE IF DONE
2113  012400  001374                            BNE     DAT4A             ,IF NOT  BR
2114  012402  000167  177646                    JMP     DS1               ,RETURN
2115
2116
2117                                            ,SCOPE LOOP ON ERROR SUBROUTINE**********
2118
2119  012406  004767  001336          SCOPE     JSR     PC,CKSWR                  ;CHECK FOR CNTL G
2120  012412  000240                            NOP
2121  012414  032777  040000  166216            BIT     #40000,@SWR       ,SEE IF LOOP ON ERROR
2122  012422  001001                            BNE     SCOPE1            ,IF SO  BR
2123  012424  000207                            RTS     PC                ;ELSE EXIT
2124  012426  000240                  SCOPE1    NOP
2125  012430  005767  166336                    TST     SCOLP             ,SEE IF SCOPE ADDRESS
2126  012434  001001                            BNE     SCOPE2            ,IF NOT  BR
2127  012436  000207                            RTS     PC                ;ELSE EXIT
2128  012440  005726                  SCOPE2    TST     (SP)+             ,RESET STACK
2129  012442  005726                            TST     (SP)+
2130  012444  000177  166322                    JMP     @SCOLP            ,LOOP ON ERROR
2131
2132                                            ,TEST ITERATION SUBROUTINE**********
2133
2134  012450  004767  001274          ITER      JSR     PC,CKSWR                  ,CHECK FOR CNTL G
2135  012454  000240                            NOP
2136
2137                                  ,         **********************************************************.
2138                                  ,                 CHECK FOR END OF PASS INDICATOR
2139                                  ,                 SET FOR QUICK VERIFY
2140
2141  012456  005767  166354                    TST     PAFLG                     ,PASS FLAG SET?
2142  012462  001404                            BEQ     ITERO                     ,BRANCH - IF NO
2143                                  ,         **********************************************************
2144
2145  012464  032777  010000  166146            BIT     #10000,@SWR       ,SEE IF ITERATIONS
2146  012472  001403                            BEQ     ITER1             ,IF SO  BR
2147  012474  005067  166260          ITERO     CLR     ITCNT             ,CLEAR ITERATION COUNTER
2148  012500  000207                            RTS     PC                ,ELSE EXIT
2149  012502  005267  166252          ITER1     INC     ITCNT             ,BUMP COUNTER
2150  012506  026767  166246  166142            CMP     ITCNT,ITAMT       ;SEE IF DONE ALL
2151  012514  001767                            BEQ     ITERO             ,IF SO  BR
2152  012516  005726                            TST     (SP)+             ,RESET STACK
2153  012520  017700  166250                    MOV     @ITRLP,R0         ,SET ITERATION POINTER
2154  012524  000110                            JMP     (R0)              ,GO ITERATE
2155
2156                                            ,INITIALIZE SUBROUTINE**********
```

```
 2157
 2158  012526  000240                    INIT1   NOP
 2159  012530  012777  000040  166052            MOV     #40,@CS         ;INIT
 2160  012536  016777  166146  166044    INIT2   MOV     DRVN,@CS        ;SELECT DRIVE
 2161  012544  016777  166142  166060            MOV     SLVN,@TC        ;SELECT SLAVE
 2162  012552  000207                            RTS     PC              ;RETURN
 2163
```

```
                                                ;MAG TAPE INTERRUPT HANDLER**********
                                
012554  000240                  MTINT   NOP
012556  022626                          CMP     (SP)+,(SP)+     ;RESET STACK POINTER
012560  000240                          NOP
012562  000240                          NOP
012564  000177  166154                  JMP     @RTRN           ;RETURN TO CALLER
                                
                                                ;TTY INTERRUPT HANDLER**********
                                
012570  000240                  TTINT   NOP
012572  000240                          NOP
012574  000240                          NOP
012576  000002                          RTI
                                
                                                ;BUS ADDRESS TRAP HANDLER**********
                                
012600  000240                  TRAP    NOP
012602  032777  020000  166030          BIT     #20000,@SWR     ;SEE IF SHOULD PRINT ERRORS
012610  001020                          BNE     TRAP2           ;IF NOT. BR
012612  005767  166066                  TST     HDRFL           ;SEE IF DONE HEADER
012616  001006                          BNE     TRAP1           ;IF SO: BR
012620  005267  166060                  INC     HDRFL           ;ELSE SET HEADER FLAG
012624  016704  166056                  MOV     EMADDR,R4
012630  004767  000320                  JSR     PC,TTOUT        ;PRINT HEADER
012634  012704  015276          TRAP1   MOV     #MSG24,R4
012640  004767  000310                  JSR     PC,TTOUT        ;PRINT ERROR
012644  010103                          MOV     R1,R3
012646  004767  000446                  JSR     PC,OCTP         ;PRINT ADDRESS OF TRAP
012652  005777  165762          TRAP2:  TST     @SWR            ;SEE IF HALT ON ERROR
012656  100001                          BPL     TRAPX           ;IF NOT: BR
012660  000000                          HALT
012662  004767  001062          TRAPX   JSR     PC,CKSWR                ;CHECK FOR CNTL G
012666  022626                          CMP     (SP)+,(SP)+     ;RESET STACK
012670  012767  003444  166074          MOV     #FT1A,SCOLP     ;SET SCOPE ADDRESS
012676  004767  177504                  JSR     PC,SCOPE        ;GO SEE IF SCOPE LOOP
012702  005767  166112                  TST     RHTF            ;SEE IF INITIAL ADDRESS TEST
012706  001402                          BEQ     TRAPXX          ;IF NOT  BR
012710  000167  167062                  JMP     STOB            ;ELSE REDO ADDRESS REQUEST
012714  000167  170530          TRAPXX  JMP     FT1B            ;RETUPN TO TEST 1
```

