* THIS IS A COPYRIGHTED PROGRAM, COPYRIGHT 1973 BY VARIAN DATA MACHINES
*
* V.D.M. PART NO.   92L0107-037B
*   C
*   RELEASED   06-28-73
*
*   73/620 MAGNETIC TAPE TEST
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*   ***************************
*   *   *
*   *   VARIAN   73/620   *
*   * MAGNETIC TAPE TEST   *
*   *   *
*   ***************************
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*

```
                              *                                                    000340
                              *        ORG       0                                 000350
                              *        JMP       EXECUTIVE                          000360
                              *                                                     000370
                              *                                                     000380
                              *                                                     000390
       000002                 *        ORG       2                                  000400
                              *                                                     000410
                              *                                                     000420
                              *        ****************************************************   000430
                              *                                                     000440
                              *     *  TEST DATA AND FLAGS          *               000450
                              *                                                     000460
                              *        ****************************************************   000470
       000002  000000    MTYP   DATA   0          MAG TAPE TYPE: 0=7 TRACK, NOT 0=9 TRACK  000480
       000003  000000    MTBN   DATA   0          BINARY/BCD FLAG: 0=BIN  1=BCD     000490
       000004  000000    MSG1   DATA   0          STORAGE FOR CURRENT RECORD NUMBER (OCTAL)  000500
       000005  000000    MTSB   DATA   0          MODE FLAG: 0=SENSE  1=BIC         000510
       000006  104110    MTUN   DATA   0104110    EXC2: SELECT MT UNIT              000520
       000007  000010    MTDA   DATA   010        CONTROLLER DEVICE ADDRESS         000530
       000010  000020    MTBC   DATA   020        BIC DEVICE ADDRESS                000540
       000011  000000    MTPM   DATA   0          PIM FLAG: 0=NO  1=YES             000550
       000012  000100    MTP1   DATA   0100       PIM INTERRUPT ADDRESS FOR DINT(BUF.READY)  000560
       000013  000102    MTP2   DATA   0102       PIM INTERRUPT ADDRESS FOR MINT(TERM.MOTION)  000570
       000014  000040    MTP3   DATA   040        PIM DA                            000580
       000015            MTT1   BSS    1          TEMP STORAGE                      000590
       000016  000000    MTT2   DATA   0          TEMP STORAGE                      000600
       000017  000000    MTSD   DATA   0          CURRENT FIXED DATA PATTERN        000610
       000020  000000    MTRA   DATA   0          READ ATTEMPTS COUNTER             000620
       000021  000000    MTWA   DATA   0          REWRITE FLAG: 0=NO REWRITE  1=WRITE AGAIN  000630
       000022  000010    MTTS   DATA   010        WRITE/READ RECORD COUNT PER DATA PATTERN  000640
       000023  000024 R  MTPP   DATA   MTD1       DATA PATTERN POINTER              000650
       000024  052525    MTD1   DATA   052525     DATA PATTERN                      000660
       000025  177777    MTD2   DATA   =1         DATA PATTERN                      000670
       000026  125252    MTD3   DATA   0125252    DATA PATTERN                      000680
       000027  000000    MTFE   DATA   0          DATA COMPARE ERROR FLAG: 0=FIRST ERROR  000690
       000030  000000    MBFA   DATA   0          WRITE BUF START ADDR              000700
       000031  000000    MBFB   DATA   0          WRITE BUF MAX END ADDR            000710
       000032  000000    MBFC   DATA   0          READ BUF START ADDR               000720
       000033  000000    MBFD   DATA   0          READ BUF MAX END ADDR             000730
       000034  000000    MBFE   DATA   0          WRITE/READ BUF LENGTH(MAX)        000740
       000035  000000    MBFF   DATA   0          CURRENT WRITE BUF LAST LOC.       000750
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000036  000000    MBFG    DATA    0           CURRENT READ BUF LAST LOC.                      000760
000037  000000    MBFH    DATA    0           CURRENT FINAL BIC ADDR FOR COMMON W/R BUF       000770
000040                    BSS     04                                                          000780
                  *********************************                                           000790
                  *                               *                                          000800
                  *     LOCATIONS 40-43 USED BY   *                                          000810
                  *     TEST EXEC POWER DOWN      *                                          000820
                  *     AND POWER UP ROUTINES.    *                                          000830
                  *                               *                                          000840
                  *********************************                                           000850
000044  000000    MBFI    DATA    0           BIC INITIAL ADDR FOR COMMON W/R BUFFER          000860
000045  000000    MBFJ    DATA    0           MAX END ADDR FOR COMMON W/R BUFFER              000870
000046  000000    MBFK    DATA    0           CURRENT LENGTH OF W/R BUF'S FOR RANDOM DATA     000880
000047  000000    MBFL    DATA    0           CURRENT LENGTH OF COMMON W/R BUFFER             000890
000050  000000    MBFM    DATA    0           FILE MARK TEST FLAG: 1=FILE MARK TEST           000900
000051  000000    MBFN    DATA    0           BURN-IN FLAG: 0=NOT DOING BURNIN TEST           000910
000052  000000    MBFP    DATA    0           CURRENT LENGTH OF INCREMENTAL BUFFER            000920
000053  000000    MBFQ    DATA    0           CURRENT FINAL ADDR FOR INCREMENTAL BUFFER       000930
000054  000000    MBFR    DATA    0           MASK FOR RANDOM DATA WORD USE                   000940
000055  000000    MBFS    DATA    0           HOLDS BUF ADDR DURING W/R WITH INTERRUPTS       000950
000056  000000    MBFT    DATA    0           BUF READY INTERRUPT FLAG. 1=PROCESS INT.        000960
                  *                            SET=0 TO DISREGARD INTERRUPT AFTER LAST        000970
                  *                            WORD OF RECORD TRANSFERRED                     000980
000057  000000    MSIZ    DATA    0           MEM SIZE: 0=4K   1=>4K                          000990
000060  000000    MTWB    DATA    0           REWRITE COUNT FOR R-AFTER-W PARITY ERROR        001000
000061  000000    MMTY    DATA    0           SAVE RECORD  LENGTH(TROUBLESHOOTING ROUTINE     001010
000062  000000    MMTZ    DATA    0           SAVE RECORDS(TROUBLESHOOTING ROUTINES)          001020
000063  000001    MBSQ    DATA    1           SEQ. CONTROL COUNTER                            001030
                  *                            (0=RANDOM DATA,1=FIXED DATA,2=INCREMENTED)     001040
000064  000000    MPIM    DATA    0           PIM MASK IS STORED HERE                         001050
                  *                                                                           001060
                  *                                                                           001070
000100                    ORG     0100        RESERVED FOR INTERRUPT ADDRES                   001080
                  *                                                                           001090
                  *                                                                           001100
000200                    ORG     0200        INDIRECR POINTER TABLE                          001110
                  *                                                                           001120
                  *                                                                           001130
                  *                                                                           001140
        000225    LTOR    BEGI    0225        START OF LITERAL TABLE                      B   001150
                  *                                                                           001160
```

```
                    *      ***********************************           001180
                    *      * AREAS RESERVED BY EXECUTIVE *               001190
                    *      ***********************************           001200
                    *                                                    001210
                    *                                                    001220
                    *      NOTE:   THE TEST EXECUTIVE ALSO RESERVES LOCATIONS 0400 TO 0477    001230
                    *              FOR A POINTER TABLE TO STANDARD ROUTINES,AND AS AN AREA     001240
                    *              FOR EXECUTIVE DATA, ALL TEST PROGRAMS WORKING WITH THE      001250
                    *              EXECUTIVE MUST PRESERVE THIS BLOCK,                         001260
                    *              STANDARD ROUTINES WILL BE CALLED INDIRECTLY THRU            001270
                    *              THIS TABLE                                                  001280
                    *                                                    001290
                    *                                                    001300
                    *                                                    001310
                    *                                                    001320
                    *                                                    001330
                    *                                                    001340
000400              *          ORG    0400                               001350
000400             OUTA       BSS    1          OUTPUT ONE CHAR ROUTINE              001360
000401             OUTB       BSS    1          OUTPUT TWO CHAR ROUTINE              001370
000402             OUTC       BSS    1          OUTPUT CR/LF     ROUTINE             001380
000403             OUTD       BSS    1          OUTPUT MESSAGE   ROUTINE             001390
000404             OUTE       BSS    1          OUTPUT OCTAL WORD ROUTINE            001400
000405             OUTF       BSS    1          OUTPUT OCTAL ADDR ROUTINE            001410
000406             OUTG       BSS    1          OUTPUT ERROR MSG  ROUTINE            001420
000407             OUTH       BSS    1          OUTPUT CONTROL CHAR TO TTY ROUTINE   001430
000410             INPA       BSS    1          INPUT   ONE CHAR            ROUTINE  001440
000411             INPB       BSS    1          INPUT   AND PRINT ONE CHAR ROUTINE   001450
000412             INPC       BSS    1          INPUT   ONE CHAR EDITED     ROUTINE  001460
000413             INPD       BSS    1          INPUT   ONE ALPHA CHAR      ROUTINE  001470
000414             INPE       BSS    1          INPUT   TWO ALPHA CHAR      ROUTINE  001480
000415             INPF       BSS    1          INPUT   COMMA/PERIOD TERMINATION ROUTINE  001490
000416             INPG       BSS    1          INPUT   OCTAL NUMBER ROUTINE         001500
000417             TOUT       BSS    1          TIME-OUT             ROUTINE         001510
000420             TDLY       BSS    1          TIME DELAY ROUTINE                   001520
000421             SSWT       BSS    1          STANDARD SENSE SWITCH ROUTINE        001530
000422             $LWE       BSS    1          LOWEST WORD USED BY EXEC             001540
000423             ESZC       BSS    1          MEMORY SIZE DETERMINATION ROUTINE    001550
000424             $MSM       BSS    1          MEMORY SIZE MESSAGE                  001560
000425             INPH       BSS    1          SENSE TTY BUFFER READY               001570
000426             INPI       BSS    1          INIT TTY(INPUT CHAR W/O SENSE BYF READY)  001580
                    *                                                    001590
```

```
                          *                                                                      001600
 000440                            ORG       0440                                                001610
                          *                                                                      001620
                          *        EXECUTIVE DATA TABLE                                           001630
                          *                                                                      001640
 000440                   SFLG     BSS       1           LOOP,ON ERROR FLAG, 0=DONT LOOP 1=LOOP   001650
 000441                   SMEM     BSS       1           MEMORY SIZE = HIGHEST AVAIL CORE         001660
 000442                   SCON     BSS       1           0=CONSOLE MODE  1=TTY MODE               001670
 000443                            BSS       22          USED BY TEST EXEC                        001680
 000471                   SDCT     BSS       1           DIGIT COUNTER FOR INPG                   001690
                          *                                                                      001700
      *****************************************************************************************   001710
                          *                                                                  *   001720
      *****************************************************************************************   001730
```

```
                                                                              001750
                                                                              001760
000500                          ORG     0500                                  001770
                                                                              001780
                                                                              001790
                                                                              001800
        ********************************************************************  001810
        *                                                                 *   001820
        *                  *         TEST INITIALIZATION            *         001830
        *                                                                 *   001840
        *          USER SPECIFIES UNIT TYPE(7 TRK OR 9 TRK),       *          001850
        *          CONTROLLER DA, UNIT NO., MODE(SENSE OR BIC,     *          001860
        *          AND PIM(YES OR NO),                             *          001870
        *          BE SPECIFIED.                                   *          001880
        *          IF PIM IS SPECIFIED,THEN THE PIM DA AND         *          001890
        *          TWO PIM INTERRUPT ADDESSES MUST BE       D      *          001900
        *          SPECIFIED. THE FIRST INTERRUPT ADDRESS IS       *          001910
        *          FOR BUFFER READY(IF SENSE MODE) OR FOR          *          001920
        *          MOTION COMPLETE.                                *          001930
        *                                                          *          001940
        ********************************************************************  001950
        *                                                          *          001960
        *                                                          *          001970
000500  010442    MIST    LDA     SCON                                        001980
000501  001010            JAZ     MICT        CONSOLE MODE                    001990
000502  001021 R
        *                                                                     002000
        *   TTY MODE INITIALIZATION                                           002010
        *                                                                     002020
000503  006030    MITP    LDXI    MSGA        'THIS IS THE 620 MAG TAPE TEST' 002030
000504  005160 R
000505  002000            CALL*   OUTD                                        002040
000506  100403 R
000507  006030    MI10    LDXI    MSGB        'UNIT TYPR'  0=7 TRK   1=9 TRK  002050
000510  005207 R
000511  002000            CALL*   OUTD                                        002060
000512  100403 R
000513  002000            CALL*   INPG        INPUT OCTAL                     002070
000514  100416 R
000515  001000            JMP     MITP        SS3 ABORT                       002080
000516  000503 R
000517  001000            JMP     MI10        BACKSLASH ABORT                 002090
```

```
000520   000507 R
000521   001000              JMP      *+2            COMMA RTN FROM INPG                           002100
000522   000523 R
                  *     NORMAL RETURN FROM INPG                                                     002110
000523   050002              STA      MTYP           MAG TAPE TYPE FLAG                            002120
000524   002000              CALL*    OUTC           CR/LF                                         002130
000525   100402 R
000526   006030    MI20      LDXI     MSGD           'CNT DA='                                     002140
000527   005224 R
000530   002000              CALL*    OUTD                                                         002150
000531   100403 R
000532   002000    MI21      CALL*    INPG           INPUT OCTAL NUMBER                            002160
000533   100416 R
000534   001000              JMP      MITP           SS3 ABORT EXIT                                002170
000535   000503 R
000536   001000              JMP      MI21           BACKSLASH ABORT                               002180
000537   000532 R
000540   001000              JMP      *+2            COMMA RETURN FROM INPG                        002190
000541   000542 R
                  *     NORMAL RETURN FROM INPG                                                     002200
000542   050007              STA      MTDA           CNT DEVICE ADDRESS                            002210
000543   002000              CALL*    OUTC           CR/LF                                         002220
000544   100402 R
000545   006030    MI30      LDXI     MSGC           'UNIT NO.'                                    002230
000546   005216 R
000547   002000              CALL*    OUTD                                                         002240
000550   100403 R
000551   002000    MI31      CALL*    INPG           INPUT OCTAL NUMBER (0-3)                      002250
000552   100416 R
000553   001000              JMP      MI20           SS3 ABORT                                     002260
000554   000526 R
000555   001000              JMP      MI31           BACKSLASH ABORT                               002270
000556   000551 R
000557   001000              JMP      *+2            COMMA RETURN FROM INPG                        002280
000560   000561 R
                  *     NORMAL RETURN FROM INPG                                                     002290
000561   001004              JAN      MT33           INVALID--RETURN FOR CORRECT UNIT NO.          002300
000562   000576 R
000563   140225              SUB      =4                                                           002310
000564   001002              JAP      MT33           INVALID--RETURN FOR CORRECT UNIT NO.          002320
000565   000576 R
000566   120226              ADD      =5                                                           002330
```

```
000567  004246          LRLA   6                                                 002340
000570  006110          ORAI   0104000    BASIC CODE FOR TRANSPORT SELECT EXC2    002350
000571  104000
000572  110007          ORA    MTDA       MTU DA                                  002360
000573  050006          STA    MTUN       UNIT SELECT CODE: EXC2=104XYY           002370
000574  001000          JMP    MI35       CONTINUE                                002380
000575  000604 R
000576  002000    MT33  CALL*  OUTG       MESSAGE: INVALID                        002390
000577  100406 R
000600  002000          CALL*  OUTC       CR/LF                                   002400
000601  100402 R
000602  001000          JMP    MI30                                               002410
000603  000545 R
000604  006030    MI35  LDXI   MSGE       'MODE(S OR B)='                         002420
000605  005233 R
000606  002000          CALL*  OUTD                                               002430
000607  100403 R
000610  002000    MI36  CALL*  INPB       INPUT ONE CHAR                          002440
000611  100411 R
000612  001000          JMP    MI20       SS3 ABORT                               002450
000613  000526 R
000614  050015          STA    MTT1                                               002460
000615  002000          CALL*  INPF       TERMINATOR                              002470
000616  100415 R
000617  001000          JMP    MI20       SS3 ABORT                               002480
000620  000526 R
000621  001000          JMP    MI36       BACKSLASH ABORT                         002490
000622  000610 R
000623  001000          JMP    MI36       BACKARROW EXIT                          002500
000624  000610 R
000625  001000          JMP    MI38       COMMA EXIT                              002510
000626  000636 R
           *     PERIOD RETURN                                                    002520
000627  010015          LDA    MTT1       GET INPUT CHAR                          002530
000630  140227          SUB    =0302      CHAR=B                                  002540
000631  001010          JAZ    MI40                                              002550
000632  000647 R
000633  140230          SUB    =021       CHAR=S ?                                002560
000634  001010          JAZ    MI43                                              002570
000635  000644 R
000636  002000    MI38  CALL*  OUTG                                               002580
000637  100406 R
```

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000640  002000           CALL*   OUTC    CR/LF                       002590
000641  100402 R
000642  001000           JMP     MI35    GO BACK                     002600
000643  000504 R
000644  050005   MI43    STA     MTSB    SET MODE FLAG TO 0=SENSE    002610
000645  001000           JMP     MI42                                002620
000646  000666 R
000647  005111   MI40    IAR                                         002630
000650  050005           STA     MTSB    SET MODE FLAG TO 1=BIC      002640
000651  006030           LDXI    MSGF    'BIC DA='                   002650
000652  005244 R
000653  002000           CALL*   OUTD                                002660
000654  100403 R
000655  002000   MI41    CALL*   INPG                                002670
000656  100416 R
000657  001000           JMP     MI20    SS3 ABORT                   002680
000660  000526 R
000661  001000           JMP     MI41    BACKSLASH ABORT             002690
000662  000655 R
000663  001000           JMP     *+2     COMMA RTN                   002700
000664  000665 R
*       NORMAL RETURN FROM INPG                                      002710
000665  050010           STA     MTBC    BIC DA                      002720
000666  006030   MI42    LDXI    MSGG    'PIM (Y OR N)='             002730
000667  005252 R
000670  002000           CALL*   OUTD                                002740
000671  100403 R
000672  002000   MI44    CALL*   INPB    INPUT CHAR                  002750
000673  100411 R
000674  001000           JMP     MI20    SS3 ABORT                   002760
000675  000526 R
000676  050015           STA     MTT1    TEMP                        002770
000677  002000           CALL*   INPF    TERMINATOR                  002780
000700  100415 R
000701  001000           JMP     MI20    SS3 ABORT                   002790
000702  000526 R
000703  001000           JMP     MI44    BACKSLASH ABORT             002800
000704  000672 R
000705  001000           JMP     MI44    BACKARROW EXIT              002810
000706  000672 R
000707  001000           JMP     MI45    COMMA RTN                   002820
000710  000720 R
```

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                              *     PERIOD RETURN                                                       002830
000711    010015                    LDA     MTT1          GET INPUT                                     002840
000712    140231                    SUB     =0316         CHAR=N ?                                      002850
000713    001010                    JAZ     MI49                                                        002860
000714    000726 R
000715    140232                    SUB     =013          CHAR=Y ?                                      002870
000716    001010                    JAZ     MI46                                                        002880
000717    000731 R
000720    002000          MI45      CALL*   OUTG                                                        002890
000721    100406 R
000722    002000                    CALL*   OUTC                                                        002900
000723    100402 R
000724    001000                    JMP     MI45                                                        002910
000725    000644 R
000726    050011          MI49      STA     MTPM          USING PIM FLAG  0=NO                          002920
000727    001000                    JMP     MCFT          START TESTS                                   002930
000730    001107 R
000731    005111          MI46      IAR                                                                 002940
000732    050011                    STA     MTPM          USING PIM FLAG  1=YES                         002950
                              *                                                                         002960
                              *                                                                         002970
000733    006030          MI47      LDXI    MSGH          'PIM ADS='                                    002980
000734    005262 R
000735    002000                    CALL*   OUTD                                                        002990
000736    100403 R
000737    005001                    TZA                                                                 003000
000740    050015                    STA     MTT1          TEMP. FLAG FOR DIRECTING INPUTS               003010
000741    002000          MI48      CALL*   INPG          INPUT OCTAL NO.                               003020
000742    100416 R
000743    001000                    JMP     MI20          SS3 ABORT                                     003030
000744    000526 R
000745    001000                    JMP     MI48          BACKSLASH ABORT                               003040
000746    000741 R
000747    001000                    JMP     MT50          COMMA RTN=STORE FIRST INPUT                   003050
000750    000766 R
                              *     PERIOD RTN                                                           003060
000751    050013                    STA     MTP2          MINT INTERRUPT ADDRESS                        003070
000752    030012                    LDX     MTP1          BUF READ INTERRUPT ADDR.                      003080
000753    010233                    LDA     =01000        STORE JMP                                     003090
000754    055000                    STA     0,1           AT ADDR.                                      003100
000755    005144                    IXR                                                                 003110
000756    070012                    STX     MTP1          SET MTP1 FOR SECOND LOC OF JMPM               003120
```

```
000757   030013            LDX    MTP2        MOTION COMPLETE INTERRUPT ADDR.       003130
000760   010233            LDA    =01000      STORE JMP                            003140
000761   055000            STA    0,1         AT ADDR.                             003150
000762   005144            IXR                                                     003160
000763   070013            STX    MTP2        SET MTP2 FOR SECOND LOC OF JMPM.     003170
000764   001000            JMP    MI50        GET PIM MASK                       B 003180
000765   001000 R
                      *                                                             003190
000766   020015    MT50    LDB    MTT1        INPUT DIRECTOR                       003200
000767   001020            JBZ    MT52                                             003210
000770   000774 R
000771   050012            STA    MTP1        STORE FIRST INTERRUPT ADDR          003220
000772   001000            JMP    MI48        GET NEXT PARAMETER                  003230
000773   000741 R
000774   040015    MT52    INR    MTT1        SET FLAG TO DIRECT 2ND INPUT        003240
000775   050014            STA    MTP3        P/M DA                              003250
000776   001000            JMP    MI48        GET NEXT PARAMETER                  003260
000777   000741 R
                      *    INPUT PIM MASK                                        B 003270
001000   006030    MI50    LDXI   MSGZ        =PIM MASK=                        B 003280
001001   005600 R
001002   002000            CALL*  OUTD                                          B 003290
001003   100403 R
001004   002000    MI52    CALL*  INPG        INPUT MASK VALUE                  B 003300
001005   100416 R
001006   001000            JMP    MITP        SS3 ABORT                         B 003310
001007   000503 R
001010   001000            JMP    MI52        BACKSLASH ABORT                   B 003320
001011   001004 R
001012   001000            JMP    *+2         COMMA RTN FROM INPG               B 003330
001013   001014 R
                      *    NORMAL(PERIOD) RTN FROM INPG                          B 003340
001014   050064            STA    MPIM        PIM MASK KEPT IN MPIM             B 003350
001015   002000            CALL*  OUTC        CR/LF                             B 003360
001016   100402 R
001017   001000            JMP    MCFT        START TESTS                       B 003370
001020   001107 R
                      *                                                           003380
                      *                                                           003390
                      *                                                           003400
                      *                                                           003410
                      *                                                           003420
```

```
                                                              003430
                                                              003440
                                                              003450
                                                              003460
                                                              003470
                           CONSOLE MODE INITIALIZATION        003480
                                                              003490
                                                              003500
001021  000111    MICT   HLT    0111      INITIALIZATION HALT        003510
001022  050015           STA    MTT1      TEMP SAVE                  003520
001023  150234           ANA    =077                                 003530
001024  050007           STA    MTDA      CONTROLLER DEVICE ADDRESS  003540
001025  010015           LDA    MTT1                                 003550
001026  001004           JAN    MIC1      UNIT TYPE=7 TRACK ?        003560
001027  001034 R
001030  005001           TZA              YES                        003570
001031  050002           STA    MTYP      UNIT TYPE STORAGE          003580
001032  001000           JMP    MIC5                                 003590
001033  001036 R
001034  005101    MIC1   INCR   01        SET A=1                    003600
001035  050002           STA    MTYP      1=9 TRK UNIT               003610
001036  005122    MIC5   ISR                                         003620
001037  005021           TBA                                         003630
001040  004246           LRLA   6                                    003640
001041  110235           ORA    =0104000  BASIC CODE FOR TRANSPORT SELECT EXC2  003650
001042  110007           ORA    MTDA      MTU DA                     003660
001043  050006           STA    MTUN      UNIT SELECT CODE:EXC2=104XYY  003670
001044  005041           TXA                                         003680
001045  001004           JAN    MIC3                                 003690
001046  001053 R
001047  005001           TZA                                         003700
001050  050005           STA    MTSB      MODE FLAG   0=SENSE        003710
001051  001000           JMP    MICA                                 003720
001052  001057 R
001053  150234    MIC3   ANA    =077                                 003730
001054  050010           STA    MTBC      BIC DA                     003740
001055  005101           INCR   01        SET A=1                    003750
001056  050005           STA    MTSB      MODE FLAG 1=BIC            003760
                  *      ****************                            003770
001057  000222    MICA   HLT    0222      * INITIALIZATION           003780
                  *      ****************                            003790
001060  001004           JAN    MIC2      A=NEGATIVE=OPERATE WITH PIM  003800
```

```
001061   001066 R
001062   005001              TZA
001063   050011              STA     MTPM      PIM FLAG                              003810
001064   001000              JMP     MCFT      START TESTS                           003820
001065   001107 R                                                                    003830
001066   070014      MIC2    STX     MTP3      PIM DA                                003840
001067   005104              INCR    04                                             003850
001070   070011              STX     MTPM      SET INTERRUPT FLAG                    003860
001071   150236              ANA     =0777     USE ONLY 9 LSB'S                      003870
001072   050012              STA     MTP1      BUF, READY INTERRUPT ADDRESS          003880
001073   005014              TAX                                                    003890
001074   010233              LDA     =01000                                         003900
001075   055000              STA     0,1                                            003910
001076   005021              TBA                                                    003920
001077   150236              ANA     =0000777                                       003930
001100   050013              STA     MTP2      TERMINATE MOTION ADDRESS             003940
001101   005014              TAX                                                    003950
001102   010233              LDA     =01000                                         003960
001103   055000              STA     0,1                                            003970
001104   001000              JMP     MCFT      START TESTS                           003980
001105   001107 R
                      *                                                             003990
```

```
                                                                              004010
   ************************************************************               004020
   *                                                          *               004030
   *                 BASIC FUNCTIONAL TESTS                   *               004040
   *                                                          *               004050
   *     THE FOLLOWING TESTS ARE MADE(SEE FLOWCHARTS FOR      *               004060
   *     SPECIFIC SEQUENCES): UNIT READY, BOT, UNIT NOT       *               004070
   *     READY, TRANSPORT MOTION COMMANDS: WRITE ONE RECORD   *               004080
   *     BINARY, BACKSPACE ONE RECORD, FORWARD ONE RECORD,    *               004090
   *     REWIND, READ ONE RECORD BINARY, WRITE ONE RECORD     *               004100
   *     BCD, READ ONE RECORD BCD, AND ODD LENGTH RECORD      *               004110
   *     TEST.                                                *               004120
   *                                                          *               004130
   *     THE TRANSPORT MOTION COMMAND TESTS DETERMINE         *               004140
   *     IF THE DESIRED MOTION OCCURS IN RESPONSE TO A        *               004150
   *     GIVEN EXC COMMAND.                                   *               004160
   *                                                          *               004170
   ************************************************************               004180
001106  000777     MCTP   HLT    0777                                         004190
001107  002000     MCFT   CALL   MA10          ADAPT I/O INSTRUCTIONS         004200
001110  004734 R
001111  100444            EXC    0444          DISABLE ALL PIMS               004210
001112  003000            XEC    MTUN          EXC2: SELECT USER SPECIFIED MT UNIT  004220
001113  000006 R
001114  101210     MC54   SEN    0210,MCFA     UNIT READY                     004230
001115  001127 R
001116  010237            LDA    #01           ERROR CODE                     004240
001117  020240            LDB    #' 1'                                        004250
001120  067200 I          STB    MSG2          ERROR CODE FOR TTY             004260
001121  002000            CALL   SSWX          SENSE SWITCH/ERROR CONTROL     004270
001122  004706 R
001123  001000            JMP    MCTP          LOOP ON ERROR RTN, MAKE UNIT READY  004280
001124  001106 R
001125  001000            JMP    MCTP          HALT: MAKE UNIT READY          004290
001126  001106 R
001127  101610     MCFA   SEN    0610,MCFB     BOT ?                          004300
001130  001140 R
001131  010241            LDA    #3            ERROR CODE                     004310
001132  020242            LDB    #' 3'                                        004320
001133  067200 I          STB    MSG2          ERROR CODE FOR TTY             004330
001134  002000            CALL   SSWX          SENSE SWITCH/ERROR CONTROL     004340
001135  004706 R
```

```
001135   001000           JMP     MCFA        LOOP ON ERROR                               004350
001137   001127 R
001140   010006    MCFB    LDA     MTUN        UNIT SELECT EXC2                            004360
001141   006150           ANAI    0177077     DESELECT CONTROLLER                       B 004370
001142   177077
001143   051144           STA     *+1                                                     004380
001144   000000           DATA    0           SELECT UNIT NOT SPECIFIED BY USER           004390
001145   101610    MCFC    SEN     0610,MC10   ERROR IF UNIT IS READY                      004400
001146   001153 R
001147   003000    MCFD    XEC     MTUN        RESELECT PROPER UNIT                        004410
001150   000006 R
001151   001000           JMP     MCFE                                                    004420
001152   001164 R
001153   010243    MC10    LDA     #2          ERROR CODE                                  004430
001154   020244           LDB     #' 2'                                                   004440
001155   067200 I         STB     MSG2        ERROR CODE FOR TTY                          004450
001156   002000           CALL    SSWX                                                    004460
001157   004706 R
001160   001000           JMP     MCFB        LOOP ON ERROR                               004470
001161   001140 R
001162   001000           JMP     MCFD        CONTINE                                     004480
001163   001147 R
                   *                                                                       004490
                   *        TRANSPORT MOTION COMMAND TESTS                                 004500
                   *                                                                       004510
001164   100210    MCFE    EXC     0210        WOR                                         004520
001165   101010    MC20    SEN     010,MC22    TAPE ERROR                                  004530
001166   001205 R
001167   002000           CALL    MSUR        UNIT READY                                  004540
001170   004221 R
001171   101610    MCFF    SEN     0610,*+4    BOT ?                                       004550
001172   001175 R
001173   001000           JMP     MC12        NO-CONTINUE                                 004560
001174   001217 R
001175   010237           LDA     #1          ERROR CODE                                  004570
001176   020240           LDB     #' 1'                                                   004580
001177   067201 I         STB     MSG3        ERROR CODE FOR TTY                          004590
001200   002000           CALL    SSWZ        SENSE SWITCH/ERROR CONTROL                  004600
001201   004721 R
001202   001000           JMP     MCFE        LOOP ON ERROR                               004610
001203   001164 R
001204   001000           JMP     MCFJ        CONTINUE                                     004620
```

