0001   ASMB,A,B,C,L   2000A TSB LOADER--VERSION F
**   NO ERRORS PASS#1 **RTE ASMB 92067-16011**

```
0001                  ASMB,A,B,C,L      2000A TSB LOADER--VERSION F
0002*
0003*                      AUGUST 1, 1970
0004*
0005  00004              ORG 4
0006                     SUP PRESS EXTRA PRINTING
0007  00004 103004       HLT 4,C         LOADER POWER FAIL HALT
```

```
0009  00100                    ORG 100B
0010  00100 000000   DIREC BSS 28      DIRECTORY TRACK HEADERS
0011  00134 000000   IDLOC BSS 1       ID TABLE DISC ADDRESS
0012  00135 000000   IDLEN BSS 1       ID TABLE LENGTH IN -WORDS
0013  00136 000000   ADLOC BSS 1       ADT DISC ADDRESS
0014  00137 000000   ADLEN BSS 1       ADT LENGTH IN -WORDS
0015  00140 000000   TRAX  BSS 16      AVAILABLE TRACK TABLE
0016  00160 000000   DTBL  BSS 4       DISC SELECT CODE TABLE
0017  00164 000000   MAGSC BSS 1       MAG TAPE SELECT CODE
0018  00165 000000   PHNSC BSS 1       PHONES SELECT CODE
```

```
0020*                              *
0021**   NORMAL ENTRY POINT  **
0022*                              *
0023  02000                  ORG 2000B
0024  02000 126001           JMP *+1,I        JUMP TO
0025  02001 004000           OCT 4000           LOADER


0027*                                    *
0028**   NON-SLEEP RELOAD ENTRY POINT  **
0029*                                    *
0030  03000                  ORG 3000B
0031  03000 107700           CLC 0,C
0032  03001 127002           JMP *+1,I
0033  03002 004122           DEF LDR6


0035  03003           MTRLT EQU *           SYSTEM SEGMENT TABLE BUFFER  [F]


0037*                                    *
0038**   LOADER-SYSTEM LINKAGE TABLE  **
0039*                                    *
0040*
0041*   CONTENTS FILLED IN FROM TSB SYSTEM TAPE ON PAPER TAPE LOADS,
0042*   FROM MAG TAPE ON MAG TAPE LOADS.
0043*
0044  04000                  ORG 4000B
0045  04000 026030           JMP LDR          INITIATE LOADING SEQUENCE
0046  04001           LSLTB EQU *
0047  04001 000000   LIBRA OCT 0              SYSTEM LIBRARY PROGRAM ORIGIN[E]
0048  04002 000000   COM6  BSS 1              ADDRESS OF SYSTEM LIBRARY DISC
0049*                                          ADDRESSES
0050  04003 000000   INCRE BSS 1              LENGTH OF TTY TABLE
0051  04004 000000   TTYDA BSS 1              ADDRESS OF USER DISC ADDRESS
0052  04005 000000   ?MASK BSS 1              ADDRESS OF USER MASK
0053  04006 000000   ?BHED BSS 1             => START OF LOGICAL BUFFER
0054  04007 000000   ?BSTR BSS 1             => END OF LOGICAL BUFFER
0055  04010 000000   ?BGIN BSS 1             => START OF PHYSICAL BUFFER
0056  04011 000000   ?BEND BSS 1             => END OF PHYSICAL BUFFER
0057  04012 000000   ?ID   BSS 1              ADDRESS OF ID-NAME
0058  04013 000000   SWPIA BSS 1              ADDRESS OF USER-DEPENDENT ITEMS
0059  04014 000000   SWPLN BSS 1              LENGTH OF SWAP AREA
0060  04015 000000   SWPAA BSS 1              CORE ADDRESS OF SWAP AREA
0061  04016 000000   DATE  BSS 1              ADDRESS OF HOUR OF YEAR
0062  04017 000000   TIME  BSS 1              ADDRESS OF TENTHS OF SECONDS
0063  04020 000000   YEAR  BSS 1              ADDRESS OF YEAR
0064  04021 000000   TSB   BSS 1              SYSTEM STARTING ADDRESS
```

0065   04022 000000   PHIN1 BSS 1   ADDRESSES
0066   04023 000000   PHIN2 BSS 1   OF PHONES
0067   04024 000000   PHIN3 BSS 1   CODE
0068   04025 000000   PHIN4 BSS 1   ADDRESS OF PHONE QUANTITY
0069   04026 000000   PWRFL BSS 1   POWER FATL INTERRUPT CODE
0070   04027 000000   ULTTA BSS 1   USER LIBRARY TRACK TABLE ADDRESS
0071   04030   LSLTE EQU *

```
0073*                            *
0074**  MAIN LOADING SEQUENCE   **
0075*                            *
0076*
0077*   BEGIN HERE FOR NORMAL LOADING SEQUENCES.
0078*
0079    04030 107700   LDR   CLC 0,C         SET I/O TO NULL STATE
0080    04031 002400         CLA             ZERO
0081    04032 073667         STA SYSLF          DIRECTORY TRACK
0082    04033 073670         STA SYSLF+1          COUNTERS
0083    04034 063557         LDA .12         ASK
0084    04035 067743         LDB LBRYA
0085    04036 117723         JSB ASR35,I        IF LIBRARY
0086    04037 002400         CLA
0087    04040 117723         JSB ASR35,I         EXISTS
0088    04041 117741         JSB GETCA,I     ANSWER GIVEN?
0089    04042 026047         JMP ERR1        NO
0090    04043 053617         CPA Y           YES, 'Y' ?
0091    04044 026142         JMP LDR7        YES, ASSUME 'YES'
0092    04045 053613         CPA N           NO, 'N' ?
0093    04046 026053         JMP LDR1        YES, ASSUME 'NO'
0094    04047 063561   ERR1  LDA .15         NO
0095    04050 067744         LDB ILINA       TRY
0096    04051 117723         JSB ASR35,I        AGAIN
0097    04052 026030         JMP LDR
0098*                            *
0099**  SYSTEM GENERATION      **
0100*                            *
0101*
0102*   CREATE NASCENT EQUIPMENT TABLE.
0103*
0104    04053 063544   LDR1  LDA M16         SET DIRECTORY LENGTH
0105    04054 070100         STA DIREC          FOR TWO DUMMY ENTRIES
0106    04055 063622         LDA EQTLN       ZERO OUT
0107    04056 073660         STA TEMP0
0108    04057 006400         CLB                THE REST
0109    04060 063575         LDA EQTA
0110    04061 002004   LDR2  INA                 OF THE
0111    04062 174000         STB 0,I
0112    04063 037660         ISZ TEMP0             EQUIPMENT TABLE
0113    04064 026061         JMP LDR2
0114    04065 002400         CLA             SET
0115    04066 073661         STA TEMP1          FOR
0116    04067 063557         LDA B14              DISC
0117    04070 073662         STA TEMP2               0
0118    04071 063571   LDR3  LDA .26         REQUEST
0119    04072 067745         LDB S/TDA
0120    04073 117723         JSB ASR35,I        NUMBER OF
0121    04074 002400         CLA
0122    04075 117723         JSB ASR35,I         SECTORS FOR
0123    04076 117737         JSB SETDA,I
0124    04077 026071         JMP LDR3             DISC 0
0125    04100 063545         LDA M12         SET
0126    04101 073660         STA TEMP0
0127    04102 063634         LDA TRAXA          TRACKS
```

```
0128    04103 043553           ADA .4
0129    04104 007400           CCB                 NOT ON
0130    04105 174000    LDR4   STB 0,I
0131    04106 002004           INA                 DISC 0
0132    04107 037660           ISZ TEMPO
0133    04110 026105           JMP LDR4                    'UNAVAILABLE'
0134    04111 077666           STB MTFLG        SET FLAG TO 'SYSGEN' MODE
0135    04112 026177           JMP LDR8
0136*                                       *
0137**   INITIATE PAPER TAPE RELOAD   **
0138*                                       *
0139*
0140*   PRIMARY USE IS FOR LINKING A NEW SYSTEM (FOR EXAMPLE, A
0141*   SYSTEM UPDATE) WITH THE LIBRARY OF A CURRENT SYSTEM.
0142*
0143    04113 063557    LDR5   LDA B14             FAKE DTBL ENTRY
0144    04114 070160           STA DTBL              FOR DISC DRIVER
0145    04115 063542           LDA M64             READ
0146    04116 173655           STA WORD,I            EQUIPMENT
0147    04117 063553           LDA DEQTA               TABLE
0148    04120 067633           LDB CEQTA                 FROM
0149    04121 117724           JSB DISC,I                 DISC 0
0150*                                       *
0151**   BEGIN EMERGENCY LOADING SEQUENCE   **
0152*                                       *
0153*
0154*   ENTRY IS TO HERE WHEN ATTEMPTING TO RELOAD THE SYSTEM
0155*   USING THE EQUIPMENT TABLE IN CORE (I.E., SYSTEM WAS
0156*   HALTED BY OTHER THAN THE 'SLEEP' ROUTINE).
0157*
0158    04122 002400    LDR6   CLA                 SET FLAG TO
0159    04123 073666           STA MTFLG            'PAPER TAPE RELOAD'
0160    04124 073667           STA SYSLF           ZERO COUNTERS FOR
0161    04125 073670           STA SYSLF+1            DIRECTORY TRACKS
0162    04126 060137           LDA ADLEN           READ
0163    04127 013542           AND M64
0164    04130 173655           STA WORD,I            ADT
0165    04131 067637           LDB ADTBA
0166    04132 047603           ADB BIT15               FROM
0167    04133 060136           LDA ADLOC
0168    04134 117724           JSB DISC,I                DISC
0169    04135 060137           LDA ADLEN           RECOVER THE
0170    04136 026331           JMP LDR19             SYSTEM TRACKS
0171*
0172    04137 063561    ERR2   LDA .15             REPORT
0173    04140 067744           LDB ILINA             PROBABLE
0174    04141 117723           JSB ASR35,I             ERROR
0175*                                       *
0176**   REQUEST MAG TAPE SELECT CODE   **
0177*                                       *
0178*
0179*   ANSWER IS THE HIGH PRIORITY SELECT CODE FOR THE MAG TAPE UNIT
0180*   OR A CARRIAGE RETURN, THE LATTER INDICATING A PAPER TAPE RELOAD.
0181*
0182    04142 117742    LDR7   JSB GTMTA,I    GET MAG TAPE SELECT CODE      [F]
```

```
0183   04143 026113          JMP LDR5        PAPER TAPE RELOAD            [F]
0184*                                *
0185**   INITIATE MAG TAPE RELOAD   **
0186*                                *
0187*                                                                    [E]
0188   04144 067666          LDB MTFLG       SAVE                        [F]
0189   04145 074164          STB MAGSC         SELECT CODE               [F]
0190   04146 005665          ELB,CLE,ERB     CLEAR BIT15                 [F]
0191   04147 117726          JSB MTDIA,I     CONFIGURE MAG TAPE DRIVER
0192   04150 117725          JSB MTAPE,I     REWIND
0193   04151 000003          OCT 3             TAPE
0194   04152 063542          LDA M64         READ
0195   04153 067575          LDB EQTA          EQUIPMENT TABLE
0196   04154 117725          JSB MTAPE,I         FROM
0197   04155 000000          OCT 0                 MAG TAPE
0198   04156 027420          JMP EOFER
0199   04157 027424          JMP TPERR
0200   04160 067666          LDB MTFLG       RECORD NEW                  [E]
0201   04161 074164          STB MAGSC         SELECT CODE               [E]
0202   04162 005665          ELB,CLE,ERB     CLEAR                       [F]
0203   04163 077666          STB MTFLG         BIT15                     [F]
0204   04164 063547          LDA M4          COUNT
0205   04165 073660          STA TEMPO
0206   04166 067576          LDB DIRE6         NUMBER OF
0207   04167 160001          LDA 1,I
0208   04170 002002          SZA                 DIRECTORY TRACKS
0209   04171 037670          ISZ SYSLF+1
0210   04172 002400          CLA                   AND SET ALL
0211   04173 170001          STA 1,I
0212   04174 047555          ADB .7                  DISC ADDRESSES
0213   04175 037660          ISZ TEMPO
0214   04176 026167          JMP *-7                    TO ZERO
0215*                                *
0216**   REQUEST DISC COMMANDS    **
0217*                                *
0218*
0219*   DISC COMMANDS MAY ADD OR REMOVE DISCS.  DISC 0
0220*   MAY ONLY BE REFERENCED ALONG WITH SELECT CODE 14 OCT; I.E.,
0221*   DISC 0 MAY NOT BE MOVED OR REMOVED.  DISCS 1-3 MAY NOT HAVE
0222*   A SELECT CODE BELOW 14 OCT OR ABOVE 76 OCT.  THE SEQUENCE OF
0223*   DISC COMMAND REQUESTS IS TERMINATED BY ANSWERING WITH A
0224*   CARRIAGE RETURN.
0225*
0226   04177 063566     LDR8 LDA .22         REQUEST
0227   04200 067746          LDB DISMA
0228   04201 117723          JSB ASR35,I       DISC
0229   04202 002400          CLA
0230   04203 117723          JSB ASR35,I         COMMANDS
0231   04204 117741          JSB GETCA,I     ANY?
0232   04205 026264          JMP LDR14       NO
0233   04206 053610          CPA D           YES
0234   04207 117741          JSB GETCA,I
0235   04210 026216          JMP ERR3        'D'
0236   04211 053611          CPA I
0237   04212 117741          JSB GETCA,I       'I'
```

```
0238    04213 026216            JMP ERR3
0239    04214 053615            CPA S               'S' ?
0240    04215 026222            JMP LDR9         YES
0241    04216 063563    ERR3    LDA .19         NO
0242    04217 067747            LDB RQSTA       PRINT
0243    04220 117723            JSB ASR35,I      ERROR
0244    04221 026177            JMP LDR8
0245    04222 002400    LDR9    CLA             PICK UP
0246    04223 117730            JSB GTDNA,I       DISC #
0247    04224 026177            JMP LDR8        NOT FOUND
0248    04225 073661            STA TEMP1       FOUND, SAVE IT
0249    04226 117741            JSB GETCA,I     NEXT
0250    04227 000000            NOP               CHARACTER
0251    04230 053574            CPA B60            A ZERO?
0252    04231 026257            JMP LDR13       YES
0253    04232 117736            JSB SELCA,I     NO, GET SELECT CODE
0254    04233 000063            OCT 63            IN [14 OCT, 76 OCT]
0255    04234 026177            JMP LDR8        NOT FOUND
0256    04235 053604            CPA COMMA       FOUND, COMMA FOLLOWING?
0257    04236 026243            JMP LDR10       YES
0258    04237 063561            LDA .15         NO,
0259    04240 067750            LDB BDLA          ERROR
0260    04241 026220            JMP ERR3+2
0261    04242 006400            CLB             STORE
0262    04243 077662    LDR10   STB TEMP2         SELECT CODE
0263    04244 002400            CLA             DISC
0264    04245 053661            CPA TEMP1         0 ?
0265    04246 026252            JMP LDR12       YES
0266    04247 117737    LDR11   JSB SETDA,I     NO, SET DISC ENTRY
0267    04250 026177            JMP LDR8
0268    04251 026177            JMP LDR8        ASK AGAIN
0269    04252 057557    LDR12   CPB B14         SELECT CODE 14 OCT?
0270    04253 026247            JMP LDR11       YES
0271    04254 063567            LDA .23         NO,
0272    04255 067751            LDB DZMBA         ERROR
0273    04256 026220            JMP ERR3+2
0274    04257 117741    LDR13   JSB GETCA,I     CARRIAGE RETURN?
0275    04260 026242            JMP LDR10-1     YES
0276    04261 063565            LDA .21         NO,
0277    04262 067752            LDB ILSCA         ERROR
0278    04263 026220            JMP ERR3+2
0279*                   *
0280**   BUILD ADT   **
0281*                   *
0282*
0283*   CREATE AN ADT ENTRY OF ZERO SECTORS FOR EACH AVAILABLE TRACK
0284*   (THE TRACK LENGTH WILL BE FILLED IN BELOW).  THE ENTRY FOR
0285*   TRACK 0, DISC 0 AND A TERMINATING PSUEDO-ENTRY BOUND THE ADT.
0286*
0287    04264 063634    LDR14   LDA TRAXA       SET POINTER TO
0288    04265 073660            STA TEMP0         AVAILABLE TRACK TABLE
0289    04266 063637            LDA ADTBA       CREATE
0290    04267 006400            CLB
0291    04270 174000            STB 0,I           FIRST
0292    04271 002004            INA
```

```
0293   04272 174000          STB 0,I            ADT
0294   04273 002004          INA
0295   04274 073661          STA TEMP1             ENTRY
0296   04275 063541          LDA M255        INITIALIZE
0297   04276 073662          STA TEMP2         TRACK COUNTER
0298   04277 063551          LDA .2              AND MASK
0299   04300 026305          JMP LDR16
0300   04301 063663  LDR15   LDA TEMP3       ROTATE MASK TO
0301   04302 001200          RAL               NEXT TRACK POSITION
0302   04303 000010          SLA             ADJUST ATT POINTER
0303   04304 037660          ISZ TEMP0         WHEN NECESSARY
0304   04305 073663  LDR16   STA TEMP3
0305   04306 047600          ADB B400        ADVANCE DISC ADDRESS
0306   04307 113660          AND TEMP0,I     AVAILABLE
0307   04310 002002          SZA                TRACK?
0308   04311 026316          JMP LDR17       NO
0309   04312 177661          STB TEMP1,I     YES
0310   04313 037661          ISZ TEMP1       CREATE
0311   04314 173661          STA TEMP1,I       ZERO-LENGTH
0312   04315 037661          ISZ TEMP1           ADT ENTRY
0313   04316 037662  LDR17   ISZ TEMP2       ALL TRACKS CONSIDERED?
0314   04317 026301          JMP LDR15       NO
0315   04320 063661          LDA TEMP1       YES
0316   04321 007400          CCB             APPEND
0317   04322 174000          STB 0,I
0318   04323 002004          INA                TERMINAL
0319   04324 006400          CLB
0320   04325 174000          STB 0,I            PSUEDO-ENTRY
0321   04326 003000          CMA             RECORD -#
0322   04327 043637          ADA ADTBA         OF WORDS
0323   04330 070137          STA ADLEN          IN ADT
0324*                        *
0325**   RECOVER TRACKS    **
0326*                        *
0327*
0328*   ALL ADT ENTRIES WITH ZERO SECTORS AVAILABLE ARE RECOVERED AS
0329*   FULL TRACKS.  THIS PICKS UP ALL SYSTEM TRACKS ON PAPER TAPE
0330*   RELOADS, OR ALL UNLOCKED TRACKS ON SYSTEM GENERATION OR
0331*   MAG TAPE RELOAD, AND RETURNS THEM TO THE POOL OF TRACKS
0332*   AVAILABLE FOR LOCKING AND LOADING BELOW.
0333*
0334   04331 043553  LDR18   ADA .4          SET ENTRY COUNTER
0335   04332 001100          ARS                (SKIPPING FIRST
0336   04333 073660          STA TEMP0           AND LAST ENTRIES)
0337   04334 063637          LDA ADTBA       LOAD ADDRESS
0338   04335 002004          INA               OF SECOND WORD
0339   04336 043551  LDR19   ADA .2              OF ENTRY
0340   04337 164000          LDB 0,I         IS LENGTH
0341   04340 006003          SZB,RSS           0 SECTORS?
0342   04341 026345          JMP LDR21       YES
0343   04342 037660  LDR20   ISZ TEMP0       NO, DONE?
0344   04343 026336          JMP LDR19       NO
0345   04344 026355          JMP LDR22       YES
0346   04345 007400  LDR21   CCB             LOAD
0347   04346 044000          ADB 0             ENTRY'S
```

```
0348   04347 160001        LDA 1,I            DISC ADDRESS
0349   04350 117733        JSB ISOTA,I   GET TRACK LENGTH
0350   04351 006004        INB              IN SECTORS
0351   04352 170001        STA 1,I       RESTORE TO
0352   04353 060001        LDA 1            FULL TRACK
0353   04354 026342        JMP LDR20
0354*                                   *
0355**    PROCESS LOCK/UNLOCK COMMANDS  **
0356*                                   *
0357   04355 063573   LDR22 LDA .38        REQUEST
0358   04356 067753        LDB LULCA          LOCK,
0359   04357 117723        JSB ASR35,I         UNLOCK,
0360   04360 002400        CLA                   OR LOAD
0361   04361 117723        JSB ASR35,I             COMMAND
0362   04362 117741        JSB GETCA,I   FIRST
0363   04363 026402        JMP ERR4        CHARACTER
0364   04364 007400        CCB               A
0365   04365 053616        CPA U             'U' ?
0366   04366 127722        JMP LKUNA,I   YES, ASSUME 'UNLOCK'
0367   04367 053612        CPA L         NO, 'L' ?
0368   04370 117741        JSB GETCA,I   YES
0369   04371 026402        JMP ERR4      NO
0370   04372 053614        CPA O         'O' ?
0371   04373 117741        JSB GETCA,I   YES
0372   04374 026402        JMP ERR4      NO
0373   04375 053606        CPA A         'A' ?
0374   04376 026406        JMP LDR23     YES, ASSUME 'LOAD'
0375   04377 006400        CLB           NO
0376   04400 053607        CPA C         'C' ?
0377   04401 127722        JMP LKUNA,I   YES, ASSUME 'LOCK'
0378   04402 063561   ERR4 LDA .15       NO
0379   04403 067744        LDB ILINA     PRINT
0380   04404 117723        JSB ASR35,I      ERROR
0381   04405 026355        JMP LDR22
0382*                           *
0383**   CLAIM DISC TRACKS   **
0384*                           *
0385*
0386*   CLAIM TRACKS FOR THE SYSTEM AND USER SWAPPING.  THE ADT
0387*   ENTRIES ARE SET TO LENGTH ZERO RATHER THAN BEING REMOVED.
0388*
0389   04406 063543   LDR23 LDA M20         GET
0390   04407 073660        STA TEMP0
0391   04410 063644        LDA TRKTA        TWO SYSTEM TRACKS,
0392   04411 073661        STA TEMP1
0393   04412 002400   LDR24 CLA               TWO SYSTEM LIBRARY TRACKS,
0394   04413 117731        JSB GTTRA,I
0395   04414 173661        STA TEMP1,I          AND
0396   04415 037661        ISZ TEMP1
0397   04416 037660        ISZ TEMP0             16 USER TRACKS
0398   04417 026412        JMP LDR24
0399   04420 104200        DLD TRKTB     SET DISC ADDRESSES OF TSB
0400   04422 104400        DST LDRTA,I     SYSTEM TRACKS INTO DISC LOADER
```

```
0402*                                      *
0403**   WRITE DISC LOADERS TO DISC   **
0404*                                      *
0405*
0406*   THIS SECTION WRITES THE TSB SYSTEM DISC LOADER ONTO SECTOR 1
0407*   OF TRACK 0, DISC 0 (I/O CHANNEL 14 OCT) AND WRITES THE DISC
0408*   BOOTSTRAP LOADER ONTO SECTOR 0, TRACK 0 AFTER CONFIGURING IT
0409*   FOR TSB.  IF THE DISC OPERATING SYSTEM IS NOT PRESENT, THE
0410*   TSB DISC LOADER IS ALSO WRITTEN TO SECTOR 2, TRACK 0 FOR SAFETY.