```
2205                                    ;*************************************************************
2206                                    ;TTY ENTRY SUBROUTINE:
2207                                    ;
2208                                    ;THIS SUBROUTINE IS USED BY THE TEST CONDITION
2209                                    ;ENTRY ROUTINE TO READ THE RESPONSE ENTERED
2210                                    ;AT THE TTY AND CHECK THEM FOR LEGALITY AND
2211                                    ;LIMITS.  ALL RESPONSE MUST BE TYPED IN OCTAL
2212                                    ;(0-7) AND MUST FALL WITHIN THE LIMITS SET BY
2213                                    ;THE CALLING ROUTINE
2214                                    ;IF AN ENTRY IS ILLEGAL OR OUTSIDE THE LIMITS,
2215                                    ;A QUESTION MARK IS TYPED (?) AND THE RESPONSE
2216                                    ;MAY BE REENTERED
2217                                    ;ENTRIES MAY NOT EXCEED SIX (6) CHARACTERS AND
2218                                    ;MAY BE TERMINATED AT LESS THAN SIX BY TYPING A
2219                                    ;CARRIAGE RETURN
2220                                    ;*************************************************************
2221
2222  012720  005067  166024        TTR     CLR     TEMP1           ;CLEAR FIRST CHARACTER FLAG
2223  012724  005000                        CLR     R0
2224  012726  004767  000152        TTR0    JSR     PC,TTIN         ;GO READ CHARACTER
2225  012732  122767  000015  165740        CMPB    #15,TIB         ;SEE IF CR
2226  012740  001005                        BNE     TTR1            ;IF NOT  BR
2227  012742  005767  166002                TST     TEMP1           ;SEE IF FIRST CHARACTER
2228  012746  001446                        BEQ     TTR5            ;IF SO  BR
2229  012750  000167  000066                JMP     TTR2            ;ELSE GO LOAD VALUE
2230  012754  122767  000060  165716  TTR1  CMPB    #60,TIB         ;SEE IF CHAR IS LESS THAN 0
2231  012762  101402                        BLOS    TTR1A           ;IF NOT  BR
2232  012764  000167  000076                JMP     TINER           ;ELSE GO TO ERROR
2233  012770  122767  000070  165702  TTR1A CMPB    #70,TIB         ;SEE IF CHAR IS GREATER THAN 7
2234  012776  101002                        BHI     TTR1B           ;IF NOT  BR
2235  013000  000167  000062                JMP     TINER           ;ELSE GO TO ERROR
2236  013004  005267  165740        TTR1B   INC     TEMP1           ;SET FIRST CHARACTER FLAG
2237  013010  000241                        CLC
2238  013012  006100                        ROL     R0
2239  013014  000241                        CLC
2240  013016  006100                        ROL     R0              ;SHIFT 3 LEFT
2241  013020  000241                        CLC
2242  013022  006100                        ROL     R0
2243  013024  042767  177770  165646        BIC     #177770,TIB     ;STRIP ASCII
2244  013032  056700  165642                BIS     TIB,R0          ;LOAD CHARACTER
2245  013036  005301                        DEC     R1              ;SEE IF DONE
2246  013040  001332                        BNE     TTR0            ;IF NOT  BR
2247  013042  020002                TTR2    CMP     R0,R2           ;SEE IF EXCEEDED MAXIMUM LIMIT
2248  013044  101402                        BLOS    TTR3            ;IF NOT  BR
2249  013046  000167  000014                JMP     TINER           ;ELSE GO TO ERROR
2250  013052  020300                TTR3    CMP     R3,R0           ;SEE IF BELOW MINIMUM LIMIT
2251  013054  101402                        BLOS    TTR4            ;IF NOT  BR
2252  013056  000167  000004                JMP     TINER           ;ELSE GO TO ERROR
2253  013062  010015                TTR4    MOV     R0,(R5)         ;LOAD VALUE
2254  013064  000207                TTR5    RTS     PC              ;EXIT
2255
```

```
2256                                            ;TTY ENTRY ERROR SUBROUTINE**********
2257
2258  013066  012704  015002          TINER   MOV     #MSG7,R4
2259  013072  004767  000056                  JSR     PC,TTOUT        ;PRINT?
2260  013076  162716  000020                  SUB     #20.(SP)        ;RESET SP TO START OF VALUE ROUTINE
2261  013102  000207                          RTS     PC              ;REDO VALUE ENTRY
2262
2263                                            ;TTY READ SUBROUTINE**********
2264
2265  013104  005077  165532          TTIN    CLR     @TKS
2266  013110  005077  165530                  CLR     @TKB
2267  013114  105777  165522                  TSTB    @TKS
2268  013120  100375                          BPL      -4
2269  013122  017767  165516  165550          MOV     @TKB,TIB
2270  013130  042767  177600  165542          BIC     #177600,TIB
2271  013136  105777  165504          TTIN2   TSTB    @TPS
2272  013142  100375                          BPL     TTIN2
2273  013144  116777  165530  165476          MOVB    TIB,@TPB
2274  013152  000207                          RTS     PC
2275
2276                                            ;TTY OUTPUT SUBROUTINE***********
2277
2278  013154  112467  165516          TTOUT.  MOVB    (R4)+,TOB
2279  013160  122767  000043  165510          CMPB    #43,TOB
2280  013166  001446                          BEQ     TEX
2281  013170  122767  000045  165500          CMPB    #45,TOB
2282  013176  001403                          BEQ     TCRLF
2283  013200  004767  000064                  JSR     PC,TOG
2284  013204  000763                          BR      TTOUT
2285  013206  112767  000015  165462  TCRLF   MOVB    #15,TOB
2286  013214  004767  000050                  JSR     PC,TOG
2287  013220  012703  000004                  MOV     #4,R3
2288  013224  005067  165446          TCRLFA  CLR     TOB
2289  013230  004767  000034                  JSR     PC,TOG
2290  013234  005303                          DEC     R3
2291  013236  001372                          BNE     TCRLFA          ;DO FILLERS
2292  013240  112767  000012  165430          MOVB    #12,TOB
2293  013246  004767  000016                  JSR     PC,TOG
2294  013252  105767  165556                  TSTB    RDSW
2295  013256  100401                          BMI     1$
2296  013260  000735                          BR      TTOUT
2297  013262  005067  165546          1$      CLR     RDSW
2298  013266  000406                          BR      TEX
2299  013270  105777  165352          TOG     TSTB    @TPS
2300  013274  100375                          BPL     TOG
2301  013276  116777  165374  165344          MOVB    TOB,@TPB
2302  013304  000207                  TEX     RTS     PC
2303
2304
```