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001205  001247 R
001206  010245      MC22    LDA     #6          ERROR CODE:WRITE RING NOT INSTALLED     004630
001207  020246              LDB     #' 6'                                               004640
001210  067200 I           STB     MSG2        TTY ERROR CODE                          004650
001211  002000             CALL    SSWX        SENSE SWITCH/ERROR                      004660
001212  004706 R
001213  001000             JMP     MCFE        LOOP ON ERROR                           004670
001214  001164 R
001215  001000             JMP     MCTP        GO WAIT FOR WRITE RING INSTALLATION     004680
001216  001106 R
001217  100610      MC12    EXC     0610        BOR                                     004690
001220  002000             CALL    MSUR        UNIT READY                              004700
001221  004221 R
001222  100610      MCFG    EXC     0610        BOR                                     004710
001223  002000             CALL    MSUR        UNIT READY                              004720
001224  004221 R
001225  101010      MCFH    SEN     010,MCFI    TAPE ERROR                              004730
001226  001236 R
001227  010247             LDA     #010        ERROR CODE                              004740
001230  020250             LDB     #'10'                                               004750
001231  067200 I           STB     MSG2        ERROR CODE FOR TTY                      004760
001232  002000             CALL    SSWX                                                004770
001233  004706 R
001234  001000             JMP     MC12        LOOP ON ERROR                           004780
001235  001217 R
001236  101610      MCFI    SEN     0610,MCFJ   BOT ?                                   004790
001237  001247 R
001240  010241             LDA     #3          ERROR CODE                              004800
001241  020242             LDB     #' 3'                                               004810
001242  067200 I           STB     MSG2        ERROR CODE FOR TTY                      004820
001243  002000             CALL    SSWX                                                004830
001244  004706 R
001245  001000             JMP     MC12        LOOP ON ERROR                           004840
001246  001217 R
001247  100510      MCFJ    EXC     0510        F.O.R.                                  004850
001250  002000             CALL    MSUR        UNIT READY                              004860
001251  004221 R
001252  101610      MCFK    SEN     0610,*+4    BOT ?                                   004870
001253  001256 R
001254  001000             JMP     MCFL        NO=                                     004880
001255  001265 R
001256  010241             LDA     #3          ERROR CODE                              004890
```

```
001257   020242          LOB      =' 3'                                              004900
001260   057201  I       STA      MSG3           ERROR CODE FOR TTY                  004910
001261   002000          CALL     SSWZ                                               004920
001262   004721  R
001263   001000          JMP      MCFJ           LOOP ON ERROR                       004930
001264   001247  R
001265   100710    MCFL  EXC      0710           REWIND                              004940
001266   030251          LDX      =0                                                 004950
001267   005001          TZA                                                         004960
001270   005311          DAR                                                         004970
001271   130252          ERA      =0177777       CPU=622(18 BIT WORD)                004980
001272   001004          JAN      *+5                                                004990
001273   001277  R
001274   020253          LDB      =7                                                 005000
001275   001000          JMP      *+3                                                005010
001276   001300  R
001277   020237          LDB      =1             SMALLER COUNT REQ'D 14 18-BIT CPU   005020
001300   002000    MC29  CALL     MLTO           EXTENDED TIME DELAY                 005030
001301   004456  R
001302   001000          JMP      *+4                                                005040
001303   001306  R
001304   001000          JMP      MC29           CONTINUE DELAY                      005050
001305   001300  R
001306   101610    MCFZ  SEN      0610,MCFM       BOT ?                              005060
001307   001317  R
001310   010253          LDA      =7             ERROR CODE                          005070
001311   020254          LDB      =' 7'                                              005080
001312   067201  I       STB      MSG3           TRANSPORT ERROR CODE                005090
001313   002000          CALL     SSWZ           SENSE SWITCH/ERROR CONTROL          005100
001314   004721  R
001315   001000          JMP      MCFL           LOOP ON ERROR                       005110
001316   001265  R
001317   100510    MCFM  EXC      0510           F.O.R.                              005120
001320   002000          CALL     MSUR           UNIT READY                          005130
001321   004221  R
001322   100710    MCFN  EXC      0710           REWIND                              005140
001323   030241          LDX      =3             DELAY REQUIRED BY E2181 MODEL BECAUSE  B 005150
001324   002000          CALL*    TDLY           OF SLOW REWIND RESPONSE.            B 005160
001325   100420  R
001326   101710    MCFO  SEN      0710,MC13       REWINDING                          005170
001327   001343  R
001330   002000          CALL     MSUR           UNIT READY                          005180
```

```
001331  004221 R
001332  010232              LOA    =013          ERROR CODE                                      005190
001333  020255              LOB    ='13'                                                          005200
001334  067200 I            STB    MSG2          UNIT STATUS ERROR CODE FOR TTY                  005210
001335  002000              CALL   SSWX          SENSE SWITCH/ERROR CONTROL                      005220
001336  004706 R
001337  001000              JMP    MCFN          LOOP ON ERROR                                   005230
001340  001317 R
001341  001000              JMP    MCFQ          CONTINUE                                        005240
001342  001426 R
001343  030000      MC13    LOX    0             TIME-OUT CONSTANT                               005250
001344  005001              TZA                                                                  005260
001345  005311              DAR                                                                  005270
001346  130252              ERA    =0177777      16 OR 18 BIT CPU ?                              005280
001347  001004              JAN    *+5           JMP IF 18 BIT                                   005290
001350  001364 R
001351  020253              LOB    =7                                                            005300
001352  001000              JMP    *+3                                                           005310
001353  001355 R
001354  020237              LOB    =1            SMALLER COUNT NEEDED FOR 18 BIT TIME-OUT        005320
001355  101810              SEN    0210,MC44     UNIT READY                                      005330
001356  001404 R
001357  101610              SEN    0610,MC48     B.O.T.                                          005340
001360  001415 R
001361  101710      MCFP    SEN    0710,*+4      REWINDING                                       005350
001362  001365 R
001363  001000              JMP    MC14          CONTINUE                                        005360
001364  001424 R
001365  002000              CALL   MLTO          EXTENDED TIME-OUT ROUTINE                       005370
001366  004456 R
001367  001000              JMP    *+4           ERROR RTN                                       005380
001370  001373 R
001371  001000              JMP    MCFP                                                          005390
001372  001361 R
001373  010232              LOA    =013          ERROR CODE                                      005400
001374  020255              LOB    ='13'                                                         005410
001375  067200 I            STB    MSG2          UNIT READY ERROR CODE                           005420
001376  002000              CALL   SSWX                                                          005430
001377  004706 R
001400  001000              JMP    MCFN          LOOP ON ERROR                                   005440
001401  001322 R
001402  001000              JMP    MC14          CONTINUE                                        005450
```

```
001403  001424 R
001404  010237      MC44    LDA     #01             ERROR CODE                              005460
001405  020240              LDB     =! 1!                                                   005470
001406  067200 I           STB     MSG2            ERROR CODE FOR TTY                      005480
001407  002000             CALL    SSWX            SENSE SWITCH/ERROR CONTROL              005490
001410  004706 R
001411  001000             JMP     MCFM            LOOP ON ERROR                           005500
001412  001317 R
001413  001000             JMP     MC14            CONTINUE                                005510
001414  001424 R
001415  010241      MC48    LDA     #03             ERROR CODE                              005520
001416  020242              LDB     =! 3!                                                   005530
001417  067200 I           STB     MSG2            ERROR CODE FOR TTY                      005540
001420  002000             CALL    SSWX                                                    005550
001421  004706 R
001422  001000             JMP     MCFM            LOOP ON ERROR                           005560
001423  001317 R
001424  002000      MC14    CALL    MSUR            UNIT READY                              005570
001425  004221 R
001426  100010      MCFQ    EXC     010             ROR-BINARY                              005580
001427  002000             CALL    MSUR                                                    005590
001430  004221 R
001431  101610      MCFR    SEN     0610,*+4        BOT ?                                   005600
001432  001435 R
001433  001000             JMP     MCFS            NO-CONTINUE                             005610
001434  001446 R
001435  010225              LDA     #4              ERROR CODE                              005620
001436  020256              LDB     =! 4!                                                   005630
001437  067201 I           STB     MSG3            ERROR CODE FOR TTY                      005640
001440  002000             CALL    SSWZ            SENSE SWITCH/ERROR CONTROL              005650
001441  004721 R
001442  001000             JMP     MCFQ            LOOP ON ERROR                           005660
001443  001426 R
001444  001000             JMP     MC52            CONTINUE                                005670
001445  001451 R
001446  100710      MCFS    EXC     0710            REWIND                                  005680
001447  002000             CALL    MSUR            UNIT READY                              005690
001450  004221 R
001451  100310      MC52    EXC     0310            WOR-BCD                                 005700
001452  005101              INCR    01              SET A=1,MUST TRANSFER NON-ZERO DATA   B 005710
            *                                       TO 7-TRACK READ-AFTER-WRITE UNITS OR  B 005720
            *                                       THE RUN-AWAY.                         B 005730
```

```
001453   103110    MC55   OAR    010                                              B 005740
001454   002000           CALL   MSUR                                               005750
001455   004221  R
001456   101610    MCFU   SEN    0610,*+4       BOT ?                                005760
001457   001462  R
001460   001000           JMP    MCFV           NO-CONTINUE                          005770
001461   001473  R
001462   010243           LDA    =2             ERROR CODE                           005780
001463   020244           LDB    =' 2'                                               005790
001464   067201  I        STB    MSG3           ERROR CODE FOR TTY                   005800
001465   002000           CALL   SSWZ           SENSE SWITCH/ERROR CONTROL           005810
001466   004721  R
001467   001000           JMP    MC52           LOOP ON ERROR                        005820
001470   001451  R
001471   001000           JMP    MCFW           CONTINUE                             005830
001472   001476  R
001473   100710    MCFV   EXC    0710           REWIND                               005840
001474   002000           CALL   MSUR           UNIT READY                           005850
001475   004221  R
001476   100110    MCFW   EXC    0110           ROR-BCD                              005860
001477   002000           CALL   MSUR                                               005870
001500   004221  R
001501   101610    MCFX   SEN    0610,*+4       BOT ?                                005880
001502   001505  R
001503   001000           JMP    MCFY           NO-CONTINUE                          005890
001504   001516  R
001505   010226           LDA    =5             ERROR CODE                           005900
001506   020257           LDB    =' 5'                                               005910
001507   067201  I        STB    MSG3           ERROR CODE FOR TTY                   005920
001510   002000           CALL   SSWZ                                               005930
001511   004721  R
001512   001000           JMP    MCFW           LOOP ON ERROR                        005940
001513   001476  R
001514   001000           JMP    MC99                                               005950
001515   001521  R
001516   100710    MCFY   EXC    0710           REWIND                               005960
001517   002000           CALL   MSUR           UNIT READY                           005970
001520   004221  R
                   *                                                                 005980
                   *       SENSE DETECTION OF ODD LENGTH RECORD ERROR                005990
                   *                                                                 006000
                   *           THIS TEST IS NOT VALID IF THE SENSE HIGH              006010
```

```
                            *              DENSITY OPTION EXISTS.                          006020
                            *                                                              006030
  001521   100210     MC99  EXC      0210              WOR                                 006040
  001522   002000           CALL     MSUR             UNIT READY                           006050
  001523   004221 R
  001524   100610     MC98  EXC      0610              BOR                                 006060
  001525   002000           CALL     MSUR                                                  006070
  001526   004221 R
  001527   100010     MC97  EXC      010               ROR                                 006080
  001530   002000           CALL     MSUR                                                  006090
  001531   004221 R
  001532   101410     MC96  SEN      0410,MC94         SEN ODD LENGTH RECORD               006100
  001533   001543 R
  001534   010260           LDA      #014              UNIT STATUS ERROR CODE FOR TTY      006110
  001535   020261           LDB      #'14'                                                 006120
  001536   067200 I         STB      MS62                                                  006130
  001537   002000           CALL     SSWX                                                  006140
  001540   004706 R
  001541   001000           JMP      MC99              LOOP ON ERROR                       006150
  001542   001521 R
  001543   001400     MC94  JSS3     MIST              BEGINNING OF TEST                   006160
  001544   000500 R
                            *                                                              006170
```

```
                                                                                                006190
    *******************************************************************************             006200
    *                        WRITE/READ COMPONENT                          *                    006210
    *                                                                      *                    006220
    *    THIS COMPONENT CONSISTS OF THREE SEGMENTS                         *                    006230
    *    **WRITE/READ BINARY RECORDS                                       *                    006240
    *    ** WRITE/READ BCD RECORDS                                         *                    006250
    *    ** WRITE/READ FILE MARK RECORDS                                   *                    006260
    *                                                                      *                    006270
    *    EACH RECORD TESTED CONSISTS OF THE FOLLOWING                      *                    006280
    *    SEQUENCE: WRITE RECORD,BACKSPACE RECORD,READ                      *                    006290
    *    RECORD,AND COMPARE REC'D DATA WITH EXPECTED.                      *                    006300
    *    FOR BOTH BINARY AND BCD, 3 RECORDS ARE TESTED                     *                    006310
    *    FOR EACH OF THREE DATA PATTERNS(052525,-1,125252).                *                    006320
    *    FILE MARK TESTING IS DETAILED AT BEGINNING OF                     *                    006330
    *    THAT SEGMENT.                                                     *                    006340
    *    RECORD LENGTH IS AS LONG AS AVAILABLE MEMORY                      *                    006350
    *    ALLOWS, FOR EXAMPLE: IF MEM SIZE IS 32K, RECORD                   *                    006360
    *    LENGTH IS APPROX. 27K WORDS.                                      *                    006370
    *                                                                      *                    006380
    *    NOTE: IF MT UNIT IS 9 TRK, THE BCD SEGMENT IS                     *                    006390
    *    EXECUTED WITH BINARY RECORDS.                                     *                    006400
    *                                                                      *                    006410
    *******************************************************************************             006420
    *                                                                                            006430
    *                                                                                            006440
    *                                                                                            006450
    *                                                                                            006460
    *                                                                                            006470
001545  000666    MWRR    HLT     0666            PRESS RUN/START TO CONTINUE                    006480
                  *                                        OR                                    006490
                  *                               SELECT TROUBLESHOOTING/ALIGNMENT ROUTINES      006500
001546  002000    MWRT    CALL    MSUR            UNIT READY                                     006510
001547  004221 R
001550  002000            CALL    MINT            INITIALIZE FOR WRITE/READ TESTING              006520
001551  002322 R
                  *                                                                              006530
                  *                                                                              006540
001552  010005    MS10    LDA     MTSB            BIC MODE ?                                     006550
001553  001010            JAZ     *+6             JMP IF NO                                      006560
001554  001561 R
001555  002000            CALL    MBCC            SETUP BIC FOR WRITING                          006570
```
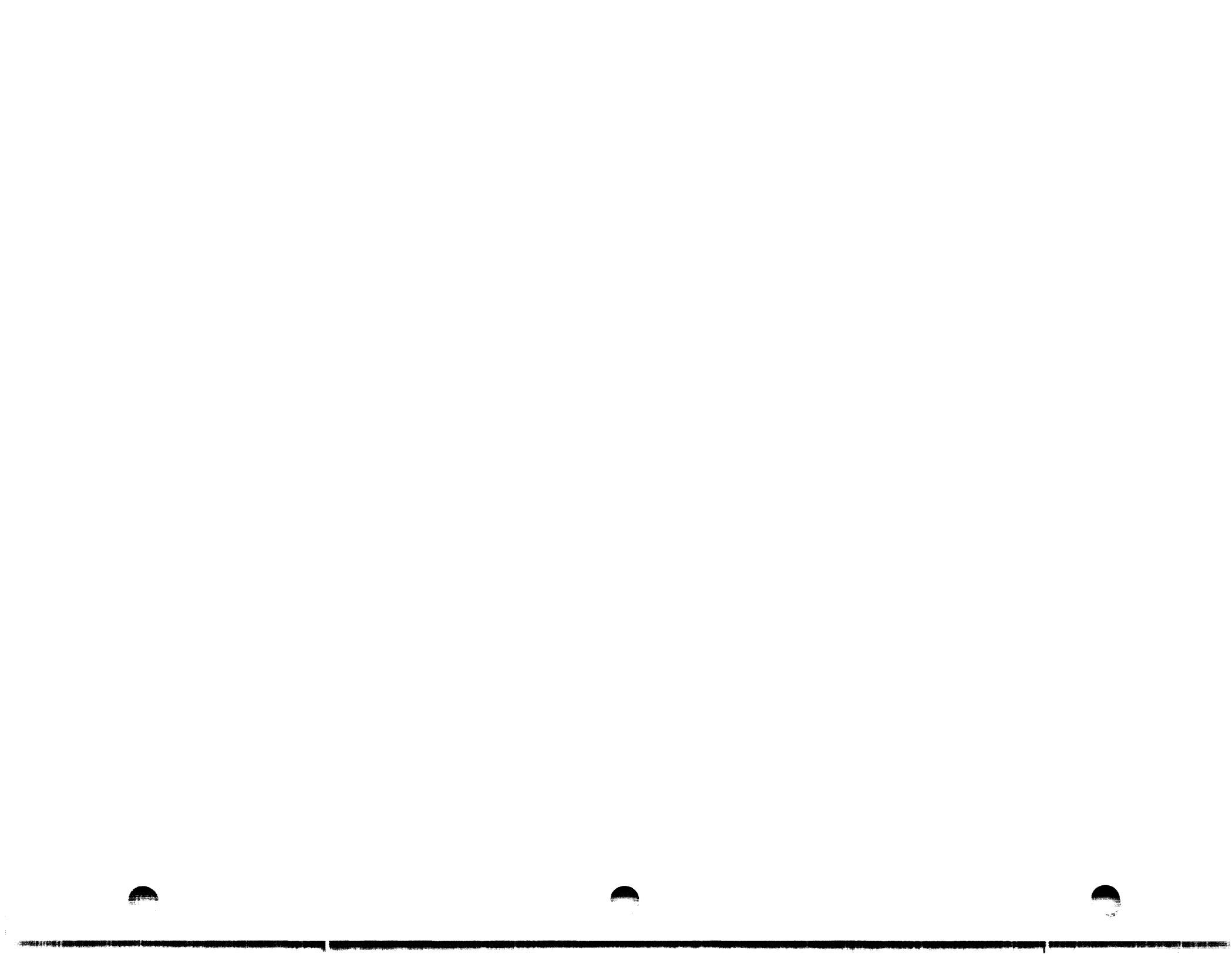
```
001556   004416 R
001557   001000           JMP     *+3                                                        006580
001560   001562 R
001561   020047           LDB     MBFL        BUF LENGTH FOR SENSE MODE WRITE                006590
001562   002000           CALL    MSWR        WRITE ONE RECORD                               006600
001563   002451 R
001564   101010   MS12    SEN     010,MS45    SENSE PARITY ERROR                             006610
001565   001640 R
001566   010060           LDA     MTWB        ANY READ AFTER WRITE PARITY THIS RECORD ?      006620
001567   001010           JAZ     MS20        JMP IF NO                                      006630
001570   001601 R
001571   005001           TZA                                                                006640
001572   050060           STA     MTWB        RESET READ-AFTER-WRITE PARITY COUNTY           006650
001573   002000           CALL*   SSWT        SENSE SWITCH/ERROR CONTROL                     006660
001574   100421 R
001575   000012           DATA    012         CODED HALT: RECOV READ/WRITE PARITY ERROR      006670
001576   005507 R         DATA    MSGW        MSG ADDR: RECOV, READ/WRITE PARITY ERROR       006680
001577   000500 R         DATA    MIST        TERMINATE EXIT                                 006690
001600   001601 R         DATA    *+1         NO LOOP ON ERROR                               006700
001601   002000   MS20    CALL    MBOR        BACKSPACE ONE RECORD                           006710
001602   002673 R
001603   002000   MS30    CALL    MBFZ        CLEAR READ BUFFER                              006720
001604   004443 R
001605   010005           LDA     MTSB        BIC MODE?                                      006730
001606   001010           JAZ     *+6         JMP IF NO                                      006740
001607   001614 R
001610   002000           CALL    MBCC        SETUP BIC FOR READING                          006750
001611   004416 R
001612   001000           JMP     *+3                                                        006760
001613   001615 R
001614   020047           LDB     MBFL        BUF LENGTH FOR SENSE MODE READ                 006770
001615   002000           CALL    MSRR        READ ONE RECORD                                006780
001616   002753 R
001617   010050   MS35    LDA     MBFM        EXECUTING FILE MARK TEST ?                     006790
001620   001010           JAZ     *+4         NO-                                            006800
001621   001624 R
001622   001000           JMP     MWR2        YES                                            006810
001623   002172 R
001624   002000   MS40    CALL    MESC        ERROR DETECT ROUTINE                           006820
001625   001775 R
         *                                     RETURN FROM THIS ROUTINE IS ONE OF THE        006830
         *                                     FOLLOWING 5 JMPS.                             006840
```