0411*
0412   04424 063570   LDR25 LDA .24        ASK IF
0413   04425 067754         LDB RDMSA
0414   04426 117723         JSB ASR35,I      DISC MONITOR SYSTEM
0415   04427 002400         CLA
0416   04430 117723         JSB ASR35,I       IS PRESENT
0417   04431 117741         JSB GETCA,I     DEMAND A
0418   04432 026437         JMP LDR26         CHARACTER
0419   04433 053617         CPA Y           'Y' ?
0420   04434 026443         JMP LDR27       YES, ASSUME 'YES'
0421   04435 053613         CPA N           NO, 'N' ?
0422   04436 026460         JMP LDR28       YES, ASSUME 'NO'
0423   04437 063561   LDR26 LDA .15         NO
0424   04440 067744         LDB ILINA       TRY
0425   04441 117723         JSB ASR35,I        AGAIN
0426   04442 026424         JMP LDR25
0427*
0428   04443 063542   LDR27 LDA M64         READ
0429   04444 173655         STA WORD,I         'BOOTSTRAP'
0430   04445 002400         CLA                 BOOTSTRAP
0431   04446 067656         LDB BSBSA            LOADER
0432   04447 047603         ADB BIT15             FROM
0433   04450 117724         JSB DISC,I              DISC
0434   04451 060016         LDA DSK7        ACCEPTABLE DISC
0435   04452 053624         CPA OTB15         SELECT CODE?
0436   04453 026476         JMP LDR29       YES
0437   04454 063572         LDA .32         NO
0438   04455 067755         LDB BLDRA       TERMINATE
0439   04456 117723         JSB ASR35,I        LOADING
0440   04457 027427         JMP ERRIN
0441*
0442   04460 063624   LDR28 LDA OTB15        CONFIGURE
0443   04461 070016         STA DSK7
0444   04462 063625         LDA STC14          'BOOTSTRAP'
0445   04463 070031         STA DSK8
0446   04464 063626         LDA LIA15          BOOTSTRAP
0447   04465 070035         STA DSK9
0448   04466 063627         LDA LINKA
0449   04467 070047         STA LINKG                 LOADER
0450   04470 063542         LDA M64
0451   04471 173655         STA WORD,I      WRITE
0452   04472 063551         LDA .2            TSB
0453   04473 067657         LDB TSBBA           LOADER
0454   04474 074003         STB DMS             TO 0,2
0455   04475 117724         JSB DISC,I            FOR SAFETY
0456   04476 067657   LDR29 LDB TSBBA        SET TSB LOAD/ENTRY ADDRESS
```

```
0457   04477  074002        STB RT/TS        IN LOADER
0458   04500  002404        CLA,INA          WRITE TSB LOADER
0459   04501  117724        JSB DISC,I         TO 0,1
0460   04502  002400        CLA              WRITE
0461   04503  067656        LDB BSBSA          'BOOTSTRAP' BOOTSTRAP
0462   04504  117724        JSB DISC,I         LOADER 0,0
0463*
0464   04505  063666        LDA MTFLG        RELOAD SYSTEM FROM
0465   04506  002003        SZA,RSS           PAPER TAPE?
0466   04507  027013        JMP LDR43        YES
0467*                                 *
0468**   GET REST OF SYSTEM TSACKS   **
0469*                                 *
0470*
0471*   CLAIM ONE TRACK FOR THE IDT AND ADT.  CLAIM ENOUGH DIRECTORY
0472*   TRACKS TO HAVE ONE PER DISC, BUT NOT FEWER THAN THE NUMBER PRE-
0473*   EXISTING IF THIS IS A MAG TAPE RELOAD.
0474*
0475   04510  003400        CCA              CLAIM
0476   04511  117731        JSB GTTRA,I        TRACK FOR
0477   04512  070134        STA IDLOC            ADT AND
0478   04513  070136        STA ADLOC             ID TABLE
0479   04514  063547        LDA M4           SYSLF PREVIOUSLY
0480   04515  073660        STA TEMP0
0481   04516  067635        LDB DTBLA          SET TO 0
0482   04517  160001  LDR30 LDA 1,I           COUNT
0483   04520  002002        SZA
0484   04521  037667        ISZ SYSLF            NUMBER OF
0485   04522  006004        INB
0486   04523  037660        ISZ TEMP0             DISCS
0487   04524  026517        JMP LDR30
0488   04525  067667        LDB SYSLF               PRESENT
0489   04526  063670        LDA SYSLF+1      COMPUTE
0490   04527  003004        CMA,INA
0491   04530  043667        ADA SYSLF          MAXIMUM OF
0492   04531  002020        SSA
0493   04532  067670        LDB SYSLF+1         SYSFL AND SYSFL+1
0494   04533  007004        CMB,INB          STORE ITS
0495   04534  077660        STB TEMP0          NEGATION
0496   04535  067576        LDB DIRE6        CLAIM
0497   04536  077661  LDR31 STB TEMP1
0498   04537  003400        CCA                THIS
0499   04540  117731        JSB GTTRA,I
0500   04541  173661        STA TEMP1,I          MANY
0501   04542  067661        LDB TEMP1
0502   04543  047555        ADB .7                 DIRECTORY
0503   04544  037660        ISZ TEMP0
0504   04545  026536        JMP LDR31                TRACKS
0505*
0506   04546  063542        LDA M64
0507   04547  173655        STA WORD,I       WRITE
0508   04550  163576        LDA DIRE6,I        NULL
0509   04551  073664        STA TEMP4          DIRECTORY
0510   04552  067641        LDB DIRBA            TO
0511   04553  117724        JSB DISC,I            DISC
```

```
0512    04554 063666        LDA MTFLG       MAG TAPE
0513    04555 002007        INA,SZA,RSS       RELOAD?
0514    04556 027013        JMP LDR43       NO
0515    04557 060135        LDA IDLEN       YES
0516    04560 067640        LDB IDTBA
0517    04561 117725        JSB MTAPE,I     READ IN
0518    04562 000000        OCT 0             ID TABLE
0519    04563 027420        JMP EOFER
0520    04564 027424        JMP TPERR
0521    04565 060135        LDA IDLEN       WRITE
0522    04566 173655        STA WORD,I        ID TABLE
0523    04567 060134        LDA IDLOC           TO ITS
0524    04570 067640        LDB IDTBA             DISC
0525    04571 117724        JSB DISC,I            TRACK
0526*                           *
0527**   LOAD USER LIBRARY   **
0528*                           *
0529*
0530*   THE LIBRARY IS STORED ON MAG TAPE AS ONE RECORD PER TRACK UP
0531*   TO 5440 WORDS; LONGER TRACKS ARE STORED AS TWO RECORDS.  THE
0532*   TRACK IMAGES ARE PRECEDED BY A TABLE OF LENGTH 255, EACH ENTRY
0533*   HOLDING THE 2'S COMPLEMENT OF THE LENGTH OF THE IMAGE IN WORDS
0534*   (TRACK 0, DISC 0 IS KNOWN NOT TO HAVE ANY USER FILES).  AS EACH
0535*   TRACK IMAGE IS READ AND STORED, ITS ENTRY IN THE TABLE IS
0536*   REPLACED WITH (NEW DISC ADDRESS - OLD DISC ADDRESS) FOR USE IN
0537*   UPDATING THE DIRECTORY BELOW.
0538*
0539    04572 063541        LDA M255        LOAD
0540    04573 073660        STA TEMP0
0541    04574 067642        LDB ULTTB           USER LIBRARY
0542    04575 077661        STB TEMP1
0543    04576 117725        JSB MTAPE,I         TRACK TABLE
0544    04577 000000        OCT 0
0545    04600 027420        JMP EOFER
0546    04601 027424        JMP TPERR
0547    04602 063600        LDA B400        INITIALIZE TO DISC ADDRESS 0,1,0
0548    04603 167661  LDR32 LDB TEMP1,I     USER LIBRARY
0549    04604 006003        SZB,RSS           TRACK?
0550    04605 026714        JMP LDR37       NO
0551    04606 177655        STB WORD,I      YES, SAVE LENGTH AND
0552    04607 073662        STA TEMP2         OLD DISC ADDRESS
0553    04610 101026        ASR 6           COMPUTE
0554    04611 077665        STB COUNT         SECTOR REQUIREMENT
0555    04612 064137        LDB ADLEN       SET
0556    04613 005100        BRS               ADT ENTRY
0557    04614 077663        STB TEMP3           COUNTER
0558    04615 067637        LDB ADTBA
0559    04616 006004        INB
0560    04617 160001  LDR33 LDA 1,I         ENOUGH
0561    04620 043665        ADA COUNT         SPACE IN
0562    04621 002021        SSA,RSS             THIS ENTRY?
0563    04622 026640        JMP LDR35       YES
0564    04623 047551        ADB .2          NO
0565    04624 037663        ISZ TEMP3       MORE ENTRIES?
0566    04625 026617        JMP LDR33       YES
```

```
0567   04626 063564   ERR5   LDA  .20         NO
0568   04627 067770          LDB  OODSA       TERMINATE
0569   04630 117723          JSB  ASR35,I       LOADING
0570   04631 027427          JMP  ERRIN
0571   04632 160001   LDR34  LDA  1,I         SAVE
0572   04633 073663          STA  TEMP3         DISC ADDRESS
0573   04634 047551          ADB  .2          ELIMINATE
0574   04635 060001          LDA  1             ENTRY
0575   04636 117734          JSB  MOVUA,I         FROM ADT
0576   04637 026652          JMP  LDR36
0577   04640 170001   LDR35  STA  1,I         STORE REMAINING SECTOR COUNT
0578   04641 047550          ADB  M1          ALL OF
0579   04642 002003          SZA,RSS            ENTRY USED?
0580   04643 026632          JMP  LDR34       YES
0581   04644 160001          LDA  1,I         NO, SAVE
0582   04645 073663          STA  TEMP3         DISC ADDRESS
0583   04646 003004          CMA,INA       CORRECT ENTRY TO
0584   04647 043665          ADA  COUNT       DISC ADDRESS OF
0585   04650 003004          CMA,INA            REMAINING
0586   04651 170001          STA  1,I              SPACE
0587   04652 063662   LDR36  LDA  TEMP2       COMPUTE
0588   04653 003004          CMA,INA           NEW DISC ADDRESS -
0589   04654 043663          ADA  TEMP3          OLD DISC ADDRESS
0590   04655 173661          STA  TEMP1,I     SAVE IN TRACK TABLE
0591   04656 163655          LDA  WORD,I      DOES TRACK
0592   04657 043602          ADA  .5440         EXCEED
0593   04660 002021          SSA,RSS             5440 WORDS?
0594   04661 026702          JMP  LDRE1       NO
0595   04662 073665          STA  COUNT       YES, SAVE DIFFERENCE
0596   04663 063537          LDA  M5440       SET FOR
0597   04664 173655          STA  WORD,I        INITIAL BLOCK
0598   04665 067640          LDB  UPRBA       READ
0599   04666 117725          JSB  MTAPE,I       5440
0600   04667 000000          OCT  0               WORDS
0601   04670 027420          JMP  EOFER
0602   04671 027424          JMP  TPERR
0603   04672 063663          LDA  TEMP3       WRITE
0604   04673 067640          LDB  UPRBA         THEM
0605   04674 117724          JSB  DISC,I          TO DISC
0606   04675 063665          LDA  COUNT       SET FOR
0607   04676 173655          STA  WORD,I        REST OF TRACK
0608   04677 067663          LDB  TEMP3       ADVANCE
0609   04700 047577          ADB  .85           DISC
0610   04701 077663          STB  TEMP3            ADDRESS
0611   04702 163655   LDRE1  LDA  WORD,I
0612   04703 067640          LDB  UPRBA       READ TRACK
0613   04704 117725          JSB  MTAPE,I       FROM TAPE
0614   04705 000000          OCT  0
0615   04706 027420          JMP  EOFER
0616   04707 027424          JMP  TPERR
0617   04710 063663          LDA  TEMP3
0618   04711 067640          LDB  UPRBA       WRITE TRACK
0619   04712 117724          JSB  DISC,I        TO DISC
0620   04713 063662          LDA  TEMP2       UPDATE OLD
0621   04714 043600   LDR37  ADA  B400          TRACK ADDRESS
```

0622   04715 037661   ISZ TEMP1   INCREMENT TABLE POINTER
0623   04716 037660   ISZ TEMP0   ALL TRACKS CONSIDERED?
0624   04717 026603   JMP LDR32   NO

```
0626*                          *
0627**   LOAD DIRECTORY  **
0628*                          *
0629*
0630*   READ IN THE DIRECTORY TRACKS ONE BY ONE; AN END-OF-FILE MARK
0631*   FOLLOWS THE LAST TRACK.  USING THE TABLE BUILT ABOVE, CORRECT
0632*   THE DISC ADDRESS IN EACH ENTRY TO THE NEW DISC ADDRESS OF THE
0633*   REFERENCED PROGRAM OR FILE.
0634*
0635    04720 063575          LDA DIREA       INITIALIZE POINTER TO
0636    04721 073660          STA TEMP0          DIREC TABLE ENTRY
0637    04722 006400          CLB
0638    04723 177643          STB ULTM1,I     COMPLETE USERS' LIBRARY TABLE[C]
0639    04724 174000          STB 0,I         SET LENGTHS
0640    04725 043555          ADA .7
0641    04726 174000          STB 0,I            OF ALL
0642    04727 043555          ADA .7
0643    04730 174000          STB 0,I               DIRECTORY TRACKS
0644    04731 043555          ADA .7
0645    04732 174000          STB 0,I                  TO ZERO
0646    04733 063537   LDR38  LDA M5440       READ A
0647    04734 067640          LDB UPRBA          DIRECTORY
0648    04735 117725          JSB MTAPE,I           TRACK
0649    04736 000000          OCT 0
0650    04737 027011          JMP LDR42       NONE FOUND
0651    04740 027424          JMP TPERR
0652    04741 173655          STA WORD,I      SAVE LENGTH
0653    04742 067664          LDB TEMP4       AVAILABLE
0654    04743 006002   LDR39  SZB                TRACK?
0655    04744 026754          JMP LDR40       YES
0656    04745 067660          LDB TEMP0       NO, MOVE
0657    04746 047555          ADB .7             TO NEXT
0658    04747 077660          STB TEMP0             DIREC ENTRY
0659    04750 047554          ADB .6          SAVE ITS
0660    04751 164001          LDB 1,I            DISC
0661    04752 077664          STB TEMP4             ADDRESS
0662    04753 026743          JMP LDR39
0663    04754 173660   LDR40  STA TEMP0,I     RECORD LENGTH IN DIREC ENTRY
0664    04755 007400          CCB             SAVE
0665    04756 101023          ASR 3              COUNT OF
0666    04757 073661          STA TEMP1             ENTRIES
0667    04760 067640          LDB UPRBA       INITIALIZE ENTRY POINTER
0668    04761 047554   LDR41  ADB .6          LOAD ENTRY'S
0669    04762 160001          LDA 1,I            DISC ADDRESS
0670    04763 013540          AND M256        LOAD THE
0671    04764 001727          ALF,ALF            TRACK TABLE
0672    04765 043643          ADA ULTM1             ENTRY THAT
0673    04766 160000          LDA 0,I                  CORRESPONDS
0674    04767 140001          ADA 1,I         COMPUTE AND RECORD
0675    04770 170001          STA 1,I            NEW DISC ADDRESS
0676    04771 047551          ADB .2          UPDATE ENTRY POINTER
0677    04772 037661          ISZ TEMP1       MORE ENTRIES?
0678    04773 026761          JMP LDR41       YES
0679    04774 063664          LDA TEMP4       NO
0680    04775 067640          LDB UPRBA       WRITE DIRECTORY
```

```
0681   04776 117724          JSB DISC,I       TO DISC
0682   04777 063547          LDA M4          READ
0683   05000 173655          STA WORD,I        FIRST FOUR
0684   05001 063664          LDA TEMP4           WORDS OF
0685   05002 067660          LDB TEMP0             DIRECTORY
0686   05003 006004          INB                     INTO
0687   05004 047603          ADB BIT15                 DIREC TABLE
0688   05005 117724          JSB DISC,I
0689   05006 002400          CLA             SET TRACK
0690   05007 073664          STA TEMP4         UNAVAILABLE
0691   05010 026733          JMP LDR38
0692*
0693   05011 053572  LDR42   CPA B40          END-OF-FILE?
0694   05012 027420          JMP EOFER        NO
0695*                          *
0696**    WRITE ADT TO DISC **
0697*                          *
0698*
0699*   IF INSUFFICIENT ROOM EXISTS ON THE IDT/ADT TRACK, ELIMINATE
0700*   ENOUGH ADT ENTRIES OF NON-ZERO LENGTHS TO FORCE A FIT.
0701*
0702   05013 060135  LDR43   LDA IDLEN        COMPUTE # OF
0703   05014 013542          AND M64          EXTRA WORDS
0704   05015 043602          ADA .5440           ON IDT/ADT
0705   05016 040137          ADA ADLEN             TRACK
0706   05017 002021          SSA,RSS          NEGATIVE?
0707   05020 027037          JMP LDR45        NO
0708   05021 001100          ARS              YES, SAVE COUNT OF
0709   05022 073660          STA TEMP0           EXCESS ADT ENTRIES
0710   05023 063637          LDA ADTBA
0711   05024 002004  LDR44   INA              LOAD
0712   05025 164000          LDB 0,I            SECTOR LENGTH
0713   05026 002004          INA                  OF ADT ENTRY
0714   05027 006003          SZB,RSS          NON-ZERO?
0715   05030 027024          JMP LDR44        NO
0716   05031 073661          STA TEMP1        YES, SAVE ADT POINTER
0717   05032 064000          LDB 0            ELIMINATE
0718   05033 117734          JSB MOVUA,I        ENTRY
0719   05034 063661          LDA TEMP1        RETRIEVE POINTER
0720   05035 037660          ISZ TEMP0        ENOUGH ENTRIES DELETED?
0721   05036 027024          JMP LDR44        NO
0722   05037 064135  LDR45   LDB IDLEN        YES
0723   05040 101026          ASR 6            COMPUTE
0724   05041 007004          CMB,INB            ADT
0725   05042 044134          ADB IDLOC            DISC
0726   05043 060001          LDA 1                  ADDRESS
0727   05044 070136          STA ADLOC        RECORD IT
0728   05045 064137          LDB ADLEN        WRITE
0729   05046 177655          STB WORD,I         ADT
0730   05047 067637          LDB ADTBA            TO
0731   05050 117724          JSB DISC,I             DISC
0732*
0733   05051 003400          CCA              INITIALIZE
0734   05052 073667          STA SYSLF          SYSTEM LIBRARY
0735   05053 073670          STA SYSLF+1          FLAGS
```

```
0736   05054 063666        LDA MTFLG          LOADING FROM
0737   05055 003026        CMA,SSA,INA,SZA      MAG TAPE?
0738   05056 027146        JMP LDR50     YES
```

```
0740*                                   *
0741**  LOAD SYSTEM FROM PAPER TAPE  **
0742*                                   *
0743*
0744*  READS THE TSB SYSTEM TAPE, OR TAPES IF MORE THAN ONE (EXECUTING
0745*  A HLT 77 ON RECOGNIZING AN END-OF-TAPE CONDITION).  THE LAST
0746*  RECORD IS IDENTIFIED BY AN ORIGIN OF 0.  CHECKSUM'S ARE
0747*  COMPUTED FOR EACH RECORD: A FAILURE MAY RETRIED BY BACKING UP
0748*  TO THE START OF THE RECORD.  THE CORE TO BE OCCUPIED BY EACH
0749*  RECORD IS CHECKED AGAINST A TABLE OF ADMISSABLE AREAS TO HELP
0750*  CATCH ORIGIN MIS-READS BEFORE LOADING A RECORD.  RECOVERY
0751*  MAY BE ATTEMPTED BY BACKING UP TO THE BEGINNING OF THE RECORD.
0752*
0753    05057 002401    LDR46 CLA,RSS        SET FOR START OF TAPE
0754    05060 063546          LDA M10        SET FOR END-OF-TAPE CHECK
0755    05061 002300          CCE            GET RECORD'S
0756    05062 117735    LDR47 JSB READA,I     WORD COUNT
0757    05063 007306          CMB,CCE,INB,SZB  AS NEGATIVE
0758    05064 027074          JMP LDR48
0759    05065 002006          INA,SZA        FEED FRAME, END-OF-TAPE?
0760    05066 027062          JMP LDR47      NO
0761    05067 063560          LDA .13        YES
0762    05070 067756          LDB EOTMA      PRINT
0763    05071 117723          JSB ASR35,I     'END OF TAPE'
0764    05072 102077          HLT 77B        WAIT FOR NEXT TAPE
0765    05073 027057          JMP LDR46
0766    05074 077665    LDR48 STB COUNT       SAVE WORD COUNT
0767    05075 007000          CMB            SAVE TRUE
0768    05076 077661          STB TEMP1        WORD COUNT -1
0769    05077 117735          JSB READA,I    SKIP FEED FRAME
0770    05100 117735          JSB READA,I    READ LOAD ORIGIN
0771    05101 006003          SZB,RSS        ZERO ORIGIN?
0772    05102 027203          JMP LDR54      YES
0773    05103 060001          LDA 1          NO, INITIALIZE CHECKSUM COUNTER
0774    05104 077660          STB TEMP0      SAVE
0775    05105 077663          STB TEMP3        ORIGIN
0776    05106 057636          CPB LNKAD      SYSTEM LINKAGE ADDRESSES?
0777    05107 027114          JMP LDR49      YES
0778    05110 117727          JSB ADVLA,I    NO, VALIDATE ORIGIN
0779    05111 064000          LDB 0          COMPUTE LAST ADDRESS
0780    05112 047661          ADB TEMP1        TO BE LOADED
0781    05113 117727          JSB ADVLA,I    VALIDATE IT
0782    05114 052001    LDR49 CPA LIBRA       SYSTEM LIBRARY PROGRAM?
0783    05115 017434          JSB SYSLB      YES
0784    05116 000040          CLE            READ A
0785    05117 117735          JSB READA,I      WORD
0786    05120 040001          ADA 1          ADD TO CHECKSUM COUNTER
0787    05121 177660          STB TEMP0,I    STORE WORD
0788    05122 037660          ISZ TEMP0      ADVANCE ADDRESS
0789    05123 037665          ISZ COUNT      RECORD ALL READ?
0790    05124 027116          JMP LDR49+2    NO
0791    05125 000040          CLE            YES
0792    05126 117735          JSB READA,I    READ CHECKSUM
0793    05127 054000          CPB 0          DO CHECKSUMS AGREE?