```
2305                                            ;OCTAL OUTPUT SUBROUTINE************
2306
2307  013306  012767  000001  000222  OCTPE   MOV     #1,OFL
2308  013314  010304                  MOV     R3,R4
2309  013316  000410                  BR      OCTPO
2310  013320  005067  000212          OCTP    CLR     OFL             ;CLEAR FLAG FOR LEADING ZERO
2311  013324  010304                  OCTPE1  MOV     R3,R4           ;SEE IF NUMBER IS ZERO
2312  013326  001004                  BNE     OCTPO           ;IF NOT ZERO. BR
2313  013330  004767  000162                  JSR     PC,OCTPG1       ;ELSE PRINT ZERO
2314  013334  000167  000120                  JMP     OCTP3           ;SPACE AND EXIT
2315  013340  032704  100000          OCTPO   BIT     #100000,R4      ;SEE IF MSD = 1
2316  013344  001406                  BEQ     OCTP1           ;IF NOT  BR
2317  013346  012704  000001                  MOV     #1,R4
2318  013352  004767  000116                  JSR     PC,OCTPG        ,PRINT 1
2319  013356  000167  000006                  JMP     OCTP2
2320  013362  005004                  OCTP1   CLR     R4
2321  013364  004767  000104                  JSR     PC,OCTPG        ,PRINT 0
2322  013370  010304                  OCTP2   MOV     R3,R4
2323  013372  006004                  ROR     R4
2324  013374  006004                  ROR     R4
2325  013376  006004                  ROR     R4              ,POSITION DIGIT
2326  013400  006004                  ROR     R4
2327  013402  000304                  SWAB    R4
2328  013404  004767  000064                  JSR     PC OCTPG        ,PRINT DIGIT 2
2329  013410  010304                  MOV     R3,P4
2330  013412  006004                  ROR     R4
2331  013414  000304                  SWAB    R4
2332  013416  004767  000052                  JSR     PC,OCTPG        ,PRINT DIGIT 3
2333  013422  010304                  MOV     R3,R4
2334  013424  006104                  ROL     P4
2335  013426  006104                  ROL     R4
2336  013430  000304                  SWAB    R4
2337  013432  004767  000036                  JSR     PC,OCTPG        ,PRINT DIGIT 4
2338  013436  010304                  MOV     R3,R4
2339  013440  006004                  ROR     R4
2340  013442  006004                  ROR     R4
2341  013444  006004                  ROR     R4
2342  013446  004767  000022                  JSR     PC,OCTPG
2343  013452  010304                  MOV     R3,R4
2344  013454  004767  000014                  JSR     PC,OCTPG        ,PRINT DIGIT 5
2345  013460  012767  000240  165210  OCTP3   MOV     #240,TOB
2346  013466  004767  177576                  JSR     PC,TOG          ;PRINT SPACE
2347  013472  000207                  RTS     PC              ,EXIT
2348  013474  042704  177770          OCTPG   BIC     #177770,R4
2349  013500  001004                  BNE     OCTPGO
2350  013502  005767  000030                  TST     OFL
2351  013506  001001                  BNE     OCTPGO
2352  013510  000207                  RTS     PC
2353  013512  005267  000020          OCTPGO  INC     OFL
2354  013516  052704  000260          OCTPG1  BIS     #260,R4
2355  013522  010467  165150                  MOV     R4,TOB
2356  013526  004767  177536                  JSR     PC,TOG
2357  013532  010304                  MOV     R3,R4
2358  013534  000207                  RTS     PC
2359  013536  000000                  OFL     0               ,FIRST CHAR FLAG
2360
```

```
                                                ;DATA CHARACTER OUTPUT SUBROUTINE************

013540  005067  165132          DOUT    CLR     TOB
013544  012704  000010                  MOV     #10,R4          ;SET NUMBER TO PRINT
013550  110367  165122                  MOVB    R3,TOB
013554  105777  165066          DOUT1   TSTB    @TPS
013560  100375                  BPL     DOUT1
013562  132767  000200  165106        BITB    #200,TOB
013570  001404                  BEQ     DOUT2
013572  012777  000061  165050        MOV     #061,@TPB
013600  000403                  BR      DOUT3
013602  012777  000060  165040  DOUT2 MOV     #060,@TPB
013610  006167  165062          DOUT3   ROL     TOB
013614  005304                  DEC     R4
013616  001356                  BNE     DOUT1
013620  000207                  RTS     PC
013622  016703  165126          DOUTD   MOV     TEMP3,R3
013626  000303                  SWAB    R3
013630  004767  177704                  JSR     PC,DOUT
013634  016703  165114                  MOV     TEMP3,R3
013640  004767  177674                  JSR     PC,DOUT
013644  000207                  RTS     PC

                                                ;TU16/TE16 SERIAL NUMBER PRINT SUBROUTINE**********

013646  010304          SNPT    MOV     R3,R4
013650  000304                  SWAB    R4
013652  006004                  ROR     R4
013654  006004                  ROR     R4
013656  006004                  ROR     R4
013660  006004                  ROR     R4              ;GET FIRST DIGIT
013662  004767  000036          JSR     PC,SNPG         ;GO PRINT
013666  010304                  MOV     R3,R4
013670  000304                  SWAB    R4              ;GET SECOND DIGIT
013672  004767  000026          JSR     PC,SNPG         ;GO PRINT
013676  010304                  MOV     R3,R4
013700  006004                  ROR     R4
013702  006004                  ROR     R4
013704  006004                  ROR     R4
013706  006004                  ROR     R4              ;GET THIRD DIGIT
013710  004767  000010          JSR     PC,SNPG         ;GO PRINT
013714  010304                  MOV     R3,R4           ;GET FOURTH DIGIT
013716  004767  000002          JSR     PC,SNPG         ;GO PRINT
013722  000207                  RTS     PC              ;EXIT
013724  012767  000260  164744  SNPG    MOV     #260,TOB        ;SET BASE = 0
013732  042704  177760                  BIC     #177760,R4      ;MASK DIGIT
013736  050467  164734                  BIS     R4,TOB          ;SET ASCII
013742  004767  177322                  JSR     PC,TOG          ;TYPE DIGIT
013746  000207                  RTS     PC              ;RETURN

                                                ;CKSWR ROUTINE THAT ALLOWS THE LOADING OF LOC 176, SWREG**********
                                                ;FROM THE TTY AT SELECTED POINTS WITHIN THE PROGRAM**********