```
001626   001000              JMP     MESG     NORMAL TETURN IF NO PARITY ERROR            006850
001627   001646 R
001630   001000              JMP     MS20      PARITY ERROR TRN--READ AGAIN               006860
001631   001601 R
001632   001000              JMP     MESG     RECOVERABLE PARITY ERROR RETURN             006870
001633   001646 R
001634   001000              JMP     MESM     PARITY ERRORS--WRITE AGAIN                  006880
001635   001657 R
001636   001000              JMP     MESG     NON-RECOVERABLE PARITY ERROR RETURN         006890
001637   001646 R
                       *                                                                  006900
                       *                                                                  006910
                       *                                                                  006920
                       *     CONTROL REWRITE ATTEMPTS FOR READ-AFTER WRITE PARITY ERROR   006930
001640   002000      MS45    CALL    MS50     REWRITE CONTROL ROUTINE                     006940
001641   001723 R
001642   001000              JMP     MS10     GO WRITE AGAIN                              006950
001643   001552 R
001644   001000              JMP     MS20     REWRITE FAILED--CONTINUE                    006960
001645   001601 R
                       *                                                                  006970
                       *                                                                  006980
                       *                                                                  006990
                       *                                                                  007000
                       *     SEQUENCE CONTROL FOR WRITE/READ COMPONENT                    007010
                       *                                                                  007020
001646   001400      MESG    JSS3    MIST     SS3 TERMINATE                               007030
001647   000500 R
001650   002000              CALL    MSCP     DATA COMPARE ROUTINE                        007040
001651   003231 R
001652   010022              LDA     MTTS     3 RECORDS TESTED FOR CURRENT PATTERN        007050
001653   005311              DAR                                                          007060
001654   001010              JAZ     MESH     YES-                                        007070
001655   001664 R
001656   050022              STA     MTTS     NO-                                         007080
001657   010017      MESM    LDA     MTSD     CURRENT DATA PATTERN                        007090
001660   002000              CALL    MFLA     FILL WRITE BUFFER                           007100
001661   004427 R
001662   001000              JMP     MS10     WRITE ANOTHER RECORD                        007110
001663   001552 R
001664   010241      MESH    LDA     *3                                                   007120
001665   050022              STA     MTTS     INIT. RECORDS PER PATTERN                   007130
```

001666	010023		LDA	MTPP	DATA PATTERN POINTER	007140
001667	140262		SUB	=MTD3	LAST PATTERN ?	007150
001670	001004		JAN	MESE	NO-	007160
001671	001714 R					
001672	010263		LDA	=MTD1	YES	007170
001673	050023		STA	MTPP	RESET PATTERN POINTER	007180
001674	010024		LDA	MTD1	0 DATA PATTERN	007190
001675	050017		STA	MTSD	CURRENT DATA PATTERN	007200
001676	010003		LDA	MTBN	BIN/BCD FLAG	007210
001677	001010		JAZ	MESD		007220
001700	001705 R					
001701	005311		DAR			007230
001702	050003		STA	MTBN	RESET FOR BINARY WRITE/READ	007240
001703	001000		JMP	MWRC	CONTINUE TO FILE MARKS TEST	007250
001704	002126 R					
		*				007260
001705	005111	MESD	IAR			007270
001706	050003		STA	MTBN	SET FLAG FOR BCD WRITE/READ	007280
001707	010017	MESF	LDA	MTSD	CURRENT DATA PATTERN	007290
001710	002000		CALL	MFLA	FILL WRITE BUFFER	007300
001711	004427 R					
001712	001000		JMP	MS10	WRITE NEXT RECORD	007310
001713	001552 R					
		*				007320
		*				007330
001714	030023	MESE	LDX	MTPP	DATA PATTERN POINTER	007340
001715	005144		IXR			007350
001716	070023		STX	MTPP		007360
001717	015000		LDA	0,1		007370
001720	050017		STA	MTSD	CURRENT DATA PATTERN FOR SENSE MODE	007380
001721	001000		JMP	MESF	CONTINUE	007390
001722	001707 R					
		*			*	007400
		*			*	007410
		*			*	007420
		*	COME HERE IF READ-AFTER-WRITE PARITY ERROR WAS DETECTED			007430
		*				007440
		*	NORMAL EXIT FOR REWRITE			007450
		*	SECOND EXIT IF 5 REWITE ATTEMPTS FAILED			007460
		*				007470
001723	000000	MS50	ENTR			007480
001724	010060		LDA	MTWB	READ-AFTER-WRITE REWRITE COUNT	007490

```
001725   140226              SUB      =5           5 ATTEMPTS ?                              007500
001726   001010              JAZ      MS52         JMP IF YES                               007510
001727   001735 R
001730   040060              INR      MTWB         INCR WRITE ATTEMPTS COUNT                007520
001731   002000              CALL     MBOR         BACKSPACE ONE RECORD                     007530
001732   002673 R
001733   001000              JMP*     MS50         EXIT FOR REWRITE                         007540
001734   101723 R
                    *    NON-RECOVERABLE READ-AFTER-WRITE PARITY ERROR                      007550
001735   050060      MS52    STA      MTWB         RESET REWRITE COUNT                      007560
001736   010051              LDA      MBFN         BURN-IN TEST                             007570
001737   001010              JAZ      MS53         JMP IF NO                                007580
001740   001757 R
001741   010442              LDA      SCON         CONSOLE MODE ?                           007590
001742   001010              JAZ      MS53         JMP IF YES                               007600
001743   001757 R
001744   001100              JSS1     MS53         BYPASS PRINTOUT                          007610
001745   001757 R
001746   005030              LDXI     MSGK         RECORD MESSAGE                           007620
001747   005331 R
001750   002000              CALL*    OUTD                                                  007630
001751   100403 R
001752   010004              LDA      MSG1         RECORD COUNT                             007640
001753   002000              CALL*    OUTE                                                  007650
001754   100404 R
001755   002000              CALL*    OUTC         CR/LF                                    007660
001756   100402 R
001757   002000      MS53    CALL*    SSWT         SENSE SWITCH/ERROR CONTROL               007670
001760   100421 R
001761   000013              DATA     013          CODED HALT: NON-RECOV. R/W PARITY ERROR  007680
001762   005533 R            DATA     MSGX         MSG ADDR.                                007690
001763   000500 R            DATA     MIST         SS3 TERMINATE                            007700
001764   001771 R            DATA     MS54         LOOP ON ERROR EXIT                       007710
001765   041723              INR      MS50                                                  007720
001766   041723              INR      MS50                                                  007730
001767   001000              JMP*     MS50                                                  007740
001770   101723 R
                    *                                                                       007750
001771   002000      MS54    CALL     MBOR         BACKSPACE ONE RECORD                     007750
001772   002673 R
001773   001000              JMP*     MS50                                                  007770
001774   101723 R
```

```
                           *                                                    *        007790
                           *                                                    *        007800
                           *                                                             007810
                           *                                                             007820
                           *      READ PARITY SENSE AND REREAD/REWRITE CONTROL           007830
                           *                                                             007840
                           *    * NORMAL EXIT IF NO PARITY ERROR                         007850
                           *    * SECOND EXIT IF ERROR AND RE-READ NEEDED                007860
                           *    * THIRD  EXIT IF RECOVERABLE PARITY ERROR                007870
                           *    * FOURTH EXIT IF REWRITE NEEDED                          007880
                           *    * FIFTH EXIT IF NON-RECOVERABLE PARITY ERROR             007890
                           *                                                             007900
                           *                                                             007910
                           *                                                    *        007920
001775  000000     MESC    ENTR    0                                                     007930
001776  101010     MESA    SEN     010,MES1        TAPE ERROR                            007940
001777  002041 R
002000  010020             LDA     MTRA            FIRST READ ATTEMPT ?                  007950
002001  001010             JAZ*    MESC                                                  007960
002002  101775 R
002003  010051             LDA     MBFN            BURN-IN TEST ?                        007970
002004  001010             JAZ     MESB            JMP IF NO                             007980
002005  002024 R
002006  010442             LDA     SCON            JMP IF                                007990
002007  001010             JAZ     MESB            CONSOLE MODE                          008000
002010  002024 R
002011  001100             JSS1    MESB            BYPASS PRINTOUT                       008010
002012  002024 R
002013  006030             LDXI    MSGK            RECORD MESSAGE                        008020
002014  005331 R
002015  002000             CALL*   OUTD                                                  008030
002016  100403 R
002017  010004             LDA     MSG1            RECORD COUNT                          008040
002020  002000             CALL*   OUTE                                                  008050
002021  100404 R
002022  002000             CALL*   OUTC            CR/LF                                 008060
002023  100402 R
002024  002000     MESB    CALL*   SSWT            SENSE SWITCH/ERROR CONTROL            008070
002025  100421 R
002026  000004             DATA    04              CODED HALT: RECOVERABLE PARITY ERROR  008080
002027  005340 R           DATA    MSGL            TTY MESSAGE                           008090
002030  000500 R           DATA    MIST            SS3 TERMINATE                         008100
```

```
002031   002032 R              DATA    *+1          NO LOOP ON ERROR                              008110
                          *                                                                       008120
002032   005001              TZA                                                                  008130
002033   050020              STA     MTRA                                                         008140
002034   011775              LDA     MESC                                                         008150
002035   120225              ADD     =4                                                           008160
002036   051775              STA     MESC                                                         008170
002037   001000              JMP*    MESC         RECOV, PARITY ERROR EXIT                        008180
002040   101775 R                                                                                 
                          *                                                                       008190
                          *                                                                       008200
002041   010021      MES1    LDA     MTWA         REWRITE FLAG ON ?                               008210
002042   001010              JAZ     MES2         NO*                                             008220
002043   002102 R                                                                                 
002044   005311              DAR                  YES*                                            008230
002045   050021              STA     MTWA         RESET FLAG                                      008240
002046   010069              LDA     MBFN         BURN-IN TEST ?                                  008250
002047   001010              JAZ     MES4         JMP IF NO                                       008260
002050   002067 R                                                                                 
002051   010442              LDA     SCON         JMP IF                                          008270
002052   001010              JAZ     MES4         CONSOLE MODE                                    008280
002053   002067 R                                                                                 
002054   001100              JSS1    MES4         BYPASS PRINTOUT                                 008290
002055   002067 R                                                                                 
002056   006030              LDXI    MSGK         RECORD MESSAGE                                  008300
002057   005331 R                                                                                 
002060   002000              CALL*   OUTD                                                         008310
002061   100403 R                                                                                 
002062   010004              LDA     MSG1         RECORD COUNT                                    008320
002063   002000              CALL*   OUTE                                                         008330
002064   100404 R                                                                                 
002065   002000              CALL*   OUTC         CR/LF                                           008340
002066   100402 R                                                                                 
002067   002000      MES4    CALL*   SSWT         SENSE SWITCH/ERROR CONTROL                      008350
002070   100421 R                                                                                 
002071   000003              DATA    03           CODED HALT: NON-RECOV, PARITY ERROR            008360
002072   005356 R            DATA    MSGM         TTY MESSAGE                                     008370
002073   000500 R            DATA    MIST         SS3 TERMINATE                                   008380
002074   002075 R            DATA    *+1          NO LOOP ON ERROR                               008390
                          *                                                                       008400
002075   011775              LDA     MESC                                                         008410
002076   120247              ADD     =010                                                         008420
```

```
002077    051775            STA    MESC                                                     008430
002100    001000            JMP*   MESC         NON-RECOV, PARITY EXIT                       008440
002101    101775 R
                                                                                            008450
                     *                                                                      008460
002102    010020     MES2   LOA    MTRA         READ ATTEMPTS COUNTER                        008460
002103    005111            IAR                                                              008470
002104    050020            STA    MTRA                                                      008480
002105    130225            ERA    #4           READATTEMPTS #5 ?                            008490
002106    001010            JAZ    MES3         YES-                                         008500
002107    002114 R
002110    041775            INR    MESC                                                      008510
002111    041775            INR    MESC                                                      008520
002112    001000            JMP*   MESC         RE-READ EXIT                                 008530
002113    101775 R
                                                                                            008540
                     *                                                                      008550
002114    0500        MES3   STA    MTRA         RESET READ ATTEMPTS COUNTER TO ZERO         008550
002115    0051               IAR                                                             008560
002116    050021            STA    MTWA         REWRITE FLAG                                 008570
002117    002000            CALL   MBOR         BACKSPACE ONE RECORD                         008580
002120    002673 R
002121    011775            LOA    MESC                                                      008590
002122    120245            ADD    #6                                                       008600
002123    051775            STA    MESC                                                      008610
002124    001000            JMP*   MESC         REWIRTE EXIT                                 008620
002125    101775 R
```

```
                    *                                                               008640
                    *                                                               008650
                    ***********************************************************     008660
                    *                                                         *     008670
                    *                     FILE MARK TEST                      *     008680
                    *                                                         *     008690
                    *          WRITE 100 FILE MARKS,TESTING EACH AS           *     008700
                    *          IT IS WRITTEN(WRITE/BACKSPACE/FWD/SENSE),       *     008710
                    *                        THEN                             *     008720
                    *          WRITE A DATA RECORD(DATA=125252),VERIFYING      *     008730
                    *          THAT IT IS WRITTEN WITHOUT PARITY ERROR,        *     008740
                    *                        THEN                             *     008750
                    *          BACKSPACE 101 RECORDS                          *     008760
                    *                        THEN                             *     008770
                    *          FORWARD 100 RECORDS,TESTING EACH FOR           *     008780
                    *          FILE MARK DETECTION,                           *     008790
                    *                        THEN                             *     008800
                    *          READ ONE RECORD AND CHECK IF DATA RECORD       *     008810
                    *          IS CORRECT.                                    *     008820
                    *                                                         *     008830
                    ***********************************************************     008840
002126  010442      MWRC    LDA     SCON            CONSOLE MODE ?                  008850
002127  001010              JAZ     MWRP            YES=                            008860
002130  00213   R
002131  00603              LDXI    MSGY            NO=                             008870
002132  005561 R
002133  002000              CALL*   OUTD            OUTPUT MESSAGE:FILE MARK TEST   008880
002134  100403 R
002135  010237      MWRP    LDA     =1              SET FILE MARK TEST  FLAG        008890
002136  050050              STA     MBFM                                            008900
002137  020264              LDB     =100                                            008910
002140  060015              STB     MTT1            RECORD COUNT                    008920
002141  002000      MWR1    CALL    MWFM            WRITE FILE MARK                 008930
002142  003464 R
002143  002000              CALL    MBOR            BACKSPACE ONE RECORD            008940
002144  002673 R
002145  002000              CALL    MFOR            FORWARD ONE RECORD              008950
002146  003136 R
002147  002000      MWRS    CALL    MSUR            SENSE UNIT READY                008960
002150  004221 R
002151  002000      MWRF    CALL    MWRZ            SENSE FILE MARK/ERROR REPORT    008970
002152  002304 R
```

```
002153  001000            JMP     MWR1        LOOP ON ERROR RTN FROM MWRZ        008980
002154  002141 R
002155  010015    MWRG    LDA     MTT1        RECORD COUNT                       008990
002156  001010            JAZ     MWRI        FINISHED WRITING 100 F.M. RECORDS  009000
002157  002164 R
002160  005311            DAR                                                    009010
002161  050015            STA     MTT1                                           009020
002162  001000            JMP     MWR1        WRITE NEXT FILE MARK               009030
002163  002141 R
                    *                                                            009040
                    *      WRITE ONE RECORD,VERIFY THAT ITS GOOD,THEN BACK UP AND 009050
                    *      REREAD FILE MARKS AND DATA RECORD,                     009060
                    *                                                            009070
002164  010265    MWRI    LDA     #0125252                                       009080
002165  050017            STA     MTSD        DATA PATTER STORAGE                009090
002166  002000            CALL    MFLA        FILL WRITE BUFFER                  009100
002167  004427 R
002170  001000            JMP     MS10        GO USE WRITE/READ STANDARD ROUTINE 009110
002171  001552 R
                    *                                                            009120
                    *      RETURN HERE AFTER WRITE/READ OF DATA RECORD            009130
002172  002000    MWR2    CALL    MSTE        SENSE PARITY ERROR                 009140
002173  004350 R
002174  001000            JMP     MWRJ        NO=CONTINUE                        009150
002175  002213 R
002176  010021            LDA     MTWA        YES=REWRITE FLAG ON ?              009160
002177  001010            JAZ     *+4         NO                                 009170
002200  002203 R
002201  005001            TZA                                                    009180
002202  050021            STA     MTWA        RESET REWRITE FLAG                 009190
002203  001000            JMP     MWRC        YES=START OVER                     009200
002204  002126 R
002205  005111            IAR                                                    009210
002206  050021            STA     MTWA                                           009220
002207  002000            CALL    MBOR        B.O.R                              009230
002210  002673 R
002211  001000            JMP     MWRI        GO WRITE/READ AGAIN                009240
002212  002164 R
                    *      BACKSPACE 101 RECORDS                                  009250
002213  020266    MWRJ    LDB     #101                                           009260
002214  060015            STB     MTT1        SAVE RECORD COUNT                  009270
002215  002000            CALL    MBOR        B.O.R                              009280
```

```
002216    002673 R
002217    020015              LDB     MTT1         GET RECORD COUNT               009290
002220    005322              DBR                                                 009300
002221    001020              JBZ     *+5                                         009310
002222    002226 R
002223    060015              STB     MTT1                                        009320
002224    001000              JMP     MWRJ+2       BACKSPACE AGAIN                009330
002225    002215 R
                        *     FORWARD 100 RECORDS                                 009340
002226    020264              LDB     #100                                        009350
002227    060015              STB     MTT1                                        009360
002230    002000    MWR3      CALL    MFOR         F.O.R                          009370
002231    003136 R
                        *                                                         009380
                        *                                                         009390
                        *                                                         009400
002232    002000    MWRL      CALL    MWRZ         SENSE FILE MARK/ERROR REPORT   009410
002233    002304 R
002234    001000              JMP     MWR3         LOOP ON ERROR RTN FROM MWRZ    009420
002235    002230 R
002236    020015              LDB     MTT1         GET RECORD COUNT               009430
002237    005322              DBR                                                 009440
002240    060015              STB     MTT1                                        009450
002241    001020              JBZ     *+4          CONTINUE                       009460
002242    002245 R
002243    001000              JMP     MWR3                                        009470
002244    002230 R
                        *                                                         009480
                        *                                                         009490
                        *                                                         009500
                        *     CHECK IF POSITIONED AT RIGHT RECORD                 009510
                        *                                                         009520
002245    002000              CALL    MBFZ         CLEAR READ BUFFER              009530
002246    004443 R
002247    010005              LDA     MTSB         BIC MODE ?                     009540
002250    001010              JAZ     *+6          JMP IF NO                      009550
002251    002256 R
002252    002000              CALL    MBCC         SETUP BIC FOR READING          009560
002253    004416 R
002254    001000              JMP     *+3                                        009570
002255    002257 R
002256    020047              LDB     MBFL         BUF LENGTH FOR SENSE MODE READ 009580
```

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002257   002000              CALL    MSRR         READ ONE RECORD                          009590
002260   002753 R
002261   030044              LDX     MBFI         READ BUF START ADDR                      009600
002262   015000              LDA     0,1                                                   009610
002263   130265              ERA     =0125252     EXPECTED DATA                            009620
002264   001010              JAZ     MWRG         JMP IF GOOD                              009630
002265   002276 R
002266   002000              CALL*   SSWT         SENSE SWITCH/ERROR CONTROL               009640
002267   100421 R
002270   000010              DATA    010          CODED HALT: WRONG RECORD FOUND           009650
002271   005464 R            DATA    MSGV         TTY MESSAGE                              009660
002272   000500 R            DATA    MIST         SS3 TERMINATE                            009670
002273   008126 R            DATA    MWRC         LOOP ON ERROR                            009680
002274   001400      MWRO    JSS3    MIST         RETURN TO TOP OF PROGRAM                 009690
002275   000500 R
002276   002000      MWRG    CALL    MSCP         DATA COMPARE ROUTINE                     009700
002277   003231 R
002300   005001              TZA                                                           009710
002301   050050              STA     MBFM         RESET FILE MARK TEST                     009720
002302   001000              JMP     MBNT         CONTINUE TO BURN-IN TEST                 009730
002303   003524 R
                     *                                                                     009740
                     *                                                                     009750
                     *                                                                     009760
                     *                ** SENSE FILE MARK/ERROR REPORT **                   009770
002304   000000      MWRZ    ENTR    0                                                     009780
002305   101310      MWRY    SEN     0310,MWRX                                             009790
002306   002316 R
002307   010267              LDA     =012         ERROR CODE                               009800
002310   020270              LDB     ='12'        TTY ASCII ERROR CODE                     009810
002311   067200 I            STB     MSG2                                                  009820
002312   002000              CALL    SSWX         SENSE SWITCH/ERROR CONTROL               009830
002313   004706 R
002314   001000              JMP*    MWRZ         LOOP ON ERROR EXIT                       009840
002315   102304 R
002316   042304      MWRX    INR     MWRZ                                                  009850
002317   042304              INR     MWRZ                                                  009860
002320   001000              JMP*    MWRZ         RETURN                                   009870
002321   102304 R
```

```
                          *                                                                        009890
                          *                                                                        009900
                          *                                                                        009910
                          *                                                                        009920
                          *          INITIALIZE FOR WRITE/READ TESTING                             009930
                          *                                                                        009940
                          *                                                                        009950
  002322   000000    MINT    ENTR                                                                  009960
  002323   010441            LDA      SMEM          MEMORY SIZE--FROM TEST EXEC                     009970
  002324   140271            SUB      *010000       MORE THAN 4K ?                                  009980
  002325   001004            JAM      MINA          NO-                                             009990
  002326   002374 R
  002327   010441            LDA      SMEM          MEM SIZE                                        010000
  002330   004341            LSRA     1                                                            010010
  002331   050054            STA      MBFR          MASK FOR RANDOM DATA WORD                       010020
  002332   010237            LDA      *1                                                            010030
  002333   050057            STA      MSIZ          MEMORY SIZE >4K                                 010040
  002334   010271            LDA      *010000       BEGINNING OF 2ND 4K                             010050
  002335   050030            STA      MBFA          WRITE BUF START ADDR                            010060
  002336   050044            STA      MBFI          INITIAL ADDR FOR COMMON W/R BUFFER              010070
  002337   010441            LDA      SMEM                                                          010080
  002340   140272            SUB      *020000       MORE THAN 8K OF MEMORY ?                        010090
  002341   001002            JAP      MINF          YES-                                            010100
  002342   002350 R
  002343   010441            LDA      SMEM          SAVE BINARY LOADER                              010110
  002344   006140            SUBI     0220          AT TOP OF MEMORY                                010120
  002345   000220
  002346   001000            JMP      MINE                                                          010130
  002347   002352 R
  002350   010441    MINF    LDA      SMEM          SAVE AID AND BLD                                010140
  002351   140273            SUB      *02000        AT TOP OF MEMORY                                010150
  002352   050033    MINE    STA      MBFD          READ BUF MAX END ADDR                           010160
  002353   050037            STA      MBFH          CURRENT FINAL ADDR OF COMMON W/R BUF            010170
  002354   050036            STA      MBFG          CURRENT READ BUF LAST LOC                       010180
  002355   050045            STA      MBFJ          MAX END ADDR FOR COMMON W/R BUFFER              010190
  002356   005111            IAR                                                                    010200
  002357   140271            SUB      *010000       WRITE BUF START ADDR                            010210
  002360   050047            STA      MBFL          CURRENT LENGTH OF COMMON W/R BUFFER             010220
  002361   004341            LSRA     1             DIVIDE BY 2                                      010230
  002362   140274            SUB      *020         LEAVE GAPE BETWEEN BUFFERS                       010240
  002363   050034            STA      MBFE          WRITE/READ MAX BUF LENGTH IF >4K                010250
  002364   120271            ADD      *010000                                                       010260
```