0794    05130 027060          JMP LDR46+1    YES
```

```
0795   05131 073661        STA TEMP1        NO, SAVE
0796   05132 077662        STB TEMP2          REGISTERS
0797   05133 007400        CCB
0798   05134 063663        LDA TEMP3        FIRST RECORD OF
0799   05135 052001        CPA LIBRA          SYSTEM LIBRARY PROGRAM?
0800   05136 077670        STB SYSLF+1      YES, PROTECT AGAINST SPURIOUS
0801   05137 063562        LDA .17            CALL TO SYSLB
0802   05140 067757        LDB CHKSA        PRINT
0803   05141 117723        JSB ASR35,I        'CHECKSUM ERROR'
0804   05142 063661        LDA TEMP1        LOAD RESISTERS
0805   05143 067662        LDB TEMP2          FOR DISPLAY
0806   05144 102066        HLT 66B          WAIT FOR REREAD ATTEMPT
0807   05145 027057        JMP LDR46
0808*                                   *
0809**   LOAD SYSTEM FROM MAG TAPE  **
0810*                                   *
0811*
0812*   READ THE TABLE OF SYSTEM RECORDS, THEN READ IN THE RECORDS
0813*   THEMSELVES (COMPRISING THE CORE-RESIDENT TSB SYSTEM).  NEXT
0814*   READ THE SYSTEM LIBRARY PROGRAMS ONE BY ONE, TERMINATING WITH
0815*   AN END-OF-FILE.
0816*
0817   05146 002400  LDR50 CLA             TURN OFF
0818   05147 073670        STA SYSLF+1       PAPER TAPE FLAG
0819   05150 063540        LDA M256         LOAD
0820   05151 067646        LDB MTRLA
0821   05152 077664        STB TEMP4          TABLE
0822   05153 002001        RSS
0823   05154 037664  LDR51 ISZ TEMP4
0824   05155 117725        JSB MTAPE,I      LOAD
0825   05156 000000        OCT 0              RECORD
0826   05157 027420        JMP EOFER
0827   05160 027424        JMP TPERR
0828   05161 037664        ISZ TEMP4        PREPARE FOR NEXT
0829   05162 104200        DLD TEMP4,I        SYSTEM SEGMENT
0830   05164 137646        ISZ MTRLA,I      ALL SEGMENTS READ?
0831   05165 027154        JMP LDR51        NO
0832   05166 063540  LDR52 LDA M256         YES
0833   05167 066001        LDB LIBRA        READ
0834   05170 117725        JSB MTAPE,I        SYSTEM LIBRARY
0835   05171 000000        OCT 0                PROGRAM
0836   05172 027176        JMP LDR53        END-OF-FILE/END-OF-TAPE
0837   05173 027424        JMP TPERR
0838   05174 017434        JSB SYSLB        WRITE TO DISC
0839   05175 027166        JMP LDR52
0840   05176 053572  LDR53 CPA B40          END-OF-FILE?
0841   05177 027420        JMP EOFER        NO
0842   05200 117725        JSB MTAPE,I      YES, REWIND
0843   05201 000005        OCT 5              AND STANDBY
0844   05202 002001        RSS
0845   05203 017434  LDR54 JSB SYSLB        TRANSFER LAST PAPER TAPE PROGRAM
```

```
0847*                                      *
0848**   INITIALIZE USER SWAP AREAS   **
0849*                                      *
0850*
0851*   FOR EACH USER PORT, INITIALIZE THE SWAPPING PORTION OF THE
0852*   LANGUAGE PROCESSOR, WRITE IT TO THE APPROPRIATE SWAP TRACK,
0853*   AND INITIALIZE THE TELETYPE TABLE ENTRY CORRESPONDINGLY.
0854*
0855    05204 063544          LDA M16          SET FOR
0856    05205 073660          STA TEMP0          16 USERS
0857    05206 062004          LDA TTYDA        FOR DISC ADDRESS
0858    05207 073661          STA TEMP1          IN TTY00
0859    05210 063645          LDA USTRA        POINTER TO
0860    05211 073662          STA TEMP2          FIRST USER TRACK ADDRESS
0861    05212 002400          CLA              INCREMENT FROM TTY00
0862    05213 073663          STA TEMP3          TO CURRENT TTY TABLE
0863    05214 062013   LDR58  LDA SWPIA        SWAP AREA COMPILER QUANTITIES
0864    05215 066005          LDB ?MASK        LOAD
0865    05216 047663          ADB TEMP3          USER
0866    05217 164001          LDB 1,I            BIT MASK
0867    05220 174000          STB 0,I          RECORD IT
0868    05221 002004          INA              RECORD
0869    05222 007000          CMB                COMPLEMENT
0870    05223 174000          STB 0,I            MASK
0871    05224 002004          INA
0872    05225 066006          LDB ?BHED        RECORD ADDRESS OF
0873    05226 047663          ADB TEMP3          CHARACTER ADDRESS
0874    05227 174000          STB 0,I            OF LOGICAL BUFFER
0875    05230 002004          INA
0876    05231 066007          LDB ?BSTR        RECORD ADDRESS OF ADDRESS OF
0877    05232 047663          ADB TEMP3          LAST CHARACTER +1
0878    05233 174000          STB 0,I            OF LOGICAL BUFFER
0879    05234 002004          INA
0880    05235 066010          LDB ?BGIN        RECORD ADDRESS OF
0881    05236 047663          ADB TEMP3          CHARACTER ADDRESS
0882    05237 174000          STB 0,I            OF PHYSICAL BUFFER
0883    05240 002004          INA
0884    05241 066011          LDB ?BEND        RECORD ADDRESS OF ADDRESS OF
0885    05242 047663          ADB TEMP3          LAST CHARACTER+1
0886    05243 174000          STB 0,I            OF PHYSICAL BUFFER
0887    05244 002004          INA
0888    05245 066012          LDB ?ID          LOAD ADDRESS OF
0889    05246 047663          ADB TEMP3          ID/NAME
0890    05247 174000          STB 0,I          RECORD IT
0891    05250 067663          LDB TEMP3        UPDATE
0892    05251 046003          ADB INCRE          TOTAL
0893    05252 077663          STB TEMP3            INCREMENT
0894    05253 163662          LDA TEMP2,I      RECORD
0895    05254 037662          ISZ TEMP2          DISC ADDRESS
0896    05255 173661          STA TEMP1,I          IN TTY TABLE
0897    05256 067661          LDB TEMP1        UPDATE TTY TABLE
0898    05257 046003          ADB INCRE          POINTER TO
0899    05260 077661          STB TEMP1            DISC ADDRESS
0900    05261 066014          LDB SWPLN        WRITE
0901    05262 177655          STB WORD,I         SWAP
```

```
0902   05263 066015         LDB SWPAA        AREA
0903   05264 117724         JSB DISC,I         TO DISC
0904   05265 037660         ISZ TEMP0      ALL DONE?
0905   05266 027214         JMP LDR58      NO
0906*                           *
0907**   WRITE SYSTEM TO DISC   **
0908*                           *
0909*
0910*   DUMP THE CORE-RESIDENT TSB SYSTEM TO THE DISC FOR POTENTIAL
0911*   BOOTSTRAP LOADING.
0912*
0913   05267 163650         LDA BSY1A,I    WRITE
0914   05270 173655         STA WORD,I
0915   05271 063552         LDA .3
0916   05272 006400         CLB              SYSTEM
0917   05273 117724         JSB DISC,I
0918   05274 163651         LDA BSY2A,I
0919   05275 173655         STA WORD,I         TO
0920   05276 063676         LDA TRKTB
0921   05277 067653         LDB RSYA1
0922   05300 117724         JSB DISC,I         DISC
0923   05301 163652         LDA BSY3A,I
0924   05302 173655         STA WORD,I
0925   05303 063677         LDA TRKTB+1
0926   05304 067654         LDB RSYA2
0927   05305 117724         JSB DISC,I
0928*                           *
0929**   GET DATE AND TIME   **
0930*                           *
0931*
0932*   THE DISC-RESIDENT TSB BOOTSTRAP LOADER TRANSFERS HERE AFTER
0933*   LOADING TSB FROM THE DISC.  THIS SECTION REQUESTS THE DATE
0934*   AND TIME OF DAY FOR THE INTERNAL CLOCKING ROUTINES.
0935*
0936   05306 063556   LDR59 LDA .8          PRINT
0937   05307 067760         LDB DATEA
0938   05310 117723         JSB ASR35,I       'DATE?'
0939   05311 002400         CLA            GET
0940   05312 117723         JSB ASR35,I       RESPONSE
0941   05313 117732         JSB INTGA,I    GET DAY OF YEAR
0942   05314 073660         STA TEMP0      SAVE FOLLOWING CHARACTER
0943   05315 006003         SZB,RSS        NON-ZERO?
0944   05316 027332         JMP ERR6       NO
0945   05317 060001         LDA 1          YES
0946   05320 047620         ADB MXDAY
0947   05321 006021         SSB,RSS        < 367 ?
0948   05322 027332         JMP ERR6       NO
0949   05323 006400         CLB            YES
0950   05324 100200         MPY .24        CONVERT
0951   05326 172016         STA DATE,I       TO HOURS
0952   05327 063660         LDA TEMP0      '\'
0953   05330 053605         CPA SLSH          NEXT?
0954   05331 027336         JMP LDR60      YES
0955   05332 063561   ERR6  LDA .15        NO, PRINT
0956   05333 067761         LDB ILDTA         'ILLEGAL
```

```
0957   05334 117723          JSB ASR35,I        DATE'
0958   05335 027306          JMP LDR59
0959   05336 117732   LDR60  JSB INTGA,I    GET YEAR
0960   05337 053560          CPA B15        MORE CHARACTERS?
0961   05340 002001          RSS            NO
0962   05341 027332          JMP ERR6       YES
0963   05342 176020          STB YEAR,I     RECORD YEAR
0964   05343 047621          ADB MAXYR
0965   05344 006021          SSB,RSS        < 100 ?
0966   05345 027332          JMP ERR6       NO
0967   05346 063556   LDR61  LDA .8         YES
0968   05347 067762          LDB TIMEA      REQUEST
0969   05350 117723          JSB ASR35,I      TIME OF DAY
0970   05351 002400          CLA            GET
0971   05352 117723          JSB ASR35,I      RESPONSE
0972   05353 117740          JSB TWODA,I    GET TWO-DIGIT
0973   05354 177750          DEC -24          INTEGER < 24
0974   05355 077660          STB TEMPO      SAVE IT
0975   05356 117740          JSB TWODA,I    GET TWO-DIGIT
0976   05357 177704          DEC -60          INTEGER < 60
0977   05360 060001          LDA 1          CONVERT
0978   05361 006400          CLB              TO TENTHS
0979   05362 100200          MPY .600           OF SECONDS
0980   05364 043623          ADA MBIAS      SAVE IN SPECIAL
0981   05365 172017          STA TIME,I       INTERNAL FORM
0982   05366 117741          JSB GETCA,I    EXTRANEOUS DIGITS?
0983   05367 027374          JMP LDR62      NO
0984   05370 063561   ERR7   LDA .15        YES
0985   05371 067763          LDB ILTIA      PRINT
0986   05372 117723          JSB ASR35,I      ERROR
0987   05373 027346          JMP LDR61
0988   05374 067660   LDR62  LDB TEMPO
0989   05375 146016          ADB DATE,I     CORRECT
0990   05376 176016          STB DATE,I       HOUR OF YEAR
0991*                        *
0992**   INITIATE TIMESHARING  **
0993*                        *
0994*
0995*   IF A PHONES BOARD EXISTS, IT IS TURNED ON.  POWER FAIL, SET TO
0996*   HALT DURING LOADING, IS SET TO THE POWER FAIL ROUTINE IN THE
0997*   SYSTEM.  FINALLY, CONTROL TRANSFERS TO TSB.
0998*
0999   05377 060165          LDA PHNSC      PHONES
1000   05400 002003          SZA,RSS          BOARD?
1001   05401 027415          JMP LDR63      NO
1002   05402 064000          LDB 0          YES
1003   05403 033630          IOR PH1        CREATE
1004   05404 172022          STA PHIN1,I
1005   05405 060001          LDA 1
1006   05406 033631          IOR PH2          APPROPRIATE
1007   05407 172023          STA PHIN2,I
1008   05410 067632          LDB RSSA
1009   05411 176024          STB PHIN3,I        INSTRUCTIONS
1010   05412 073413          STA *+1        EXECUTE
1011   05413 000000          NOP              LAST ONE
```

[C]

```
1012   05414 172025           STA PHIN4,I    SET UP PHONES STATUS
1013   05415 062026   LDR63 LDA PWRFL        SET POWER-FAIL
1014   05416 070004           STA 4           INTERRUPT LINK
1015   05417 126021           JMP TSB,I      RUN
```

```
1017*                     *
1018**   TAPE ERRORS    **
1019*                     *
1020   05420 063573   EOFER LDA .38         NO RECORD
1021   05421 067764         LDB EOFMA        WHERE
1022   05422 117723         JSB ASR35,I        EXPECTED
1023   05423 027427         JMP ERRIN       TERMINATE LOADING
1024*
1025   05424 063566   TPERR LDA .22         TIMING
1026   05425 067765         LDB TAPEA        OR PARITY
1027   05426 117723         JSB ASR35,I        ERROR
1028*
1029   05427 063564   ERRIN LDA .20         OUTPUT
1030   05430 067766         LDB LABOA        TERMINATION
1031   05431 117723         JSB ASR35,I       MESSAGE
1032   05432 102001         HLT 1           IRRECOVERABLE
1033   05433 027432         JMP *-1          HALT
```

```
1035*                                           *
1036**   RECORD SYSTEM LIBRARY PROGRAM   **
1037*                                           *
1038*
1039*   UPON FIRST ENTRY SYSLF = -1 AND SYSLF+1 = -1 FOR A PAPER TAPE
1040*   LOAD OR 0 FOR A MAG TAPE LOAD.  MAG TAPE LOADS CALL SYSLB AFTER
1041*   LOADING A SYSTEM LIBRARY PROGRAM TO STORE IT ONTO THE DISC;
1042*   PAPER TAPE LOADS CALL SYSLB BEFORE LOADING A SYSTEM LIBRARY
1043*   PROGRAM TO STORE THE PRECEDING ONE ONTO THE DISC, HENCE THE
1044*   FIRST CALL MUST BE IGNORED.  THE FIRST SYSTEM LIBRARY PROGRAM,
1045*   A TABLE OF LENGTHS IN WORDS OF THE SYSTEM LIBRARY PROGRAMS,
1046*   IS COPIED INTO A CORE-RESIDENT TABLE.  AS EACH PROGRAM IS STORED
1047*   ONTO THE DISC, ITS DISC ADDRESS REPLACES ITS LENGTH IN THIS
1048*   TABLE, WHICH BECOMES THE LINKAGE BETWEEN TSB AND THE SYSTEM
1049*   LIBRARY.  WHILE SWR(15) IS 'UP', THE LOADER HALTS TO ALLOW
1050*   PATCHING JUST BEFORE WRITING EACH PROGRAM ONTO THE DISC.
1051*
1052   05434 000000   SYSLB NOP
1053   05435 037670         ISZ SYSLF+1       FIRST CALL FROM PAPER TAPE LOAD?
1054   05436 002001         RSS               NO
1055   05437 127434         JMP SYSLB,I       YES
1056*
1057   05440 106501         LIB 1             DEBUGGING AID:
1058   05441 006020         SSB                  HLT 15B BEFORE SYSLIB PROGRAM
1059   05442 102015         HLT 15B                 GOES TO DISC IF SWR(15) = 1
1060   05443 002400         CLA
1061   05444 053667         CPA SYSLF         FIRST SYSTEM LIBRARY PROGRAM?
1062   05445 027472         JMP SYSL2         NO
1063*
1064   05446 162001         LDA LIBRA,I       YES
1065   05447 073667         STA SYSLF         SET MOVE COUNTER
1066   05450 066002         LDB COM6          SET
1067   05451 077675         STB SLDIR            TABLE POINTER
1068   05452 062001         LDA LIBRA         SET POINTER TO
1069   05453 073664         STA TEMP4            ADDRESS TABLE
1070   05454 163664   SYSL1 LDA TEMP4,I       COPY
1071   05455 170001         STA 1,I              LENGTH
1072   05456 037664         ISZ TEMP4               TABLE
1073   05457 006004         INB                        INTO
1074   05460 037667         ISZ SYSLF                     ADDRESS
1075   05461 027454         JMP SYSL1                         TABLE
1076   05462 063700         LDA TRKTB+2       SET DISC ADDRESSES OF
1077   05463 073671         STA SYST1
1078   05464 117733         JSB ISOTA,I          SYSTEM LIBRARY TRACKS AND
1079   05465 073673         STA SYSS1
1080   05466 063701         LDA TRKTB+3          # OF SECTORS AVAILABLE
1081   05467 073672         STA SYST2
1082   05470 117733         JSB ISOTA,I             ON EACH ONE
1083   05471 073674         STA SYSS2
1084*
1085   05472 067540   SYSL2 LDB M256          SET WORD COUNT
1086   05473 177655         STB WORD,I           FOR DISC TRANSFER
1087   05474 167675         LDB SLDIR,I       COMPUTE # OF
1088   05475 101026         ASR 6                SECTORS NEEDED
1089   05476 063547         LDA M4            ROOM ON
```

```
1090   05477 043673          ADA SYSS1      FIRST
1091   05500 002020          SSA               TRACK?