013750  022767  000176  164662  CKSWR   CMP     #SWREG,SWR              ;SOFTWARE SWITCH REG PRESENT
013756  001041                  BNE     OUT                     ;NO, GET OUT
013760  105777  164656                  TSTB    @TKS                    ;YES,WAIT FOR
```

```
2417  013764  100036                        BPL     OUT                     ,READY, GET CHARACTER
2418  013766  017767  164652  164704        MOV     @TKB,TIB                ,AND STRIP OFF
2419  013774  042767  177600  164676        BIC     #177600,TIB             ,THE GARBAGE
2420  014002  022767  000007  164670        CMP     #7,TIB          ,IS IT A ' G>
2421  014010  001024                        BNE     OUT
2422  014012  012704  017601                MOV     #$CNTG,R4
2423  014016  004767  177132                JSR     PC,TTOUT
2424  014022  012704  017605        CNTLU:  MOV     #$MSWR,R4
2425  014026  004767  177122                JSR     PC,TTOUT
2426  014032  017703  164602                MOV     @SWR,R3
2427  014036  004767  177244                JSR     PC,OCTPE
2428  014042  012704  017614                MOV     #$MNEW,R4
2429  014046  004767  177102                JSR     PC,TTOUT
2430  014052  005037  001030                CLR     @#TEMPST
2431  014056  004767  000002                JSR     PC,$READ                ,GO READ A LINE
2432  014062  000207                OUT     RTS     PC                      ,RETURN TO MA N BODY OF PROGRAM
2433
2434  014064  005067  164740        $READ   CLR     TEMPST
2435  014070  012767  000007  164734        MOV     #7,COUNT
2436  014076  004767  177002        1$      JSR     PC,TTIN         ,GO  READ A CHARACTER
2437  014102  042767  177600  164570        BIC     #177600,TIB     ,STRIP OFF GARBAGE
2438  014110  122767  000025  164562        CMPB    #25,TIB         ,IS IT A  U?
2439  014116  001002                        BNE     2$              ;BRANCH IF NOT
2440  014120  005726                3$      TST     (SP)+           ,POP THE STACK
2441  014122  000737                        BR CNTLU                ,START OVER
2442  014124  122767  000015  164546  2$    CMPB    #15,TIB         ,IS IT A <CR>?
2443  014132  001013                        BNE     4$              ,BRANCH IF NOT
2444  014134  012767  000200  164672        MOV     #200,RDSW
2445  014142  004767  177040                JSR     PC,TCRLF        ,ECHO IT WITH <LF>
2446  014146  022767  000007  164656        CMP     #7,COUNT        ,WAS IT FIRST CHARACTER
2447  014154  001037                        BNE     7$              ;CHANGE SWR IF NOT FIRST ONE
2448  014156  005726                8$      TST     (SP)+           ,POP THE STACK
2449  014160  000740                        BR      OUT             ,GET OUT
2450  014162  122767  000060  164510  4$    CMPB    #60,TIB
2451  014170  003004                        BGT     5$
2452  014172  122767  000067  164500        CMPB    #67,TIB
2453  014200  003005                        BGT     6$
2454  014202  012704  017624        5$      MOV     #$QUEST,R4
2455  014206  004767  176742                JSR     PC,TTOUT
2456  014212  000742                        BR      3$              ,START OVEP IF NOT LEGAL CHARACTER
2457  014214  006367  164610        6$      ASL     TEMPST
2458  014220  006367  164604                ASL     TEMPST
2459  014224  006367  164600                ASL     TEMPST
2460  014230  142767  000060  164442        BICB    #60,TIB         ,GET NITTY-GRITTY
2461  014236  156767  164436  164564        BISB    TIB,TEMPST
2462  014244  005367  164562                DEC     COUNT           ;ONLY WANT 6   DIGITS
2463  014250  001754                        BEQ     5$
2464  014252  000711                        BR      1$
2465  014254  016777  164550  164356  7$    MOV     TEMPST,@SWR     ,CHANGE SWITCH REGISTER CONTENTS
2466  014262  000735                        BR      8$
2467
```