002365	050031		STA	MBFB	WRITE BUF MAX END ADDR	010270
002366	050035		STA	MBFF	CURRENT WRITE BUF LAST LOC	010280
002367	010033		LDA	MBFD		010290
002370	140034		SUB	MBFE	BUF LENGTH	010300
002371	050032		STA	MBFC	READ BUF START ADDR	010310
002372	001000		JMP	MINB		010320
002373	002411 R					
		*				010330
		*	MEM SIZE = 4K; RANDOM DATA BURN-IN SUBTEST IS BYPASSED			010340
		*	BECAUSE OF LIMITED MEMORY			010350
002374	005001	MINA	TZA			010360
002375	050057		STA	MSIZ	MEMORY SIZE	010370
002376	006010		LDAI	MEND	END OF THIS PROGRAM	010380
002377	005607 R					
002400	050044		STA	MBFI	BIC INITIAL ADDR FOR COMMON W/R BUFFER	010390
002401	006010		LDAI	06147	HIGHEST CELL IF ONLY 4K, THIS SAVES NONE	010400
002402	006147					
		*			OF THE TEST EXEC UTILITY ROUTINES,	010410
002403	050037		STA	MBFH	CURRENT FINAL ADDR OF COMMON W/R BUF	010420
002404	050045		STA	MBFJ	MOX END ADDR FOR COMMON W/R BUFFER	010430
002405	005111		IAR			010440
002406	006140		SUBI	MEND	END OF THIS PROGRAM	010450
002407	005607 R					
002410	050047		STA	MBFL	BUFFER LENGTH	010460
		*	INITIALIZE FLAGS/PARAMETERS			010470
002411	005001	MINB	TZA			010480
002412	050003		STA	MTBN	BINARY/BCD FLAG	010490
002413	050004		STA	MSG1	CURRENT RECORD NUMBER	010500
002414	050020		STA	MTRA	READ ATTEMPTS COUNTER	010510
002415	050021		STA	MTWA	REWRITE FLAG	010520
002416	050027		STA	MTFE	DATA COMPARE ERROR FLAG	010530
002417	050060		STA	MTWB	READ-AFTER-WRITE PARITY ERROR COUNT	010540
002420	050050		STA	MBFM	FILE MARK TEST FLAG	010550
002421	050051		STA	MBFN	BURN-IN FLAG	010560
002422	050056		STA	MBFT	BUF READY INTERRUPT CONTROL	010570
002423	010275		LDA	=052525	FIRST DATA PATTERN	010580
002424	050017		STA	MTSD	DATA PATTERN	010590
002425	002000		CALL	MFLA	FILL WRITE BUF WITH FIRST DATA PATTERN	010600
002426	004427 R					
002427	010237		LDA	=1		010610
002430	050063		STA	MBSQ	INIT. WRITE/READ FOR FIXED DATA	010620
002431	010263		LDA	=MTD1		010630

```
002432   050023          STA   MTPP    SET DATA PATTERN POINTER              010640
002433   010241          LDA   #3                                           010650
002434   050022          STA   MTTS    WRITE/READ RECORD COUNT PER DATA PATTERN   010660
002435   007400          ROF                                                010670
002436   010011          LDA   MTPM    USING PIM                            010680
002437   001010          JAZ   MIND    NOW                                  010690
002440   002446 R
002441   010064          LDA   MPIM    SET MASK                             010700
002442   103140    MING  OAR   040     SET PIM MASK REGISTER              B  010710
002443   100340    MINC  EXC   0340    ENABLE INTERRUPTS                    010720
002444   001000          JMP*  MINT    RETURN                               010730
002445   102322 R
002446   100540    MIND  EXC   0540    DISABLE INTERRUPTS                   010740
002447   001000          JMP*  MINT    RETURN                               010750
002450   102322 R
                         *                                    *             010760
                         *                                    *             010770
```

```
                              *                    ** WRITE ONE RECORD **                           *        010790
                              *                      ** W/WO BIC                                    *        010800
                              *                      ** BINARY OR BCD DATA                          *        010810
                              *                      ** W/WO PIM                                    *        010820
                              *                      ** ENTER WITH B=RECORD LENGTH                  *        010830
                              *                                                                     *        010840
   002451  000000    MSWR     ENTR    0                                                                      010850
   002452  002000             CALL    MSUR              UNIT READY                                           010860
   002453  004221 R
   002454  010011             LDA     MTPM              OPERATE WITH PIM ?                                   010870
   002455  001010             JAZ     MSWZ              NO-                                                  010880
   002456  002606 R
   002457  010276             LDA     =MSWD             YES-                                                 010890
   002460  057012             STA*    MTP1              BUFFER READY INTERRUPT ADDRESS                       010900
   002461  010277             LDA     =MSW3                                                                  010910
   002462  057013             STA*    MTP2              MOTION COMPLETE INTERRUPT ADDRESS                    010920
   002463  030044             LDX     MBFI              BUFFER INITIAL ADDR                                  010930
   002464  070055             STX     MBPS              HOLDS BUF WORD ADDR                                  010940
   002465  010005             LDA     MTSB              BIC MODE ?                                           010950
   002466  001010             JAZ     MSWA              JMP IF NO                                            010960
   002467  002512 R
   002470  005001             TZA                                                                            010970
   002471  050056             STA     MBFT              0=DISREGARD INTERRUPT; WAIT FOR MOT. COMP.           010980
   002472  010003             LDA     MTBN              WRITE BIN/BCD ?                                      010990
   002473  001010             JAZ     MSWC              JMP IF BINARY                                        011000
   002474  002500 R
   002475  100310    MSWB     EXC     0310              WOR-BCD                                              011010
   002476  001000             JMP     *+3                                                                   011020
   002477  002501 R
   002500  100210    MSWC     EXC     0210              WOR-BIN                                              011030
   002501  002000             CALL    MBIS              CHECK BIC BUSY/ABNORMAL STOP                         011040
   002502  004311 R
   002503  030251             LDX     =0                                                                    011050
   002504  002000             CALL*   TOLY              TIME DELAY FOR INTERRUPT AFTER BIC COMPLETE          011060
   002505  100420 R
   002506  002000    MSWI     CALL    MSW9              ERROR-NO MOTION COMPLETE INTERRUPT                   011070
   002507  002661 R
   002510  001000             JMP*    MSWR              EXIT                                                 011080
   002511  102451 R
   002512  010237    MSWA     LDA     =1                                                                    011090
   002513  050056             STA     MBFT              1=PROCESS BUF READY INTERRUPT                        011100
   002514  010003             LDA     MTBN              WRITE BIN/BCD ?                                      011110
```

```
002515  001010          JAZ     MSWP        JMP IF BINARY                           011120
002516  002523 R
002517  003000          XEC     MSWB        EXC: WOR-BCD                            011130
002520  002475 R
002521  001000          JMP     *+4                                                 011140
002522  002525 R
002523  003000  MSWP    XEC     MSWC        EXC: WOR-BIN                            011150
002524  002500 R
002525  030251  MSW1    LDX     =0          TIME DELAY FOR BUFFER READY             011160
002526  002000          CALL*   TDLY        TIME DELAY-FOR BUFFER READY             011170
002527  100420 R
002530  002000          CALL    MSW7        ERROR-NO BUF READY INTERRUPT            011180
002531  002647 R
002532  001000          JMP*    MSWR        EXIT                                    011190
002533  102451 R
                *                                                                   011200
                *       BUF READY/BIC COMPLETE INTERRUPT RETURN                     011210
                *                                                                   011220
002534  100440  MSWD    EXC     0440        DISABLE INTERRUPTS: THIS NEEDED BECAUSE 011230
                *                            FIRST TWO BUF READY INTERRUPTS OCCUR    011240
                *                            BACK-TO BACK AFTER EXC ISSUED TO LOAD THE 011250
                *.                           DOUBLE WRITE  BUFFERS,                  011260
002535  010056          LDA     MBFT        INT, FLAG, FOR BUF READY INTERRUPT USE, 011270
002536  001010          JAZ     MSWL        0=DISREGARD INT,AFTER LAST WORD TRANSFER 011280
002537  002553 R
002540  017055          LDA*    MBFS        GET WORD TO WRITE                       011290
002541  103110  MSWN    OAR     010         OUTPUT WORD                            011300
002542  005322          DBR                 LAST WORD TO WRITE                     011310
002543  001020          JBZ     MSW2        YES-                                    011320
002544  002552 R
002545  040055          INR     MBFS                                               011330
002546  100240  MSWH    EXC     0240        ENABLE INTERRUPTS                      011340
002547  005000          NOP                                                        011350
002550  001000          JMP     MSW1        NO-                                     011360
002551  002525 R
                *                                                                   011370
002552  060056  MSW2    STB     MBFT        0=DISREGARD BUF READY INT,AFTER LAST TRANSF 011380
002553  003000  MSWL    XEC     MSWH        EXC:ENABLE INTERRUPTS                  011390
002554  002546 R
002555  030251          LDX     =0                                                 011400
002556  002000  MSWM    CALL*   TOUT        TIME OUT                               011410
002557  100417 R
```

```
002560  001000           JMP    MSWI     ERROR=NO MOTION COMPLETE INTERRUPT     011420
002561  002506 R
002562  001000           JMP    MSWM                                           011430
002563  002556 R
                    *                                                          011440
                    *       MOTION COMPLETE INTERRUPT RETURN                   011450
                    *                                                          011460
002564  010005   MSW3   LDA    MTSB     BIC MODE ?                             011470
002565  001010           JAZ    *+6      NO=                                    011480
002566  002573 R
002567  002000           CALL   MBIS     BIC BUSY/ABNORMAL STOP                011490
002570  004311 R
002571  002000   MSWK   CALL   MSXA     CHECK UNIT READY                       011500
002572  004241 R
002573  001000           JMP*   MSWR     OK                                     011510
002574  102451 R
002575  010253   MSWY   LDA    =07      ERROR CODE                             011520
002576  020300           LDB    ='07'    TTY ASCII ERROR CODE                  011530
002577  067200 I         STB    MSG2     UNIT STATUS CODE                      011540
002600  002000           CALL   SSWX     SENSE SWITCH/ERROR CONTROL            011550
002601  004706 R
002602  001000           JMP    MCTP     LOOP ERROR: RESTART AT LOAD POINT     011560
002603  001106 R
002604  001000           JMP    MCTP                                          011570
002605  001106 R
                    *                                                          011580
                    *                                                          011590
                    *                                                          011600
                    *       SENSE/BIC MODES WITHOUT INTERRUPTS                 011610
                    *                                                          011620
                    *                                                          011630
002606  010003   MSWZ   LDA    MTBN     WRITE BIN/BCD ?                        011640
002607  001010           JAZ    *+6                                           011650
002610  002615 R
002611  003000           XEC    MSWB     EXC:WOR=BCD                           011660
002612  002475 R
002613  001000           JMP    *+4                                           011670
002614  002617 R
002615  003000           XEC    MSWC     EXC:WOR=BIN                           011680
002616  002500 R
002617  010005           LDA    MTSB     BIC MODE ?                           011690
002620  001010           JAZ    MSW5     NO=                                   011700
```

```
002521  002526 R
002522  002000                CALL    MBIS    YES-SENSE BIC BUSY/ABNORMAL STOP    011710
002523  004311 R
002524  001000                JMP     MSWK    CHECK TRANSPORT READY BEFORE EXIT   011720
002525  002571 R
002526  030044        MSW5     LDX     MBFI    BUFFER INITIAL ADDR                011730
002527  002000        MSWJ     CALL    MSBR    SENSE BUFFER READY                 011740
002530  004257 R
002531  001000                 JMP*    MSWR    BUF READY TIME-OUT--EXIT          011750
002532  102451 R
002533  015000        MSWE     LDA     0,1                                       011760
002534  103110        MSWF     OAR     010     OUTPUT WORD                       011770
002535  005322                 DBR                                               011780
002536  001020                 JBZ     MSW6    LAST WORD ?                       011790
002537  002543 R
002540  005144                 IXR                                              011800
002541  001000                 JMP     MSWJ    OUTPUT NEXT WORD                 011810
002542  002527 R
002543  002000        MSW6     CALL    MSUR    UNIT READY                       011820
002544  004221 R
002545  001000                 JMP*    MSWR    RETURN                           011830
002546  102451 R
                                *                                               011840
```

```
                                    *                                                              011860
                                    *     ERROR REPORT-NO BUF, READY INTERRUPT                      011870
                                                                                                   011880
002647    000000           MSW7     ENTR                                                           011890
002650    010301                    LDA       #016              ERROR CODE                          011900
002651    020302                    LDB       #'16'                                                 011910
002652    067200  I                 STB       MSG2             UNIT STATUS ERROR CODE               011920
002653    002000                    CALL      SSWX             SENSE SWITCH/ERROR CONTROL
002654    004706  R
002655    001000                    JMP       *+1              NO LOOP ON ERROR                     011930
002656    002656  R
002657    001000                    JMP*      MSW7                                                  011940
002660    102647  R
                                    *                                                              011950
                                    *     ERROR REPORT-NO MOTION COMPLETE INTERRUPT                 011960
002661    000000           MSW9     ENTR                                                           011970
002662    010303                    LDA       #017             ERROR CODE                          011980
002663    020304                    LDB       #'17'                                                 011990
002664    067200  I                 STB       MSG2             UNIT STATUS ERROR CODE               012000
002665    002000                    CALL      SSWX             SENSE SWITCH/ERROR CONTROL           012010
002666    004706  R
002667    001000                    JMP       *+1              NO LOOP ON ERROR                     012020
002670    002670  R
002671    001000                    JMP*      MSW9                                                  012030
002672    102661  R
```

```
                                   *                                              *        012050
                                   *                                              *        012060
                                   *          ** BACKSPACE ONE RECORD **          *        012070
                                   *                                              *        012080
                                   *                                              *        012090
                                   *                                              *        012100
002673  000000        MBOR    ENTR     0                                                   012110
002674  002000                CALL     MSUR        UNIT READY                              012120
002675  004221 R
002676  010011                LDA      MTPM        OPERATE WITH PIM ?                      012130
002677  001010                JAZ      MBOB        NO-                                     012140
002700  002726 R
002701  010305                LDA      =MB01       YES-                                    012150
002702  057013                STA*     MTP2        MOTION COMPLETE INTERRUPT RTN.          012160
002703  100610        MBOA    EXC      0610        BOR                                     012170
002704  030251                LDX      =0          TIME DELAY TO WAIT FOR                  012180
002705  020253                LDB      =7                                                  012190
002706  002000        MBOE    CALL     MLTO        EXTENDED TIME DELAY                     012200
002707  004456 R
002710  001000                JMP      *+4         TIMES UP                                012210
002711  002714 R
002712  001000                JMP      MBOE                                                012220
002713  002706 R
002714  002000                CALL     MSW9        REPORT ERROR-NO MOTION COMPLETE INTERRUPT  012230
002715  002661 R
002716  001000                JMP*     MBOR        EXIT                                    012240
002717  102673 R
                      *     MOTION COMPLETE INTERRUPT RETURN                               012250
002720  002000        MB01    CALL     MSTE        SENSE TAPE ERROR                        012260
002721  004350 R
002722  001000                JMP*     MBOR        RETURN                                  012270
002723  102673 R
002724  001000                JMP      MSWY        ERROR-LOSS OF TRANSPORT READINESS       012280
002725  002575 R
                      *     BOR/SENSE COMPLETE                                             012290
002726  003000        MBOB    XEC      MBOA        EXC-B.O.R.                              012300
002727  002703 R
002730  030251                LDX      =0                                                  012310
002731  020253                LDB      =7                                                  012320
002732  101210        MBOC    SEN      0210,(MBOR)*  UNIT READY ?                          012330
002733  102673 R
002734  002000                CALL     MLTO        EXTENDED TIME-OUT ROUTINE               012340
```

```
002735  004456 R
002736  001000        JMP      *+4            NO-ERROR                        012350
002737  002742 R
002740  001000        JMP      MBOC                                           012360
002741  002732 R
                 *                                                            012370
002742  010247        LDA      =010           ERROR CODE                      012380
002743  020250        LDB      ='110'         TTY ASCII ERROR CODE            012390
002744  067201 I      STB      MSG3           TRANSPORT MOTION ERROR          012400
002745  002000        CALL     SSWZ           SENSE SWITCH/ERROR CONTROL      012410
002746  004721 R
002747  001000        JMP      MBOR+1         LOOP ON ERROR                   012420
002750  002674 R
002751  001000        JMP*     MBOR           EXIT                            012430
002752  102673 R
```

```
                       *                                                                    *          012450
                       *                                                                    *          012460
                       *                    ** READ ONE RECORD **                           *          012470
                       *                      ** W/WO BIC                                    *          012480
                       *                      ** BINARY OR BCD DATA                          *          012490
                       *                      ** W/WO PIM                                    *          012500
                       *                      ** ENTER WITH B=RECORD LENGTH                  *          012510
                       *                                                                    *          012520
                       *                                                                    *          012530
  002753  000000    MSRR   ENTR    0                                                                   012540
  002754  002000           CALL    MSUR            UNIT READY                                          012550
  002755  004221 R
  002756  010011           LDA     MTPM            OPERATE WITH PIM ?                                  012560
  002757  001010           JAZ     MSR3            NO-                                                 012570
  002760  003067 R
  002761  010306           LDA     *MSRG           YES-                                                012580
  002762  057012           STA*    MTP1            BUFFER READY INTERRUPT ADDRESS                      012590
  002763  010307           LDA     *MSR2                                                               012600
  002764  057013           STA*    MTP2            MOTION COMPLETE INTERRUPT ADDRESS                   012610
  002765  010063           LDA     MBSQ            RANDOM DATA TESTING                                 012620
  002766  001010           JAZ     *+5             JMP IF YES                                          012630
  002767  002773 R
  002770  030044           LDX     MBFI            START ADDR OF COMMON W/R BUFFER                     012640
  002771  001000           JMP     *+3                                                                 012650
  002772  002774 R
  002773  030032           LDX     MBFC            START ADDR OF RANDOM DATA READ BUF                  012660
  002774  070055           STX     MBFS            HOLDS BUF WORD ADDR                                 012670
  002775  010003           LDA     MTBN            READ BINARY/BCD                                     012680
  002776  001010           JAZ     MSRC            BIN                                                 012690
  002777  003026 R
  003000  100110    MSRB   EXC     0110            RDR-BCD                                             012700
  003001  010005    MSRJ   LDA     MTSB            BIC MODE                                            012710
  003002  001010           JAZ     MSRK            JMP IF NO                                           012720
  003003  003015 R
  003004  002000           CALL    MBIS            SENSE BIC BUSY/ABNORMAL STOP                        012730
  003005  004311 R
  003006  030251           LDX     *0                                                                  012740
  003007  002000           CALL*   TDLY            TIME DELAY FOR INTERRUPT AFTER BIC COMPLETE         012750
  003010  100420 R
  003011  002000    MSRM   CALL    MSW9            ERROR-NO MOTION COMPLETE INTERRUPT                  012760
  003012  002661 R
  003013  001000           JMP*    MSRR            EXIT                                                012770
```

```
003014   102753 R
003015   010237    MSRK   LDA    #1                                                      012780
003016   050056           STA    MBFT      1=PROCESS BUF READY INTERRUPT                 012790
003017   030251           LDX    #0                                                      012800
003020   002000           CALL*  TDLY      TIME DELAY FOR BUF READY                      012810
003021   100420 R
003022   002000           CALL   MSW7      ERROR=NO BUF READY INTERRUPT                  012820
003083   002647 R
003024   001000           JMP*   MSRR      EXIT                                          012830
003025   102753 R
003026   100010    MSRC   EXC    010       ROR=BIN                                       012840
003027   001000           JMP    MSRJ                                                    012850
003030   003001 R
                   *                                                                     012860
                   *                                                                     012870
                   *        BUF READY/BIC COMPLETE INTERRUPT RETURN                      012880
                   *                                                                     012890
003031   010056    MSRG   LDA    MBFT      BUF READY INTERRUPT FLAG                      012900
003032   001010           JAZ    MSRN      0=DISREGARD INT.AFTER LAST WORD TRANSFER      012910
003033   003045 R
003034   102510    MSRQ   CIA    010       INPUT WORD                                    012920
003035   057055           STA*   MBFS                                                    012930
003036   040055           INR    MBFS                                                    012940
003037   005322           DBR                                                            012950
003040   001020           JBZ    MSRL      CHECK FOR MOTION COMPLETE                     012960
003041   003044 R
003042   001000           JMP    MSRK      GO WAIT FOR NEXT INTERRUPT                    012970
003043   003015 R
003044   060056    MSRL   STB    MBFT      0=DISREGARD BUF READY INT.AFTER LAST TRANF.   012980
003045   030251    MSRN   LDX    #0                                                      012990
003046   002000    MSRP   CALL*  TOUT      TIME OUT                                      013000
003047   100417 R
003050   001000           JMP    MSRM      ERROR=NO MOTION COMPLETE INTERRUPT            013010
003051   003011 R
003052   001000           JMP    MSRP                                                    013020
003053   003046 R
                   *                                                                     013030
                   *        MOTION COMPLETE INTERRUPT RETURN                             013040
                   *                                                                     013050
003054   010005    MSR2   LDA    MTSB      BIC MODE ?                                    013060
003055   001010           JAZ    *+6       NO=                                           013070
003056   003063 R
```

```
003057  002000          CALL    MBIS        BIC BUSY/ABNORMAL STOP                   013080
003060  004311 R
003061  002000   MSR5    CALL    MSXA        CHECK IF UNIT READY                      013090
003062  004241 R
003063  001000          JMP*    MSRR        YES-EXIT                                 013100
003064  102753 R
003065  001000          JMP     MSWY        NO- REPORT ERROR                         013110
003066  002575 R
                 *                                                                    013120
                 *      SENSE/BIC MODES WITHOUT INTERRUPTS                            013130
                 *                                                                    013140
                 *                                                                    013150
003067  010003   MSR3    LDA     MTBN        READ BIN/BCD ?                           013160
003070  001010          JAZ     *+6         BIN                                      013170
003071  003076 R
003072  003000          XEC     MSRB        EXC:ROR-BCD                              013180
003073  003000 R
003074  001000          JMP     *+4                                                  013190
003075  003100 R
003076  003000          XEC     MSRC        EXC:ROR-BIN                              013200
003077  003026 R
003100  010005          LDA     MTSB        BIC MODE ?                               013210
003101  001010          JAZ     MSRF        NO-                                      013220
003102  003107 R
003103  002000          CALL    MBIS        YES-SENSE BIC BUSY/ABNORMAL STOP         013230
003104  004311 R
003105  001000          JMP     MSR5        CHECK UNIT READY BEFORE EXIT             013240
003106  003061 R
003107  010063   MSRF    LDA     MBSQ        RANDOM DATA TESTING ?                    013250
003110  001010          JAZ     *+5         JMP IF YES                               013260
003111  003115 R
003112  030044          LDX     MBFI        START ADDR FOR COMMON W/R BUFFER          013270
003113  001000          JMP     *+3                                                  013280
003114  003116 R
003115  030032          LDX     MBFC        START ADDR OF RANDOM DATA READ BUF.       013290
003116  002000   MSR6    CALL    MSBR        SENSE BUF. READY                         013300
003117  004257 R
003120  001000          JMP*    MSRR        BUF READY TIME-OUT--EXIT                  013310
003121  102753 R
003122  102510   MSRH    CIA     010         INPUT WORD                               013320
003123  055000          STA     0,1                                                  013330
003124  005144          IXR                                                          013340
```

```
003125  005322           OBR                              013350
003126  001020           JBZ     MSR4                     013360
003127  003132 R
003130  001000           JMP     MSR6      INPUT NEXT WORD 013370
003131  003116 R
003132  002000    MSR4   CALL    MSUR      UNIT READY     013380
003133  004221 R
003134  001000           JMP*    MSRR      RETURN         013390
003135  102753 R
```

```
                           *                                                                        013410
                           *                                                                        013420
                           *      ***************************************************************   013430
                           *      *                                                            *    013440
                           *      *              FORWARD ONE RECORD                            *    013450
                           *      *                                                            *    013460
                           *      ***************************************************************   013470
                           *                                                                        013480
                           *                                                                        013490
003136    000000     MFOR  ENTR   0                                                                 013500
003137    002090           CALL   MSUR              UNIT READY                                      013510
003140    004221 R
003141    010011           LDA    MTPM              OPERATE WITH PIM ?                              013520
003142    001010           JAZ    MFOC              NO-                                             013530
003143    003171 R
003144    010310           LDA    *MFOB             YES                                             013540
003145    057013           STA*   MTP2              MOTION COMPLETE INTERRUPT ADDRESS               013550
003146    100510     MFOA  EXC    0510              F.O.R.                                          013560
003147    030251           LOX    =0                TIME DELAY TO WAIT FOR                          013570
003150    020253           LOB    =7                                                                013580
003151    002000     MFOG  CALL   MLTO              EXTENDED TIME DELAY                             013590
003152    004456 R
003153    001000           JMP    *+4               TIMES UP                                        013600
003154    003157 R
003155    001000           JMP    MFOG                                                              013610
003156    003151 R
003157    002000           CALL   MSW9              REPORT ERROR-NOMOTION COMPLETE INTERRUPT        013620
003160    002661 R
003161    001000           JMP*   MFOR                                                              013630
003162    103136 R

*  MOTION COMPLETE INTERRUPT RETURN                                                                 013640
003163    002000     MFOB  CALL   MSXA              CHECK IF UNIT READY                             013650
003164    004241 R
003165    001000           JMP*   MFOR              YES-EXIT                                        013660
003166    103136 R
003167    001000           JMP    MSWY              NO-REPORT LOSS OF TRANSPORT READINESS           013670
003170    002575 R
*    FOR/SENSE COMPLETE                                                                             013680
003171    003000     MFOC  XEC    MFOA              EXC-F.O.R.                                      013690
003172    003146 R
003173    030251           LOX    =0                                                                013700
003174    020253           LOB    =7                                                                013710
```

```
003175  101210    MFOD    SEN     0210,(MFOR)*    UNIT READY                      013720
003176  103136 R
003177  002000            CALL    MLTO                                            013730
003200  004456 R
003201  001000            JMP     *+4             TIME-OUT ERROR                  013740
003202  003205 R
003203  001000            JMP     MFOD            CHECK AGAIN                     013750
003204  003175 R
                  *    PROCESS ERROR                                              013760
003205  010241            LDA     #3              ERROR CODE                      013770
003206  020242            LDB     #' 3'           TTY ASCII ERROR CODE            013780
003207  067201 I          STB     MSG3            TRANPORT MOTION ERROR           013790
003210  002000            CALL    SSWZ            SENSE SWITCH/ERROR CONTROL      013800
003211  004721 R
003212  001000            JMP     MFOR+1          LOOP ON ERROR                   013810
003213  003137 R
003214  001000            JMP*    MFOR            EXIT                            013820
003215  103136 R
                  *                                                               013830
                  *                                                               013840
                  *                                                               013850
                  *                                                               013860
                  *                                                               013870
                  *                                                               013880
                  *                        ** REWIND **                           013890
                  *                                                               013900
003216  000000    MRWD    ENTR    0                                               013910
003217  002000            CALL    MSUR            UNIT READY                      013920
003220  004221 R
003221  100710    MRWA    EXC     0710            REWIND                          013930
003222  101710    MRWB    SEN     0710,MRWC       REWINDING                       013940
003223  003226 R
003224  001000            JMP*    MRWD            RETURN                          013950
003225  103216 R
003226  005000    MRWC    NOP                                                     013960
003227  001000            JMP     MRWB                                            013970
003230  003222 R
```

```
*                                                                      013990
*                                                                      014000
*                                                                      014010
***********************************************************************  014020
*                                                                    *  014030
*                    DATA COMPARE ROUTINE                            *  014040
*                                                                    *  014050
*          USES MBSQ(SEQ CONTROL COUNTER)TO DETERMINE                *  014060
*          COMPARE METHOD.                                           *  014070
*          0=RANDOM DATA: COMPARE CONTENTS OF READ BUF WITH          *  014080
*                         CONTENTS OF WRITE BUFFER                   *  014090
*                                                                    *  014100
*          1=FIXED DATA: COMPARE CONTENTS OF READ BUFFER WITH        *  014110
*                         FIXED DATA WORD STORED IN MTSD             *  014120
*                                                                    *  014130
*          2=INCREMENTED DATA: COMPARE CONTENTS OF READ BUFFER       *  014140
*                         WITH INCR DATA STARTING WITH               *  014150
*                         MTSD=000000                                *  014160
*                                                                    *  014170
*          NOTE: FOR RANDOM DATA,SEPARATE WRITE/READ BUFFERS         *  014180
*                ARE USED. FOR FIXED & INCR DATA,A COMMON            *  014190
*                WRITE/READ BUFFER IS USED TO ALLOW FOR              *  014200
*                LONGER RECORDS.                                     *  014210
*                                                                    *  014220
***********************************************************************  014230
*                                                                    *  014240
*                                                                    *  014250
003231  000000     MSCP   ENTR                                          014260
003232  010063            LDA      MBSQ           SEQ. CONTROL COUNTER   014270
003233  001010            JAZ      MSCA           0=RANDOM DATA          014280
003234  003244 R
003235  005311            DAR                     1=FIXED DATA           014290
003236  001010            JAZ      MSCC                                  014300
003237  003264 R
          *    INCR DATA                           2=INCR DATA           014310
003240  005001            TZA                                           014320
003241  050017            STA      MTSD           START INCR DATA FROM ZERO  014330
003242  001000            JMP      MSCC                                  014340
003243  003264 R
          *    RANDOM DATA COMPARE                                       014350
003244  030032     MSCA   LDX      MBFC           READ BUF. START ADDR   014360
003245  020030            LDB      MBFA           WRITE BUF. START ADDR  014370
```

```
003246    015000        MSCB    LDA     0,1             READ DATA                                           014380
003247    146000                SUB     0,2             EXPECTED DATA                                       014390
003250    001010                JAZ     *+4             0=GOOD COMPARE                                      014400
003251    003254 R
003252    001000                JMP     MSCE            ERROR                                               014410
003253    003334 R
003254    005041        MSC2    TXA                                                                         014420
003255    140036                SUB     MBFG            LAST CURRENT READ BUF LOC                           014430
003256    001010                JAZ     MSCM            FINISHED                                            014440
003257    003456 R
003260    005144                IXR                                                                         014450
003261    005122                IBR                                                                         014460
003262    001000                JMP     MSCB            COMPARE NEXT WORD                                   014470
003263    003246 R
                        *               FIXED/INCR DATA                                                     014480
                        *                                                                                   014490
                        *       FOR 7 TRACK MTU'S ON 16 BIT CPU IN BCD WRITE/READ, ONLY THE                 014500
                        *       LOWER 12 BITS ARE WRITE-READ TO THE TAPE UNIT.                              014510
                        *                                                                                   014520
003264    010003        MSCC    LDA     MTBN            BIN/BCD FLAG                                        014530
003265    001010                JAZ     MSC6            JMP IF BINARY                                       014540
003266    003306 R
003267    010002                LDA     MTYP            7 TRACK OR 9 TRACK MTU ?                            014550
003270    001010                JAZ     *+4             JMP IF 7 TRACK                                      014560
003271    003274 R
003272    001000                JMP     MSC6                                                                014570
003273    003306 R
003274    005001                TZA                     DETERMINE                                           014580
003275    005311                DAR                     IF                                                  014590
003276    130252                ERA     =0177777                                                            014600
003277    001004                JAN     MSC6            JMP IF 18 BIT                                       014610
003300    003306 R
003301    010017                LDA     MTSD                                                                014620
003302    150311                ANA     =07777                                                              014630
003303    053313                STA     MSC8                                                                014640
003304    001000                JMP     MSC7                                                                014650
003305    003310 R
003306    010017        MSC6    LDA     MTSD                                                                014660
003307    053313                STA     MSC8                                                                014670
003310    030044        MSC7    LDX     MBFI            READ BUF START ADDR                                 014680
003311    015000        MSCD    LDA     0,1                                                                 014690
003312    005130                ERAI    0               EXPECTED DATA WORD                                  014700
```

```
003313   000000
003313              MSC8   BES    0                ESTABLISHED BY ABOVE CODING          014710
003314   001010            JAZ    *+4              JMP IF GOOD                          014720
003315   003320 R
003316   001000            JMP    MSCE             ERROR                                014730
003317   003334 R
003320   010063     MSC3   LDA    MBSQ             SEQ CONTROL                          014740
003321   005311            DAR                     FIXED DATA ?                         014750
003322   001010            JAZ    *+3              YES-                                 014760
003323   003325 R
003324   043313            INR    MSC8             INCR EXPECTED DATA WORD              014770
003325   005041            TXA                                                          014780
003326   140037            SUB    MBFH             CURRENT END ADDR OF BUF              014790
003327   001010            JAZ    MSCM             FINISHED                             014800
003330   003456 R
003331   005144            IXR                                                          014810
003332   001000            JMP    MSCD             COMPARE NEXT WORD                    014820
003333   003311 R
      *    COMPARE ERROR                                                                014830
003334   010442     MSCE   LDA    SCON             CONSOLE MODE ?                       014840
003335   001010            JAZ    MSCF             JMP IF YES                           014850
003336   003404 R
003337   010027            LDA    MTFE             FIRST ERROR                          014860
003340   001010            JAZ    MSCK             JMP IF YES AND PRINT HEADER          014870
003341   003425 R
      *    PRINT EXPECTED/ACTUAL DATA                                                   014880
003342   001100     MSCL   JSS1   MSCN             BYPASS ERROR PRINTPOT                014890
003343   003375 R
003344   010063            LDA    MBSQ             SEQ CONTROL                          014900
003345   001010            JAZ    *+5              JMP IF RANDOM DATA                   014910
003346   003352 R
003347   013313            LDA    MSC8             EXPECTED DATA                        014920
003350   001000            JMP    *+3                                                  014930
003351   003353 R
003352   016000            LDA    0,2              EXPECTED DATA                        014940
003353   002000            CALL*  OUTE             PRINT IT                             014950
003354   100404 R
003355   070015            STX    MTT1             SAVE X                               014960
003356   006030            LDXI   MSGU                                                  014970
003357   005461 R
003360   002000            CALL*  OUTD             OUTPUT SPACEX                        014980
003361   100403 R
```
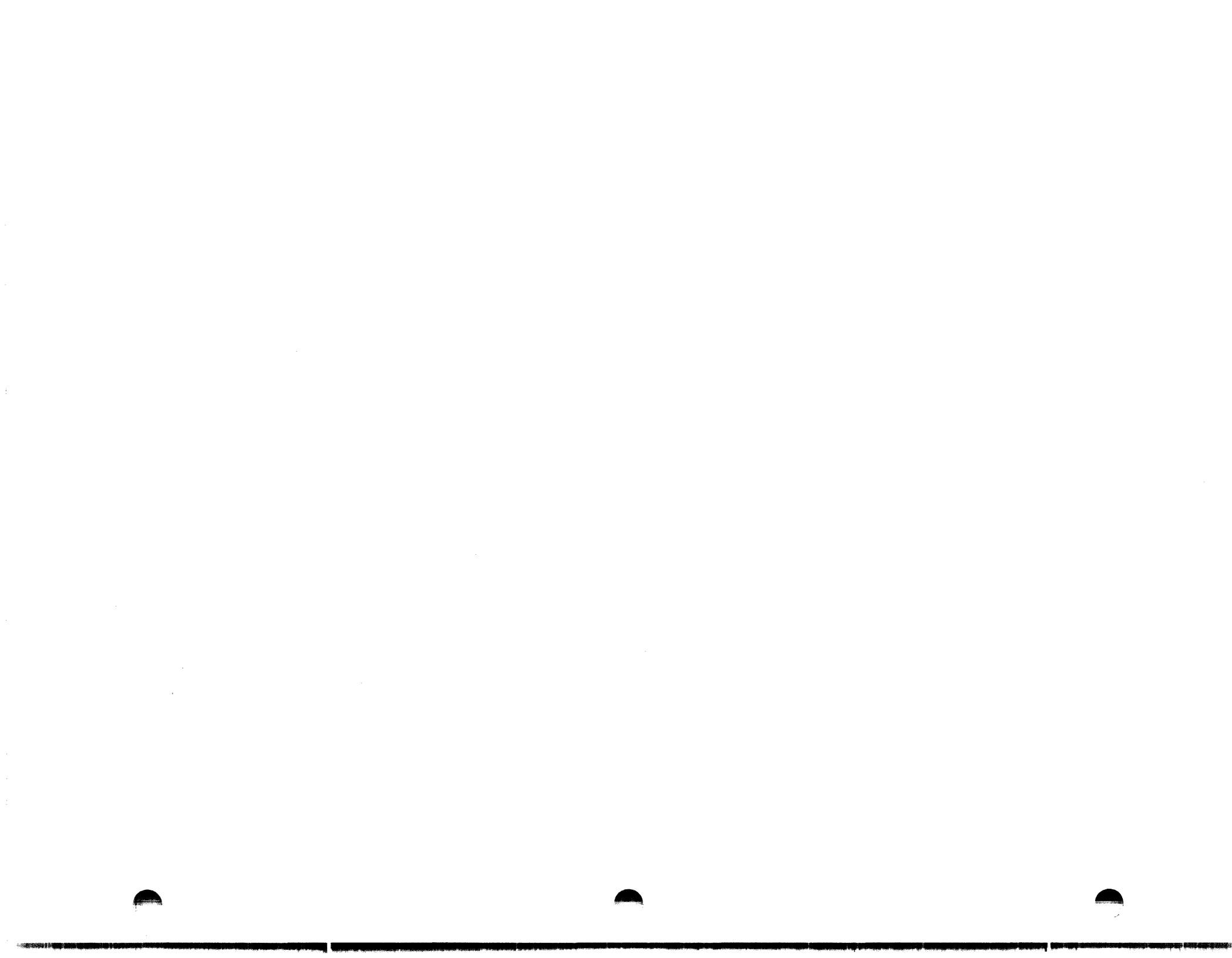
```
003362  030015           LDX    MTT1         RESTORE X                                        014990
003363  015000           LDA    0,1          READ DATA                                        015000
003364  002000           CALL*  OUTE         PRINT IT                                         015010
003365  100404 R
003366  005041           TXA                                                                  015020
003367  002000           CALL*  OUTF         OUTPUT ADDRESS OF READ DATA                      015030
003370  100405 R
003371  002000           CALL*  OUTC         CR/LF                                            015040
003372  100402 R
003373  001000           JMP    MSCF                                                          015050
003374  003404 R
003375  001400    MSCN   JSS3   MSCM         ABORT ERROR EXIT                                 015060
003376  003455 R
003377  010053           LDA    MBSQ         SEQ CONTROL                                      015070
003400  001010           JAZ    MSC2         JMP FOR RANDOM DATA                              015080
003401  003254 R
003402  001000           JMP    MSC3         FIXED/INCR DATA                                  015090
003403  003320 R
                   *  CONSOLE MODE ERROR HALT                                                 015100
003404  001200    MSCF   JSS2   **4          HALT ON ERROR                                    015110
003405  003410 R
003406  001000           JMP    MSCN         BYPASS ERROR HALT                                015120
003407  003375 R
003410  010063           LDA    MBSQ         SEQ CONTROL                                      015130
003411  001010           JAZ    MSCG         JMP IF RANDOM DATA                               015140
003412  003420 R
                   *  FIXED/INCR DATA                                                         015150
003413  010017           LDA    MTSD         EXPECTED DATA                                    015160
003414  025000           LDB    0,1          READ(ACTUAL) DATA:B=DATA X=LOCATION              015170
                   *****************************                                              015180
003415  000005           HLT    05           * COMPARE ERROR(FIXED/INCR DATA)                 015190
                   *****************************                                              015200
003416  001000           JMP    MSCN                                                          015210
003417  003375 R
                   *  RANDOM DATA                                                             015220
003420  016000    MSCG   LDA    0,2                                                           015230
003421  025000           LDB    0,1                                                           015240
                   *****************************                                              015250
003422  000011           HLT    011          * COMPARE ERROR(RANDOM DATA)                     015260
                   *****************************                                              015270
003423  001000           JMP    MSCN                                                          015280
003424  003375 R
```
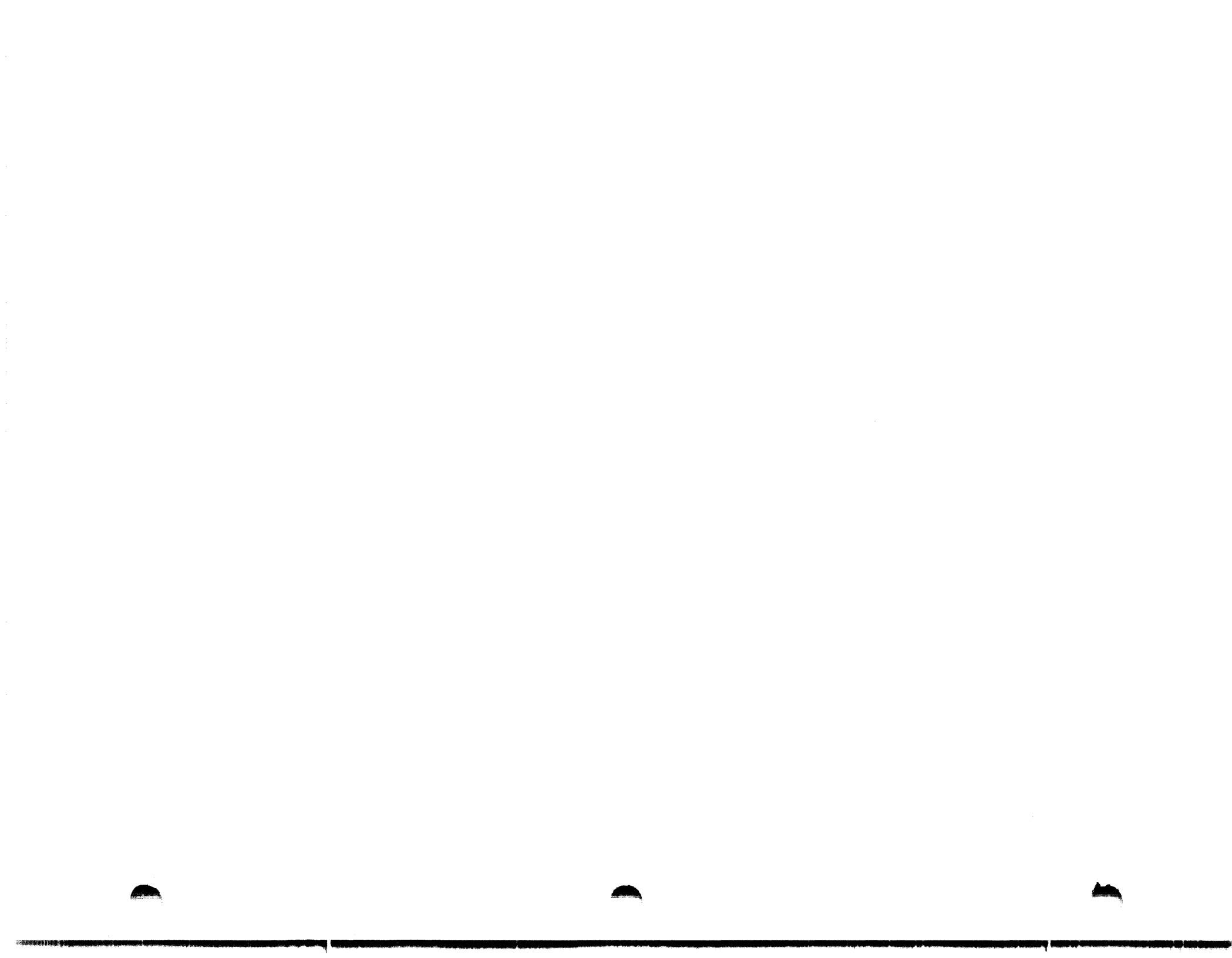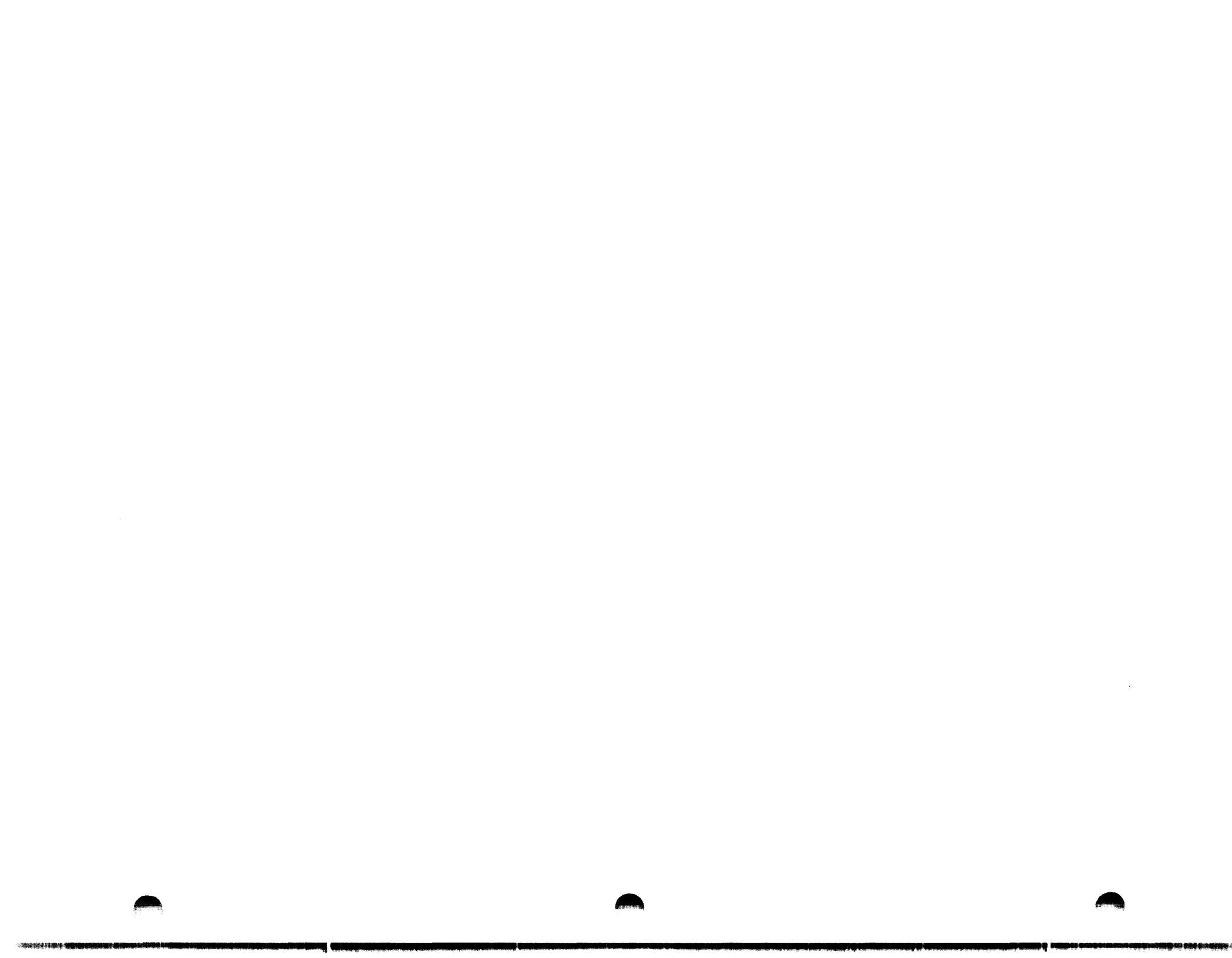
```
                              *                                                                    015290
003425   001100           MSCK    JSS1     MSCL          BYPASS ERROR PRINTOUT                      015300
003426   003342 R
003427   010051                   LDA      MBFN          BURN-IN TEST                               015310
003430   001010                   JAZ      MSCJ          JMP IF NO                                  015320
003431   003445 R
003432   070015                   STX      MTT1          SAVE X                                     015330
003433   006030                   LDXI     MSGK          RECORD MESSAGE                             015340
003434   005331 R
003435   002000                   CALL*    OUTD                                                     015350
003436   100403 R
003437   010004                   LDA      MSG1          RECORD COUNT                               015360
003440   002000                   CALL*    OUTE                                                     015370
003441   100404 R
003442   002000                   CALL*    OUTC          CR/LF                                      015380
003443   100402 R
003444   030015                   LDX      MTT1          RETURN X                                   015390
003445   070015           MSCJ    STX      MTT1          SAVE X                                     015400
003446   006030                   LDXI     MSGO          !EXPECTED ACTUAL!                          015410
003447   005376 R
003450   002000                   CALL*    OUTD                                                     015420
003451   100403 R
003452   040027                   INR      MTFE          FIRST ERROR FLAG                           015430
003453   030015                   LDX      MTT1          RESTORE X                                  015440
003454   001000                   JMP      MSCL          PRINT DATA                                 015450
003455   003342 R
                              *                                                                    015460
003456   001400           MSCM    JSS3     MSCM          STAY HERE UNTIL SS3 RESET                  015470
003457   003456 R
003460   005001                   TZA                    SET FIRST ERROR                            015480
003461   050027                   STA      MTFE          MESSAGE FLAG                               015490
003462   001000                   JMP*     MSCP          ABORT EXIT                                 015500
003463   103231 R
```

```
                                     *                                                        *        015520
                                     *                                                        *        015530
                                     *                      ** WRITE FILE MARK **             *        015540
                                     *                                                        *        015550
                                     *                                                        *        015560
                                     *                                                        *        015570
                                     *                                                        *        015580
003464  000000       MWFM   ENTR    0                                                                  015580
003465  002000              CALL    MSUR            SENSE UNIT READY                                    015590
003466  004221 R
003467  010011              LDA     MTPM            OPERATE WITH PIM ?                                  015600
003470  001010              JAZ     MWF1            NO*                                                 015610
003471  003511 R
003472  010312              LDA     *MWF2                                                              015620
003473  057013              STA*    MTP2            MOTION COMPLETE INT, ADDR                           015630
003474  100410       MWFB   EXC     0410            WRITE FILE MARK                                     015640
003475  030251              LOX     *0                                                                 015650
003476  020243              LOB     *2                                                                 015660
003477  002000       MWFC   CALL    MLTO            EXTENDED TIME-OUT ROUTINE                           015670
003500  004456 R
003501  001000              JMP     *+4             TIME-OUT                                            015680
003502  003505 R
003503  001000              JMP     MWFC                                                               015690
003504  003477 R
                     *    REPORT ERROR-NO MOTION COMPLETE INTERRUPT                                     015700
003505  002000              CALL    MSW9                                                               015710
003506  002661 R
003507  001000              JMP*    MWFM                                                               015720
003510  103464 R
                     *                                                                                 015730
003511  100410       MWF1   EXC     0410            WRITE FILE MARK                                     015740
003512  002000              CALL    MSUR            WAIT FOR UNIT READY                                 015750
003513  004221 R
003514  001000              JMP*    MWFM            RETURN                                             015760
003515  103464 R
                     *                                                                                 015770
003516  002000       MWF2   CALL    MSXA            UNIT READY                                          015780
003517  004241 R
003520  001000              JMP*    MWFM            NO-RETURN                                           015790
003521  103464 R
003522  001000              JMP     MSWY            YES-REPORT ERROR                                    015800
003523  002575 R
                     *                                                                         *        015810
```

```
****************************************************************    015830
*                                                             *    015840
*                     BURN-IN TEST                            *    015850
*                                                             *    015860
*      THE BURN-IN TEST CONSISTS OF SEQUENCES OF THE          *    015870
*      FOLLOWING: WRITE ONE RECORD, SENSE EOT/REWIND,         *    015880
*      WRITE EOF, BACKSPACE ONE RECORD, FORWARD ONE           *    015890
*      RECORD, BACKSPACE ONE RECORD, BACKSPACE ONE            *    015900
*      RECORD, READ ONE RECORD, AND DATA COMPARE OF           *    015910
*      RECIEVED RECORD WITH EXPECTED(WRITTEN) DATA.           *    015920
*                                                             *    015930
*      ONE CYCLE OF THE TEST CONSISTS OF THREE OF THE         *    015940
*      ABOVE SEQUENCES:                                       *    015950
*      SEQ.0: WRITE/READ BINARY; RANDOM DATA AND RANDOM       *    015960
*             RECORD LENGTH.                                  *    015970
*             NOTE: THIS SEQUENCE IS BYPASSED IF ONLY         *    015980
*                   4K OF MEMORY EXISTS.                      *    015990
*                                                             *    016000
*      SEQ.1: WRITE/READ BCD; FIXED DATA + FIXED RECORD       *    016010
*             LENGTH. THE DATA CONSISTS OF THREE              *    016020
*             PATTERNS(052525,177777,125252). RECORD          *    016030
*             LENGTH IS 02000 IF >4K, OR AVAILABLE            *    016040
*             MEMORY(APPROX. 0125 WORDS) IF ONLY 4K.          *    016050
*                                                             *    016060
*             IF MT UNIT IS 9 TRACK, THE CONTROLLER           *    016070
*             WILL GENERATE BINARY WRITE/READ COMMANDS        *    016080
*             EVEN THOUGH BCD COMMANDS ARE ISSUED.            *    016090
*                                                             *    016100
*      SEQ.2: WRITE/READ BINARY; INCREMENTAL DATA AND         *    016110
*             INCREMENTAL RECORD LENGTH.                      *    016120
*                                                             *    016130
****************************************************************    016140
*                                                                  016150
003524  010442    MBNT  LDA    SCON          CON. MODE ?            016160
003525  001010          JAZ    MBNB          YES-                   016170
003526  003533 R
003527  006030          LDXI   MSGP          'START OF BURN-IN TEST' 016180
003530  005416 R
003531  002000          CALL*  OUTD                                 016190
003532  100403 R
003533  002000    MBNB  CALL   MRWD          REWIND                 016200
003534  003216 R
```

```
003535   002000   MBNC   CALL   MBIT          INITIALIZE FOR BURN-IN                         016210
003536   004157 R
003537   010237          LDA    =1                                                           016220
003540   050051          STA    MBFN          SET BURN-IN FLAG                                016230
                  *                                                                           016240
                  *                                                                           016250
                  *                                                                           016260
                  *                    ** BURN-IN SEQUENCE CONTROL **                         016270
                  *                                                                           016280
003541   010063   MBSA   LDA    MBSQ          SEQ CONTROL                                     016290
003542   001010          JAZ    MBS2                                                          016300
003543   003553 R
003544   140243          SUB    =2                                                           016310
003545   001010          JAZ    MBS3          JMP IS SEQ WAS 2                                016320
003546   003557 R
003547   120241          ADD    =3                                                           016330
003550   050063          STA    MBSQ          SET =2                                          016340
003551   001000          JMP    MBS4          GO DO SEQ,2                                     016350
003552   004001 R
003553   005111   MBS2   IAR                                                                 016360
003554   050063          STA    MBSQ          SET =1                                          016370
003555   001000          JMP    MBSN          GO DO SEQ, 1                                    016380
003556   004043 R
003557   010057   MBS3   LDA    MSIZ          MORE THAN 4K MEMORY                             016390
003560   001010          JAZ    MBS5          NO-SKIP SEQ 0, NOT ENOUGH MEMORY **             016400
003561   003566 R
003562   005001          TZA                  YES-                                           016410
003563   050063          STA    MBSQ          SET=0                                           016420
003564   001000          JMP    MBSF          GO DO SEQ 0,                                    016430
003565   004113 R
003566   010237   MBS5   LDA    =1            SKIP SEQ 0 (RANDOM DATA)                        016440
003567   050063          STA    MBSQ          IF ONLY 4K MEMORY                               016450
003570   001000          JMP    MBSN          GO DO SEQ 1,                                    016460
003571   004043 R
                  *                                                                           016470
                  *                                                                           016480
                  *                                                                           016490
                  *                                                                           016500
                  *    SETUP FOR   WRITING                                                    016510
003572   040004   MBND   INR    MSG1          INCR RECORD COUNT                               016520
003573   010063          LDA    MBSQ          RANDOM DATA OPERATION                           016530
003574   005311          DAR                                                                  016540
```

```
003575  001002              JAP    MBNE        JMP IF NO                                      016550
003576  003611 R
003577  010005              LDA    MTSB        USING BIC ?                                    016560
003600  001010              JAZ    *+6         JMP IF NO                                       016570
003601  003606 R
003602  002000              CALL   MBCW        SETUP BIC FOR RANDOM DATA WRITE BUFFER         016580
003603  004374 R
003604  001000              JMP    MBNF        GO WRITE                                       016590
003605  003621 R
003606  020046              LDB    MBFK        RANDOM BUF LENGTH                              016600
003607  001000              JMP    MBNF        GO WRITE                                       016610
003610  003621 R
                     *      WRITE OPERATIONS EXCLUDING RANDOM DATA                            016620
003611  010005       MBNE   LDA    MTSB        USING BIC ?                                    016630
003612  001010              JAZ    *+6         JMP IF NO                                       016640
003613  003620 R
003614  002000              CALL   MBCC        SETUP BIC                                      016650
003615  004416 R
003616  001000              JMP    MBNF        GO WRITE                                       016660
003617  003621 R
003620  020047              LDB    MBFL        CURRENT LENGTH OF W/R  BUFFER                  016670
                     ****************************                                             016680
003621  002000       MBNF   CALL   MSWR        *  WRITE ONE RECORD                            016690
003622  002451 R
                     ****************************                                             016700
                     *                                                                        016710
003623  101010       MBN2   SEN    010,MBNP    PARITY ERROR ?                                 016720
003624  003756 R
003625  010060              LDA    MTWB        ANY READ AFTER WRITE PARITY THIS RECORD ?      016730
003626  001010              JAZ    MBNN        JMP IF NO                                       016740
003627  003656 R
003630  005001              TZA                                                               016750
003631  050060              STA    MTWB        RESET PARITY ERROR COUNT                       016760
003632  010442              LDA    SCON        JMP IF                                         016770
003633  001010              JAZ    MBNM        CONSOLE MODE                                   016780
003634  003650 R
003635  001100              JSS1   MBNM        BYPASS ERROR PRINTOUT                          016790
003636  003650 R
003637  006030              LDXI   MSGK        RECORD NUMBER MESSAGE                          016800
003640  005331 R
003641  002000              CALL*  OUTD                                                       016810
003642  100403 R
```

```
003643  010004         LDA     MSG1      RECORD COUNT                                      016820
003644  002000         CALL*   OUTE                                                        016830
003645  100404 R
003646  002000         CALL*   OUTC      CR/LF                                             016840
003647  100402 R
003650  002000  MBNM   CALL*   SSWT      SENSE SWITCH/ERROR CONTROL                        016850
003651  100421 R
003652  000012         DATA    012       ERROR CODE                                        016860
003653  005507 R       DATA    MSGW      ERROR MSG: RECOV, READ/WRITE PARITY ERROR         016870
003654  000500 R       DATA    MIST      SS3 TERMINATE                                     016880
003655  003656 R       DATA    *+1       NO LOOP ON ERROR                                  016890
003656  002000  MBNN   CALL    MSET      CHECK FOR EOT; REWIND IF YES                      016900
003657  004361 R
003660  001000         JMP     MBNT      EOT RETURN                                        016910
003661  003524 R
                *                                                                          016920
003662  002000  MBNG   CALL    MBBK      BURN-IN ROUTINE SEQUENCE                          016930
003663  003764 R
                *                                                                          016940
                *   SETUP FOR READING                                                      016950
003664  010063  MBNH   LDA     MBSQ      RANDOM DATA OPERATION                             016960
003665  005311         DAR                                                                 016970
003666  001002         JAP     MBNK      JMP IF NO                                         016980
003667  003714 R
                *   CLEAR RANDOM DATA READ BUFFER                                           016990
003670  020032         LDB     MBFC      READ BUF, START ADDR                              017000
003671  005001  MBNI   TZA                                                                 017010
003672  056000         STA     0,2                                                         017020
003673  005021         TBA                                                                 017030
003674  140033         SUB     MBFD      READ BUF END ADDR                                 017040
003675  001010         JAZ     MBNJ      FINISHED                                          017050
003676  003702 R
003677  005122         IBR                                                                 017060
003700  001000         JMP     MBNI                                                        017070
003701  003671 R
003702  010005  MBNJ   LDA     MTSB      USING BIC ?                                       017080
003703  001010         JAZ     *+6       JMP IF NO                                         017090
003704  003711 R
003705  002000         CALL    MBCR      SETUP BIC FOR RANDOM DATA READ BUFFER             017100
003706  004405 R
003707  001000         JMP     MBNL      GO READ                                           017110
003710  003726 R
```

```
003711   020046          LDB    MBFK        RANDOM BUF LENGTH                              017120
003712   001000          JMP    MBNL        GO READ                                        017130
003713   003726 R
                  *    READ OPERATIONS EXCLUDING RANDOM DATA                                017140
003714   002000   MBNK   CALL   MBFZ        CLEAR READ BUFFER                              017150
003715   004443 R
003716   010005          LDA    MTSB        USING BIC                                      017160
003717   001010          JAZ    *+6         JMP IF NO                                      017170
003720   003725 R
003721   002000          CALL   MBCC        SETUP BIC                                      017180
003722   004416 R
003723   001000          JMP    MBNL        GO READ                                        017190
003724   003726 R
003725   020047          LDB    MBFL        CURRENT LENGTH OF W/R  BUFFER                  017200
                  ************************************                                      017210
003726   002000   MBNL   CALL   MBRR        *   READ ONE RECORD                            017220
003727   002753 R
                  *****************************                                             017230
                  *                                                                        017240
003730   002000   MBNQ   CALL   MESC        ERROR DETECT ROUTINE                           017250
003731   001775 R
                  *                          RETURN FROM THIS ROUTINE IS ONE OF THE        017260
                  *                          FOLLOWING 5 JMPS.                             017270
003732   001000          JMP    MBNS        NORMAL RETURN IF NO PARITY ERROR              017280
003733   003750 R
003734   001000          JMP    MBNR        PARITY ERROR RETURN--READ AGAIN               017290
003735   003744 R
003736   001000          JMP    MBNS        RECOVERABLE PARITY ERROR RETURN               017300
003737   003750 R
003740   001000          JMP    MBSA        PARITY ERRORS--WRITE AGAIN WITH NEXT SEQ.      017310
003741   003541 R
003742   001000          JMP    MBSA        NON-RECOV. PARITY ERROR RETURN-CONTINUE        017320
003743   003541 R
                  *                                                                        017330
003744   002000   MBNR   CALL   MBOR        BACKSPACE ONE RECORD                           017340
003745   002673 R
003746   001000          JMP    MBNH        GO READ AGAIN                                  017350
003747   003664 R
003750   001400   MBNS   JSS3   MIST        SS3 TERMINATE                                  017360
003751   000500 R
003752   002000          CALL   MSCP        DATA COMPARE ROUTINE                           017370
003753   003231 R
```

```
003754    001000         JMP      MBSA           BURN-IN SEQ CONTROL ROUTINE              017380
003755    003541 R
                   *                                                                      017390
                   *                                                                      017400
                   *    CONTROL REWRITE ATTEMPTS FOR READ-AFTER-WRITE PARITY ERROR        017410
003756    002000   MBNP  CALL     MB50           REWRITE CONTROL ROUTINE                  017420
003757    001723 R
003760    001000         JMP      MBND           GO WRITE AGAIN                           017430
003761    003572 R
003762    001000         JMP      MBSA           REWRITES FAILED--GO TO NEXT RECORD.      017440
003763    003541 R
                   *                                                                      017450
                   *                                                                      017460
                   *                                                                      017470
                   *                                                                      017480
                   *              ** BURN-IN ROUTINE SEQUENCE **                          017490
                   *                                                                      017500
003764    000000   MBBK  ENTR     0                                                       017510
003765    002000         CALL     MWFM           WRITE EOF                                017520
003766    003464 R
003767    002000         CALL     MBOR           B.O.R.                                   017530
003770    002673 R
003771    002000         CALL     MFOR           F.O.R.                                   017540
003772    003136 R
003773    002000         CALL     MBOR           B.O.R.                                   017550
003774    002673 R
003775    002000         CALL     MBOR           B.O.R.                                   017560
003776    002673 R
003777    001000         JMP*     MBBK           RETURN                                   017570
004000    103764 R
                   *                                                                      017580
                   *                                                                      017590
                   *                                                                      017600
                   *                                                                      017610
                   *                                                                      017620
                   *                                                                      017630
                   *    SEQ  2: WRITE/READ BINARY, INCREMENTAL DATA & RECORD LENGTHS      017640
004001    005001   MBS4  TZA                                                             017650
004002    050003         STA      MTBN           SET FOR BINARY  WRITE/READ               017660
004003    010053         LDA      MBFQ           MAT END ADDR                             017670
004004    140045         SUB      MBPJ           COMMON W/R BUFFER ?                       017680
004005    001010         JAZ      MBSD           JMP IF YES                               017690
```

```
004006  004033 R
004007  040052              INR     MBFP        CURRENT LENGTH OF INCREMENTAL BUFFER          017700
004010  010052              LDA     MBFP                                                      017710
004011  050047              STA     MBFL        CURRENT BUF LENGTH FOR WRITE/READ ROUTINE     017720
004012  040053              INR     MBFQ        FINAL ADDR FOR INCREMENT BUFFER               017730
004013  010053              LDA     MBFQ                                                      017740
004014  050037              STA     MBFH        BUF LAST LOC.                                 017750
004015  002000              CALL    MBFZ        CLEAR WRITE/READ BUF                          017760
004016  004443 R
                    *       FILL WRITE BUFFER WITH INCREMENTED DATA                           017770
004017  020044      MBSE    LDB     MBFI        BUF START ADDR                                017780
004020  005001              TZA                                                               017790
004021  056000      MBSB    STA     0,2         STORE WORD IN BUFFER                          017800
004022  005014              TAX                                                               017810
004023  005021              TBA                                                               017820
004024  140037              SUB     MBFH        LOST LOC. TO FILL ?                           017830
004025  001010              JAZ     MBND        YES- GO WRITE/READ NEXT RECORD                017840
004026  003572 R
004027  005141              INCR    041         INCR DATA WORD AND PUT BACK INTO A            017850
004030  005122              IBR                                                               017860
004031  001000              JMP     MBSB                                                      017870
004032  004021 R
                    *                                                                         017880
                    *                                                                         017890
004033  010044      MBSD    LDA     MBFI        RECYCLE BUF LAST LOC.                         017900
004034  050053              STA     MBFQ        BACK TO BEGINNING                             017910
004035  050037              STA     MBFH        BUF LAST LOC                                  017920
004036  010237              LDA     =1          RECYCLE RECORD                                017930
004037  050052              STA     MBFP        LENGTH BACK TO 1 WORD                         017940
004040  050047              STA     MBFL        CURRENT BUF LENGTH=USED IN W/R ROUTINES       017950
004041  001000              JMP     MBSE        CONTINUE                                      017960
004042  004017 R
                    *                                                                         017970
                    *                                                                         017980
                    *                                                                         017990
                    *                                                                         018000
                    *       SEQ.1: WRITE/READ BCD,FIXED DATA AND FIXED RECORD LENGTH          018010
                    *                                                                         018020
                    *       THREE DATA PATTERNS ARE USED--052525,177777,125252               018030
004043  010237      MBSN    LDA     =1                                                        018040
004044  050003              STA     MTBN        SET FOR BCD WRITE/READ                        018050
004045  010057              LDA     MSIZ        MEM SIZE >4K ?                                018060
```

```
004045  001010              JAZ    MBS6          NO-                                          018070
004047  004057 R
004050  010273              LDA    *02000        YES-                                         018080
004051  050047              STA    MBFL          SET BUF LENGTH TO OCTAL 2000 WORDS           018090
004052  005311        .     DAR                                                               018100
004053  120044              ADD    MBFI          BUFFER INITIAL ADDR.                         018110
004054  050037              STA    MBFH          BUFFER LAST LOC.                             018120
004055  001000              JMP    MBSO                                                       018130
004056  004066 R
004057  006010       MBS6   LDAI   06147         HIGHEST CELL TO USE IF ONLY 4K, THIS         018140
004060  006147
                     *                           SAVES NONE OF THE TEST EXEC UTILITY.         018150
004061  050037              STA    MBFH          BUFFER LAST LOC.                             018160
004062  006140              SUBI   MEND          END OF THIS PROGRAM                          018170
004063  005507 R
004064  005111              IAR                                                               018180
004065  050047              STA    MBFL          BUFFER LENGTH                                018190
                     *  CONTROL DATA PATTERN AND FILL WRITE BUFFER                            018200
004066  010023       MBSO   LDA    MTPP          DATA PATTERN POINTER                         018210
004067  140262              SUB    *MTD3         LAST PATTERN ?                               018220
004070  001004              JAN    MBSP          NO-                                          018230
004071  004100 R
004072  010263              LDA    *MTD1         YES-                                         018240
004073  050023              STA    MTPP          RESET POINTER                                018250
004074  010024              LDA    MTD1          FIRST PATTERN(0'S)                           018260
004075  050017              STA    MTSD          CURRENT DATA PATTERN                         018270
004076  001000              JMP    MBSR                                                       018280
004077  004104 R
004100  040023       MBSP   INR    MTPP                                                       018290
004101  030023              LDX    MTPP                                                       018300
004102  015000              LDA    0,1                                                        018310
004103  050017              STA    MTSD          CURRENT DATA WORD                            018320
                     *  FILL WRITE BUFFER AND GO WRITE NEXT RECORD                            018330
004104  002000       MBSR   CALL   MBFZ          CLEAR WRITE/READ BUF.                        018340
004105  004443 R
004106  010017              LDA    MTSD          DATA PATTERN                                 018350
004107  002000              CALL   MFLA          FILL WRITE BUF WITH CURRENT DATA PATTERN     018360
004110  004427 R
004111  001000              JMP    MBND          GO WRITE NEXT RECORD                         018370
004112  003572 R
                     *                                                                        018380
                     *                                                                        018390
```

```
                              *                                                          018400
                              *     SE Q 0: WRITE/READ RANDOM DATA AND RANDOM RECORD LENGTH    018410
                              *                                                          018420
004113  002000      MBSF    CALL    MBSJ            FILL RANDOM BUFFER                   018430
004114  004117 R
004115  001000              JMP     MBND            GO WRITE NEXT                        018440
004116  003572 R
                              *                                                          018450
                              *     THIS ROUTINE GENERATES THE RANDOM BUFFER LENGTH AND FILLS THE BUFFE  018460
                              *     WITH RANDOM DATA                                      018470
004117  000000      MBSJ    ENTR                                                         018480
004120  002000      MBSG    CALL    MRAN            RANDOM NUMBER GENERATOR              018490
004121  004174 R
004122  150054              ANA     MBFR            MASK TO LIMIT NUMBER OF BITS IN RANDOM    B 018500
                              *                             WORD TO THAT OF MAX BUF LENGTH,     B 018510
004123  001010              JAZ     MBSG            NO ZERO RECORD LENGTH,               B 018520
004124  004120 R
004125  005012              TAB                     SAVE NUMBER                          018530
004126  140034              SUB     MBFE            MAX WRITE/READ BUF LENGTH            018540
004127  001004              JAN     *+4             OK=RANDOM NO, LESS THAN AVAIL BUF LENGTH    018550
004130  004133 R
004131  001000              JMP     MBSG            TRY AGAIN                            018560
004132  004120 R
004133  060046              STB     MBFK            CURRENT RANDOM BUFFER LENGTH         018570
004134  005021              TBA                                                          018580
004135  120030              ADD     MBFA            WRITE BUF START ADDR                 018590
004136  050035              STA     MBFF            CURRENT WRITE BUF LAST LOC           018600
004137  010032              LDA     MBFC            READ BUF START ADDR                  018610
004140  120046              ADD     MBFK            CURRENT BUF LENGTH                   018620
004141  050036              STA     MBFG            CURRENT READ BUF LAST LOC            018630
                              *     FILL WRITE BUFFER WITH RANDOM DATA                    018640
004142  002000              CALL    MBFZ            CLEAR WOR BUF                        018650
004143  004443 R
004144  020046              LDB     MBFK            CURRENT RANDOM BUF LENGTH            018660
004145  030030              LDX     MBFA            WRITE BUF START ADDR                 018670
004146  002000      MBSH    CALL    MRAN            RANDOM NO, GENERATOR                 018680
004147  004174 R
004150  055000              STA     0,1                                                 018690
004151  005322              DBR                                                          018700
004152  001020              JBZ*    MBSJ            FINISHED                             018710
004153  104117 R
004154  005144              IXR                                                         018720
```

```
004155  001000          JMP     MBSH                                        018730
004156  004146 R
                  *                                                         018740
                  *                                                         018750
                  *     INITIALIZATION FOR BURN-IN                          018760
                  *                                                         018770
004157  000000  MBIT    ENTR                                                018780
004160  002000          CALL    MINT    WRITE/READ INITIALIZATION           018790
004161  002322 R
004162  005001          TZA                                                 018800
004163  050004          STA     MBG1    RECORD COUNT                        018810
004164  010237          LDA     #1                                          018820
004165  050052          STA     MBFP    INCREMENTAL BUFFER LENGTH           018830
004166  005111          IAR             A=2                                 018840
004167  050063          STA     MBSQ    INITIALIZE FOR SEQ. 0               018850
004170  010044          LDA     MBFI    BUF START ADDR                      018860
004171  050053          STA     MBFG    INCREMENTAL BUF LENGTH              018870
004172  001000          JMP*    MBIT    RETURN                              018880
004173  104157 R
                  *                                                         018890
                  *         ** RANDOM NUMBER GENERATOR **                   018900
                  *           ** RETURNS WITH NUMBER                        018910
                  *           ** IN A REGISTER                              018920
                  *                                                         018930
004174  000000  MRAN    ENTR    0                                           018940
004175  014017          LDA     MRAD                                        018950
004176  004241          LRLA    1                                           018960
004177  124015          ADD     MRAD                                        018970
004200  006120          ADDI    5                                           018980
004201  000005
004202  124013          ADD     MRAD+1                                      018990
004203  134013          ERA     MRAD+2                                      019000
004204  054013          STA     MRAD+3                                      019010
004205  014010          LDA     MRAD+1                                      019020
004206  054010          STA     MRAD+2                                      019030
004207  014005          LDA     MRAD                                        019040
004210  054005          STA     MRAD+1                                      019050
004211  014006          LDA     MRAD+3                                      019060
004212  054002          STA     MRAD                                        019070
004213  001000          JMP*    MRAN                                        019080
004214  104174 R
004215  000000  MRAD    DATA    0,0,0,0                                     019090
```

```
004216   000000
004217   000000
004220   000000
```

```
                              *                                                                  019110
                              *                                                          *       019120
                              *                   SENSE UNIT READY                       *       019130
                              *                                                          *       019140
004221   000000     MSUR     ENTR     0                                                          019150
004222   007401     MS42     SOF                                                                 019160
004223   030251     MSU3     LOX      *0                                                         019170
004224   101210     MSUA     SEN      0210,(MSUR)*    UNIT READY                                 019180
004225   104221 R
004226   002000              CALL*    TOUT                                                       019190
004227   100417 R
004230   001000              JMP      *+4                                                        019200
004231   004234 R
004232   001000              JMP      MSUA                                                       019210
004233   004224 R
004234   001001              JOF      MSU3                                                       019220
004235   004223 R
004236   007401              SOF                        TOGGLE OVFL WHILE                        019230
004237   001000              JMP      MSU3              WAITING FOR UNIT READY                   019240
004240   004223 R
                              *                                                                  019250
                              *                                                                  019260
                              *                                                                  019270
                              *                   SENSE UNIT READY (HAS TIME-OUT RETURN)         019280
                              *                   2ND RTN IS TIME-OUT RTN                        019290
004241   000000     MSXA     ENTR                                                                019300
004242   030251              LOX      *0                                                         019310
004243   101210     MSXC     SEN      0210,(MSXA)*    UNIT READY                                 019320
004244   104241 R
004245   002000     MSXB     CALL*    TOUT                                                       019330
004246   100417 R
004247   001000              JMP      *+4               TIME-OUT                                 019340
004250   004253 R
004251   001000              JMP      MSXC              CHECK AGAIN                              019350
004252   004243 R
004253   047202 I            INR      MSXA                                                       019360
004254   047202 I            INR      MSXA                                                       019370
004255   001000              JMP*     MSXA              TIME-OUT RTN                             019380
004256   104241 R
                              *                                                          *       019390
                              *                                                          *       019400
                              *                   SENSE BUFFER READY                     *       019410
```

```
                              *                    1ST RTN IS TIME-OUT RTN                          019420
                              *                    2ND RTN IS NORMAL RTN                            019430
                              *                                                          *          019440
004257  000000       MSBR     ENTR     0                                                            019450
004260  070015                STX      MTT1                 SAVE X                                  019460
004261  060016                STB      MTT2                 SAVE B                                  019470
004262  030251                LDX      =0                                                          019480
004263  101110       MSBA     SEN      0110,MSBB                                                    019490
004264  004303 R
004265  002000                CALL*    TOUT                 TIME OUT                                019500
004266  100417 R
004267  001000                JMP      *+4                  REPORT ERROR                            019510
004270  004273 R
004271  001000                JMP      MSBA                                                         019520
004272  004263 R
                              *        BUFFER TIME-OUT ERROR                                        019530
004273  004874 R              DATA     *+1                  NO LOOP ON ERROR                        019540
004274  010313                LDA      =011                                                         019550
004275  020314                LDB      ='11'                                                        019560
004276  067200 I              STB      MSG2                                                         019570
004277  002000                CALL     SSWX                 REPORT ERROR                            019580
004300  004706 R
004301  001000                JMP*     MSBR                 ERROR RETURN(NO LOOPING)                019590
004302  104257 R
004303  030015       MSBB     LDX      MTT1                 RESTORE X                               019600
004304  020016                LDB      MTT2                 RESTORE B                               019610
004305  047203 I              INR      MSBR                                                         019620
004306  047203 I              INR      MSBR                                                         019630
004307  001000                JMP*     MSBR                 RETURN                                  019640
004310  104257 R
                              *                                                                     019650
                              *                    *                                     *          019660
                              *                    *                                     *          019670
                              *                    *   SENSE BIC BUSY/BIC ABNORMAL STOP  *          019680
                              *                    *                                     *          019690
                              *                    *                                     *          019700
                              *                    *                                                019700
004311  000000       MBIS     ENTR     0                                                            019710
004312  030251                LDX      =0                                                           019720
004313  020253                LDB      =7                                                           019730
004314  101020       MBIA     SEN      020,MBIB             BIC NOT BUSY                            019740
004315  004324 R
004316  002000                CALL     MLTO                 EXTENDED TIME-OUT ROUTINE               019750
```

```
004317  004456 R
004320  001000           JMP     MBID        REPORT ERROR                              019760
004321  004340 R
004322  001000           JMP     MBIA                                                  019770
004323  004314 R
004324  101021   MBIB    SEN     021,*+4     BIC ABNORMAL STOP                         019780
004325  004330 R
004326  001000           JMP*    MBIS        RETURN                                    019790
004327  104311 R
004330  002000           CALL*   SSWT        SENSE SWITCH/ERROR CONTROL                019800
004331  100421 R
004332  000006           DATA    06          ERROR CODE                                019810
004333  005433 R         DATA    MSGQ        ERROR MSG: BIC ABNORMAL STOP              019820
004334  000500 R         DATA    MIST        SSS TERMINATE                             019830
004335  004336 R         DATA    *+1         NO LOOP ON ERROR                          019840
004336  001000           JMP*    MBIS        ERROR RETURN                              019850
004337  104311 R
                   *                                                                   019860
004340  002000   MBID    CALL*   SSWT        SENSE SWITCH/ERROR CONTROL                019870
004341  100421 R
004342  000007           DATA    07          ERROR CODE                                019880
004343  005446 R         DATA    MSGR        ERROR MSG: BIC BUSY TIME OUT              019890
004344  000500 R         DATA    MIST        SSS TERMINATE                             019900
004345  004346 R         DATA    *+1                                                   019910
004346  001000           JMP*    MBIS        ERROR RETURN                              019920
004347  104311 R
                   *                                                                   019930
                   *                                                                   019940
                   *                                                         *          019950
                   *                                                         *          019950
                   *          SENSE TAPE ERROR                               *          019970
                   *                                                         *          019980
004350  000000   MSTE    ENTR    0                                                     019990
004351  101010   MSTA    SEN     010,*+4                                               020000
004352  004355 R
004353  001000           JMP*    MSTE        NO ERROR RETURN                           020010
004354  104350 R
004355  047204 I         INR     MSTE                                                  020020
004356  047204 I         INR     MSTE                                                  020030
004357  001000           JMP*    MSTE        ERROR RETURN                              020040
004360  104350 R
                   *                                                                   020050
```

```
                            *                                                    020060
                            *        SENSE END OF TAPE/REWIND                     020070
                            *                                                     020080
004361    000000   MSET     ENTR     0                                           020090
004362    101510   MSEA     SEN      0510,*+6        EOT                         020100
004363    004370 R
004364    047205 I          INR      MSET                                        020110
004365    047205 I          INR      MSET                                        020120
004366    001000           JMP*     MSET            FALSE-RETURN                 020130
004367    104361 R
004370    002000           CALL     MRWD            REWIND                       020140
004371    003216 R
004372    001000           JMP*     MSET            RETURN                       020150
004373    104361 R
                            *                                                     020160
                            *                                                     020170
                            *        SETUP BIC FOR WRITING                        020180
                            *                                                     020190
004374    000000   MBCW     ENTR                                                 020200
004375    100021   MBC2     EXC      021             INITIALIZE BIC              020210
004376    010030           LDA      MBFA            WRITE BUF START ADDR         020220
004377    103120   MBC3     OAR      020             LOAD BIC INITIAL ADDR       020230
004400    010035           LDA      MBFF            CURRENT WRIT BUF LAST LOC    020240
004401    103121   MBC4     OAR      021             LOAD BIC FINAL ADDR         020250
004402    100020           EXC      020             ENABLE BIC                  020260
004403    001000           RETU*    MBCW                                        020270
004404    104374 R
                            *                                                     020280
                            *                                                     020290
                            *        SETUP BIC FOR READING                        020300
                            *                                                     020310
004405    000000   MBCR     ENTR                                                 020320
004406    100021   MBC5     EXC      021             INITIALIZE BIC              020330
004407    010032           LDA      MBFC            READ BUF START ADDR          020340
004410    103120   MBC6     OAR      020             LOAD BIC INITIAL ADDR       020350
004411    010036           LDA      MBFG            CURRENT READ BUF LAST LOC    020360
004412    103121   MBC7     OAR      021             LOAD BIC FINAL ADDR         020370
004413    100020           EXC      020             ENABLE BIC                  020380
004414    001000           RETU*    MBCR                                        020390
004415    104405 R
                            *                                                     020400
                            *                                                     020410
```

```
                              *                                                      020420
                              *        SETUP BIC FOR WRITING/READING                 020430
                              *        ** THIS ROUTINE USED WHEN ALL OF              020440
                              *        ** AVAIL CORE IS USED FOR A COMMON            020450
                              *        ** WRITE/READ BUFFER.                         020460
                              *                                                      020470
004416  000000        MBCC    ENTR                                                   020480
004417  100021        MBC8    EXC     021.                                           020490
004420  010044                LDA     MBFI        BUFFER START ADDR                  020500
004421  103120        MBC9    OAR     020         LOAD BIC INITIAL ADDR.             020510
004422  010037                LDA     MBFH        CURRENT FINAL BIC ADDR.            020520
004423  103121        MBCX    OAR     021         LOAD BIC FINAL ADDR.               020530
004424  100020                EXC     020         ENABLE BIC                         020540
004425  001000                RETU*   MBCC                                          020550
004426  104416 R
                              *     FILL WRITE BUFFER                                020560
                              *        ENTER WITH VALUE IN A REG, AND LAST LOC       020570
                              *        TO FILL STORED IN MBFH                        020580
004427  000000        MFLA    ENTR                                                   020590
004430  020044                LOB     MBFI        BUF INIT ADDR                      020600
004431  056000        MFL2    STA     0,2                                            020610
004432  005014                TAX                                                    020620
004433  005021                TBA                                                    020630
004434  140037                SUB     MBFH        CURRENT LAST LOC FOR BUFFER        020640
004435  001010                JAZ*    MFLA                                          020650
004436  104427 R
004437  005041                TXA                                                    020660
004440  005122                IBR                                                    020670
004441  001000                JMP     MFL2                                          020680
004442  004431 R
                              *                                                      020690
                              *                                                      020700
                              *                                                      020710
                              *     CLEAR READ BUFFER(COMMON WRITE/READ BUFFER)      020720
                              *                                                      020730
004443  000000        MBFZ    ENTR                                                   020740
004444  020044                LOB     MBFI        START OF BUFFER                    020750
004445  005001        MBF2    TZA                                                    020760
004446  056000                STA     0,2                                            020770
004447  005021                TBA                                                    020780
004450  140045                SUB     MBFJ        END OF WRITE/READ BUFFER           020790
004451  001010                JAZ*    MBFZ                                          020800
```

```
004452  104443 R
004453  005122              IBR                         020810
004454  001000              JMP     MBF2                020820
004455  004445 R
                    *                                   020830
                    *                                   020840
                    *                                   020850
                    *   EXTENDED TIME-OUT ROUTINE       020860
                    *     ENTER WITH X=0 AND B EQUAL TO 020870
                    *     NUMBER OF TIME-OUT CYCLES      020880
                    *                                   020890
004456  000000  MLTO    ENTR                            020900
004457  002000          CALLW   TOUT                    020910
004460  100417 R
004461  001000          JMP     *+4                     020920
004462  004465 R
004463  001000          JMP     *+5                     020930
004464  004470 R
004465  005322          DBR                             020940
004466  001020          JBZ*    MLTO                    020950
004467  104456 R
004470  047206 I        INR     MLTO                    020960
004471  047206 I        INR     MLTO                    020970
004472  001000          JMP*    MLTO                    020980
004473  104456 R
```

```
                    **************************************************      021000
                    *                                               *      021010
                    *     TROUBLESHOOTING/ALIGNMENT ROUTINES        *      021020
                    *                                               *      021030
                    *     ** WRITE RECORDS ROUTINE                  *      021040
                    *                                               *      021050
                    *     ** READ RECORDS ROUTINE                   *      021060
                    *                                               *      021070
                    *     ** WRITE/READ ROUTINE                     *      021080
                    *                                               *      021090
                    *                                               *      021100
                    **************************************************      021110
                    *                                                      021120
                    *     COMMON SETUP FOR ALL THREE ROUTINES              021130
                    *                                                      021140
                    *     A=FIXED DATA PATTERN                             021150
                    *     B=RECORD LENGTH(WORDS)                           021160
                    *     X=NO. OF RECORDS TO EXECUTE                      021170
                    *     SS1; RESET=BIN; SET=BCD                          021180
                    *                                                      021190
004474  000700      MMTX    HLT     0700                                   021200
004475  050015      MMTA    STA     MTT1      TEMP. SAVE OF DATA PATTERN   021210
004476  060061              STB     MMTY      SAVE RECORD LENGTH           021220
004477  070062              STX     MMTZ      SAVE NO. OF RECORDS          021230
004500  002000              CALL    MINT      INITIALIZE FOR WRITE/READ    021240
004501  002322 R
004502  005001              TZA                                           021250
004503  001100              JSS1    *+5       RESET=BIN SET=BCD            021260
004504  004510 R
004505  050003              STA     MTBN      O'WRITE/READ IN BINARY       021270
004506  001000              JMP     *+4                                   021280
004507  004512 R
004510  010237              LDA     =1                                    021290
004511  050003              STA     MTBN      1=WRITE/READ IN BCD          021300
004512  010015              LDA     MTT1      INITIALIZATION ROUTINE       021310
004513  050017              STA     MTSD      ZEROS OUT MTSD.              021320
004514  010061              LDA     MMTY      RECORD LENGTH                021330
004515  140047              SUB     MBFL      AVAIL BUF LENGTH             021340
004516  001004              JAN     MMTB      JMP IF OK                    021350
004517  004523 R
                    ****************************                           021360
004520  000701              HLT     0701      * SPECIFIED RECORD LENGTH TOO LONG   021370
```

```
                    **************************                              021380
004521  001000      JMP     MMTA            * RESPECIFY ALL PARAMETERS      021390
004522  004475 R
004523  010044 MMTB LDA     MBFI            BUF START ADDR                  021400
004524  120061      ADD     MMTY            SPECIFIED RECORD LENGTH         021410
004525  005311      DAR                                                     021420
004526  050037      STA     MBFH            FINAL BIC ADDR                  021430
004527  002000      CALL    MBFZ            CLEAR WRITE/READ BUFFER         021440
004530  004443 R
004531  010017      LDA     MTSD            DATA PATTERN                    021450
004532  002000      CALL    MFLA            FILL WRITE BUFFER               021460
004533  004427 R
004534  001000      JMP     MMTR                                           021470
004535  004551 R
                 *                                                          021480
004536  000000 MMTW ENTR                                                   021490
004537  010005      LDA     MTSB            BIC MODE ?                      021500
004540  001010      JAZ     *+6             JMP IF NO                       021510
004541  004546 R
004542  002000      CALL    MBCC            SETUP BIC FOR WRITE/READ        021520
004543  004416 R
004544  001000      JMP     *+3                                            021530
004545  004547 R
004546  020061      LDB     MMTY            USER SPECIFIED RECORD LENGTH    021540
004547  001000      JMP*    MMTW                                           021550
004550  104536 R
                 ***********************************                        021560
004551  000702 MMTR HLT     0702            THIS COMPLETES THE SETUP FOR EACH   021570
                 ************************************ OF THE TROUBLESHOOTING/ALIGNMENT 021580
                 *                                   * ROUTINES.            021590
                 *                                                          021600
                 *                           * START BELOW AS REQUIRED      021610
                 *                                                          021620
                 *                                                          021630
                 *                                                          021640
                 *                                                          021650
                 *                                                          021660
                 *                                                          021670
                 *                                                          021680
                 *                                                          021690
                 *    WRITE  RECORDS ROUTINE                                021700
                 *                                                          021710
```

```
004552   002000      MMTC   CALL    MMTW         SETUP FOR BIC OR SENSE MODE        021720
004553   004536 R
004554   002000             CALL    MSWR         WRITE ONE RECORD                   021730
004555   002451 R
004556   101010      MMT2   SEN     010,MMTD     PARITY ERROR                       021740
004557   004562 R
004560   001000             JMP     MMTE         WRITE NEXT RECORD                  021750
004561   004571 R
                     *                                                              021760
004562   001200      MMTD   JSS2    *+4          HALT ON ERROR                      021770
004563   004566 R
004564   001000             JMP     MMTE         WRITE NEXT RECORD                  021780
004565   004571 R
                     *******************************                                021790
004566   000710             HLT     0710         * READ-AFTER WRITE PARITY ERROR    021800
                     *******************************                                021810
004567   001000             JMP     MMTE         WRITE NEXT RECORD                  021820
004570   004571 R
                     *                                                              021830
004571   010062      MMTE   LOA     MMTZ         NO. OF RECORDS                     021840
004572   005311             DAR                                                     021850
004573   050062             STA     MMTZ                                            021860
004574   001010             JAZ     MMTX         THATS ALL FOLKS                    021870
004575   004474 R
004576   001400             JSS3    MMTX         TERMINATE                          021880
004577   004474 R
004600   001000             JMP     MMTC         WRITE NEXT RECORD                  021890
004601   004552 R
                     *                                                              021900
                     *                                                              021910
                     *                                                              021920
                     *      READ RECORDS ROUTINE                                    021930
                     *                                                              021940
004602   002000      MMTF   CALL    MBFZ         CLEAR READ BUFFER                  021950
004603   004443 R
004604   002000      MMTG   CALL    MMTW         SETUP FOR BIC OR SENSE MODE        021960
004605   004536 R
004606   002000             CALL    MSRR         READ ON RECORD                     021970
004607   002753 R
004610   101010      MMT3   SEN     010,MMTH     PARITY ERROR                       021980
004611   004614 R
004612   001000             JMP     MMTI         GO READ NEXT RECORD                021990
```

```
004613    004621 R
004614    001200        MMTH    JSS2      *+4           HALT ON ERROR                          022000
004615    004620 R
004616    001000                JMP       MMTI          READ NEXT RECORD                       022010
004617    004621 R
                                                                                                022020
                        ***********************************  * READ PARITY ERROR               022030
004620    000720                HLT       0720          * READ PARITY ERROR                    022030
                        ***********************************                                      022040
004621    010062        MMTI    LDA       MMTZ          NO. OF RECORDS                         022050
004622    005311                DAR                                                             022060
004623    050062                STA       MMTZ                                                 022070
004624    001010                JAZ       MMTX          THATS ALL FOLKS                        022080
004625    004474 R
004626    001400                JSS3      MMTX          TERMINATE                              022090
004627    004474 R
004630    001000                JMP       MMTF          READ NEXT RECORD                       022100
004631    004602 R
                        *                                                                       022110
                        *                                                                       022120
                        *                                                                       022130
                        *                                                                       022140
                        *       WRITE/BACKSPACE/READ RECORDS ROUTINE                            022150
                        *                                                                       022160
004632    002000        MMTJ    CALL      MMTW          SETUP FOR BIC OR SENSE MODE            022170
004633    004536 R
004634    010017                LDA       MTSD          DATA PATTERN                           022180
004635    002000                CALL      MFLA          FILL WRITE BUFFER                      022190
004636    004427 R
004637    002000                CALL      MSWR          WRITE ONE RECORD                       022200
004640    002451 R
004641    101010        MMT4    SEN       010,MMTN      PARITY ERROR                           022210
004642    004670 R
004643    002000        MMTK    CALL      MBOR          BACKSPACE ONE RECORD                   022220
004644    002673 R
004645    002000                CALL      MBFZ          CLEAR READ BUFFER                      022230
004646    004443 R
004647    002000        MMTL    CALL      MMTW          SETUP FOR BIC OR SENSE MODE            022240
004650    004536 R
004651    002000                CALL      MSRR          READ ONE RECORD                        022250
004652    002753 R
004653    001400                JSS3      MMTX          TERMINATE                              022260
004654    004474 R
```