1092   05501 027517          JMP SYSL5      NO
1093   05502 060001          LDA 1          YES, UPDATE
1094   05503 043673          ADA SYSS1        REMAINING
1095   05504 073673          STA SYSS1          SECTOR COUNT
1096   05505 063671          LDA SYST1      LOAD DISC ADDRESS
1097   05506 007004          CMB,INB        SAVE
1098   05507 047671          ADB SYST1        DISC ADDRESS OF
1099   05510 077671          STB SYST1          REMAINING SPACE
1100   05511 173675   SYSL4 STA SLDIR,I     SAVE DISC ADDRESS
1101   05512 037675          ISZ SLDIR        IN LOADER TABLE
1102*
1103   05513 066001          LDB LIBRA      WRITE PROGRAM
1104   05514 117724          JSB DISC,I       TO DISC
1105   05515 062001          LDA LIBRA
1106   05516 127434          JMP SYSLB,I
1107   05517 063547   SYSL5 LDA M4          HANDLE
1108   05520 043674          ADA SYSS2
1109   05521 002020          SSA               SECOND
1110   05522 027533          JMP SYSL6
1111   05523 060001          LDA 1             TRACK
1112   05524 043674          ADA SYSS2
1113   05525 073674          STA SYSS2
1114   05526 063672          LDA SYST2
1115   05527 007004          CMB,INB
1116   05530 047672          ADB SYST2
1117   05531 077672          STB SYST2
1118   05532 027511          JMP SYSL4
1119   05533 063571   SYSL6 LDA .26         OUTPUT
1120   05534 067767          LDB SYSLA        OVERFLOW
1121   05535 117723          JSB ASR35,I        MESSAGE
1122   05536 027427          JMP ERRIN      TERMINATE LOADING
```

```
1124   05537 165300   M5440 DEC -5440
1125   05540 177400   M256  DEC -256
1126   05541 177401   M255  DEC -255
1127   05542 177700   M64   DEC -64
1128   05543 177754   M20   DEC -20
1129   05544 177760   M16   DEC -16
1130   05545 177764   M12   DEC -12
1131   05546 177766   M10   DEC -10
1132   05547 177774   M4    DEC -4
1133   05550 177777   M1    DEC -1
1134   05551 000002   .2    DEC 2
1135   05552 000003   .3    DEC 3
1136   05553 000004   .4    DEC 4
1137   05554 000006   .6    DEC 6
1138   05555 000007   .7    DEC 7
1139   05556 000010   .8    DEC 8
1140   05557 000014   .12   DEC 12
1141   05557          B14   EQU .12
1142   05560 000015   .13   DEC 13
1143   05560          B15   EQU .13
1144   05561 000017   .15   DEC 15
1145   05562 000021   .17   DEC 17
1146   05563 000023   .19   DEC 19
1147   05564 000024   .20   DEC 20
1148   05565 000025   .21   DEC 21
1149   05566 000026   .22   DEC 22
1150   05567 000027   .23   DEC 23
1151   05570 000030   .24   DEC 24
1152   05571 000032   .26   DEC 26
1153   05572 000040   .32   DEC 32
1154   05572          B40   EQU .32
1155   05573 000046   .38   DEC 38
1156   05574 000060   B60   OCT 60
1157   05575 000100   B100  OCT 100
1158   05576 000106   B106  OCT 106
1159   05577 000125   .85   DEC 85
1160   05600 000400   B400  OCT 400
1161   05601 001130   .600  DEC 600
1162   05602 012500   .5440 DEC 5440
1163   05603 100000   BIT15 OCT 100000
1164   05604 000054   COMMA OCT 54        ','
1165   05605 000057   SLSH  OCT 57        '/'
1166   05606 000101   A     OCT 101       'A'
1167   05607 000103   C     OCT 103       'C'
1168   05610 000104   D     OCT 104       'D'
1169   05611 000111   I     OCT 111       'I'
1170   05612 000114   L     OCT 114       'L'
1171   05613 000116   N     OCT 116       'N'
1172   05614 000117   O     OCT 117       'O'
1173   05615 000123   S     OCT 123       'S'
1174   05616 000125   U     OCT 125       'U'
1175   05617 000131   Y     OCT 131       'Y'
1176   05620 177221   MXDAY DEC -367      1'S COMPLEMENT OF MAXIMUM DAY
1177   05621 177634   MAXYR DEC -100      1'S COMPLEMENT OF MAXIMUM YEAR
1178   05622 177713   EQTLN DEC -53       LENGTH OF EQUIPMENT TABLE
```

1179   05623 071540   MBIAS ABS -30000-6000   TENTHS-OF-SECOND COUNTER

```
1181   05624 106615   OTB15 OTB  15B        'BOOTSTRAP'
1182   05625 102714   STC14 STC  14B          BOOTSTRAP LOADER
1183   05626 102515   LIA15 LIA  15B            INSTRUCTIONS
1184   05627 020014   LINKA OCT  20014
1185*
1186   05630 102600   PH1   OTA  0          SKELETON CODE
1187   05631 102500   PH2   LIA  0            FOR PHONES
1188   05632 002001   RSSA  RSS
1189*
1190   05575          EQTA  EQU  B100       EQUIPMENT TABLE ADDRESS
1191   05633 100100   CEQTA OCT  100100     EQT 'DISC READ' CORE ADDRESS
1192   05553          DEQTA EQU  .4         EQT DISC ADDRESS
1193   05575          DIREA EQU  B100       DIRECTORY TABLE ADDRESS
1194   05576          DIRE6 EQU  B106
1195   05634 000140   TRAXA DEF  TRAX       AVAILABLE TRACK TABLE ADDRESS
1196   05635 000160   DTBLA DEF  DTBL       DISC SELECT CODE TABLE ADDRESS
1197   05636 004001   LNKAD DEF  LSLTB      LINKAGE TABLE ADDRESS
1198   25200          ADTBL EQU  37700B-12500B  ADT BUFFER
1199   05637 025200   ADTBA DEF  ADTBL        ADT BUFFER ADDRESS
1200   12500          IDTBL EQU  ADTBL-12500B   ID TABLE BUFFER
1201   05640 012500   IDTBA DEF  IDTBL      ID TABLE BUFFER ADDRESS
1202   05640          UPRBA EQU  IDTBA      USER PROGRAM BUFFER ADDRESS
1203   05641 005771   DIRBA DEF  DIRBF      ADDRESS OF NULL DIRECTORY
1204   05642 012101   ULTTB DEF  12101B     USER LIBRARY TRACK TABLE ADDRESS
1205   05643 012100   ULTM1 DEF  12100B
1206   05644 005676   TRKTA DEF  TRKTB      SYSTEM TRACK TABLE ADDRESS
1207   05645 005702   USTRA DEF  TRKTB+4    USER TRACK DISC ADDRESSES
1208   05646 003003   MTRLA DEF  MTRLT      BUFFER ADDRESS FOR SEGMENT TABLE
1209   05647 002504   LDRTA DEF  LDRTT      => DISC LOADER DISC ADDRESSES
1210   05650 002500   BSY1A DEF  BSYS1      ADDRESSES OF
1211   05651 002501   BSY2A DEF  BSYS2        SYSTEM SEGMENT
1212   05652 002502   BSY3A DEF  BSYS3          WORD COUNTS
1213   05653 014000   RSYA1 OCT  14000      SYSTEM SEGMENT
1214   05654 026500   RSYA2 OCT  26500        CORE ADDRESSES
1215   05655 002423   WORD  DEF  WORDC      DISC BLOCK WORD COUNT ADDRESS
1216   05656 000000   BSBSA DEF  BSBSO      ADDRESS OF 'BOOTSTRAP' BOOTSTRAP
1217   05657 002436   TSBBA DEF  BSLDR      ADDRESS OF TSB BOOTSTRAP LOADER
1218*
1219   05660 000000   TEMP0 BSS  1
1220   05661 000000   TEMP1 BSS  1
1221   05662 000000   TEMP2 BSS  1
1222   05663 000000   TEMP3 BSS  1
1223   05664 000000   TEMP4 BSS  1
1224   05665 000000   COUNT BSS  1
1225   05666 000000   MTFLG BSS  1          LOADER MODE FLAG
1226   05667 000000   SYSLF BSS  2          SYSTEM LIBRARY FLAGS
1227   05671 000000   SYST1 BSS  1          DISC ADDRESSES OF SPACE
1228   05672 000000   SYST2 BSS  1            ON SYSTEM LIBRARY TRACKS
1229   05673 000000   SYSS1 BSS  1          SPACE AVAILABLE ON
1230   05674 000000   SYSS2 BSS  1            SYSTEM LIBRARY TRACKS
1231   05675 000000   SLDIR BSS  1          SYSTEM LIBRARY DIRECTORY POINTER
1232   05676 000000   TRKTB BSS  20         CLAIMED TRACKS TABLE
```

```
1234  05722 006362   LKUNA DEF LKUNL   LOCK/UNLOCK CODE ADDRESS
1235  05723 002010   ASR35 DEF TTY35   TTY DRIVER ADRESS
1236  05724 002145   DISC  DEF DISCD   DISC DRIVER ADDRESS
1237  05725 010356   MTAPE DEF MTD     MAG TAPE DRIVER ADDRESS
1238  05726 011457   MTDIA DEF MTDIN   MAG TAPE INITIALIZATION ROUTINE
1239  05727 007112   ADVLA DEF ADVAL
1240  05730 006625   GTDNA DEF GTDNO
1241  05731 006755   GTTRA DEF GTTRK
1242  05732 007021   INTGA DEF INTGR
1243  05733 007011   ISOTA DEF ISOTL
1244  05734 007171   MOVUA DEF MOVUP
1245  05735 007077   READA DEF READ
1246  05736 006563   SELCA DEF SELCD
1247  05737 006665   SETDA DEF SETDS
1248  05740 007053   TWODA DEF TWODG
1249  05741 007233   GETCA DEF GETCR
1250  05742 007251   GTMTA DEF GETMT                            [F]
1251*
1252  05743 006011   LBRYA DEF LBRY
1253  05744 011706   ILINA DEF ILIN
1254  05745 006017   S/TDA DEF S/TDO
1255*                                            [F]
1256  05746 006050   DISMA DEF DISMD
1257  05747 006063   RQSTA DEF RQSTD
1258  05750 006075   BDLA  DEF BDDL
1259  05751 006105   DZMBA DEF DZMBF
1260  05752 006121   ILSCA DEF ILSCD
1261  05753 006134   LULCA DEF LULC
1262  05754 006157   RDMSA DEF RDMS
1263  05755 006173   BLDRA DEF BLDRC
1264  05756 006213   EOTMA DEF EOTM
1265  05757 006222   CHKSA DEF CHKSM
1266  05760 006233   DATEA DEF DATER
1267  05761 006237   ILDTA DEF ILDTE
1268  05762 006247   TIMEA DEF TIMER
1269  05763 006253   ILTIA DEF ILTIM
1270  05764 006263   EOFMA DEF EOFM
1271  05765 006306   TAPEA DEF TAPER
1272  05766 006321   LABOA DEF LABOR
1273  05767 006333   SYSLA DEF SYSL
1274  05770 006350   OODSA DEF OODSP


1276*
1277*  NULL DIRECTORY
1278*
1279  05771 000000   DIRBF DEC 0,0,0,0,0,-1,0,0     DIRECTORY
1280  06001 177777         DEC -1,-1,-1,-1,0,-1,0,0   PSUEDO-ENTRIES
```

```
1282    06011  006412   LBRY   OCT  6412
1283    06012  046111          ASC  5,LIBRARY?
1284    06017  005123   S/TD0  OCT  5123
1285    06020  042503          ASC  12,ECTORS/TRACK ON DISC 0?
1286    06034  005115   MTSC   OCT  5115
1287    06035  040507          ASC  11,AG TAPE SELECT CODE?
1288    06050  005104   DISMD  OCT  5104
1289    06051  044523          ASC  10,ISC MODIFICATIONS?
1290    06063  005102   RQSTD  OCT  5102
1291    06064  042507          ASC  8,EGIN WITH 'DISC'
1292    06074  006400          OCT  6400
1293    06075  005102   BDDL   OCT  5102
1294    06076  040504          ASC  6,AD DELIMITER
1295    06104  006400          OCT  6400
1296    06105  005104   DZMBF  OCT  5104
1297    06106  044523          ASC  10,ISC 0 MUST BE IN 14
1298    06120  006400          OCT  6400
1299    06121  005111   ILSCD  OCT  5111
1300    06122  046114          ASC  9,LLEGAL SELECT CODE
1301    06133  006400          OCT  6400
1302    06134  006412   LULC   OCT  6412
1303    06135  043511          ASC  17,GIVE LOCK, UNLOCK, OR LOAD COMMAND
1304    06156  006412          OCT  6412
1305    06157  005104   RDMS   OCT  5104
1306    06160  044523          ASC  11,ISC MONITOR PRESENT?
1307    06173  005114   BLDRC  OCT  5114
1308    06174  047501          ASC  15,OADER NOT CONFIGURED FOR TSB,
1309    06213  005105   EOTM   OCT  5105
1310    06214  047104          ASC  5,ND OF TAPE
1311    06221  006400          OCT  6400
1312    06222  005103   CHKSM  OCT  5103
1313    06223  044105          ASC  7,HECKSUM ERROR
1314    06232  006400          OCT  6400
1315    06233  005104   DATER  OCT  5104
1316    06234  040524          ASC  3,ATE?
1317    06237  005111   ILDTE  OCT  5111
1318    06240  046114          ASC  6,LLEGAL DATE
1319    06246  006400          OCT  6400
1320    06247  005124   TIMER  OCT  5124
1321    06250  044515          ASC  3,TME?
1322    06253  005111   ILTIM  OCT  5111
1323    06254  046114          ASC  6,LLEGAL TIME
1324    06262  006400          OCT  6400
1325    06263  005000   EOFM   OCT  5000
1326    06264  052516          ASC  18,UNEXPECTED END-OF-FILE/END-OF-TAPE,
1327    06306  005124   TAPER  OCT  5124
1328    06307  040520          ASC  10,APE CANNOT BE READ,
1329    06321  046117   LABOR  ASC  9,LOAD/DUMP ABORTED
1330    06332  006412          OCT  6412
1331    06333  005123   SYSL   OCT  5123
1332    06334  054523          ASC  12,YSTEM LIBRARY OVERFLOW,
1333    06350  005117   OODSP  OCT  5117
1334    06351  052524          ASC  9,UT OF DISC SPACE,
```

```
1336*                           *
1337**   INTERPRET REQUEST   **
1338*                           *
1339*
1340*   UPON ENTRY (B) = 0 FOR A 'LOCK' OR -1 FOR AN 'UNLOCK'.  SEARCH
1341*   THE INPUT RECORD FOR   - <DISC #>,<TRACK #>,<TRACK #>  OR FOR
1342*   - <DISC #>,<TRACK #> .  INSURE THAT <DISC #> DOES NOT EXCEED 3
1343*   AND CORRESPONDS TO AN EXISTING DISC.  INSURE THAT ANY <TRACK #>
1344*   DOES NOT EXCEED 64 AND THAT THE SECOND <TRACK #>, IF PRESENT,
1345*   IS AT LEAST AS GREAT AS THE FIRST.
1346*
1347   06362 077417   LKUNL STB MFLAG      SAVE MODE
1348   06363 003400         CCA            GET LEGAL
1349   06364 016625         JSB GTDNO        DISC #
1350   06365 127402         JMP L22A,I      NOT FOUND
1351   06366 001020         ALS,ALS         FOUND, SAVE POINTER
1352   06367 043373         ADA LTRAX          TO ITS
1353   06370 073411         STA LTMP1            TRAX TABLE
1354   06371 017021         JSB INTGR       GET TRACK #
1355   06372 073413         STA LTMP3       SAVE FOLLOWING CHARACTER
1356   06373 017145         JSB PARCK       VALIDATE AND SAVE
1357   06374 077412         STB LTMP2         TRACK NUMBER
1358   06375 063410         LDA LTMP0       SAVE
1359   06376 001323         RAR,RAR           DISC
1360   06377 005727         BLF,BLF             ADDRESS
1361   06400 040001         ADA 1                 OF
1362   06401 073414         STA LTMP4               TRACK
1363   06402 063413         LDA LTMP3       WAS DELIMITER
1364   06403 053331         CPA LB54          A COMMA?
1365   06404 026414         JMP LKUN2       YES
1366   06405 007400         CCB             NO
1367   06406 053321         CPA LB15        CARRIAGE RETURN?
1368   06407 026425         JMP LKUN3-1     YES
1369   06410 063322   LKUN1 LDA L.15        NO
1370   06411 067424         LDB BDDLA       PRINT
1371   06412 117377         JSB ASRDA,I        ERROR
1372   06413 127402         JMP L22A,I
1373   06414 017021   LKUN2 JSB INTGR       GET SECOND TRACK #
1374   06415 053321         CPA LB15        FOLLOWED BY CARRIAGE RETURN?
1375   06416 002001         RSS             YES
1376   06417 026410         JMP LKUN1       NO
1377   06420 017145         JSB PARCK       VALIDATE PARAMETER
1378   06421 007000         CMB             COMPUTE # OF TRACKS
1379   06422 047412         ADB LTMP2          TO BE LOCKED/UNLOCKED
1380   06423 006021         SSB,RSS         ONE OR MORE?
1381   06424 027152         JMP PARC1       NO
1382   06425 077413         STB LTMP3       YES, SAVE COUNT
1383*
1384*   FOR EACH TRACK IN TURN, EXTRACT ITS STATUS AND JUMP TO THE
1385*   LOCK OR UNLOCK CODE.
1386*
1387   06426 063414   LKUN3 LDA LTMP4
1388   06427 001066         ALS,CLE,ELA     SET POINTER
1389   06430 006400         CLB             TO PROPER
1390   06431 100022         ASL 2               WORD OF
```

```
1391   06432 047411          ADB LTMP1          TRAX
1392   06433 077415          STB LTMP5            TABLE
1393   06434 001700          ALF             SAVE
1394   06435 043375          ADA BMSKA          APPROPRIATE
1395   06436 160000          LDA 0,I             BIT
1396   06437 073416          STA LTMP6            MASK
1397   06440 113415          AND LTMP5,I     EXTRACT TRACK STATUS
1398   06441 067417          LDB MFLAG
1399   06442 006006          INB,SZB         UNLOCK?
1400   06443 026516          JMP LKUN6       NO
1401*                    *
1402**   UNLOCK A TRACK   **
1403*                    *
1404*
1405*   IF TRACK IS LOCKED, UNLOCK IT AND INSERT A FULL-TRACK ENTRY
1406*   INTO THE ADT (IF THE ADT IS FULL, THE TRACK IS LOST UNTIL A
1407*   SUBSEQUENT RELOAD).
1408*
1409   06444 002003          SZA,RSS         IS TRACK LOCKED?
1410   06445 026507          JMP LKUN5       NO
1411   06446 123415          XOR LTMP5,I     YES
1412   06447 173415          STA LTMP5,I     UNLOCK TRACK
1413   06450 064137          LDB ADLEN       IS ADT
1414   06451 057340          CPB MXADT          FULL?
1415   06452 026507          JMP LKUN5       YES, TRACK LOST
1416   06453 007004          CMB,INB         NO
1417   06454 047372          ADB ADTBF       SET POINTER TO
1418   06455 077415          STB LTMP5          LAST WORD +1 OF ADT
1419   06456 064137          LDB ADLEN       CORRECT
1420   06457 047313          ADB LM2            ADT
1421   06460 074137          STB ADLEN             LENGTH
1422   06461 017156          JSB FADTP       FIND POSITION FOR NEW ENTRY
1423   06462 063415          LDA LTMP5       COMPUTE
1424   06463 003004          CMA,INA            # OF
1425   06464 040001          ADA 1               ENTRIES
1426   06465 001100          ARS                   TO BE
1427   06466 073410          STA LTMP0               MOVED
1428   06467 063415          LDA LTMP5
1429   06470 043313   LKUN4  ADA LM2          SET
1430   06471 073416          STA LTMP6          SOURCE ADDRESS
1431   06472 104200          DLD LTMP6,I     MOVE
1432   06474 104400          DST LTMP5,I        ENTRY
1433   06476 063416          LDA LTMP6       UPDATE TO NEXT
1434   06477 073415          STA LTMP5          DESTINATION ADDRESS
1435   06500 037410          ISZ LTMP0       ALL ENTRIES MOVED?
1436   06501 026470          JMP LKUN4       NO
1437   06502 063414          LDA LTMP4       YES
1438   06503 173415          STA LTMP5,I     SET ENTRY'S DISC ADDRESS
1439   06504 017011          JSB ISOTL       SET
1440   06505 037415          ISZ LTMP5          ENTRY'S LENGTH
1441   06506 173415          STA LTMP5,I          IN SECTORS
1442*
1443*   CHECK IF UNPROCESSED TRACKS REMAIN.  IF SO, UPDATE REFERENCE
1444*   QUANTITIES AND PROCEED TO PROCESS THE NEXT ONE; ELSE RETURN
1445*   TO THE LOADER FOR FURTHER INSTRUCTIONS.
```

```
1446*
1447   06507 063414   LKUN5 LDA LTMP4       COMPUTE
1448   06510 043335         ADA LB400         DISC ADDRESS OF
1449   06511 073414         STA LTMP4           NEXT TRACK
1450   06512 037412         ISZ LTMP2       ADVANCE TRACK #
1451   06513 037413         ISZ LTMP3       ALL TRACKS CONSIDERED?
1452   06514 026426         JMP LKUN3       NO
1453   06515 127402         JMP L22A,I      YES
1454*                   *
1455**   LOCK A TRACK   **
1456*                   *
1457*
1458*   IF THE TRACK IS UNLOCKED AND LOCKABLE, LOCK IT AND REMOVE ITS
1459*   ENTRY FROM THE ADT; ELSE PRINT A MESSAGE AND CONTINUE TO THE
1460*   NEXT TRACK.  A TRACK IS LOCKABLE IF IT HAS AN ADT ENTRY
1461*   CORRESPONDING TO THE FULL LENGTH OF THE TRACK; I.E., NO PART
1462*   OF THE TRACK IS IN USE.
1463*
1464   06516 002002   LKUN6 SZA             TRACK LOCKED?
1465   06517 026507         JMP LKUN5       YES
1466   06520 017156         JSB FADTP       NO, FIND ADT ENTRY FOR TRACK
1467   06521 063414         LDA LTMP4       ENTRY
1468   06522 150001         CPA 1,I           FOUND?
1469   06523 006005         INB,RSS         YES
1470   06524 026537         JMP LKUN7       NO
1471   06525 017011         JSB ISOTL       GET TRACK LENGTH
1472   06526 150001         CPA 1,I         IS PART OF TRACK IN USE?
1473   06527 006005         INB,RSS         NO
1474   06530 026537         JMP LKUN7       YES
1475   06531 060001         LDA 1           DELETE
1476   06532 017171         JSB MOVUP         ADT ENTRY
1477   06533 163415         LDA LTMP5,I     LOCK
1478   06534 033416         IOR LTMP6
1479   06535 173415         STA LTMP5,I       TRACK
1480   06536 026507         JMP LKUN5
1481*
1482   06537 063324   LKUN7 LDA L.20        PRINT 'CANNOT
1483   06540 067432         LDB TRKNA         LOCK TRACK #'
1484   06541 117377         JSB ASRDA,I
1485   06542 006400         CLB             COMPUTE
1486   06543 063412         LDA LTMP2         DIGITS OF
1487   06544 100400         DIV L.10            TRACK #
1488   06546 047332         ADB LB60        COMPUTE
1489   06547 002003         SZA,RSS
1490   06550 026553         JMP LKUN8         ASCII OF
1491   06551 043332         ADA LB60
1492   06552 001727         ALF,ALF             TRACK #
1493   06553 030001   LKUN8 IOR 1
1494   06554 067344         LDB B6400       PRINT
1495   06555 104400         DST EBUFA,I
1496   06557 063316         LDA L.3         IT
1497   06560 067376         LDB EBUFA
1498   06561 117377         JSB ASRDA,I
1499   06562 026507         JMP LKUN5
```

```
1501*                         *
1502**   GET SELECT CODE  **
1503*                         *
1504*
1505*   ENTER WITH A CHARACTER IN (A).  FIND A TWO-DIGIT OCTAL
1506*   INTEGER IN [(77 OCT - SELCD,I),76 OCT].  IF THIS CANNOT BE DONE,
1507*   PRINT AN ERROR AND EXIT TO (P+2), ELSE EXIT TO (P+3) WITH THE
1508*   INTEGER IN (B) AND THE FOLLOWING CHARACTER IN (A).
1509*
1510   06563 000000   SELCD NOP
1511   06564 017220         JSB DIGCK       DIGIT?
1512   06565 026621         JMP SELC2       NO
1513   06566 047311         ADB LM8         YES, OCTAL
1514   06567 006021         SSB,RSS          DIGIT?
1515   06570 026621         JMP SELC2       NO
1516   06571 001723         ALF,RAR         YES
1517   06572 073411         STA LTMP1       SAVE IT * 8
1518   06573 017233         JSB GETCR       NEXT
1519   06574 026621         JMP SELC2
1520   06575 017220         JSB DIGCK        CHARACTER AN
1521   06576 026621         JMP SELC2
1522   06577 047311         ADB LM8            OCTAL DIGIT?
1523   06600 006021         SSB,RSS
1524   06601 026621         JMP SELC2       NO
1525   06602 043411         ADA LTMP1       YES, SAVE
1526   06603 073411         STA LTMP1          SELECT CODE
1527   06604 017233         JSB GETCR
1528   06605 000000         NOP
1529   06606 067411         LDB LTMP1       SELECT CODE
1530   06607 047307         ADB LD77
1531   06610 006021         SSB,RSS            WITHIN
1532   06611 026621         JMP SELC2
1533   06612 146563         ADB SELCD,I        LEGAL RANGE?
1534   06613 006020         SSB
1535   06614 026621         JMP SELC2       NO
1536   06615 067411         LDB LTMP1       YES
1537   06616 036563         ISZ SELCD
1538   06617 036563   SELC1 ISZ SELCD
1539   06620 126563         JMP SELCD,I
1540   06621 063325   SELC2 LDA L.21       REPORT
1541   06622 067425         LDB ILSCL
1542   06623 117377         JSB ASRDA,I     ERROR
1543   06624 026617         JMP SELC1
1544*                         *
1545**   GET DISC NUMBER  **
1546*                         *
1547*   SEARCH THE INPUT RECORD FOR A '-' FOLLOWED BY AN INTEGER IN
1548*   [0,3] FOLLOWED BY A COMMA.  IF (A) = -1 UPON ENTRY, CHECK THAT
1549*   THE REFERENCED DISC EXISTS.  EXIT TO (P+2) WITH THE INTEGER IN
1550*   (A) IF ABOVE CONDITIONS ARE MET; OTHERWISE, PRINT AN ERROR AND
1551*   EXIT TO (P+1).
1552*
1553   06625 000000   GTDNO NOP
1554   06626 073410         STA LTMP0       SAVE FLAG
1555   06627 017233   GTDN1 JSB GETCR
```

```
1556   06630 026637         JMP GTDN2
1557   06631 053343         CPA DASH        '-' ?
1558   06632 002001         RSS             YES
1559   06633 026627         JMP GTDN1       NO
1560   06634 017021         JSB INTGR       GET DISC #
1561   06635 053331         CPA LB54        FOLLOWED BY A COMMA?
1562   06636 026643         JMP GTDN3       YES
1563   06637 063322   GTDN2 LDA L.15        NO
1564   06640 067424         LDB BDDLA       PRINT
1565   06641 117377         JSB ASRDA,I       ERROR
1566   06642 126625         JMP GTDNO,I
1567   06643 060001   GTDN3 LDA 1           DISC #
1568   06644 047312         ADB LM4
1569   06645 006020         SSB             < 4 ?
1570   06646 026653         JMP GTDN5       YES
1571   06647 063323   GTDN4 LDA L.17        NO
1572   06650 067430         LDB BADDA       PRINT
1573   06651 117377         JSB ASRDA,I       ERROR
1574   06652 126625         JMP GTDNO,I
1575   06653 037410   GTDN5 ISZ LTMPO       CHECK DISC TABLE?
1576   06654 026663         JMP GTDN6       NO
1577   06655 073410         STA LTMPO       YES, SAVE DISC #
1578   06656 043374         ADA LDTBL       DOES
1579   06657 006400         CLB               DISC
1580   06660 154000         CPB 0,I             EXIST?