```
2468
2469                                    ;       ************************************************************
2470                                    ;               CHECK FOR DUMP MODE OR AUTO MODE
2471                                    ;       ************************************************************
2472
2473  014264  005067  164400            CKMODE  CLR     AUTOM                   ;INIT AUTO MODE
2474  014270  005737  000042                    TST     @#42                    ;AUTO MODE?
2475  014274  001417                            BEQ     2$                      ;BRANCH - IF NOT
2476  014276  005267  164366                    INC     AUTOM                   ;SET AUTO MODE INDICATORE
2477  014302  023737  000042  000046            CMP     @#42,@#46               ;ACT11 MODE?
2478  014310  001403                            BEQ     1$                      ;BRANCH - IF YES
2479  014312  105267  164355                    INCB    XXDPM                   ;INDICATE XXDP AUTO MODE
2480  014316  000421                            BR      5$                      ;AND EXIT
2481  014320  105267  164346            1$      INCB    ACT11M                  ;INDICATE ACT11 AUTO MODE
2482  014324  052777  104000  164306            BIS     #104000,@SWR            ;SET FOR CON CYCLE  & HALT ON ERROR
2483  014332  000413                            BR      5$                      ;AND EXIT
2484  014334  105737  000041            2$      TSTB    @#41                    ;MAN:  MODE VIA ACT11/PAPER TAPE?
2485  014340  001003                            BNE     3$                      ;BRANCH - IF NOT
2486  014342  105267  164326                    INCB    ADUMPM                  ;INDICATE MAN  MODE VIA ACT11/PAPER TAPE
2487  014346  000402                            BR      4$                      ;AND EXIT THRU M I
2488  014350  105267  164321            3$      INCB    XDUMPM                  ;INDICATE MANUAL MODE VIA XXDP
2489  014354  052737  020000  000052    4$      BIS     #20000,@#52             ;ALLOW MANUAL INTERVENTION
2490  014362  000207                    5$      RTS     PC                      ;RETURN
2491
2492                                            ************************************************
2493
```

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2494
2495                                    ;       **********************************************************
2496                                    ;               DISCONTINUE TESTING FOR
2497                                    ;               ILLEGAL CONDITIONS
2498                                    ;       **********************************************************
2499
2500  014364                            ABORT
2501  014364  000005                           RESET                   ;INITIALIZE THE WORLD
2502  014366  012704  014476                   MOV     #MSGD,R4        ;GET ABORT MESSAGE
2503  014372  004767  176556                   JSR     PC,TTOUT        ;TYPE ABORT MESSAGE
2504  014376  105767  164271                   TSTB    XXDPM           ;XXDP AUTO MODE?
2505  014402  001405                    .      BEQ     1$              ;BRANCH - IF NOT
2506  014404  013700  000042                   MOV     @#42,R0         ;GET MONITOR EXIT ADDRESS
2507  014410  005037  000042                   CLR     @#42            ;USE AS ABORT FLAG
2508  014414  004710                           JSR     PC,(R0)         ;EXIT TO XXDP MONITOR
2509  014416  000777                    1$     BR                      ;AND HANG
2510
2511                                    ;       **********************************************************
```

```
2512                                        ;MESSAGE TABLE*****
2513                                        ;*************************************************************
2514  014420  050045  047522  051107  MSGC    ASCII  /%PROGRAM DISABLED ? NO MANUAL INTERVENTION %#/
2515  014426  046501  042040  051511
2516  014434  041101  042514  020104
2517  014442  037440  047040  020117
2518  014450  040515  052516  046101
2519  014456  044440  052116  051105
2520  014464  042526  052116  047511
2521  014472  027116  021445
2522  014476  050045  047522  051107  MSGD    ASCII  /%PROGRAM ABORTED%#/
2523  014504  046501  040440  047502
2524  014512  052122  042105  021445
2525
2526                                        ;*****************************************************************
2527  014520  041445  030523  020040  MSG1    ASCII  /%CS1    WC     BA     FC     CS2    /
2528  014526  020040  041527  020040
2529  014534  020040  041040  020101
2530  014542  020040  020040  041506
2531  014550  020040  020040  041440
2532  014556  031123  020040  020040
2533  014564  051504  020040  020040          ASCII  /DS     ER     TC%#/
2534  014572  042440  020122  020040
2535  014600  020040  041524  021445
2536  014606  051045  053505  047111  MSG2    ASCII  /%REWIND ERROR#/
2537  014614  020104  051105  047522
2538  014622  021522
2539  014624  022445  046524  031060  MSG3    ASCII  /%%TM02 - TU16 - TE16 BSC FC (CZTUBGO) %/
2540  014632  026440  052040  030525
2541  014640  020066  020055  042524
2542  014646  033061  041040  041523
2543  014654  043040  020103  041450
2544  014662  052132  041125  030107
2545  014670  020051     045
2546  014673     105  052116  051105          ASCII  'ENTER CONDITIONS IN OCTAL%#/
2547  014700  041440  047117  044504
2548  014706  044524  047117  020123
2549  014714  047111  047440  052103
2550  014722  046101  021445
2551  014726  051045  043505  051511  MSG4    ASCII  /%REGISTER START = #/
2552  014734  042524  020122  052123
2553  014742  051101  020124  020075
2554  014750     043
2555  014751     045  042526  052103  MSG5    ASCII  /%VECTOR = #/
2556  014756  051117  036440  021440
2557  014764  042445  042116  047440  MSG6    ASCII  /%END OF PASS #/
2558  014772  020106  040520  051523
2559  015000  021440
2560  015002  037440  021440          MSG7    ASCII  / ? #/
2561  015006  021445                  MSG8    ASCII  /%#/
2562  015010  050045  051517  052111  MSG9    ASCII  /%POSITION ERROR  #/
2563  015016  047511  020116  051105
2564  015024  047522  035122  021440
2565  015032  042045  044522  042526  MSG10   ASCII  /%DRIVE NUMBER  #/
2566  015040  047040  046525  042502
2567  015046  035122  021440
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 2568  015052  051445  040514  042526  MSG11   .ASCII  /%SLAVE NUMBER  #/
 2569  015060  047040  046525  042502
 2570  015066  035122  021440
 2571  015072  053445  044522  042524  MSG12    ASCII  /%WRITE ERROR #/
 2572  015100  042440  051122  051117
 2573  015106  021440
 2574  015110  051045  040505  020104  MSG13    ASCII  /%READ REVERSE ERROR #/
 2575  015116  042522  042526  051522
 2576  015124  020105  051105  047522
 2577  015132  020122     043
 2578  015135     045  042522  042101  MSG14    ASCII  /%READ FORWARD ERROR #/
 2579  015142  043040  051117  040527
 2580  015150  042122  042440  051122
 2581  015156  051117  021440
 2582  015162  053445  044522  042524  MSG15    ASCII  /%WRITE TM ERROR #/
 2583  015170  052040  020115  051105
 2584  015176  047522  020122     043
 2585  015203     045  042522  042526  MSG16    ASCII  /%REVERSE ERROR #/
 2586  015210  051522  020105  051105
 2587  015216  047522  020122     043
 2588  015223     045  047506  053522  MSG17    ASCII  /%FORWARD ERROR #/
 2589  015230  051101  020104  051105
 2590  015236  047522  020122     043
 2591  015243     040  051116  020132  MSG20    ASCII  / NRZ #/
 2592  015250     043
 2593  015251     040  042520  021440  MSG21    ASCII  / PE #/
 2594  015256  042440  050130  035124  MSG22    ASCII  / EXPT  #/
 2595  015264  021440
 2596  015266  051040  053103  035104  MSG23    ASCII  / RCVD  #/
 2597  015274  021440
 2598  015276  041045  051525  052040  MSG24    ASCII  /%BUS TRAP  #/
 2599  015304  040522  035120  021440
 2600  015312  053445  035103  021440  MSG25    ASCII  /%WC  #/
 2601  015320  041045  035101  021440  MSG26    ASCII  /%BA  #/
 2602  015326  042045  035102  021440  MSG27    ASCII  /%DB  #/
 2603  015334  044445  044516  020124  MSG28    ASCII  /%INIT DID NOT CLEAR PH #/
 2604  015342  044504  020104  047516
 2605  015350  020124  046103  040505
 2606  015356  020122  044122  021440
 2607  015364  051445  020103  047516  MSG29    ASCII  /%SC NOT RESET BY INIT #/
 2608  015372  020124  042522  042523
 2609  015400  020124  054502  044440
 2610  015406  044516  020124     043
 2611  015413     045  051124  020105  MSG30    ASCII  /%TRE NOT RESET BY INIT #/
 2612  015420  047516  020124  042522
 2613  015426  042523  020124  054502
 2614  015434  044440  044516  020124
 2615  015442     043
 2616  015443     045  051503  020062  MSG31    ASCII  /%CS2 NOT RESET BY INIT #/
 2617  015450  047516  020124  042522
 2618  015456  042523  020124  054502
 2619  015464  044440  044516  020124
 2620  015472     043
 2621  015473     045  046104  020124  MSG32    ASCII  /%DLT NOT SET #/
 2622  015500  047516  020124  042523
 2623  015506  020124     043
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 2624  015511     045  041523  047040  MSG33    ASCII  /%SC NOT SET #/
 2625  015516  052117  051440  052105
 2626  015524  021440
 2627  015526  052045  042522  047040  MSG34    ASCII  /%TRE NOT SET #/
 2628  015534  052117  051440  052105
 2629  015542  021440
 2630  015544  044445  020122  047516  MSG35    ASCII  /%IR NOT SET BY INIT #/
 2631  015552  020124  042523  020124
 2632  015560  054502  044440  044516
 2633  015566  020124     043
 2634  015571     045  051117  047040  MSG36    ASCII  /%OR NOT RESET BY INIT #/
 2635  015576  052117  051040  051505
 2636  015604  052105  041040  020131
 2637  015612  047111  052111  021440
 2638  015620  047445  020122  047516  MSG37    ASCII  /%OR NOT RESET BY 1 SILO ENTRY #/
 2639  015626  020124  042522  042523
 2640  015634  020124  054502  030440
 2641  015642  051440  046111  020117
 2642  015650  047105  051124  020131
 2643  015656     043
 2644  015657     045  051117  047040  MSG38    ASCII  /%OR NOT SET BY SILO FULL #/
 2645  015664  052117  051440  052105
 2646  015672  041040  020131  044523
 2647  015700  047514  043040  046125
 2648  015706  020114     043
 2649  015711     045  040502  020104  MSG39    ASCII  /%BAD SILO READ #/
 2650  015716  044523  047514  051040
 2651  015724  040505  020104     043
 2652  015731     045  051111  047040  MSG40    ASCII  /%IR NOT RESET BY SILO FULL#/
 2653  015736  052117  051040  051505
 2654  015744  052105  041040  020131
 2655  015752  044523  047514  043040
 2656  015760  046125  021514
 2657  015764  047040  047117  042455  MSG41    ASCII  / NON-EXIST DRIVE#.
 2658  015772  044530  052123  042040
 2659  016000  044522  042526     043
 2660  016005     040  047516  026516  MSG42    ASCII  / NON-EXIST SLAVE#/
 2661  016012  054105  051511  020124
 2662  016020  046123  053101  021505
 2663  016026  051440  051105  040511  MSG43    ASCII  / SERIAL NO  #/
 2664  016034  020114  047516  020072
 2665  016042     043
 2666  016043     045  051105  051501  MSG44    ASCII  /%ERASE HEAD INOPERATIVE
 2667  016050  020105  042510  042101
 2668  016056  044440  047516  042520
 2669  016064  040522  044524  042526
 2670  016072  041445  042510  045503           ASCII  /%CHECK POLARITY#/
 2671  016100  050040  046117  051101
 2672  016106  052111  021531
 2673  016112  042445  040522  042523  MSG45    ASCII  /%ERASE HEAD POLARITY WRONG#/
 2674  016120  044040  040505  020104
 2675  016126  047520  040514  044522
 2676  016134  054524  053440  047522
 2677  016142  043516     043
 2678  016145     045  042523  026524  MSG46    ASCII  /%SET-UP WRITE ERROR#/
 2679  016152  050125  053440  044522
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 2680  016160  042524  042440  051122
 2681  016166  051117     043
 2682  016171     045  050123  041501  MSG47    ASCII  /%SPACE FORWARD ERROR#/
 2683  016176  020105  047506  053522
 2684  016204  051101  020104  051105
 2685  016212  047522  021522
 2686  016216  051445  040520  042503  MSG48    ASCII  /%SPACE REVERSE ERROR#/
 2687  016224  051040  053105  051105
 2688  016232  042523  042440  051122
 2689  016240  051117     043
 2690  016243     045  052502  043106  MSG49    ASCII  /%BUFFERED WRITE ERROR#/
 2691  016250  051105  042105  053440
 2692  016256  044522  042524  042440
 2693  016264  051122  051117     043
 2694  016271     045  047502  020124  MSG50    ASCII  /%BOT SET AFTER BUFFERED WRITE#/
 2695  016276  042523  020124  043101
 2696  016304  042524  020122  052502
 2697  016312  043106  051105  042105
 2698  016320  053440  044522  042524
 2699  016326     043
 2700  016327     045  047516  041040  MSG51    ASCII  /%NO BOT FROM READ IN PRESET#/
 2701  016334  052117  043040  047522
 2702  016342  020115  042522  042101
 2703  016350  044440  020116  051120
 2704  016356  051505  052105     043
 2705  016363     045  041524  044440  MSG52    ASCII  /%TC INCORRECT #/
 2706  016370  041516  051117  042522
 2707  016376  052103  021440
 2708  016402  051445  040514  042526  MSG53    ASCII  /%SLAVE NOT OFF LINE#/
 2709  016410  047040  052117  047440
 2710  016416  043106  046040  047111
 2711  016424  021505
 2712  016426  022445  042522  042523  MSG54    ASCII  /%RESET SLAVE TO ON LINE BEFORE CONTINUING#/
 2713  016434  020124  046123  053101
 2714  016442  020105  047524  047440
 2715  016450  020116  044514  042516
 2716  016456  041040  043105  051117
 2717  016464  020105  047503  052116
 2718  016472  047111  044525  043516
 2719  016500     043
 2720  016501     045  051116  020132  MSG55    ASCII  /%NRZ ONLY  #/
 2721  016506  047117  054514  020072
 2722  016514     043
 2723  016515     040  052111  051105  MSG56    ASCII  / ITER  #/
 2724  016522  020072     043
 2725  016525     045  046524  047040  MSG57    ASCII  /%TM NOT SET#/
 2726  016532  052117  051440  052105
 2727  016540     043
 2728  016541     045  044505  044124  MSG60    ASCII  /%EITHER TAPE NOT ERASED OR OPI PROBLEM#
 2729  016546  051105  052040  050101
 2730  016554  020105  047516  020124
 2731  016562  051105  051501  042105
 2732  016570  047440  020122  050117
 2733  016576  020111  051120  041117
 2734  016604  042514  021515
 2735  016610  051045  030510  020061  MSG61    ASCII  /%RH11 OR RH70  #/
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  2736  016616  051117  051040  033510
  2737  016624  035060  021440
  2738  016630  051045  020110  047117  MSG62    ASCII  /%RH ONLY. #/
  2739  016636  054514  020072     043
  2740
```