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004655    101010      MMT5    SEN     010,MMTP        PARITY ERROR                            022270
004656    004677 R
004657    002000      MMT6    CALL    MSCP            DATA COMPARE ROUTINE                    022280
004660    003231 R
004661    010062      MMTM    LDA     MMTZ            NO OF RECORDS                           022290
004662    005311              DAR                                                             022300
004663    050062              STA     MMTZ                                                    022310
004664    001010              JAZ     MMTX            THATS ALL FOLKS                         022320
004665    004474 R
004666    001000              JMP     MMTJ            GO WRITE NEXT RECORD                    022330
004667    004632 R
*        READ-AFTER WRITE PARITY ERROR                                                        022340
004670    001200      MMTN    JSS2    *+4             HALT ON ERROR                           022350
004671    004674 R
004672    002000              JMPM    MMTM            WRITE NEXT RECORD                       022360
004673    004661 R
*******************************                                                               022370
004674    000730              HLT     0730            *  READ-AFTER-WRITE PARITY ERROR        022380
*******************************                                                               022390
004675    001000              JMP     MMTM            WRITE NEXT RECORD                       022400
004676    004661 R
*        STANDARD READ PARITY ERROR                                                           022410
004677    001200      MMTP    JSS2    *+4             HALT ON ERROR                           022420
004700    004703 R
004701    001000              JMP     MMT6            GO COMPARE DATA                         022430
004702    004657 R
*******************************                                                               022440
004703    000732              HLT     0732            *  READ PARITY ERROR                    022450
*******************************                                                               022460
004704    001000              JMP     MMT6            GO COMPARE DATA                         022470
004705    004657 R
```