1581   06661 026647         JMP GTDN4       NO
1582   06662 063410         LDA LTMPO       YES, LOAD DISC #
1583   06663 036625   GTDN6 ISZ GTDNO
1584   06664 126625         JMP GTDNO,I
1585*                               *
1586**   SET DISC TABLE ENTRY    **
1587*                               *
1588*
1589*   UPON ENTRY TEMP1 HOLDS THE DISC # AND TEMP2 HOLDS THE DISC'S
1590*   SELECT CODE.  IF TEMP2 > 0 UPON ENTRY, SEARCH THE INPUT
1591*   BUFFER FOR AN INTEGER IN [90,128] FOLLOWED BY A CARRIAGE RETURN.
1592*   IF FOUND, RESET THE DISC TABLE ENTRY APPROPRIATELY AND UNLOCK THE
1593*   TRACKS ON THE DISC, EXITING TO (P+2).  IF NO PROPER
1594*   INTEGER IS FOUND, PRINT AN ERROR AND EXIT TO (P+1).  IF TEMP2 = 0
1595*   UPON ENTRY, ZERO THE DISC'S TABLE ENTRY AND LOCK ITS TRACKS,
1596*   EXITING TO (P+2).
1597*
1598   06665 000000   SETDS NOP
1599   06666 167406         LDB TMP1A,I     COMPUTE ADDRESS OF PROPER
1600   06667 047374         ADB LDTBL           DISC TABLE ENTRY
1601   06670 163407         LDA TMP2A,I     DISC
1602   06671 002002         SZA               REMOVAL?
1603   06672 026710         JMP SETD3       NO
1604   06673 170001         STA 1,I         YES, REMOVE DISC
1605   06674 067312   SETD1 LDB LM4         SET
1606   06675 077411         STB LTMP1         COUNTER
1607   06676 167406         LDB TMP1A,I     COMPUTE
1608   06677 005020         BLS,BLS           TRACK TABLE
1609   06700 047373         ADB LTRAX           ADDRESS
1610   06701 003000         CMA             SET DISC AVAILABLE
```

```
1611   06702 170001    SETD2 STA 1,I
1612   06703 006004          INB                OR NOT AS
1613   06704 037411          ISZ LTMP1
1614   06705 026702          JMP SETD2              APPROPRIATE
1615   06706 036665          ISZ SETDS
1616   06707 126665          JMP SETDS,I
1617   06710 077412    SETD3 STB LTMP2         SAVE DTBL ADDRESS
1618   06711 017021          JSB INTGR         GET # OF SECTORS
1619   06712 053321          CPA LB15          END-OF-LINE?
1620   06713 026720          JMP SETD5         YES
1621   06714 063326    SETD4 LDA L.23          NO
1622   06715 067426          LDB ILTRA         PRINT
1623   06716 117377          JSB ASRDA,I         ERROR
1624   06717 126665          JMP SETDS,I
1625   06720 060001    SETD5 LDA 1
1626   06721 047305          ADB LM129         VERIFY RESULT
1627   06722 006021          SSB,RSS
1628   06723 026714          JMP SETD4            TO BE WITHIN
1629   06724 047330          ADB L.39
1630   06725 006020          SSB                   [90,128]
1631   06726 026714          JMP SETD4
1632   06727 001727          ALF,ALF           POSITION AND
1633   06730 073411          STA LTMP1            SAVE LENGTH
1634   06731 006400          CLB               DELETE
1635   06732 177412          STB LTMP2,I         PRIOR ENTRY
1636   06733 167407          LDB TMP2A,I       COMPUTE
1637   06734 002001          RSS                 TRIAL
1638   06735 047333    SETD6 ADB LB100             SELECT CODE PART
1639   06736 063374          LDA LDTBL         SET
1640   06737 073413          STA LTMP3           FOR
1641   06740 063312          LDA LM4               TABLE
1642   06741 073414          STA LTMP4               SEARCH
1643   06742 163413    SETD7 LDA LTMP3,I       SELECT CODE PART
1644   06743 013334          AND LB377           ALREADY
1645   06744 050001          CPA 1                 USED?
1646   06745 026735          JMP SETD6         YES
1647   06746 037413          ISZ LTMP3         NO, MORE
1648   06747 037414          ISZ LTMP4           TABLE ENTRIES?
1649   06750 026742          JMP SETD7         YES
1650   06751 047411          ADB LTMP1         NO, CREATE
1651   06752 177412          STB LTMP2,I         NEW ENTRY
1652   06753 003400          CCA               UNLOCK
1653   06754 026674          JMP SETD1           TRACKS
1654*                            *
1655**   GET A COMPLETE TRACK   **
1656*                            *
1657*
1658*   SEARCH ADT FOR A FULL TRACK.  IF NONE FOUND, TERMINATE
1659*   LOADING.  IF FOUND, RETURN WITH DISC ADDRESS IN (A).  IF
1660*   (A) = -1 UPON ENTRY, DELETE TRACK'S ADT ENTRY, ELSE SET
1661*   ITS SECTOR COUNT TO ZERO.
1662*
1663   06755 000000    GTTRK NOP
1664   06756 073411          STA LTMP1         SAVE FLAG
1665   06757 067315          LDB L.2           SET
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                                                                    [E]

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1666   06760 044137          ADB ADLEN      ENTRY COUNTER,          [E]
1667   06761 005100          BRS              SKIPPING LAST         [E]
1668   06762 077412          STB LTMP2          PSUEDO-ENTRY        [E]
1669   06763 067372          LDB ADTBF      (B) WILL HOLD ENTRY ADDRESSES
1670   06764 160001  GTTR1   LDA 1,I        LOAD ENTRY'S DISC ADDRESS
1671   06765 017011          JSB ISOTL      GET TRACK LENGTH
1672   06766 006004          INB              IN SECTORS
1673   06767 150001          CPA 1,I        ALL OF TRACK AVAILABLE?
1674   06770 026775          JMP GTTR2      YES
1675   06771 006004          INB            NO
1676   06772 037412          TSZ LTMP2      MORE ADT ENTRIES?
1677   06773 026764          JMP GTTR1      YES
1678   06774 127404          JMP ERR5A,I    NO
1679   06775 002400  GTTR2   CLA            CLAIM
1680   06776 170001          STA 1,I          TRACK
1681   06777 047314          ADB LM1        LOAD
1682   07000 160001          LDA 1,I          DISC ADDRESS
1683   07001 037411          TSZ LTMP1      REMOVE ENTRY?
1684   07002 126755          JMP GTTRK,I    NO
1685   07003 073412          STA LTMP2      YES
1686   07004 047315          ADB L.2        ELIMINATE
1687   07005 060001          LDA 1
1688   07006 017171          JSB MOVUP        ENTRY
1689   07007 063412          LDA LTMP2      RETRIEVE
1690   07010 126755          JMP GTTRK,I      DISC ADDRESS
1691*                            *
1692**   ISOLATE TRACK LENGTH   **
1693*                            *
1694*
1695*   ENTER WITH A DISC ADDRESS IN (A).  RETURN WITH THE LENGTH IN
1696*   SECTORS OF THE REFERENCED TRACK IN (A).
1697*
1698   07011 000000  ISOTL   NOP
1699   07012 001222          RAL,RAL        GET
1700   07013 013316          AND L.3          DISC #
1701   07014 043374          ADA LDTBL      LOAD WORD FROM
1702   07015 160000          LDA 0,I          DISC TABLE
1703   07016 001727          ALF,ALF        EXTRACT TRACK LENGTH
1704   07017 013334          AND LB377        IN SECTORS
1705   07020 127011          JMP ISOTL,I
1706*                            *
1707**   BUILD AN INTEGER   **
1708*                            *
1709*
1710*   SEARCH THE INPUT STRING FOR AN INTEGER.  IF FOUND, RETURN WITH
1711*   IT IN (B).  IF NO DIGITS ARE FOUND OR THE INTEGER OVERFLOWS
1712*   16 BITS, RETURN WITH 32767 IN (B).
1713*
1714   07021 000000  INTGR   NOP
1715   07022 003400          CCA            SET 'NO DIGITS'
1716   07023 073415          STA LTMP5        FLAG
1717   07024 002400          CLA            INITIALIZE TO ZERO
1718   07025 073416  INTG1   STA LTMP6      STORE PARTIAL RESULT
1719   07026 017233          JSB GETCR      MORE CHARACTERS?
1720   07027 027046          JMP INTG2      NO
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1721   07030 017220      JSB DIGCK     YES, DIGIT?
1722   07031 027046      JMP INTG2     NO
1723   07032 073415      STA LTMP5     YES, SAVE IT
1724   07033 063416      LDA LTMP6     MULITPLY PARTIAL
1725   07034 100200      MPY L.10        RESULT BY 10
1726   07036 000040      CLE           ADD IN
1727   07037 043415      ADA LTMP5        NEW DIGIT
1728   07040 006043      SEZ,SZB,RSS
1729   07041 002020      SSA           OVERFLOW?
1730   07042 002001      RSS           YES
1731   07043 027025      JMP INTG1     NO
1732   07044 067336      LDB INF       REPLACE WITH
1733   07045 127021      JMP INTGR,I     MAXIMUM INTEGER
1734   07046 067416 INTG2 LDB LTMP6    LOAD INTEGER
1735   07047 037415      ISZ LTMP5     ANY DIGITS FOUND?
1736   07050 127021      JMP INTGR,I   YES
1737   07051 067336      LDB INF       NO, LOAD ILLEGAL INTEGER
1738   07052 127021      JMP INTGR,I
1739*                                  *
1740**   CONVERT TWO-DIGIT INTEGER   **
1741*                                  *
1742*
1743*   SEARCH THE INPUT RECORD FOR A TWO-DIGIT INTEGER NOT TO EXCEED
1744*   -(TWODG,I UPON ENTRY).  IF FOUND, RETURN TO (P+2) WITH INTEGER
1745*   IN (B), ELSE EXIT TO ERROR ROUTINE.
1746*
1747   07053 000000  TWODG NOP
1748   07054 017233      JSB GETCR     FETCH
1749   07055 127405      JMP ERR7A,I     AND
1750   07056 017220      JSB DIGCK        VERIFY
1751   07057 127405      JMP ERR7A,I       DIGIT
1752   07060 006400      CLB           MULTIPLY
1753   07061 100200      MPY L.10        BY 10
1754   07063 073411      STA LTMP1        AND SAVE
1755   07064 017233      JSB GETCR     FETCH
1756   07065 127405      JMP ERR7A,I     AND
1757   07066 017220      JSB DIGCK        VERIFY
1758   07067 127405      JMP ERR7A,I       DIGIT
1759   07070 047411      ADB LTMP1     COMBINE WITH PRIOR RESULT
1760   07071 060001      LDA 1
1761   07072 143053      ADA TWODG,I   INTEGER
1762   07073 037053      ISZ TWODG       TOO
1763   07074 002020      SSA               LARGE?
1764   07075 127053      JMP TWODG,I   NO
1765   07076 127405      JMP ERR7A,I   YES
1766*                                  *
1767**   READ FROM PAPER TAPE   **
1768*                                  *
1769*
1770*   RETURN WITH A WORD FROM PAPER TAPE IN (B).  IF (E) = 1 UPON
1771*   ENTRY, READ ONLY THE NEXT FRAME.  IF (E) = 0 UPON ENTRY,
1772*   COMBINE THE NEXT TWO FRAMES INTO A 16-BIT RESULT.
1773*
1774   07077 000000  READ NOP
1775   07100 006600      CLB,CME
```

```
1776   07101 103713   READ1 STC 13B,C    READ
1777   07102 102313         SFS 13B       A
1778   07103 027102         JMP *-1         CHARACTER
1779   07104 106713         CLC 13B      INCLUSIVE OR
1780   07105 106413         MIB 13B        INTO (B)
1781   07106 002041         SEZ,RSS      SECOND CHARACTER TO BE READ?
1782   07107 127077         JMP READ,I   NO
1783   07110 005767         BLF,CLE,BLF  YES, MOVE FIRST CHARACTER
1784   07111 027101         JMP READ1       TO HIGH PART OF (B)
```

```
1786*                          *
1787**   VALIDATE ADDRESS    **
1788*                          *
1789*
1790*   ENTER WITH AN ADDRESS IN (B).  VERIFY THAT THIS!ADDRESS LIES
1791*   WITHIN AN AREA OF CORE CONTAINING TSB SYSTEM CODE.  IF THIS IS
1792*   NOT THE CASE, HLT 55 OCT WITH THE OFFENDING ADDRESS IN (A).
1793*
1794   07112 000000   ADVAL NOP
1795   07113 077411         STB LTMP1       SAVE ADDRESS
1796   07114 000040         CLE             BELOW
1797   07115 047365         ADB MAXAD          PROTECTED
1798   07116 002040         SEZ                    LOADER?
1799   07117 027137         JMP ADVA1       NO
1800   07120 047366         ADB SYSTA       YES, IN MAIN PART
1801   07121 006021         SSB,RSS             OF SYSTEM?
1802   07122 127112         JMP ADVAL,I     YES
1803   07123 047367         ADB MAXBA       NO, BELOW
1804   07124 006021         SSB,RSS            UNUSED SWAP AREA?
1805   07125 027137         JMP ADVA1       NO
1806   07126 047370         ADB BPAGA       YES, IN BASE PART
1807   07127 006021         SSB,RSS             OF SYSTEM?
1808   07130 127112         JMP ADVAL,I     YES
1809   07131 047371         ADB INRPA       NO, WITHIN LEGAL
1810   07132 006021         SSB,RSS             INTERRUPT AREA?
1811   07133 027137         JMP ADVA1       NO
1812   07134 047317         ADB LB11        YES,
1813   07135 006021         SSB,RSS            (A) OR (B) ?
1814   07136 127112         JMP ADVAL,I     NO
1815   07137 063323   ADVA1 LDA L.17        YES
1816   07140 067427         LDB BDADA       PRINT
1817   07141 117377         JSB ASRDA,I       ERROR
1818   07142 063411         LDA LTMP1       DISPLAY ADDRESS
1819   07143 102055         HLT 55B         WAIT FOR REREAD ATTEMPT
1820   07144 127403         JMP L46A,I
1821*                          *
1822**   VALIDATE TRACK NUMBER    **
1823*                          *
1824*
1825*   ENTER WITH AN INTEGER IN (B).  IF IT IS LESS THAN 64, EXIT WITH
1826*   (B) UNCHANGED; OTHERWISE, PRINT AN ERROR AND RETURN TO LOADER
1827*   SEQUENCE.
1828*
1829   07145 000000   PARCK NOP
1830   07146 060001         LDA 1
1831   07147 043306         ADA LM64        TRACK #
1832   07150 002020         SSA                < 64 ?
1833   07151 127145         JMP PARCK,I     YES
1834   07152 063321   PARC1 LDA L.13        NO
1835   07153 067431         LDB BADPA       PRINT 'BAD
1836   07154 117377         JSB ASRDA,I       TRACK #'
1837   07155 127402         JMP L22A,I
```

```
1839*                          *
1840**   FIND ADT POSITION   **
1841*                          *
1842*
1843*   SEARCH THE ADT FOR THE FIRST ENTRY WHOSE DISC ADDRESS IS EQUAL
1844*   TO OR EXCEEDS THE DISC ADDRESS IN LTMP4.  RETURN WITH A POINTER
1845*   TO THIS ENTRY IN (B).
1846*
1847   07156 000000   FADTP NOP
1848   07157 063414         LDA LTMP4       2'S COMPLEMENT
1849   07160 003104         CMA,CLE,INA      DISC ADDRESS
1850   07161 073410         STA LTMP0       SAVE IT
1851   07162 067372         LDB ADTBF       INITIAL ADT POINTER
1852   07163 140001   FADT1 ADA 1,I         FIRST ADT ENTRY >=
1853   07164 002040         SEZ              TRACK DISC ADDRESS?
1854   07165 127156         JMP FADTP,I     YES
1855   07166 063410         LDA LTMP0       NO, TRY
1856   07167 047315         ADB L.2            NEXT ENTRY
1857   07170 027163         JMP FADT1
1858*                          *
1859**   ELIMINATE ADT ENTRY   **
1860*                          *
1861*
1862*   ENTER WITH THE ADDRESS OF THE SCRATCHED ADT ENTRY IN (A) AND (B).
1863*   MOVE THE TABLE BELOW IT OVER IT AND DECREMENT THE ADT LENGTH
1864*   BY 2.
1865*
1866   07171 000000   MOVUP NOP
1867   07172 073421         STA SOURC       SAVE SOURCE ADDRESS
1868   07173 047313         ADB LM2         SAVE
1869   07174 077420         STB DEST          DESTINATION ADDRESS
1870   07175 040137         ADA ADLEN       COMPUTE
1871   07176 003004         CMA,INA           NUMBER OF
1872   07177 043372         ADA ADTBF           ENTRIES
1873   07200 003004         CMA,INA              TO BE
1874   07201 001100         ARS                    MOVED
1875   07202 073422         STA MCNT
1876   07203 104200   MOVU1 DLD SOURC,I     MOVE
1877   07205 104400         DST DEST,I        ENTRY
1878   07207 063421         LDA SOURC       UPDATE
1879   07210 073420         STA DEST
1880   07211 043315         ADA L.2           ADDRESSES
1881   07212 073421         STA SOURC
1882   07213 037422         ISZ MCNT        DONE?
1883   07214 027203         JMP MOVU1       NO
1884   07215 034137         ISZ ADLEN       YES, REDUCE TABLE LENGTH
1885   07216 034137         ISZ ADLEN          BY ONE ENTRY
1886   07217 127171         JMP MOVUP,I
```

```
1888*                          *
1889**   CHECK FOR A DIGIT  **
1890*                          *
1891*
1892*    ENTER WITH A CHARACTER IN (A).  IF IT IS A DIGIT, RETURN TO
1893*    (P+2) WITH THE BINARY DIGIT IN (A) AND (B).  OTHERWISE, RETURN
1894*    TO (P+1) WITH THE CHARACTER IN (A).
1895*
1896   07220 000000   DIGCK NOP
1897   07221 064000         LDB 0          ASCII
1898   07222 047310         ADB LD72        72 OCT OR
1899   07223 006021         SSB,RSS           GREATER?
1900   07224 127220         JMP DIGCK,I    YES
1901   07225 047320         ADB LB12       NO, ASCII 57 OCT
1902   07226 006020         SSB               OR LESS?
1903   07227 127220         JMP DIGCK,I    YES
1904   07230 060001         LDA 1          NO
1905   07231 037220         ISZ DIGCK
1906   07232 127220         JMP DIGCK,I
1907*                          *
1908**   FETCH INPUT CHARACTER   **
1909*                          *
1910*
1911*    RETURN TO (P+2) WITH THE NEXT NON-BLANK CHARACTER FROM THE INPUT
1912*    RECORD IN (A).  IF A CARRIAGE RETURN IS FOUND, RETURN TO (P+1)
1913*    WITH IT IN (A).
1914*
1915   07233 000000   GETCR NOP
1916   07234 067423         LDB BADDR      LOAD CHARACTER POINTER
1917   07235 037423         ISZ BADDR      ADVANCE IT
1918   07236 004065         CLE,ERB        LOAD
1919   07237 160001         LDA 1,I          WORD
1920   07240 002041         SEZ,RSS        ADJUST AS
1921   07241 001727         ALF,ALF          NECESSARY
1922   07242 013334         AND LB377      MASK OFF CHARACTER
1923   07243 053341         CPA BLANK      BLANK?
1924   07244 027234         JMP GETCR+1    YES, IGNORE IT
1925   07245 053321         CPA LB15       NO, CARRIAGE RETURN?