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2741                                            ;TEST HEADERS*****
2742
2743  016643     045  043045  030524  MSFT1    ASCII  /%%FT1 RH ADDRESSING #/
2744  016650  051072  020110  042101
2745  016656  051104  051505  044523
2746  016664  043516  021440
2747  016670  022445  052106  035062  MSFT2    ASCII  /%%FT2 RH REGISTER BITS TEST #/
2748  016676  044122  051040  043505
2749  016704  051511  042524  020122
2750  016712  044502  051524  052040
2751  016720  051505  020124     043
2752  016725     045  043045  031524  MSFT3    ASCII  /%%FT3 RH INITIALIZE TEST #/
2753  016732  051072  020110  047111
2754  016740  052111  040511  044514
2755  016746  042532  052040  051505
2756  016754  020124     043
2757  016757     045  043045  032124  MSFT4    ASCII  /%%FT4 RH11 SILO TEST 1 #/
2758  016764  051072  030510  020061
2759  016772  044523  047514  052040
2760  017000  051505  020124  020061
2761  017006     043
2762  017007     045  043045  032524  MSFT5    ASCII  /%%FT5 RH11 SILO TEST 2 #/
2763  017014  051072  030510  020061
2764  017022  044523  047514  052040
2765  017030  051505  020124  020062
2766  017036     043
2767  017037     045  043045  033124  MSFT6    ASCII  /%%FT6 RH11 SILO TEST 3 #/
2768  017044  051072  030510  020061
2769  017052  044523  047514  052040
2770  017060  051505  020124  020063
2771  017066     043
2772  017067     045  043045  033524  MSFT7    ASCII  /%%FT7 RH11 SILO TEST 4 #/
2773  017074  051072  030510  020061
2774  017102  044523  047514  052040
2775  017110  051505  020124  020064
2776  017116     043
2777  017117     045  043045  030524  MSFT10   ASCII  /%%FT10 RH11 SILO TEST 5 #/
2778  017124  035060  044122  030461
2779  017132  051440  046111  020117
2780  017140  042524  052123  032440
2781  017146  021440
2782  017150  022445  052106  030461  MSFT11   ASCII  /%%FT11 NOP TEST#/
2783  017156  047072  050117  052040
2784  017164  051505  021524
2785  017170  022445  052106  031061  MSFT12   ASCII  /%%FT12 REWIND TEST#/
2786  017176  051072  053505  047111
2787  017204  020104  042524  052123
2788  017212     043
2789  017213     045  043045  030524  MSFT13   ASCII  /%%FT13 WRITE-READ TEST#/
2790  017220  035063  051127  052111
2791  017226  026505  042522  042101
2792  017234  052040  051505  021524
2793  017242  022445  052106  032061  MSFT14   ASCII  /%%FT14 SPACE TEST#/
2794  017250  051472  040520  042503
2795  017256  052040  051505  021524
2796  017264  022445  052106  032461  MSFT15   ASCII  /%%FT15 ERASE TEST#/
```