```
                                                                                    022490
                         *                                                          022500
                         *      STANDARD SENSE SWITCH ROUTINE AND ERROR             022510
                         *      CONTROL FOR UNIT STATUS ERROR                       022520
                         *        FIRST RETURN FOR LOOP ON ERROR                    022530
                         *        SECOND RETURN IS NORMAL EXIT                      022540
                         *                                                          022550
004706  000000    SSWX   ENTR                                                       022560
004707  002000           CALL*   SSWT                                              022570
004710  100421 R
004711  000001           DATA    01            CODED HALT                          022580
004712  005271 R         DATA    MSGI          ADDR OF MSG: UNIT STATUS ERROR       022590
004713  000500 R         DATA    MIST          TERMINATE EXIT                       022600
004714  104706 R         DATA    (SSWX)*       LOOP ON ERROR EXIT                   022610
004715  047207 I         INR     SSWX                                              022620
004716  047207 I         INR     SSWX                                              022630
004717  001000           JMP*    SSWX          NORMAL EXIT                          022640
004720  104706 R
                         *                                                          022650
                         *      STANDARD SENSE SWITCH ROUTINE AND ERROR             022660
                         *      CONTROL FOR TRANSPORT MOTION ERROR                  022670
                         *        FIRST RETURN FOR LOOP ON ERROR EXIT               022680
                         *        SECOND RETURN IS NORMAL EXIT                      022690
                         *                                                          022700
004721  000000    SSWZ   ENTR                                                       022710
004722  002000           CALL*   SSWT                                              022720
004723  100421 R
004724  000002           DATA    02            CODED HALT                          022730
004725  005310 R         DATA    MSGJ          ADDR OF MSG: TRANSPORT MOTION ERROR  022740
004726  000500 R         DATA    MIST          TERMINATE                           022750
004727  104721 R         DATA    (SSWZ)*       LOOP ON ERROR EXIT                   022760
004730  047210 I         INR     SSWZ                                              022770
004731  047210 I         INR     SSWZ                                              022780
004732  001000           JMP*    SSWZ          NORMAL EXIT                          022790
004733  104721 R
```