1926   07246 127233         JMP GETCR,I    YES, EXIT TO (P+1)
1927   07247 037233         ISZ GETCR      NO, EXIT
1928   07250 127233         JMP GETCR,I      TO (P+2)
1929*                          *                              [F]
1930**   GET MAG TAPE SELECT CODE   **                        [F]
1931*                          *                              [F]
1932*                                                         [F]
1933*    REQUEST MAG TAPE SELECT CODE.  IF THE ANSWER IS A CARRIAGE   [F]
1934*    RETURN, INDICATING PAPER TAPE RELOAD, RETURN TO (P+1).       [F]
1935*    OTHERWISE, LOOK FOR A SELECT CODE IN [16 OCT, 76 OCT]. A "*" [F]
1936*    FOLLOWING THE SELECT CODE DESIGNATES THE MAG TAPE CONTROLLER [F]
1937*    AS A 7970 TYPE. EXIT TO (P+2) AFTER FINDING A VALID SELECT   [F]
1938*    CODE.                                                        [F]
1939*                                                         [F]
1940   07251 000000   GETMT NOP                                   [F]
1941   07252 063327         LDA L.24       ASK                    [F]
1942   07253 067400         LDB MTSCA        FOR
```

```
1943  07254 117377        JSB ASRDA,I     MAG TAPE                      [F]
1944  07255 002400        CLA                 SELECT
1945  07256 117377        JSB ASRDA,I           CODE                    [F]
1946  07257 017233        JSB GETCR       EMPTY INPUT RECORD?           [F]
1947  07260 127251        JMP GETMT,I     YES, PAPER TAPE RELOAD        [F]
1948  07261 016563        JSB SELCD       GET SELECT CODE              [F]
1949  07262 000061        OCT 61             IN [16 OCT, 76 OCT]
1950  07263 027252        JMP GETMT+1     NOT FOUND                     [F]
1951  07264 177401        STB MTFLA,I     FOUND, SET FLAG TO 'MAG TAPE'[F]
1952  07265 053321        CPA LB15        CARRIAGE RETURN FOLLOWS?      [F]
1953  07266 027303        JMP GTMT3       YES                           [F]
1954  07267 053342        CPA STAR        NO, ASTERISK?                 [F]
1955  07270 027275        JMP GTMT2       YES                           [F]
1956  07271 063325  GTMT1 LDA L.21        NO, OUTPUT                    [F]
1957  07272 067425        LDB ILSCL          ERROR                      [F]
1958  07273 117377        JSB ASRDA,I          MESSAGE                  [F]
1959  07274 027252        JMP GETMT+1     REQUEST AGAIN                 [F]
1960  07275 017233  GTMT2 JSB GETCR       CARRIAGE RETURN FOLLOWS?      [F]
1961  07276 002001        RSS             YES                           [F]
1962  07277 027271        JMP GTMT1       NO                            [F]
1963  07300 163401        LDA MTFLA,I     FLAG                          [F]
1964  07301 033337        IOR SGNBT         AS                          [F]
1965  07302 173401        STA MTFLA,I        7970                       [F]
1966  07303 037251  GTMT3 ISZ GETMT                                     [F]
1967  07304 127251        JMP GETMT,I                                   [F]
```

```
1969   07305 177577   LM129 DEC  -129
1970   07306 177700   LM64  DEC  -64
1971   07307 177701   LD77  OCT  -77
1972   07310 177706   LD72  OCT  -72
1973   07311 177770   LM8   DEC  -8
1974   07312 177774   LM4   DEC  -4
1975   07313 177776   LM2   DEC  -2
1976   07314 177777   LM1   DEC  -1
1977   07315 000002   L.2   DEC  2
1978   07316 000003   L.3   DEC  3
1979   07317 000011   LB11  OCT  11
1980   07320 000012   L.10  DEC  10
1981   07320            LB12  EQU  L.10
1982   07321 000015   L.13  DEC  13
1983   07321            LB15  EQU  L.13
1984   07322 000017   L.15  DEC  15
1985   07323 000021   L.17  DEC  17
1986   07324 000024   L.20  DEC  20
1987   07325 000025   L.21  DEC  21
1988   07326 000027   L.23  DEC  23
1989   07327 000030   L.24 DEC 24                                           [F]
1990   07330 000047   L.39  DEC  39
1991   07331 000054   LB54  OCT  54
1992   07332 000060   LB60  OCT  60
1993   07333 000100   LB100 OCT  100
1994   07334 000377   LB377 OCT  377
1995   07335 000400   LB400 OCT  400
1996   07336 077777   INF   OCT  77777
1997   07337 100000   SGNBT OCT  100000                                     [F]
1998   07340 165300   MXADT DEC  -5440
1999   07341 000040   BLANK OCT  40
2000   07342 000052   STAR  OCT  52            '*'                          [F]
2001   07343 000055   DASH  OCT  55            '-'
2002   07344 006400   B6400 OCT  6400          CARRIAGE RETURN - NULL
2003   07345 000001   BMASK OCT  1,2,4,10,20,40,100,200,400,1000
2004   07357 002000         OCT  2000,4000,10000,20000,40000,100000
2005*
2006   07365 140100   MAXAD OCT  140100
2007   07366 023700   SYSTA ABS  37700B-14000B
2008   07367 012000   MAXBA ABS  14000B-2000B
2009   07370 001600   BPAGA ABS  2000B-200B
2010   07371 000165   INRPA ABS  200B-13B
2011*
2012   07372 025200   ADTBF DEF ADTBL       ADT BUFFER ADDRESS
2013   07373 000140   LTRAX DEF TRAX        ADDRESS OF AVAILABLE TRACK TABLE
2014   07374 000160   LDTBL DEF DTBL        DISC SELECT CODE TABLE ADDRESS
2015   07375 007345   BMSKA DEF BMASK       ADDRESS OF BIT MASK TABLE
2016   07376 011641   EBUFA DEF EBUF        ADDRESS OF ERROR BUFFER
2017   07377 002010   ASRDA DEF TTY35       ADDRESS OF TTY DRIVER
2018   07400 006034   MTSCA DEF MTSC                                        [F]
2019   07401 005666   MTFLA DEF MTFLG                                       [F]
2020   07402 004355   L22A  DEF LDR22
2021   07403 005057   L46A  DEF LDR46
2022   07404 004626   ERR5A DEF ERR5
2023   07405 005370   ERR7A DEF ERR7
```

```
2024   07406 005661   TMP1A DEF TEMP1
2025   07407 005662   TMP2A DEF TEMP2
```

```
2027   07410 000000   LTMP0 BSS 1
2028   07411 000000   LTMP1 BSS 1
2029   07412 000000   LTMP2 BSS 1
2030   07413 000000   LTMP3 BSS 1
2031   07414 000000   LTMP4 BSS 1
2032   07415 000000   LTMP5 BSS 1
2033   07416 000000   LTMP6 BSS 1
2034   07417 000000   MFLAG BSS 1           LOCK/UNLOCK MODE FLAG
2035   07420 000000   DEST  BSS 1
2036   07421 000000   SOURC BSS 1
2037   07422 000000   MCNT  BSS 1
2038   07423 000000   BADDR BSS 1           POINTER TO NEXT INPUT CHARACTER
2039*
2040   07424 006075   BDDLA DEF BDDL
2041   07425 006121   ILSCL DEF ILSCD
2042   07426 007433   ILTRA DEF ILTRL
2043   07427 007447   BDADA DEF BADAD
2044   07430 007460   BADDA DEF BADD
2045   07431 007471   BADPA DEF BADP
2046   07432 007500   TRKNA DEF TRKNL
2047*
2048   07433 005111   ILTRL OCT 5111
2049   07434 046114         ASC 10,LLEGAL TRACK LENGTH
2050   07446 006400         OCT 6400
2051   07447 005111   BADAD OCT 5111
2052   07450 046114         ASC 7,LLEGAL ADDRESS
2053   07457 006400         OCT 6400
2054   07460 005102   BADD  OCT 5102
2055   07461 040504         ASC 7,AD DISC NUMBER
2056   07470 006400         OCT 6400
2057   07471 005102   BADP  OCT 5102
2058   07472 040504         ASC 5,AD TRACK #
2059   07477 006400         OCT 6400
2060   07500 005103   TRKNL OCT 5103
2061   07501 040516         ASC 9,ANNOT LOCK TRACK #
```

2063*   [F]

```
2065*
2066*    IF THE MAG TAPE SELECT CODE IS NON-ZERO, TSB IS DUMPED IN ITS
2067*    ENTIRETY.  ON MAG TAPE FAILURES (HLT 11 OCT) THE DUMP MAY BE
2068*    RETRIED BY CORRECTING THE CAUSE OF ERROR AND PRESSING 'RUN'.
2069*
2070   10000                   ORG 10000B
2071   10000 064164   MTDMP LDB MAGSC        LOAD MAG TAPE SELECT CODE
2072   10001 006003         SZB,RSS          NON-ZERO?
2073   10002 026260         JMP MTDM8        NO
2074   10003 005665         ELB,CLE,ERB      CLEAR BIT15                    [F]
2075   10004 017457         JSB MTDIN        YES, CONFIGURE MAG TAPE DRIVER
2076*                             *
2077**   MOVE USER LIBRARY TRACK TABLE    **
2078*                             *
2079*
2080*    THE AREA OCCUPIED BY THE USER LIBRARY TRACK TABLE IS OVERWRITTEN
2081*    DURING THE MAG TAPE DUMP.  TO INSURE RESTARTIBILITY OF THE DUMP
2082*    AFTER A MAG TAPE FAILURE, THE TABLE IS MOVED TO A SECTION OF
2083*    CORE WHICH IS OTHERWISE UNUSED.
2084*
2085   10005 063562         LDA DM255        SET LENGTH
2086   10006 073626         STA DTMP0         OF MOVE
2087   10007 063666         LDA DULTB        SET
2088   10010 073627         STA DTMP1         DESTINATION ADDRESS
2089   10011 167665         LDB DULTT,I      LOAD SOURCE ADDRESS
2090   10012 160001   MTDM0 LDA 1,I          MOVE
2091   10013 173627         STA DTMP1,I       A WORD
2092   10014 006004         INB              ADVANCE
2093   10015 037627         ISZ DTMP1         POINTERS
2094   10016 037626         ISZ DTMP0        DONE?
2095   10017 026012         JMP MTDM0        NO
2096   10020           MTDM1 EQU *                                         [F]
2097   10020 067672         LDB MSTOC        B => STA XWNEC,I              [F]
2098   10021 002404         CLA,INA          A = WRITE REQUEST CODE        [F]
2099   10022           MTVFS EQU *           COME HERE FOR VERIFY START    [F]
2100   10022 072305         STA MTVFL        STORE REQUEST CODE            [F]
2101   10023 076667         STB MTVLC        SET 3030 DRIVER FOR VERIFY    [F]
2102   10024 077273         STB MTVLQ        SET 7970 FOR VERIFY           [F]
2103   10025 016356   MTRWD JSB MTD          REWIND                        [F]
2104   10026 000003         OCT 3             TAPE
2105   10027 016356         JSB MTD          GET                           [F]
2106   10030 000007         OCT 7             STATUS                       [F]
2107   10031 100111         RRL 9                                          [F]
2108   10032 006021         SSB,RSS          START OF TAPE?                [F]
2109   10033 026025         JMP MTRWD        NO                            [F]
2110*                             *
2111**   DUMP EQUIPMENT TABLE    **
2112*                             *
2113   10034 062346         LDA BPLEN        READ
2114   10035 173660         STA WORDN,I       SYSTEM                       [F]
2115   10036 063573         LDA BSPGA          BASE PAGE
2116   10037 067646         LDB BASPG           INTO
2117   10040 117657         JSB DISCN,I          CORE                      [F]
2118   10041 063563         LDA DM64         WRITE
2119   10042 067611         LDB DDIRA         EQUIPMENT
```

```
2120   10043 016302              JSB MTWR            TABLE TO TAPE              [F]
2121*                        *
2122**   DUMP ID TABLE    **
2123*                        *
2124   10044 064135              LDB IDLEN    READ
2125   10045 177660              STB WORDN,I                                    [F]
2126   10046 060134              LDA IDLOC      ID TABLE
2127   10047 067670              LDB DTRKR
2128   10050 117657              JSB DISCN,I      FROM DISC                     [F]
2129   10051 060135              LDA IDLEN    WRITE
2130   10052 067667              LDB DTRKB      ID TABLE
2131   10053 016302              JSB MTWR       ID TABLE TO TAPE               [F]
2132*                        *
2133**   DUMP TRACK TABLE   **
2134*                        *
2135   10054 063562              LDA DM255    WRITE
2136   10055 073626              STA DTMP0
2137   10056 067666              LDB DULTB        USER LIBRARY TRACK TABLE
2138   10057 077627              STB DTMP1
2139   10060 016302              JSB MTWR          TO TAPE                     [F]
2140*                                     *
2141**   DUMP USER LIBRARY TRACKS   **
2142*                                     *
2143*
2144*   NON-ZERO ENTRIES IN THE USER LIBRARY TRACK TABLE HOLD THE
2145*   LENGTH IN -WORDS FOR EACH DISC TRACK CONTAINING USER LIBRARY
2146*   PROGRAMS.  EACH SUCH TRACK IS DUMPED AS ONE RECORD IF NO
2147*   LONGER THAN 5440 WORDS, OTHERWISE AS TWO RECORDS.
2148*
2149   10061 063621              LDA DB400    LOAD DISC ADDRESS 0,1,0
2150   10062 167627       MTDM2  LDB DTMP1,I  USER LIBRARY
2151   10063 006003              SZB,RSS        TRACK?
2152   10064 026110              JMP MTDM3    NO
2153   10065 177660              STB WORDN,I  YES, SAVE LENGTH                 [F]
2154   10066 073630              STA DTMP2      AND DISC ADDRESS
2155   10067 067670              LDB DTRKR    READ USER PROGRAMS
2156   10070 117657              JSB DISCN,I    FROM DISC                      [F]
2157   10071 067667              LDB DTRKB    LOAD BUFFER ADDRESS
2158   10072 163660              LDA WORDN,I  WORD COUNT                       [F]
2159   10073 043624              ADA D5440    GREATER
2160   10074 002021              SSA,RSS        THAN 5440?
2161   10075 026105              JMP MTDE1    NO
2162   10076 073631              STA CCNT     YES, SAVE EXCESS COUNT
2163   10077 063561              LDA N5440    WRITE BLOCK
2164   10100 016302              JSB MTWR       OF 5440 WORDS                  [F]
2165   10101 063631              LDA CCNT     LOAD WORD COUNT
2166   10102 067667              LDB DTRKB    COMPUTE BUFFER
2167   10103 047624              ADB D5440      FOR REMAINDER
2168   10104 002001              RSS
2169   10105 163660       MTDE1  LDA WORDN,I  WRITE TRACK                      [F]
2170   10106 016302              JSB MTWR       TO TAPE                        [F]
2171   10107 063630              LDA DTMP2    UPDATE DISC ADDRESS
2172   10110 043621       MTDM3  ADA DB400      TO NEXT TRACK
2173   10111 037627              ISZ DTMP1    INCREMENT TABLE POINTER
2174   10112 037626              ISZ DTMP0    ALL TRACKS CONSIDERED?
```

```
2175   10113 026062          JMP MTDM2        NO
2176*                             *
2177**   DUMP DIRECTORY TRACKS   **
2178*                             *
2179*
2180*   EACH DIRECTORY TRACK OF NON-ZERO LENGTH IS DUMPED AS ONE
2181*   RECORD.  AN END-OF-FILE MARK FOLLOWS THE LAST TRACK DUMPED.
2182*
2183   10114 063566          LDA DM4          SET COUNTER FOR
2184   10115 073626          STA DTMP0          DIRECTORY TRACKS
2185   10116 063611          LDA DDIRA        LOAD DIRECTORY
2186   10117 164000  MTDM4   LDB 0,I            LENGTH
2187   10120 043574          ADA D.6          COMPUTE POINTER TO DISC ADDRESS
2188   10121 006003          SZB,RSS          EMPTY DIRECTORY TRACK?
2189   10122 026134          JMP MTDM5        YES
2190   10123 073627          STA DTMP1        NO, SAVE TABLE POINTER
2191   10124 177660          STB WORDN,I      READ                              [F]
2192   10125 160000          LDA 0,I            DIRECTORY
2193   10126 067670          LDB DTRKR            TRACK
2194   10127 117657          JSB DISCN,I            FROM DISC                   [F]
2195   10130 163660          LDA WORDN,I      WRITE                             [F]
2196   10131 067667          LDB DTRKB          DIRECTORY TRACK
2197   10132 016302          JSB MTWR             TO TAPE                       [F]
2198   10133 063627          LDA DTMP1        UPDATE
2199   10134 002004  MTDM5   INA                TABLE POINTER
2200   10135 037626          ISZ DTMP0        ALL FOUR DISCS CONSIDERED?
2201   10136 026117          JMP MTDM4        NO
2202   10137 016320          JSB MTWF         YES, WRITE EOF MARK               [F]
2203*                     *
2204**   DUMP SYSTEM   **
2205*                     *
2206*
2207*   THE SYSTEM IS READ INTO CORE IN ITS ENTIRETY.  IT IS DUMPED IN
2208*   SEGMENTS AS DEFINED IN THE SYSTEM SEGMENT INFORMATION TABLE.
2209*
2210   10140 062355          LDA MTBLN        WRITE SYSTEM
2211   10141 066354          LDB MLTBA          SEGMENT TABLE
2212   10142 016302          JSB MTWR             TO TAPE                       [F]
2213   10143 163647        ‐ LDA JSYS2,I      LOAD                              [F]
2214   10144 173660          STA WORDN,I                                        [F]
2215   10145 163650          LDA JDRTT,I                                        [F]
2216   10146 167651          LDB JSAD2,I        SYSTEM                          [F]
2217   10147 117657          JSB DISCN,I                                        [F]
2218   10150 163652          LDA JSYS3,I                                        [F]
2219   10151 173660          STA WORDN,I          FROM                          [F]
2220   10152 163653          LDA JDRT1,I                                        [F]
2221   10153 167654          LDB JSAD3,I                                        [F]
2222   10154 117657          JSB DISCN,I              DISC                      [F]
2223   10155 062354          LDA MLTBA        SET TABLE
2224   10156 073627          STA DTMP1          POINTER
2225   10157 062343          LDA MLTBL        SET
2226   10160 002004          INA                SEGMENT
2227   10161 073626          STA DTMP0            COUNTER
2228   10162 037627  MTDM6   ISZ DTMP1        LOAD
2229   10163 104200          DLD DTMP1,I          TABLE
```

2230   10165 037627   ISZ DTMP1   ENTRY
2231   10166 016302   JSB MTWR   WRITE SEGMENT TO TAPE   [F]
2232   10167 037626   ISZ DTMP0   MORE SEGMENTS?
2233   10170 026162   JMP MTDM6   YES
2234*   *
2235**   DUMP SYSTEM LIBRARY   **
2236*   *
2237*
2238*   THE SYSTEM LIBRARY IS DUMPED ONE PROGRAM AT A TIME.   AN
2239*   END-OF-FILE MARK FOLLOWS THE LAST ONE.
2240*
2241   10171 163664   LDA COM6A,I   SET POINTER TO ADDRESS TABLE
2242   10172 073627   STA DTMP1   OF SYSTEM LIBRARY PROGRAMS
2243   10173 067563   LDB DM64   READ
2244   10174 177660   STB WORDN,I   [F]
2245   10175 163627   LDA DTMP1,I   LENGTH TABLE
2246   10176 067671   LDB DMTRL
2247   10177 077630   STB DTMP2   OF SYSTEM
2248   10200 047625   ADB B100K
2249   10201 117657   JSB DISCN,I   LIBRARY PROGRAMS   [F]
2250   10202 163630   LDA DTMP2,I   SET ENTRY COUNTER
2251   10203 073626   STA DTMP0   OF LENGTH TABLE
2252   10204 163630   MTDM7 LDA DTMP2,I   READ
2253   10205 173660   STA WORDN,I   SYSTEM   [F]
2254   10206 163627   LDA DTMP1,I   LIBRARY
2255   10207 067670   LDB DTRKR   PROGRAM
2256   10210 117657   JSB DISCN,I   FROM DISC   [F]
2257   10211 163630   LDA DTMP2,I   WRITE
2258   10212 067667   LDB DTRKB   IT TO
2259   10213 016302   JSB MTWR   TAPE   [F]
2260   10214 037627   ISZ DTMP1   ADVANCE
2261   10215 037630   ISZ DTMP2   POINTERS
2262   10216 037626   ISZ DTMP0   DONE?
2263   10217 026204   JMP MTDM7   NO
2264   10220 016320   JSB MTWF   YES, WRITE EOF MARK   [F]
2265   10221 062305   LDA MTVFL   WAS THIS PASS VERIFY   [F]
2266   10222 002003   SZA,RSS   [F]
2267   10223 026256   JMP MTDMV   VERIFY COMPLETED OKAY   [F]
2268   10224 016356   JSB MTD   REWIND   [F]
2269   10225 000003   OCT 3   [F]
2270   10226   MTESQ   EQU *   [F]
2271   10226 063600   LDA D.10   [F]
2272   10227 067701   LDB VRFYA   PRINT "VERIFY"   [F]
2273   10230 117656   JSB TT35I,I   QUESTION   [F]
2274   10231 002400   CLA   [F]
2275   10232 117656   JSB TT35I,I   CALL FOR INPUT   [F]
2276   10233 117655   JSB MGTCA,I   GET THE FIRST CHARACTER   [F]
2277   10234 026241   JMP MTENR   EMPTY LINE IS ERROR   [F]
2278   10235 053645   CPA .Y   OPERATOR TYPE "YES"?   [F]
2279   10236 026245   JMP MTGVT   YES, GO VERIFY TAPE   [F]
2280   10237 053644   CPA .N   OPERATOR TYPE "NO"?   [F]
2281   10240 026250   JMP MTDMU   MUST NOT DESIRE VERIFY   [F]
2282   10241   MTENR   EQU *   [F]
2283   10241 063602   LDA DB17   [F]
2284   10242 067675   LDB ILINM   "ILLEGAL INPUT"   [F]

```
2285   10243 117656          JSB TT35I,I     COMPLAIN ABOUT QUALITY OF      [F]
2286   10244 026226          JMP MTESQ       ANSWER.                        [F]
2287   10245          MTGVT EQU *                                           [F]
2288   10245 002400          CLA             CODE FOR VERIFY                [F]
2289   10246 067673          LDB MCPAC       LOAD COMPARE INSTRUCTION       [F]
2290   10247 026022          JMP MTVFS       REPEAT SLEEP PROCESS,          [F]
2291*                                        WITH MINOR CHANGES             [F]
2292   10250 002400   MTDMU  CLA             SPACE ZERO FILES AND           [F]
2293   10251 006404          CLB,INB         ONE RECORD FORWARD             [F]
2294   10252 016356          JSB MTD                                        [F]
2295   10253 000004          OCT 4                                          [F]
2296   10254 026312          JMP MTDER                                      [F]
2297   10255 026312          JMP MTDER                                      [F]
2298   10256          MTDMV EQU *                                           [F]
2299   10256 016356          JSB MTD         REWIND AND
2300   10257 000005          OCT 5             STANDBY
2301   10260 162275   MTDM8  LDA ADD2K,I     SET
2302   10261 172276          STA ADD3K,I       ALL
2303   10262 066277          LDB ADD4K           STARTING
2304   10263 062300          LDA HLT22             SEQUENCES
2305   10264 170001          STA 1,I                 TO PRODUCE
2306   10265 006004          INB                       AN IRRECOVERABLE
2307   10266 062301          LDA JMPM1                    HLT 22B
2308   10267 170001          STA 1,I
2309   10270 063576          LDA DB10        PRINT
2310   10271 067674          LDB DONEA         'DONE'
2311   10272 117656          JSB TT35I,I                                    [F]
2312   10273 102077          HLT 77B         ALLOW NEW DUMP                 [E]
2313   10274 026020          JMP MTDM1         ON 'RUN'                     [E]
2314*
2315   10275 002000   ADD2K  OCT 2000        UTILITY WORDS FOR
2316   10276 003000   ADD3K  OCT 3000
2317   10277 004031   ADD4K  DEF LDR+1          DISABLING LOADER WITHOUT    [F]
2318   10300 102022   HLT22  HLT 22B
2319   10301 026000   JMPM1  OCT 26000           RELOADING TSB LOADER TAPE
2320*                                                                       [F]
2321   10302 000000   MTWR   NOP             WRITE OR VERIFY RECORD         [F]
2322   10303 072320          STA MTWF        SAVE BUFFER LENGTH             [F]
2323   10304 016356          JSB MTD                                        [F]
2324   10305 000001   MTVFL  OCT 1           THIS WORD IS A ONE FOR SLEEP,  [F]
2325*                                        CHANGED TO A ZERO FOR VERIFY   [F]
2326   10306 026312          JMP MTDER       TAPE                           [F]
2327   10307 026312          JMP MTDER        ERRORS                        [F]
2328   10310 052320          CPA MTWF        CHECK RECORD LENGTH            [F]
2329   10311 126302          JMP MTWR,I                                     [F]
2330*                   *
2331**   TAPE ERROR   **
2332*                   *
2333   10312 107700   MTDER  CLC 0,C                                        [F]
2334   10313 063604          LDA D.24        PRINT                          [F]
2335   10314 067676          LDB TAPMA         TAPE ERROR
2336   10315 117656          JSB TT35I,I         MESSAGE                    [F]
2337   10316 102011          HLT 11B         WAIT FOR
2338   10317 026020          JMP MTDM1         RETRY
2339*                                                                       [F]
```

```
2340  10320 000000   MTWF  NOP               TO WRITE OR VERIFY FILE MARK [F]
2341  10321 002400         CLA                                            [F]
2342  10322 052305         CPA  MTVFL         WRITE OR VERIFY?            [F]
2343  10323 026331         JMP  MTWFY         VERIFY                      [F]
2344  10324 016356         JSB  MTD           WRITE AN EOF MARK           [F]
2345  10325 000002         OCT  2                                         [F]
2346  10326 026312         JMP  MTDER         TAPE                        [F]
2347  10327 026312         JMP  MTDER            ERRORS                   [F]
2348  10330 126320         JMP  MTWF,I                                    [F]
2349  10331            MTWFY EQU  *                                       [F]
2350  10331 063565         LDA  DM5           TRY TO READ A SHORT         [F]
2351  10332 067667         LDB  DTRKB            RECORD INTO BUFFER       [F]
2352  10333 016356         JSB  MTD                                       [F]
2353  10334 000000         OCT  0                                         [F]
2354  10335 026340         JMP  MTWFZ                                     [F]
2355  10336 026312         JMP  MTDER         EXPECT END OF FILE          [F]
2356  10337 026312         JMP  MTDER         EXPECT END OF FILE          [F]
2357  10340 057616   MTWFZ CPB  DB200         EOF STATUS?                 [F]
2358  10341 126320         JMP  MTWF,I        YES, OKAY                   [F]
2359  10342 026312         JMP  MTDER         NO                          [F]
```

```
2361*                                          *
2362**   SYSTEM SEGMENT INFORMATION TABLE   **
2363*                                          *
2364*
2365*   THE FIRST WORD OF THE TABLE GIVES THE NUMBER OF SEGMENTS.   THE
2366*   TWO-WORD SEGMENT ENTRIES ARE THE LENGTH OF THE SEGMENT IN -WORDS
2367*   AND THE ABSOLUTE CORE ADDRESS.