```
 2797  017272  042472  040522  042523
 2798  017300  052040  051505  021524
 2799  017306  022445  052106  033061  MSFT16  .ASCII  /%%FT16 TAPE MARK WRITE-READ TEST#/
 2800  017314  052072  050101  020105
 2801  017322  040515  045522  053440
 2802  017330  044522  042524  051055
 2803  017336  040505  020104  042524
 2804  017344  052123     043
 2805  017347     045  043045  030524  MSFT17   ASCII  /%%FT17 TM SPACE TEST #/
 2806  017354  035067  046524  051440
 2807  017362  040520  042503  052040
 2808  017370  051505  020124     043
 2809  017375     045  043045  031124  MSFT20   ASCII  /%%FT20 WRITE CHECK TEST #/
 2810  017402  035060  051127  052111
 2811  017410  020105  044103  041505
 2812  017416  020113  042524  052123
 2813  017424  021440
 2814  017426  022445  052106  030462  MSFT21   ASCII  /%%FT21 ERASE HEAD TEST#/
 2815  017434  042472  040522  042523
 2816  017442  044040  040505  020104
 2817  017450  042524  052123     043
 2818  017455     045  043045  031124  MSFT22   ASCII  /%%FT22 BUFFERED COMMAND TEST#/
 2819  017462  035062  052502  043106
 2820  017470  051105  042105  041440
 2821  017476  046517  040515  042116
 2822  017504  052040  051505  021524
 2823  017512  022445  052106  031462  MSFT23   ASCII  /%%FT23 READ IN PRESET TEST#/
 2824  017520  051072  040505  020104
 2825  017526  047111  050040  042522
 2826  017534  042523  020124  042524
 2827  017542  052123     043
 2828  017545     045  043045  031124  MSFT24   ASCII  /%%FT24 REWIND-OFF LINE TEST#/
 2829  017552  035064  042522  044527
 2830  017560  042116  047455  043106
 2831  017566  046040  047111  020105
 2832  017574  042524  052123     043
 2833  017601     045  043536     043  $CNTG    ASCII  /% G#/
 2834  017605     045  053523  036522  $MSWR   .ASCII  /%SWR= #/
 2835  017612  021440
 2836  017614  020040  042516  036527  $MNEW   .ASCII  /  NEW= #/
 2837  017622  021440
 2838  017624  022477     043          $QUEST   ASCII  /?%#/
 2839
 2840
 2841          017630                          EVEN
 2842  017630  000000                  WDATA   0
 2843          021342                          = +1510
 2844  021342  000000                  RDATA   0
 2845
 2846          000001                          END
```