```
****************************************************************                    022810
*                                                              *                    022820
*          I/O INSTRUCTION OVERLAY ROUTINE                     *                    022830
*                                                              *                    022840
*          THIS ROUTINE ADAPTS ALL I/O INSTRUCTION IN THE      *                    022850
*          PROGRAM TO THE DEVICE ADDRESSES SPECIFIED BY THE    *                    022860
*          USER, EXCEPT FOR ONE INSTRUCTION: THE TAPE UNIT     *                    022870
*          SELECT COMMAND(EXC 104XXX) UK ADAPTED AS A DIRECT   *                    022880
*          RESPONSE TO THE USER INPUT,                         *                    022890
*                                                              *                    022900
*          THE MT CONTROLLER DA IS STORED IN MTDA,             *                    022910
*          THE BIC UNIT DA IS STORED IN MTBC,                  *                    022920
*          THE PIM UNIT DA IS STORED IN MTP3,                  *                    022930
*                                                              *                    022940
*                                                              *                    022950
*                                                              *                    022960
****************************************************************                    022970
*                                                                                   022980
*                                                                                   022990
*                                                                                   023000
*                                                                                   023010
*                                                                                   023020
*                                                                                   023030
004734  000000      MA10    ENTR                                                    023040
*                                                                                   023050
*          ADAPT MT CONTROLLER I/O INSTRUCTIONS                                      023060
004735  010007              LDA     MTDA        USER SPECIFIED MT CONTROLLER DA      023070
004736  054073              STA     MA91                                            023080
004737  006020              LOBI    MA1A        ADDR OF INST ADDR TABLE           B 023090
004740  005033 R
004741  036000      MA12    LDX     0,2         GET ADDR OF I/O INST              B 023100
004742  001040              JXZ     MA14        GO TO NEXT GROUP                  B 023110
004743  004751 R
004744  002000              CALL    MA90        ADAPT I/O INST                   B 023120
004745  005023 R
004746  005122              IBR                                                  B 023130
004747  001000              JMP     MA12                                         B 023140
004750  004741 R
*                                                                                   023150
*          ADAPT BIC I/O INSTRUCTIONS                                                023160
*                                                                                   023170
004751  010010      MA14    LDA     MTBC        BIC DEVICE ADDR                  B 023180
```

```
004752   054057            STA     MA91                                              023190
004753   005122            IBR                                                      B 023200
004754   036000     MA15   LDX     0,2                                              B 023210
004755   001040            JXZ     MA16           GO TO NEXT GROUP                  B 023220
004756   004764 R
004757   002000            CALL    MA90           ADAPT I/O INST                    B 023230
004760   005023 R
004761   005122            ISR                                                      B 023240
004762   001000            JMP     MA15                                             B 023250
004763   004754 R