2368*
2369  10343 177773   MLTBL DEC  -5            SYSTEM
2370  10344 177767         ABS  2-13B
2371  10345 000002         OCT  2                 SEGMENT
2372  10346 176200   BPLEN ABS  200B-2000B                             [F]
2373  10347 000200         OCT  200               TABLE
2374  10350 177751         ABS  LSLTB-LSLTE
2375  10351 004001         DEF  LSLTB
2376  10352 154500         ABS  14000B-37300B
2377  10353 014000         OCT  14000
2378  10354            MLTBE EQU  *
2379  10354 010343   MLTBA DEF  MLTBL         SYSTEM SEGMENT TABLE ADDRESS
2380  10355 177767   MTBLN ABS  MLTBL-MLTBE       SYSTEM SEGMENT TABLE LENGTH
```

```
2382   00000           CMND  EQU  0
2383   00000           DATA  EQU  0
2384*
2385*  CALLING SEQUENCE: (WRITE/READ)
2386*       LDA <BUFFER LENGTH>   (>0=CHARS, <0=WORDS)
2387*       LDB <BUFFER ADDRESS>
2388*       JSB MTAPE,I
2389*       OCT <COMMAND CODE>   (0=READ, 1=WRITE)
2390*       <EOF/EOT RETURN>
2391*       <ERROR RETURN>
2392*       <NORMAL RETURN>  (A)=RECORD LENGTH, (B)=STATUS
2393*
2394*       READ AND WRITE REQUESTS OF 0 LENGTH ARE RETURNED
2395*        BY THE DRIVER TO THE NORMAL RETURN LOCATION
2396*        WITHOUT ANY TAPE MOVEMENT.
2397*
2398*       THE FIRST WORD OF 2 BYTES WRITTEN ON TAPE IS THE
2399*        USER'S REQUEST LENGTH.  THIS WORD IS NOT STORED
2400*        IN THE USER'S BUFFER BY A READ REQUEST, BUT IS
2401*        LEFT IN THE A REGISTER IN THE FORM WHICH THE
2402*        USER SPECIFIED (+CHARACTERS OR -WORDS) AS THE
2403*        TAPE RECORD LENGTH IF THE TAPE RECORD < THE
2404*        BUFFER REQUEST LENGTH.
2405*
2406*       SINCE THE MINIMUM TAPE RECORD LENGTH WHICH CAN BE
2407*        WRITTEN OR READ IS 12 CHARACTERS OR 6 WORDS,
2408*        WRITE REQUESTS SMALLER THAN 5 WORDS WILL BE
2409*        WRITTEN AS AN EXTENDED RECORD OF 6 WORDS
2410*        (INCLUDING THE RECORD LENGTH WORD).
2411*
2412*       ALL USER READ BUFFERS SHOULD HAVE A MINUMUM STORAGE
2413*        AREA OF 5 WORDS SINCE THE SMALLEST RECORD THAT CAN
2414*        BE READ FROM THE TAPE IS 6 WORDS.  THE RECORD LENGTH
2415*        WORD IS STRIPPED BY THE DRIVER AND IS NOT STORED IN
2416*        THE USER BUFFER.
2417*
2418*  CALLING SEQUENCE: (REWIND/REWIND STANDBY/STATUS)
2419*       JSB MTAPE,I
2420*       OCT <COMMAND CODE>  (3=REWIND, 7=STATUS,
2421*       <NORMAL RETURN>          5=REWIND & STANDBY)
2422*
2423*
2424*  CALLING SEQUENCE:  (GAP/WRITE END OF FILE)
2425*       JSB MTAPE,I
2426*       OCT <COMMAND CODE>  (6=GAP, 2=END OF FILE)
2427*       <EOF/EOT RETURN>
2428*       <ERROR RETURN>
2429*       <NORMAL RETURN>      (B) = STATUS
2430*
2431*
2432*  CALLING SEQUENCE:  (POSITION)
2433*       LDA <FILE COUNT>      (+=FORWARD, -=REVERSE)
2434*       LDB <RECORD COUNT>         "            "
2435*       JSB MTAPE,I
2436*       OCT 4
```

```
2437*     <EOF/EOT RETURN>
2438*     <ERROR RETURN>
2439*     <NORMAL RETURN>    (A)=FILE COUNT, (B)=STATUS
2440*
2441*          A BACKFILE LEAVES THE TAPE POSITIONED ON THE SIDE OF
2442*           THE N-TH FILE MARK (-N IN A FOR BACKFILE) AWAY FROM
2443*           LOAD POINT. THUS (A) = -2 LEAVES THE TAPE AT THE
2444*           BEGINNING OF THE FILE PRECEEDING THE CURRENT FILE.
2445*
2446*          RECORD OPERATIONS WILL MOVE THE TAPE THE APPROPRIATE
2447*           # OF RECORDS. THE FILE MARK IS COUNTED AS 1 RECORD.
2448*
2449*          COMMANDS TRYING TO CROSS THE SOT OR EOT MARKERS WILL
2450*           CAUSE AN EXIT TO THE END OF TAPE RETURN POINT.
2451*
2452*          END OF TAPE ON READ, WRITE OR GAP WILL BE CHECKED
2453*           BEFORE THE OPERATION IS INITIATED.
2454*
2455*       TAPE COMMANDS -
2456*       OCT 0 - READ
2457*           1 - WRITE
2458*           2 - WRITE END OF FILE
2459*           3 - REWIND
2460*           4 - POSITION
2461*           5 - REWIND AND STANDBY
2462*           6 - GAP (3" BLANK TAPE)
2463*           7 - STATUS (RETURNS STATUS IN -B- )
2464*
2465*                                                               [F]
2466*
2467* THE STATUS WORD BIT ASSIGNMENTS FOR THE 3030 ARE:            [F]
2468*
2469* BIT   MEANING
2470*  0   BUSY (TAPE IN MOTION OR LOCAL STATUS)
2471*  1   PARITY ERROR
2472*  2   WRITE NOT ENABLED OR TAPE REWINDING
2473*  3   REJECT: 1 MOTION REQ'D AND CONTROLLER BUSY
2474*             2 BACKWARD MOTION REQ'D & AT LOAD POINT
2475*             3 WRITE COMMAND GIVEN AND NO WRITE RING
2476*  4   TIMING ERROR
2477*  5   END OF TAPE
2478*  6   START OF TAPE
2479*  7   END OF FILE
2480*  8   LOCAL MODE
2481*                                                               [F]
2482* THE STATUS WORD BIT ASSIGNMENTS FOR THE 7970 ARE:            [F]
2483*                                                               [F]
2484* BIT   MEANING                                                 [F]
2485*                                                               [F]
2486*  0   TAPE UNIT NOT ON-LINE                                    [F]
2487*  1   PARITY AND/OR TIMING ERROR                               [F]
2488*  2   FILE PROTECTED (NO WRITE ENABLE RING)                    [F]
2489*  3   REJECT: 1  MOTION REQ'D AND CONTROLLER BUSY              [F]
2490*             2  BACKWARD MOTION REQ'D & AT LOAD POINT          [F]
2491*             3  WRITE COMMAND GIVEN AND NO WRITE RING          [F]
```

```
2492*  4   TIMING ERROR                                      [F]
2493*  5   END OF TAPE                                       [F]
2494*  6   START OF TAPE                                     [F]
2495*  7   END OF FILE                                       [F]
2496*  8   CONTROLLER BUSY                                   [F]
2497*  9   TAPE UNIT NOT READY                               [F]
2498* 10   TAPE UNIT REWINDING                               [F]
2499* 11   ODD NUMBER OF BYTES READ                          [F]
```

```
2501  10356 000000  MTD   NOP            ** MAG TAPE DRIVER ENTRY **
2502  10357 073633         STA BUFL       SAVE LENGTH AND
2503  10360 077632         STB BUFA        ADDRESS OF BUFFER
2504  10361 060164         LDA MAGSC                              [F]
2505  10362 002020         SSA            7970?                   [F]
2506  10363 027026         JMP XMTD       YES                     [F]
2507  10364 102500  MT.21 LIA CMND        SET EOT FLAG
2508  10365 013607         AND DB40
2509  10366 073636         STA EOTF
2510  10367 016774         JSB AUTCK      INSURE TAPE UNIT IN AUTO [E]
2511  10370 063620  MT.52 LDA DB300       ISSUE A CLEAR COMMAND TO
2512  10371 017006         JSB CMAND       THE CONTROLLER AND WAIT.
2513  10372 162356         LDA MTD,I      FETCH OPERATION CODE
2514  10373 036356         ISZ MTD        INCREMENT RETURN POINT (P+2)
2515  10374 013575         AND DB7
2516  10375 042377         ADA TBASE      LOOK UP PROCESSOR IN TABLE
2517  10376 124000         JMP 0,I        CALL PROCESSOR
2518*
2519  10377 110400  TBASE DEF *+1,I       COMMAND PROCESSOR ENTRY
2520  10400 010623         DEF READT        POINT TABLE
2521  10401 010553         DEF WRITE
2522  10402 010543         DEF WEOF
2523  10403 010415         DEF REW
2524  10404 010424         DEF POS
2525  10405 010422         DEF RES
2526  10406 010536         DEF GAP
2527  10407 010534         DEF STAT
2528*
2529  10410 016530  EXIT  JSB STIN        GET STATUS, RECORD COUNT
2530  10411 036356         ISZ MTD        AND EXIT
2531  10412 036356         ISZ MTD
2532  10413 063633         LDA BUFL
2533  10414 126356         JMP MTD,I
2534*
2535  10415 063617  REW   LDA DB201       REWIND
2536  10416 102600  MT.20 OTA CMND
2537  10417 002006         INA,SZA        TIME OUT FOR TAPE UNIT
2538  10420 026417         JMP *-1        TO ACCEPT COMMAND
2539  10421 126356         JMP MTD,I
2540*
2541  10422 063612  RES   LDA DB101       REWIND AND STANDBY
2542  10423 026416         JMP MT.20
2543*
2544*     TAPE POSITIONING ROUTINE
2545*
2546*     ENTER WITH COMMANDS STORED IN BUFL AND BUFA.
2547*
2548  10424 067633  POS   LDB BUFL        GET FILE COUNT
2549  10425 016502         JSB ABS         SET FLAGS, COMMANDS AND COUNT
2550  10426 026436         JMP P.1         # FILES = 0, DO RECORDS
2551  10427 063633         LDA BUFL
2552  10430 002020         SSA            TEST FWD/REV
2553  10431 026451         JMP P.2        BACKSPACE FILES
2554  10432 016515         JSB SPACE      FORWARD SPACE
2555  10433 026432         JMP *-1        REPEAT UNTIL FILE
```

```
2556   10434 037635         ISZ CNT        CHECK FOR FINISHED
2557   10435 026432         JMP *-3        NO, LOOP
2558   10436 067632  P.1    LDB BUFA       PROCESS RECORDS
2559   10437 016502         JSB ABS        SET FOR FWD/REV RECORD SPACING
2560   10440 026410         JMP EXIT       NO RECORDS, EXIT
2561   10441 063632         LDA BUFA
2562   10442 002020         SSA            TEST FWD/REV
2563   10443 026472         JMP P.3        BACKSPACE RECORD
2564   10444 016515         JSB SPACE      FORWARD SPACE
2565   10445 000000         NOP            COUNT FILE MARK AS ONE RECORD
2566   10446 037635         ISZ CNT        FINISHED?
2567   10447 026444         JMP *-3        NO , LOOP
2568   10450 026410         JMP EXIT       YES RETURN
2569*
2570   10451 016530  P.2    JSB STIN       GET TAPE STATUS (BACKFILE)
2571   10452 013611         AND DB100      MASK FOR SOT
2572   10453 002002         SZA
2573   10454 026467         JMP P.4        SOT SET - EXIT IF CNT > 1
2574   10455 063634         LDA WCNT
2575   10456 017006         JSB CMAND      BACKSPACE
2576   10457 013616         AND DB200
2577   10460 002003         SZA,RSS        EOF?
2578   10461 026451         JMP P.2        NO, LOOP
2579   10462 037635         ISZ CNT        DONE?
2580   10463 026451         JMP P.2        NO, LOOP AGAIN
2581   10464 037632         ISZ BUFA       BUMP RECORD COUNTER TO RECROSS
2582   10465 026436         JMP P.1         LAST FILE MARK AND DO RECORDS
2583   10466 026410         JMP EXIT       NO RECORDS NOW, EXIT
2584*
2585   10467 037635  P.4    ISZ CNT        CNT = -1?
2586   10470 126356         JMP MTD,I      NO, TRIED TO CROSS SOT, ERROR
2587   10471 026436         JMP P.1        YES, DO RECORD SPACING
2588*
2589   10472 063634  P.3    LDA WCNT       BACKSPACE RECORD
2590   10473 017006         JSB CMAND
2591   10474 013611         AND DB100
2592   10475 002002         SZA            SOT?
2593   10476 126356         JMP MTD,I      YES - EOT EXIT
2594   10477 037635         ISZ CNT        DONE?
2595   10500 026472         JMP P.3        NO, LOOP
2596   10501 026410         JMP EXIT
2597*
2598   10502 000000  ABS    NOP            SET-UP ROUTINE
2599   10503 063571         LDA D.3        FORWARD SPACE COMMAND
2600   10504 006020         SSB            IF # IS < 0 SET FOR
2601   10505 063610         LDA DB41       BACKSPACE COMMAND
2602   10506 073634         STA WCNT
2603   10507 006021         SSB,RSS        GET -ABS(#) FOR CNT
2604   10510 007004         CMB,INB
2605   10511 077635         STB CNT
2606   10512 006002         SZB            IF = 0 EXIT CALL + 1
2607   10513 036502         ISZ ABS        OTHERWISE CALL + 2
2608   10514 126502         JMP ABS,I
2609*
2610   10515 000000  SPACE NOP             SPACE TAPE
```

```
2611   10516  016530          JSB  STIN      GET TAPE STATUS
2612   10517  013607          AND  DB40      CHECK FOR EOT
2613   10520  002002          SZA
2614   10521  126356          JMP  MTD,I     EOT EXIT
2615   10522  063634          LDA  WCNT
2616   10523  017006          JSB  CMAND     SPACE
2617   10524  013616          AND  DB200     CHECK FOR EOF
2618   10525  002002          SZA            RETURN CALL + 1 FOR EOF
2619   10526  036515          ISZ  SPACE
2620   10527  126515          JMP  SPACE,I
2621*
2622   10530  000000  STIN    NOP            GET TAPE STATUS
2623   10531  102500  S.1     LIA  CMND
2624   10532  106500  S.2     LIB  CMND
2625   10533  126530          JMP  STIN,I
2626*
2627   10534  016530  STAT    JSB  STIN      GET TAPE STATUS
2628   10535  126356          JMP  MTD,I     EXIT DRIVER
2629*
2630*                    WRITE 3" BLANK TAPE
2631*
2632   10536  016761  GAP     JSB  WNEC      CHECK FOR WRITE RING IN
2633   10537  017014          JSB  EOTC      CHECK FOR END OF TAPE
2634   10540  063577          LDA  DB11      COMMAND
2635   10541  017006          JSB  CMAND
2636   10542  026410          JMP  EXIT      NORMAL EXIT
2637*
2638*                    WRITE END OF FILE
2639*
2640   10543  016761  WEOF    JSB  WNEC      CHECK FOR WRITE RING IN
2641   10544  063606          LDA  DB35      WRITE FILE MARK CODE
2642   10545  017006          JSB  CMAND
2643   10546  023616          XOR  DB200
2644   10547  033636          IOR  EOTF      CHECK EOT
2645   10550  002002          SZA
2646   10551  126356          JMP  MTD,I
2647   10552  026410          JMP  EXIT
2648   10553  017014  WRITE   JSB  EOTC      WRITE **
2649   10554  016761          JSB  WNEC      CHECK FOR WRITE RING IN
2650   10555  016746          JSB  CNTR      GET NEG # WORDS
2651   10556  006021          SSB,RSS        IS REQUEST AT LEAST 5 WORDS?
2652   10557  063565          LDA  DM5       NO, PAD BUFFER
2653   10560  043570          ADA  DM1       ADD 1 FOR RECORD LENGTH
2654   10561  073635          STA  CNT
2655   10562  073634  RETRY   STA  WCNT      SAVE WORD COUNT              [F]
2656   10563  067632          LDB  BUFA      GET BUFFER ADDRESS
2657   10564  047570          ADB  DM1       INITIALIZE BUFFER POINTER
2658   10565  063605          LDA  DB31      WRITE CHARACTERS CODE
2659   10566  102600  MT.10   OTA  CMND      START FORWARD TAPE MOTION
2660   10567  063633          LDA  BUFL      FIRST WRITTEN WORD IS BUFL
2661   10570  001727  OUT     ALF,ALF        POSITION FIRST BYTE
2662   10571  102300  MT.8    SFS  DATA
2663   10572  026571          JMP  *-1       WAIT FOR DATA CHANNEL FLAG
2664   10573  103600  MT.9    OTA  DATA,C    WRITE FIRST BYTE
2665   10574  006004          INB            STEP BUFFER POINTER
```

```
2666   10575 001727           ALF,ALF      POSITION SECOND BYTE
2667   10576 102300    MT.2   SFS DATA
2668   10577 026576           JMP *-1      WAIT FOR DATA FLAG
2669   10600 103600    MT.3   OTA DATA,C   WRITE SECOND BYTE
2670   10601 160001           LDA 1,I      GET NEXT WORD
2671   10602 037634           ISZ WCNT     STEP AND TEST WORD COUNT
2672   10603 026570           JMP OUT      NOT END, LOOP
2673   10604 106700    MT.5   CLC DATA     INITIATE END OF RECORD SEQUENCE
2674   10605 002400           CLA          WAIT FOR CONTROL FLAG
2675   10606 017006           JSB CMAND      AND GET STATUS
2676   10607 013622           AND DB733    DISCARD EOT BIT
2677   10610 002003           SZA,RSS      TEST FOR ERRORS DURING WRITE
2678   10611 026410           JMP EXIT     NORMAL EXIT
2679   10612 063610           LDA DB41     BACKSPACE                     [F]
2680   10613 017006           JSB CMAND                                 [F]
2681   10614 063577           LDA DB11     GAP                          [F]
2682   10615 017006           JSB CMAND                                 [F]
2683   10616 013607           AND DB40                                  [F]
2684   10617 002002           SZA          EOT?                         [F]
2685   10620 027022           JMP ERR      YES                          [F]
2686   10621 063635           LDA CNT      NO,                          [F]
2687   10622 026562           JMP RETRY      RETRY                      [F]
2688*
2689   10623 017014    READT  JSB EOTC     READ
2690   10624 063564           LDA DM10
2691   10625 073637           STA ECNT     SET RETRY COUNTER TO -10
2692   10626 016746           JSB CNTR     GET NEG # OF WORDS
2693   10627 006021           SSB,RSS      IS REQUEST AT LEAST 5 WORDS?
2694   10630 063565           LDA DM5      NO, PAD BUFFER
2695   10631 073635           STA CNT
2696   10632 067635    RERED  LDB CNT      NEGATIVE WORD COUNT
2697   10633 063632           LDA BUFA
2698   10634 043570           ADA DM1
2699   10635 073400           STA XWNEC    INITIALIZE BUFFER POINTER    [F]
2700   10636 063603           LDA DB23     READ CHARACTERS CODE
2701   10637 102600    MT.40  OTA CMND     START TAPE MOTION
2702   10640 103700    MT.41  STC CMND,C
2703   10641 102300    MT.42  SFS DATA
2704   10642 026641           JMP *-1      WAIT FOR DATA FLAG
2705   10643 103500    MT.43  LIA DATA,C   READ TAPE RECORD LENGTH
2706   10644 001727           ALF,ALF
2707   10645 102200    MT.30  SFC CMND     CHECK FOR EOF/EOT
2708   10646 026727           JMP ENDR
2709   10647 102300    MT.44  SFS DATA
2710   10650 026645           JMP *-3      WAIT FOR DATA FLAG
2711   10651 103400    MT.45  MIA DATA,C
2712   10652 073140           STA XABS     SAVE RECORD LENGTH           [F]
2713   10653 102200    LOOP   SFC CMND     CHECK FOR END OF TAPE
2714   10654 026727           JMP ENDR
2715   10655 102300    MT.46  SFS DATA       OR NEXT WORD
2716   10656 026653           JMP *-3
2717   10657 103500    MT.47  LIA DATA,C   READ FIRST BYTE
2718   10660 001727           ALF,ALF      POSITION BYTE
2719   10661 037400           ISZ XWNEC    STEP BUFFER POINTER          [F]
2720   10662 102200    MT.51  SFC CMND
```

```
2721  10663 026727        JMP ENDR
2722  10664 102300  MT.48 SFS DATA
2723  10665 026662        JMP *-3
2724  10666 103400  MT.49 MIA DATA,C      READ AND MERGE SECOND BYTE
2725  10667 173400  MTVLC STA XWNEC,I     *** THIS WORD CHANGED ***    [F]
2726  10670 006007        INB,SZB,RSS     END OF BUFFER?               [F]
2727  10671 002001        RSS             NO COMPARE OR BUFFER END     [F]
2728  10672 026655        JMP MT.46       NOT END, READ NEXT WORD
2729  10673 006002        SZB             SKIP IF BUFFER END           [F]
2730  10674 026312        JMP MTDER       NO COMPARE ON VERIFY         [F]
2731  10675 106700  MT.50 CLC DATA        START END OF RECORD SEQUENCE
2732  10676 002400        CLA
2733  10677 017006        JSB CMAND       WIAT FOR END OF RECORD
2734  10700 013623        AND DB757       DISCARD TIMING ERROR BIT
2735  10701 002001        RSS             PROCESS END OF RECORD
2736  10702 016530  READX JSB STIN        RESTORE STATUS
2737  10703 013622        AND DB733       DISCARD NW AND EOT BITS
2738  10704 002003        SZA,RSS         ANY ERRORS?