```
ABORT   014364            851    2500#
ACT11M  000672            715#    876    2481*
ADUMPM  000674            717#   2486*
AS      000616            685#
AUTOM   000670            714#    844     924     968    1016    1108    1135    1141   2473*   2476*
BA      000604            680#   1183    1947*   2033
BADDR   000714            730#   1441*   1459*   1483*   1492*   1493*   1500*   1576*   1639*   1723*   1770*   1782*   1787*
                         1806*   1823*   1855*   1889*   1947
BAE     000634            692#   1056
BTRP    000664            707#   1153*   1163*
BTRP2   000666            708#   1154*
CC      000620            686#
CKMODE  014264            843    2473#
CKSWR   013750           1084    1144    1386    1623    2048    2119    2134    2196   2414#
CNTLU   014022            867    2424#   2441
CONT1   002334            935     956#
CONT2   002526            979    1002#
COUNT   001032            769#   2435*   2446    2462*
CRCNT   001012            761#
CS      000610            682#    943*    948*    950     956*    957*    959    1002*   1003*   1240*   1251    1280*   1282
                         1307    1311    1316    1322    1346    1350    1400   1414*   1419*   1423    1533*   1831*   2037
                         2159*   2160*
C1      000600            678#    908     949     958    1156    1243    1247    1284    1286   1863*   1927*   1954*   1973*
                         2029
DATA0   001042             776#
DATA1   001044             777#
DATA2   001046             778#
DATA3   001050             779#
DATBL   001040             775#   2072
DAT1    012324             776    2089#
DAT1A   012330            2090#   2099    2104
DAT1B   012334            2091#   2093
DAT2    012346             777    2098#
DAT3    012354             778    2103#
DAT4    012364             779    2108#
DAT4A   012372            2110#   2113
DB      000622             687#   1192    1281    1315*   1320*   1342*   1355   1397*   1416*   1420*   1421    1422
DOUT    013540            2363#   2379    2381
DOUT0   013622            2377#
DOUT1   013554            2366#   2367    2375
DOUT2   013602            2369    2372#
DOUT3   013610            2371    2373#
DRIVE   000040             616#
DRVN    000710             728#    930     941*    944*    945     948     957    987    1003   2160
DRVTP   000654             703#
DS      000612             683#   1463    1864    1873    1900    1906    1931   1958   1977   1979   1992   1993   2039
DSAV    000762             749#   1992*   2055
DSUP    012232            1478    1769    1805   2067#
DS0     012234            2068#
DS1     012254            2073#   2094    2114
DS2     012274            2077#   2079
DS3     012304            2074    2080#
DS4     012314            2082#   2084
DT      000626             689#    995     997    1005    2073
EMADDR  000706             727#   1152*   1172*   1212    1237*   1263   1279*   1304*   1338*   1370   1393*   1412*   1447*
                          1465*   1476*   1521*   1637*   1666*   1702*   1766*   1802*   1851*   1886*   1925*   1981    2008
```

```
                    2187
ER      000614       684#  1996  2041
ERADD   000746       743#  1180* 1189* 1200* 1215  1245* 1249* 1255* 1266  1290* 1292* 1294* 1309*
                    1313* 1318* 1326* 1348* 1352* 1404* 1430* 1839* 1842* 1875* 1908* 1915* 1934*
ERCHK   011624      1448  1466  1488  1497  1505  1537  1555  1565  1645  1659  1675  1681  1686
                    1711  1730  1744  1777  1784  1789  1813  1815  1829  1872  1991#
ERPT    011650      1994  1996#
ERPTA   011740      2006  2010#
ERPTA1  011672      1998  2000#
ERPTB   011776      2011  2018#
ERPTB1  012010      2019  2021#
ERPTC   012040      2022  2027#
ERPTD   012150      2004  2045#
ERPTG   011700      2002# 2061
ERPTX   012160      2001  2046  2048#
ERPTXX  012170      2050#
EPPT1A  011772      2015  2017#
ERRP    000724       734# 1076* 1485* 1495* 1502* 1536* 1554* 1564* 1644* 1657* 1674* 1680* 1685*
                    1710* 1728* 1738* 1752* 1776* 1780* 1785* 1812* 1828* 1870* 2010
ERRP1   000726       735# 2018  2060* 2062*
EXEC    011374      1445  1461  1486  1496  1504  1534  1553  1563  1578  1586  1643  1655  1672
                    1678  1684  1708  1727  1742  1775  1783  1788  1811  1814  1820  1827  1834
                    1859  1868  1893  1897  1943#
EXECA   011446      1949  1952#
EXECB   011454      1951  1953#
EXECC   011474      1958# 1961  1963
EXECX   011514      1959  1964#
EXECXA  011520      1965# 1966
EXECXX  011524      1967#
EXFL    000776       755#
EXIT    003402      1143  1145#
FC      000606       681# 1581  1588  1617  1835  1837  1840  1946* 1952* 2035
FCNT    000716       731# 1439* 1457* 1481* 1526* 1541* 1542  1669* 1722* 1771* 1807* 1818* 1824*
                    1832* 1856* 1890* 1946
FT1     003412       785   786  1152#
FT1A    003444      1157# 1162  2198
FT1B    003450      1159# 2203
FT1X    003462      1160  1163#
FT1XX   003506      1165  1168#
FT10    005166       799   800  1410#  1413
FT10A   005222      1416# 1418
FT10ER  005306      1424  1430#
FT10X   005264      1411  1425#  1432
FT10XX  005302      1427  1429#
FT11    005322       801   802  1435#  1436
FT12    005440       803   804  1453#  1454
FT12A   005520      1463# 1464
FT13    005552       805   806  1472#
FT13A   005624      1480# 1516
FT13B   005666      1486# 1490
FT13C   005746      1496# 1499
FT13D   006014      1504# 1507
FT13E   006066      1512  1515#
FT13X   006100      1509  1514  1517#
FT14    006104       807   808  1520#
FT14A   006156      1528# 1546
```