                    *      ADAPT THE DA+1 SIC I/O INSTRUCTIONS                         023260
004764   044045     MA16   INR     MA91                                             B 023270
004765   005122            ISR                                                      B 023280
004766   036000     MA17   LDX     0,2            GET ADDR OF I/O INST              B 023290
004767   001040            JXZ     MA18           GO TO NEXT BLOCK                  B 023300
004770   004776 R
004771   002000            CALL    MA90           ADAPT I/O INST                    B 023310
004772   005023 R
004773   005122            ISR                                                      B 023320
004774   001000            JMP     MA17                                             B 023330
004775   004766 R

                    *                                                                 023340
                    *      ADAPT PIM ENABLE/DISABLE EXC'S                             023350
004776   010014     MA18   LDA     MTP3                                             B 023360
004777   054032            STA     MA91                                               023370
005000   005122            ISR                                                      B 023380
005001   036000     MA19   LDX     0,2                                              B 023390
005002   001040            JXZ*    MA10           ALL FINISHED                      B 023400
005003   104734 R
005004   002000            CALL    MA90           ADAPT I/O INST                    B 023410
005005   005023 R
005006   005122            ISR                                                      B 023420
005007   001000            JMP     MA19                                             B 023430
005010   005001 R
005011   002000            CALL    MA90                                              023440
005012   005023 R
005013   006030            LDXI    MINC                                              023450
005014   002443 R
005015   002000            CALL    MA90                                              023460
005016   005023 R
005017   006030            LDXI    MIND                                              023470
005020   002446 R
```

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005021   002000              CALL    MA90                                          023480
005022   005023 R
                      *                                                             023490
                      *                                                             023500
                      *        ADAPT I/O INSTRUCTION                                023510
                      *                                                             023520
005023   000000      MA90     ENTR                                                  023530
005024   015000               LDA     0,1            I/O INST                       023540
005025   150315               ANA     =0177700       MASK                           023550
005026   114003               ORA     MA91           USER SPECIFIED DA              023560
005027   055000               STA     0,1            RESTORE                        023570
005030   001000               JMP*    MA90                                          023580
005031   105023 R
005032   000000      MA91     DATA    0              STORAGE FOR DA TO USE HEREIN   023590
                      *   MAG TAPE I/O INSTRUCTION ADDRESSES                      B 023600
005033   001114 R    MA1A     DATA    MC54,MCFA,MCFC,MCFE,MC20,MCFF,MC12,MCFG,MCFH,MCFI  B 023610
005034   001127 R
005035   001145 R
005036   001164 R
005037   001165 R
005040   001171 R
005041   001217 R
005042   001222 R
005043   001226 R
005044   001236 R
005045   001247 R             DATA    MCFJ,MCFK,MCFL,MCFZ,MCFM,MCFN,MCFO,MCFP=4,MCFP=2  B 023620
005046   001252 R
005047   001265 R
005050   001306 R
005051   001317 R
005052   001322 R
005053   001326 R
005054   001355 R
005055   001357 R
005056   001361 R             DATA    MCFP,MCFQ,MCFR,MCFS,MC52,MCFU,MCFV,MCFW,MCFX,MCFY  B 023630
005057   001426 R
005060   001431 R
005061   001446 R
005062   001451 R
005063   001456 R
005064   001473 R
005065   001476 R
```

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005066    001501  R
005067    001516  R
005070    001521  R          DATA      MC99,MC98,MC97,MC96,MESA,MWRY,MSWB,MSWC,MSWN,MSWF         B 023640
005071    001524  R
005072    001527  R
005073    001532  R
005074    001776  R
005075    002305  R
005076    002475  R
005077    002500  R
005100    002541  R
005101    002634  R
005102    002703  R          DATA      MBOA,MBOC,MSRB,MSRC,MSRQ,MSRH,MFOA,MFOD,MRWA,MRWB         B 023650
005103    002732  R
005104    003000  R
005105    003026  R
005106    003034  R
005107    003122  R
005110    003146  R
005111    003175  R
005112    003221  R
005113    003222  R
005114    003474  R          DATA      MWFB,MWF1,MBN2,MSUA,MSXC,MSBA,MSTA,MSEA,MMT2,MMT3         B 023660
005115    003511  R
005116    003623  R
005117    004224  R
005120    004243  R
005121    004263  R
005122    004351  R
005123    004362  R
005124    004556  R
005125    004610  R
005126    004641  R          DATA      MMT4,MMT5,MC55,0                                          B 023670
005127    004655  R
005130    001453  R
005131    000000
                       *                                                                        B 023680
                       *      BIC I/O INSTRUCTION ADDRESSES                                      B 023690
005132    004314  R  MA2A     DATA      MBIA,MBC3,MBC4+1,MBC6,MBC7+1,MBC9,MBCX+1,0               B 023700
005133    004377  R
005134    004402  R
005135    004410  R
```

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005136   004413 R
005137   004421 R
005140   004424 R
005141   000000
005142   004324 R            DATA    MBIB,MBC2,MBC4,MBC5,MBC7,MBC8,MBCX,0                    B 023710
005143   004375 R
005144   004401 R
005145   004406 R
005146   004412 R
005147   004417 R
005150   004423 R
005151   000000
                      *                                                                     B 023720
                      *    PIM INSTRUCTION ADDRESSES                                        B 023730
005152   002442 R    MA3A    DATA    MING,MINC,MIND,MSWD,MSWH,0                             B 023740
005153   002443 R
005154   002446 R
005155   002534 R
005156   002546 R
005157   000000
                      *                                                                     B 023750
```

```
                         *                                                                                    023770
                         *        *********************************************************                    023780
                         *        *                                                        *                   023790
                         *        *                    MESSAGE TABLE                        *                   023800
                         *        *                                                        *                   023810
                         *        *********************************************************                    023820
005160    106512    MSGA    DATA    0106512,0106512,'THIS IS THE 73/620 MAGNETIC TAPE TEST'                    023830
005161    106612
005162    152310
005163    144723
005164    120311
005165    151640
005166    152310
005167    148640
005170    133663
005171    127656
005172    131860
005173    120315
005174    140707
005175    147305
005176    152311
005177    141640
005200    152301
005201    150305
005202    120324
005203    142723
005204    152240
005205    106612            DATA    0106512,0                                                                   023840
005206    000000
005207    106612    MSGB    DATA    0106512,'UNIT TYPE=',0                                                      023850
005210    152716
005211    144724
005212    120324
005213    154720
005214    142675
005215    000000
005216    152716    MSGC    DATA    'UNIT NO.=',0                                                               023860
005217    144724
005220    120316
005221    147656
005222    136640
005223    000000
```

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005224    106612      MSGD    DATA    0106612,'CNT. DA= ',0                          023870
005225    141716
005226    152256
005227    120304
005230    140675
005231    120240
005232    000000
005233    106612      MSGE    DATA    0106612,'MODE(3 OR 8)=',0                       023880
005234    146717
005235    142305
005236    124323
005237    120317
005240    151240
005241    141251
005242    136640
005243    000000
005244    106612      MSGF    DATA    0106612,'BIC DA=',0                             023890
005245    141311
005246    141640
005247    142301
005250    136640
005251    000000
005252    106612      MSGG    DATA    0106612,'PIM(Y OR N)=',0                        023900
005253    150311
005254    146650
005255    154640
005256    147722
005257    120316
005260    124675
005261    000000
005262    106612      MSGH    DATA    0106612,'PIM ADDR=',0                           023910
005263    150311
005264    146640
005265    140704
005266    142322
005267    136640
005270    000000
005271    106612      MSGI    DATA    0106612,'UNIT STATUS ERROR NO.'                 023920
005272    152716
005273    144724
005274    120323
005275    152301
```

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005276    152329
005277    151640
005300    142722
005301    151317
005302    151240
005303    147317
005304    127240
005305    000000    MSG2    DATA    0,0106612,0    ERROR NO.                              023930
005306    106612
005307    000000
005310    106612    MSGJ    DATA    0106612,'TRANSPORT MOTION ERROR NO.'               023940
005311    152322
005312    140716
005313    151720
005314    147722
005315    152240
005316    146717
005317    152311
005320    147716
005321    120305
005322    151322
005323    147722
005324    120316
005325    147656
005326    000000    MSG3    DATA    0,0106612,0    ERROR NO.                              023950
005327    106612
005330    000000
005331    106612    MSGK    DATA    0106612,0106612,'RECORD ',0                        023960
005332    106612
005333    151305
005334    141717
005335    151304
005336    120240
005337    000000
005340    151305    MSGL    DATA    'RECOVERABLE PARITY ERROR',0106612,0               023970
005341    141717
005342    153305
005343    151301
005344    141314
005345    142640
005346    150301
005347    151311
```

```
005350    152331
005351    120305
005352    151322
005353    147722
005354    106612
005355    000000
005356    147317      MSGM      DATA      'NON-RECOVERABLE PARITY ERROR',0106612,0        023980
005357    147255
005360    151305
005361    141717
005362    153305
005363    151301
005364    141314
005365    142640
005366    150301
005367    151311
005370    152331
005371    120305
005372    151322
005373    147722
005374    106612
005375    000000
005376    106612      MSGO      DATA      0106612,'EXPECTED  ACTUAL  ADDRESS',0106612,0   023990
005377    142730
005400    150305
005401    141724
005402    142704
005403    120240
005404    140703
005405    152325
005406    140714
005407    120240
005410    140704
005411    142322
005412    142723
005413    151640
005414    106612
005415    000000
005416    151724      MSGP      DATA      'START OF BURN-IN TEST',0106612,0               024000
005417    140722
005420    152240
005421    147705
```

```
005422   120302
005423   152722
005424   147255
005425   144716
005426   120324
005427   142723
005430   152240
005431   106612
005432   000000
005433   141311     MSGQ    DATA     'BIC ABNORMAL STOP',0106612,0                      024010
005434   141640
005435   140702
005436   147317
005437   151315
005440   140714
005441   120325
005442   152317
005443   150240
005444   106612
005445   000000
005446   141311     MSGR    DATA     'BIC BUSY TIME-OUT',0106612,0                      024020
005447   141640
005450   141325
005451   151731
005452   120324
005453   144715
005454   142655
005455   147725
005456   152240
005457   106612
005460   000000
005461   120240     MSGU    DATA     '  ',0          ASCII SPACES                       024030
005462   120240
005463   000000
005464   143311     MSGV    DATA     'FILE MARK TEST: WRONG RECORD FOUND',0106612,0     024040
005465   146305
005466   120315
005467   140722
005470   145640
005471   152305
005472   151724
005473   135240
```

```
005474   153722
005475   147716
005476   143640
005477   151305
005500   141717
005501   151304
005502   120306
005503   147725
005504   147304
005505   106612
005506   000000
005507   151305        MSGW    DATA    'RECOVERABLE READ/WRITE PARITY ERROR',0106612,0                    024050
005510   141717
005511   153305
005512   151301
005513   141314
005514   142640
005515   151305
005516   140704
005517   127727
005520   151311
005521   152305
005522   120320
005523   140722
005524   144724
005525   154640
005526   142722
005527   151317
005530   151240
005531   106612
005532   000000
005533   147317        MSGX    DATA    'NON-RECOVERABLE READ/WRITE PARITY ERROR',0106612,0                024060
005534   147255
005535   151305
005536   141717
005537   153305
005540   151301
005541   141314
005542   142640
005543   151305
005544   140704
005545   127727
```

```
005546   151311
005547   152305
005550   120320
005551   140722
005552   144724
005553   154640
005554   142722
005555   151317
005556   151240
005557   106612
005560   000000
005561   106612      MSGY    DATA    0106612,'START OF FILE MARK TEST',0106612,0        024070
005562   151724
005563   140722
005564   152240
005565   147706
005566   120306
005567   144714
005570   142640
005571   146701
005572   151313
005573   120324
005574   142723
005575   152240
005576   106612
005577   000000
005600   106612      MSGZ    DATA    0106612,'PIM MASK=',0                            B 024080
005601   150311
005602   146640
005603   146701
005604   151713
005605   136640
005606   000000
                     *                                                                  024090
005607 R  MEND    EQU     *        FIRST ADDR FOR 4K MEMORY WRITE BUF               024100
000500 R          END     MIST     START OF TEST                                    024110

LITERALS
  000225   000004
  000226   000005
  000227   000302
  000230   000021
```

```
000231    000316
000232    000013
000233    001000
000234    000077
000235    104000
000236    000777
000237    000001
000240    120261
000241    000003
000242    120263
000243    000002
000244    120262
000245    000006
000246    120266
000247    000010
000250    130660
000251    000000
000252    177777
000253    000007
000254    120267
000255    130663
000256    120264
000257    120265
000260    000014
000261    130664
000262    000026
000263    000024
000264    000144
000265    125252
000266    000145
000267    000012
000270    130662
000271    010000
000272    020000
000273    002000
000274    000020
000275    052525
000276    002534
000277    002564
000300    130267
000301    000016
000302    130566
```

```
000303    000017
000304    130667
000305    002720
000306    003031
000307    003054
000310    003163
000311    007777
000312    003516
000313    000011
000314    130661
000315    177700
```

POINTERS
```
000200    005305
000201    005326
000202    004241
000203    004257
000204    004350
000205    004361
000206    004456
000207    004706
000210    004721
```

SYMBOLS

```
1    005607  R    MEND
1    005600  R    MSGZ
1    005561  R    MSGY
1    005533  R    MSGX
1    005507  R    MSGW
1    005464  R    MSGV
1    005461  R    MSGU
1    005446  R    MSGR
1    005433  R    MSGQ
1    005416  R    MSGP
1    005376  R    MSGO
1    005356  R    MSGM
1    005340  R    MSGL
1    005331  R    MSGK
1    005326  R    MSG3
1    005310  R    MSGJ
```

```
1    005305  R    MSG2
1    005271  R    MSGI
1    005262  R    MSGH
1    005252  R    MSGG
1    005244  R    MSGF
1    005233  R    MSGE
1    005224  R    MSGD
1    005216  R    MSGC
1    005207  R    MSGB
1    005160  R    MSGA
0    005152  R    MA3A
0    005132  R    MA2A
1    005033  R    MA1A
1    005032  R    MA91
1    005023  R    MA90
1    005001  R    MA19
1    004776  R    MA18
1    004766  R    MA17
1    004764  R    MA16
1    004754  R    MA15
1    004751  R    MA14
1    004741  R    MA12
1    004734  R    MA10
1    004721  R    SSWZ
1    004706  R    SSWX
1    004677  R    MMTP
1    004670  R    MMTN
1    004661  R    MMTM
1    004657  R    MMT6
1    004655  R    MMT5
0    004647  R    MMTL
0    004643  R    MMTK
1    004641  R    MMT4
1    004632  R    MMTJ
1    004621  R    MMTI
1    004614  R    MMTH
1    004610  R    MMT3
0    004604  R    MMTG
1    004602  R    MMTF
1    004571  R    MMTE
1    004562  R    MMTD
1    004556  R    MMT2
```

```
1   004552  R   MMTC
1   004551  R   MMTR
1   004536  R   MMTW
1   004523  R   MMTB
1   004475  R   MMTA
1   004474  R   MMTX
1   004466  R   MLTO
1   004445  R   MBF2
1   004443  R   MBFZ
1   004431  R   MFL2
1   004427  R   MFLA
1   004423  R   MBCX
1   004421  R   MBC9
1   004417  R   MBC8
1   004416  R   MBCC
1   004412  R   MBC7
1   004410  R   MBC6
1   004406  R   MBC5
1   004405  R   MBCR
1   004401  R   MBC4
1   004377  R   MBC3
1   004375  R   MBC2
1   004374  R   MBCW
1   004362  R   MSEA
1   004361  R   MSET
1   004351  R   MSTA
1   004350  R   MSTE
1   004340  R   MBID
1   004324  R   MBIB
1   004314  R   MBIA
1   004311  R   MBIS
1   004303  R   MSBB
1   004263  R   MSBA
1   004257  R   MSBR
0   004245  R   MSXB
1   004243  R   MSXC
1   004241  R   MSXA
1   004224  R   MSUA
1   004223  R   MSU3
0   004222  R   MS42
1   004221  R   MSUR
1   004215  R   MRAD
```

```
1    004174  R    MRAN
1    004157  R    MBIT
1    004146  R    MBSH
1    004120  R    MBSG
1    004117  R    MBSJ
1    004113  R    MBSF
1    004104  R    MBSR
1    004100  R    MBSP
1    004066  R    MBSO
1    004057  R    MBS6
1    004043  R    MBSN
1    004033  R    MBSD
1    004021  R    MBSB
1    004017  R    MBSE
1    004001  R    MBS4
1    003764  R    MBBK
1    003756  R    MBNP
1    003750  R    MBNS
1    003744  R    MBNR
0    003730  R    MBNQ
1    003726  R    MBNL
1    003714  R    MBNK
1    003702  R    MBNJ
1    003671  R    MBNI
1    003664  R    MBNH
0    003662  R    MBNG
1    003656  R    MBNN
1    003650  R    MBNM
1    003623  R    MBN2
1    003621  R    MBNF
1    003611  R    MBNE
1    003572  R    MBND
1    003566  R    MBS5
1    003557  R    MBS3
1    003553  R    MBS2
1    003541  R    MBSA
0    003535  R    MBNC
1    003533  R    MBNB
1    003524  R    MBNT
1    003516  R    MWF2
1    003511  R    MWF1
1    003477  R    MWFC
```

```
1   003474  R   MWFB
1   003464  R   MWFM
1   003456  R   MSCM
1   003445  R   MSCJ
1   003425  R   MSCK
1   003420  R   MSCG
1   003404  R   MSCF
1   003375  R   MSCN
1   003342  R   MSCL
1   003334  R   MSCE
1   003320  R   MSC3
1   003313  R   MSC8
1   003311  R   MSCD
1   003310  R   MSC7
1   003306  R   MSC6
1   003264  R   MSCC
1   003254  R   MSC2
1   003246  R   MSCB
1   003244  R   MSCA
1   003231  R   MSCP
1   003226  R   MRWC
1   003222  R   MRWB
1   003221  R   MRWA
1   003216  R   MRWD
1   003175  R   MFOD
1   003171  R   MFOC
1   003163  R   MFOB
1   003151  R   MFOG
1   003146  R   MFOA
1   003136  R   MFOR
1   003132  R   MSR4
1   003122  R   MSRH
1   003116  R   MSR6
1   003107  R   MSRF
1   003067  R   MSR3
1   003061  R   MSR5
1   003054  R   MSR2
1   003046  R   MSRP
1   003045  R   MSRN
1   003044  R   MSRL
1   003034  R   MSRQ
1   003031  R   MSRG
```

```
1    003026  R    MSRC
1    003015  R    MSRK
1    003011  R    MSRM
1    003001  R    MSRJ
1    003000  R    MSRB
1    002753  R    MSRR
1    002732  R    MBOC
1    002726  R    MBOB
1    002720  R    MBO1
1    002706  R    MBOE
1    002703  R    MBOA
1    002673  R    MBOR
1    002661  R    MSW9
1    002647  R    MSW7
1    002643  R    MSW6
1    002634  R    MSWF
0    002633  R    MSWE
1    002627  R    MSWJ
1    002626  R    MSW8
1    002606  R    MSWZ
1    002575  R    MSWY
1    002571  R    MSWK
1    002564  R    MSW3
1    002556  R    MSWM
1    002553  R    MSWL
1    002552  R    MSW2
1    002546  R    MSWH
1    002541  R    MSWN
1    002534  R    MSWD
1    002525  R    MSW1
1    002523  R    MSWP
1    002512  R    MSWA
1    002506  R    MSWI
1    002500  R    MSWC
1    002475  R    MSWB
1    002451  R    MSWR
1    002446  R    MIND
1    002443  R    MINC
1    002442  R    MING
1    002411  R    MINB
1    002374  R    MINA
1    002352  R    MINE
```

```
1    002350  R    MINF
1    002322  R    MINT
1    002316  R    MWRX
1    002305  R    MWRY
1    002304  R    MWRZ
1    002276  R    MWRQ
0    002274  R    MWRO
0    002232  R    MWRL
1    002230  R    MWR3
1    002213  R    MWRJ
1    002172  R    MWR2
1    002164  R    MWRI
0    002155  R    MWRG
0    002151  R    MWRE
0    002147  R    MWR8
1    002141  R    MWR1
1    002135  R    MWRP
1    002126  R    MWRC
1    002114  R    MES3
1    002102  R    MES2
1    002067  R    MES4
1    002041  R    MES1
1    002024  R    MES8
1    001776  R    MESA
1    001775  R    MESC
1    001771  R    MS54
1    001757  R    MS53
1    001735  R    MS52
1    001723  R    MS50
1    001714  R    MESE
1    001707  R    MESF
1    001705  R    MESD
1    001664  R    MESH
1    001657  R    MESM
1    001646  R    MESG
1    001640  R    MS45
0    001624  R    MS40
0    001617  R    MS35
0    001603  R    MS30
1    001601  R    MS20
0    001564  R    MS12
1    001552  R    MS10
```

```
0    001546  R    MWRT
0    001545  R    MWRR
1    001543  R    MC94
1    001532  R    MC96
1    001527  R    MC97
1    001524  R    MC98
1    001521  R    MC99
1    001516  R    MCFY
1    001501  R    MCFX
1    001476  R    MCFW
1    001473  R    MCFV
1    001466  R    MCFU
1    001453  R    MC55
1    001451  R    MC52
1    001446  R    MCFS
1    001431  R    MCFR
1    001426  R    MCFQ
1    001424  R    MC14
1    001415  R    MC46
1    001404  R    MC44
1    001361  R    MCFP
1    001343  R    MC13
1    001326  R    MCFO
1    001322  R    MCFN
1    001317  R    MCFM
1    001306  R    MCFZ
1    001300  R    MC29
1    001265  R    MCFL
1    001252  R    MCFK
1    001247  R    MCFJ
1    001236  R    MCFI
1    001225  R    MCFH
1    001222  R    MCFG
1    001217  R    MC12
1    001206  R    MC22
1    001171  R    MCFF
1    001165  R    MC20
1    001164  R    MCFE
1    001153  R    MC10
1    001147  R    MCFD
1    001145  R    MCFC
1    001140  R    MCFB
```

```
1   001127  R   MCFA
1   001114  R   MC54
1   001107  R   MCFT
1   001106  R   MCTP
1   001066  R   MIC2
1   001057  R   MICA
1   001053  R   MIC3
1   001036  R   MIC5
1   001034  R   MIC1
1   001021  R   MICT
1   001004  R   MI52
1   001000  R   MI50
1   000774  R   MT52
1   000766  R   MT50
1   000741  R   MI48
0   000733  R   MI47
1   000731  R   MI46
1   000726  R   MI49
1   000720  R   MI45
1   000672  R   MI44
1   000666  R   MI42
1   000655  R   MI41
1   000647  R   MI40
1   000644  R   MI43
1   000636  R   MI38
1   000610  R   MI36
1   000604  R   MI35
1   000576  R   MT33
1   000551  R   MI31
1   000545  R   MI30
1   000532  R   MI21
1   000526  R   MI20
1   000507  R   MI10
1   000503  R   MITP
1   000500  R   MIST
0   000471  R   SDCT
1   000442  R   SCON
1   000441  R   SMEM
0   000440  R   SFLG
0   000426  R   INPI
0   000425  R   INPH
0   000424  R   SMSM
```

```
0    000423  R    ESZC
0    000422  R    SLWE
1    000421  R    SSWT
1    000420  R    TDLY
1    000417  R    TOUT
1    000416  R    INPG
1    000415  R    INPF
0    000414  R    INPE
0    000413  R    INPD
0    000412  R    INPC
1    000411  R    INPB
0    000410  R    INPA
0    000407  R    OUTH
1    000406  R    OUTG
1    000405  R    OUTF
1    000404  R    OUTE
1    000403  R    OUTD
1    000402  R    OUTC
0    000401  R    OUTB
0    000400  R    OUTA
1    000064  R    MPIM
1    000063  R    MBSQ
1    000062  R    MMTZ
1    000061  R    MMTY
1    000060  R    MTWB
1    000057  R    MSIZ
1    000056  R    MBFT
1    000055  R    MBFS
1    000054  R    MBFR
1    000053  R    MBFQ
1    000052  R    MBFP
1    000051  R    MBFN
1    000050  R    MBFM
1    000047  R    MBFL
1    000046  R    MBFK
1    000045  R    MBFJ
1    000044  R    MBFI
1    000037  R    MBFH
1    000036  R    MBFG
1    000035  R    MBFF
1    000034  R    MBFE
1    000033  R    MBFD
```

```
1   000032  R   MBFC
1   000031  R   MBFB
1   000030  R   MBFA
1   000027  R   MTFE
1   000026  R   MTD3
0   000025  R   MTD2
1   000024  R   MTD1
1   000023  R   MTPP
1   000022  R   MTTS
1   000021  R   MTWA
1   000020  R   MTRA
1   000017  R   MTSD
1   000016  R   MTT2
1   000015  R   MTT1
1   000014  R   MTP3
1   000013  R   MTP2
1   000012  R   MTP1
1   000011  R   MTPM
1   000010  R   MTSC
1   000007  R   MTDA
1   000006  R   MTUN
1   000005  R   MTSB
1   000004  R   MSG1
1   000003  R   MTBN
1   000002  R   MTYP
```