2739  10705 026410        JMP EXIT        NO,DONE
2740  10706 013616        AND DB200       CHECK FOR END OF FILE
2741  10707 002002        SZA
2742  10710 126356        JMP MTD,I       EOF EXIT
2743  10711 074000        STB 0           RESTORE STATUS
2744  10712 037637        ISZ ECNT        HAVE WE TRIED 10 TIMES?
2745  10713 002001        RSS             NO
2746  10714 026720        JMP SHORT       YES, CHECK FOR SHORT RECORD  [F]
2747  10715 063610        LDA DB41        BACKSPACE
2748  10716 017006        JSB CMAND
2749  10717 026632        JMP RERED       TRY AGAIN
2750  10720 063632  SHORT LDA BUFA        RECORD                       [F]
2751  10721 003004        CMA,INA                                      [F]
2752  10722 043400        ADA XWNEC       < 5                          [F]
2753  10723 043565        ADA DM5                                      [F]
2754  10724 002020        SSA                     WORDS?               [F]
2755  10725 026623        JMP READT       YES                          [F]
2756  10726 027022        JMP ERR         NO                           [F]
2757* RECORD < BUFFER LENGTH, GET TAPE LENGTH IN USER'S BUFFER
2758*
2759  10727 063140  ENDR  LDA XABS        GET TAPE RECORD LENGTH       [F]
2760  10730 067633        LDB BUFL        GET USER BUFFER LENGTH
2761  10731 006020        SSB             CHECK USER'S SPECIFICATIONS:
2762  10732 026740        JMP *+6         USER SPECIFIED WORDS
2763  10733 002021        SSA,RSS         USER SPECIFIED CHARACTERS
2764  10734 026744        JMP ENDR1       BOTH ARE WORDS
2765  10735 001000        ALS             DIFFERENT, CONVERT TO CHARS
2766  10736 003004        CMA,INA
2767  10737 026744        JMP ENDR1
2768  10740 002020        SSA             CHECK TAPE TYPE
2769  10741 026744        JMP ENDR1       WORDS,
2770  10742 003004        CMA,INA         CHARACTERS, MAKE WORDS
2771  10743 001100        ARS
2772  10744 073633  ENDR1 STA BUFL        SAVE TAPE LENGTH FOR USER
2773  10745 026702        JMP READX       CONTINUE READ PROCESSING
2774*
2775  10746 000000  CNTR  NOP             GET NEG # WORDS IN A
```

```
2776   10747 063633        LDA BUFL        USER'S BUFFER LENGTH
2777   10750 002003        SZA,RSS
2778   10751 026410        JMP EXIT        0 LENGTH, DON'T READ OR WRITE
2779   10752 002020        SSA             WORDS OR CHARACTERS?
2780   10753 026756        JMP *+3         WORDS, LEAVE AS IS
2781   10754 003004        CMA,INA         CHARACTERS, CONVERT TO WORDS
2782   10755 001100        ARS
2783   10756 064000        LDB 0
2784   10757 047573        ADB D.5         RETURN WITH (NEG # WORDS + 5)
2785   10760 126746        JMP CNTR,I         IN B
```

```
2787   10761 000000   WNEC  NOP              CHECK FOR WRITE RING
2788   10762 102500   MT.12 LIA CMND
2789   10763 013572         AND D.4
2790   10764 002003         SZA,RSS
2791   10765 126761         JMP WNEC,I        EXIT WITH WRITE ENABLED
2792   10766 063603         LDA D.19          REQUEST
2793   10767 067700         LDB WNEA            WRITE
2794   10770 117656         JSB TT35I,I           RING              [F]
2795   10771 102033         HLT 33B           WAIT
2796   10772 016774         JSB AUTCK         INSURE TAPE UNIT IN AUTO    [E]
2797   10773 026762         JMP MT.12
2798*                                                                    [E]
2799*                       CHECK FOR TAPE UNIT IN AUTO                   [E]
2800*                                                                    [E]
2801   10774 000000   AUTCK NOP                                          [E]
2802   10775 102500   MT.1  LIA CMND          IS                        [E]
2803   10776 013621         AND DB400           STATUS                  [E]
2804   10777 002003         SZA,RSS               AUTO?                 [E]
2805   11000 126774         JMP AUTCK,I        YES                      [E]
2806   11001 063605         LDA D.25          NO                        [E]
2807   11002 067677         LDB MTLMA         REQUEST                   [E]
2808   11003 117656         JSB TT35I,I          AUTO                   [F]
2809   11004 102044         HLT 44B           WAIT                      [E]
2810   11005 026775         JMP MT.1                                    [E]
2811*
2812   11006 000000   CMAND NOP              ISSUE THE COMMAND IN -A-
2813   11007 102600   MT.14 OTA CMND
2814   11010 102300   MT.15 SFS CMND
2815   11011 027010         JMP *-1
2816   11012 016530         JSB STIN          GET TAPE STATUS
2817   11013 127006         JMP CMAND,I
2818*
2819   11014 000000   EOTC  NOP              CHECK FOR EOT
2820   11015 016530         JSB STIN
2821   11016 063636         LDA EOTF
2822   11017 002002         SZA
2823   11020 126356         JMP MTD,I
2824   11021 127014         JMP EOTC,I
2825*
2826   11022 016530   ERR   JSB STIN          ERROR EXIT
2827   11023 002400         CLA
2828   11024 036356         ISZ MTD
2829   11025 126356         JMP MTD,I
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2831  11026 017165  XMTD  JSB XSTIN       GET STATUS                      [F]
2832  11027 000010        SLA             CONTROLLER BUSY?                [F]
2833  11030 027166        JMP XS.1        YES, CONTINUE                   [F]
2834  11031 106700  XT.13 CLC DATA        CLEAR CONTROL BIT               [F]
2835  11032 106700  XT.16 CLC CMND          ON BOTH CHANNELS             [F]
2836  11033 063116        LDA SL0         NO                              [F]
2837  11034 102600  XT.1  OTA CMND        SELECT UNIT 0                   [F]
2838  11035 017432        JSB XATCK       INSURE TAPE UNIT IN AUTO        [F]
2839  11036 162356        LDA MTD,I       FETCH OPERATION CODE            [F]
2840  11037 013575        AND DB7         USE LOWER 3 BITS                [F]
2841  11040 053575        CPA DB7         STATUS REQUEST?                 [F]
2842  11041 027123        JMP ERR.1       YES, STATUS IN (B)              [F]
2843  11042 073140        STA XABS        NO                              [F]
2844  11043 063614        LDA DB110       ISSUE CLEAR                     [F]
2845  11044 017415        JSB XCMND          COMMAND                      [F]
2846  11045 063140        LDA XABS                                        [F]
2847  11046 036356        ISZ MTD         INCREMENT RETURN POINT (P+2)    [F]
2848  11047 043051        ADA XBASE       LOOK UP PROCESSOR IN TABLE      [F]
2849  11050 124000        JMP 0,I         CALL PROCESSOR                  [F]
2850*                                                                     [F]
2851  11051 111052  XBASE DEF *+1,I       COMMAND PROCESSOR ENTRY         [F]
2852  11052 011251        DEF XREAD          POINT TABLE                  [F]
2853  11053 011212        DEF XWRTE                                       [F]
2854  11054 011202        DEF XWEOF                                       [F]
2855  11055 011063        DEF XREW                                        [F]
2856  11056 011070        DEF XPOS                                        [F]
2857  11057 011061        DEF XRES                                        [F]
2858  11060 011172        DEF XGAP                                        [F]


2860  11061 063613  XRES  LDA DB105       REWIND/STANDBY COMMAND          [F]
2861  11062 002301        CCE,RSS                                         [F]
2862  11063 063612  XREW  LDA DB101       REWIND COMMAND                  [F]
2863  11064 002300        CCE                                             [F]
2864  11065 017415        JSB XCMND       INITIATE COMMAND EXECUTION      [F]
2865  11066 017165        JSB XSTIN       GET STATUS                      [F]
2866  11067 027124        JMP XIT1                                        [F]
2867*                                                                     [F]
2868** TAPE POSITIONING ROUTINE  **                                       [F]
2869*                                                                     [F]
2870* ENTER WITH COMMANDS STORED IN BUFA AND BUFL                         [F]
2871*                                                                     [F]
2872  11070 067633  XPOS  LDB BUFL        GET FILE COUNT                  [F]
2873  11071 063616        LDA DB200                                       [F]
2874  11072 017140        JSB XABS        SET FLAGS, COMMANDS AND COUNT   [F]
2875  11073 027107        JMP XP.1        # FILES = 0, DO RECORDS         [F]
2876  11074 003741  XP.5  CCA,SEZ,CCE,RSS  BACKWARDS MOTION?              [F]
2877  11075 017127        JSB XP.2        YES, GO CHECK FOR "BOT"         [F]
2878  11076 017153        JSB XSPCE       FORWARD SPACE                   [F]
2879  11077 027074        JMP XP.5        REPEAT UNTIL FILE               [F]
2880  11100 037370        ISZ XCNTR       FINISHED?                       [F]
2881  11101 027074        JMP XP.5        NO, LOOP                        [F]
2882  11102 063633        LDA BUFL                                        [F]
2883  11103 001276        RAL,CLE,SLA,ELA  BACKFILE REQUEST?              [F]
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2884   11104 037632          ISZ BUFA                                        [F]
2885   11105 000031          SLA,ARS      SKIP                               [F]
2886   11106 027121          JMP XIT                                         [F]
2887   11107 067632   XP.1   LDB BUFA     PROCESS RECORDS                    [F]
2888   11110 002400          CLA                                             [F]
2889   11111 017140          JSB XABS     SET FOR FWD/REV RECORD SPACE       [F]
2890   11112 027121          JMP XIT      NO RECORDS, EXIT                   [F]
2891   11113 003541   XP.0   CCA,SEZ,CLE,RSS  BACKWARDS MOTION?              [F]
2892   11114 017127          JSB XP.2     YES, GO CHECK FOR "BOT"            [F]
2893   11115 017153          JSB XSPCE    FORWARD SPACE                      [F]
2894   11116 001400   SL0    ALR          SELECT UNIT 0 COMMAND              [F]
2895   11117 037370          ISZ XCNTR    FINISHED?                          [F]
2896   11120 027113          JMP XP.0     NO, LOOP                           [F]
2897*                                                                        [F]
2898   11121 036356   XIT    ISZ MTD                                         [F]
2899   11122 017165          JSB XSTIN    GO LOAD THE MT STATUS              [F]
2900   11123 036356   ERR.1  ISZ MTD                                         [F]
2901   11124 063633   XIT1   LDA BUFL                                        [F]
2902   11125 106700   XT.4   CLC CMND     CLEAR MT COMMAND CONTROL BIT       [F]
2903   11126 126356          JMP MTD,I                                       [F]


2905   11127 000000   XP.2   NOP                                             [F]
2906   11130 017165          JSB XSTIN    GET STATUS                         [F]
2907   11131 001200          RAL          SHIFT SOT BIT TO A15.              [F]
2908   11132 002021          SSA,RSS      MT UNIT AT "SOT"?                  [F]
2909   11133 127127          JMP XP.2,I   NO, RETURN                         [F]
2910   11134 002040          SEZ          YES, FILE SKIPPING?                [F]
2911   11135 037370          ISZ XCNTR    CNT=-1?                            [F]
2912   11136 027124          JMP XIT1     NO, TRIED TO CROSS SOT             [F]
2913   11137 027107          JMP XP.1     YES, DO RECORD SPACING             [F]


2915   11140 000000   XABS   NOP          SET-UP ROUTINE                     [F]
2916   11141 006021          SSB,RSS                                         [F]
2917   11142 043571          ADA D.3      FORWARD SPACE COMMAND              [F]
2918   11143 006020          SSB          IF # IS < 0 SET FOR                [F]
2919   11144 043610          ADA DB41        BACKSPACE COMMAND               [F]
2920   11145 073400          STA XWNEC                                       [F]
2921   11146 006121          CLE,SSB,RSS  GET -ABS(#) FOR CNT                [F]
2922   11147 007306          CMB,CCE,INB,SZB IS THE MT TO BE MOVED?          [F]
2923   11150 037140          ISZ XABS     YES, EXIT TO (P+2)                 [F]
2924   11151 077370          STB XCNTR                                       [F]
2925   11152 127140          JMP XABS,I                                      [F]
2926   11153 000000   XSPCE  NOP                                             [F]
2927   11154 002120          CLE,SSA      IS TAPE MOTION BACKWARDS           [F]
2928   11155 017451          JSB XEOTC                                       [F]
2929   11156 063400          LDA XWNEC                                       [F]
2930   11157 017415          JSB XCMND    SPACE                              [F]
2931   11160 001210          RAL,SLA      EOF MARK?                          [F]
2932   11161 037153          ISZ XSPCE    YES                                [F]
2933   11162 002320          CCE,SSA      NO, IS THE TAPE AT SOT?            [F]
2934   11163 027124          JMP XIT1     YES                                [F]
2935   11164 127153          JMP XSPCE,I  NO                                 [F]
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2937  11165 000000  XSTIN NOP           GET TAPE STATUS             [F]
2938  11166 102500  XS.1  LIA CMND                                  [F]
2939  11167 064000        LDB 0         (B)= STATUS                 [F]
2940  11170 001727        ALF,ALF       (A)= STATUS SHIFTED 8 BITS  [F]
2941  11171 127165        JMP XSTIN,I                               [F]
2942*                                                               [F]
2943**  WRITE 4" BLANK TAPE  **                                     [F]
2944*                                                               [F]
2945  11172 017400  XGAP  JSB XWNEC     CHECK FOR WRITE RING        [F]
2946  11173 017451        JSB XEOTC     CHECK FOR END OF TAPE       [F]
2947  11174 063601        LDA DB15      COMMAND                     [F]
2948  11175 017415        JSB XCMND                                 [F]
2949  11176 027121        JMP XIT                                   [F]
2950*                                                               [F]
2951**  WRITE END OF FILE  **                                       [F]
2952*                                                               [F]
2953  11177 063610  XWEOR LDA DB41      BACKSPACE RECORD COMMAND    [F]
2954  11200 017415        JSB XCMND     EXECUTE COMMAND             [F]
2955  11201 027204        JMP RWEOF                                 [F]
2956  11202 017400  XWEOF JSB XWNEC     CHECK FOR WRITE             [F]
2957  11203 103100  XT.12 CLF DATA                                  [F]
2958  11204 063615  RWEOF LDA DB215     WRITE FILE MARK CODE        [F]
2959  11205 017415        JSB XCMND                                 [F]
2960  11206 005332        RBR,SLB,RBL   PARITY OR TIMING ERROR OCCUR?[F]
2961  11207 027177        JMP XWEOR     YES, GO BACKSPACE           [F]
2962  11210 017451        JSB XEOTC                                 [F]
2963  11211 027121        JMP XIT                                   [F]


2965  11212 017400  XWRTE JSB XWNEC     CHECK FOR WRITE ENABLED     [F]
2966  11213 017451        JSB XEOTC     CHECK FOR END OF TAPE       [F]
2967  11214 017370        JSB XCNTR     GET NEG # WORDS             [F]
2968  11215 043570        ADA DM1       ADD 1 FOR RECORD LENGTH     [F]
2969  11216 073400        STA XWNEC     SAVE WORD COUNT             [F]
2970  11217 063605        LDA DB31      WRITE RECORD COMMAND        [F]
2971  11220 017415        JSB XCMND     GO INITIATE WRITE SEQUENCE  [F]
2972  11221 103700  XT.9  STC DATA,C    INITIALIZE DATA CHANNEL     [F]
2973  11222 047632        ADB BUFA      BUFFER ADDRESS - 1          [F]
2974  11223 063633        LDA BUFL      FIRST WRITTEN WORD IS BUFL  [F]
2975  11224 006004  XOUT  INB           STEP BUFFER POINTER         [F]
2976  11225 102200  XT.20 SFC CMND                                  [F]
2977  11226 027235        JMP XT.5                                  [F]
2978  11227 102300  XT.2  SFS DATA      WAIT FOR                    [F]
2979  11230 027225        JMP XT.20       DATA FLAG                 [F]
2980  11231 103600  XT.3  OTA DATA,C    WRITE RECORD HEADER WORD    [F]
2981  11232 160001        LDA 1,I       GET NEXT WORD               [F]
2982  11233 037400        ISZ XWNEC     DONE                        [F]
2983  11234 027224        JMP XOUT      NO, LOOP                    [F]
2984  11235 106700  XT.5  CLC DATA      INITIATE END RECORD SEQUENCE[F]
2985  11236 102300  XT.10 SFS CMND      WRITE COMPLETE?             [F]
2986  11237 027236        JMP XT.10     NO, CONTINUE                [F]
2987  11240 017165        JSB XSTIN     YES, GET STATUS             [F]
2988  11241 005310        RBR,SLB       PARITY OR TIMING ERROR?     [F]
2989  11242 002101        CLE,RSS       YES                         [F]
2990  11243 027121        JMP XIT       NO                          [F]
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2991   11244 063610        LDA DB41      BACKSPACE                      [F]
2992   11245 017415        JSB XCMND                                    [F]
2993   11246 063601        LDA DB15      GAP                            [F]
2994   11247 017415        JSB XCMND                                    [F]
2995   11250 027452        JMP XEOTC+1   RETRY                          [F]


2997   11251 017451  XREAD JSB XEOTC     READ                           [F]
2998   11252 063567        LDA DM3       SET RETRY                      [F]
2999   11253 073153        STA XSPCE       COUNTER TO -3                [F]
3000   11254 017370        JSB XCNTR     GET NEG # OF WORDS             [F]
3001   11255 073370        STA XCNTR                                    [F]
3002   11256 003700  XRERD CCA,CCE                                      [F]
3003   11257 043632        ADA BUFA      BUFFER ADDRESS - 1             [F]
3004   11260 073400        STA XWNEC                                    [F]
3005   11261 002400        CLA           INITIALIZE RECORD              [F]
3006   11262 073140        STA XABS        LENGTH COUNTER               [F]
3007   11263 063603        LDA DB23      READ CHARACTERS CODE           [F]
3008   11264 017415        JSB XCMND     INITIATE READ RECORD SEQUENCE [F]
3009   11265 103700  XT.11 STC DATA,C    INITIALIZE DATA CHANNEL        [F]
3010   11266 067370        LDB XCNTR     LOAD NEG WORD COUNT            [F]
3011   11267 017361        JSB XWAIT     WAIT FOR 1ST WORD              [F]
3012   11270 073140        STA XABS      SAVE RECORD LENGTH             [F]
3013   11271 017361        JSB XWAIT     WAIT FOR NEXT WORD OR EOR      [F]
3014   11272 037400        ISZ XWNEC     STEP BUFFER POINTER            [F]
3015   11273 173400  MTVLQ STA XWNEC,I   *** THIS WORD CHANGED ***      [F]
3016   11274 006007        INB,SZB,RSS   END OF BUFFER?                 [F]
3017   11275 002001        RSS           END OF BUFFER OR NO COMPARE.   [F]
3018   11276 027362        JMP XLOOP                                    [F]
3019   11277 006002        SZB           END OF BUFFER                  [F]
3020   11300 026312        JMP MTDER     NO, NO COMPARE                 [F]
3021   11301 106700  XT.50 CLC DATA      YES, START EOR SEQUENCE        [F]
3022   11302 102300  XT.8  SFS CMND      READ FUNCTION COMPLETE?        [F]
3023   11303 027302        JMP XT.8      NO                             [F]
3024   11304 017165        JSB XSTIN     YES, RESTORE STATUS            [F]
3025   11305 002020        SSA           WAN AN "EOF" READ?             [F]
3026   11306 027124        JMP XIT1      YES, RETURN TO (P+2)           [F]
3027   11307 005332        RBR,SLB,RBL   PARITY OR TIMING ERROR         [F]
3028   11310 002001        RSS           YES                            [F]
3029   11311 027327        JMP XENDR     NO                             [F]
3030   11312 037153  NOISE ISZ XSPCE     HAVE WE TRIED 3 TIMES?         [F]
3031   11313 002101        CLE,RSS       NO                             [F]
3032   11314 027320        JMP XSHRT     YES                            [F]
3033   11315 063610        LDA DB41      BACKSPACE                      [F]
3034   11316 017415        JSB XCMND                                    [F]
3035   11317 027256        JMP XRERD     TRY AGAIN                      [F]
3036   11320 063632  XSHRT LDA BUFA      RECORD                         [F]
3037   11321 003004        CMA,INA                                      [F]
3038   11322 043400        ADA XWNEC       < 5                          [F]
3039   11323 043565        ADA DM5                                      [F]
3040   11324 002020        SSA               WORDS?                     [F]
3041   11325 027251        JMP XREAD     YES                            [F]
3042   11326 027123        JMP ERR.1     NO                             [F]
3043*                                                                   [F]
3044**   RECORD < BUFFER LENGTH, GET TAPE LENGTH IN USER'S BUFFER  ** [F]
```

```
3045*                                                                    [F]
3046   11327 063140   XENDR LDA XABS       GET TAPE RECORD LENGTH        [F]
3047   11330 002003         SZA,RSS        IS LENGTH 0?                  [F]
3048   11331 027312         JMP NOISE      YES, ASSUME TAPE NOISE        [F]
3049   11332 067633         LDB BUFL       GET USER BUFFER LENGTH        [F]
3050   11333 077632         STB BUFA       SAVE USER REUQEST             [F]
3051   11334 002020         SSA                                          [F]
3052   11335 027341         JMP XEND2                                    [F]
3053   11336 006020         SSB                                          [F]
3054   11337 001100         ARS                                          [F]
3055   11340 027344         JMP XEND1                                    [F]
3056*                                                                    [F]
3057   11341 006021   XEND2 SSB,RSS                                      [F]
3058   11342 001000         ALS                                          [F]
3059   11343 003004         CMA,INA                                      [F]
3060   11344 073633   XEND1 STA BUFL       SAVE TAPE LENGTH FOR USER     [F]
3061   11345 006021         SSB,RSS        USER LENGTH IN CHARS?         [F]
3062   11346 007004         CMB,INB        YES                           [F]
3063   11347 040001         ADA 1          NO                            [F]
3064   11350 007004         CMB,INB                                      [F]
3065   11351 002021         SSA,RSS        RECORD LENGTH > USER REQUEST?[F]
3066   11352 077633         STB BUFL       YES, STORE USER REQUEST LENGT[F]
3067   11353 063633         LDA BUFL                                     [F]
3068   11354 067632         LDB BUFA       GET ORIGINAL REQUEST          [F]
3069   11355 006020         SSB            USER REQUEST FOR WORDS?       [F]
3070   11356 003004         CMA,INA        YES, NEGATE ACTUAL LENGTH     [F]
3071   11357 073633         STA BUFL       NO                            [F]
3072   11360 027121         JMP XIT        CONTINUE READ PROCESSING      [F]


3074   11361 000000   XWAIT NOP                                          [F]
3075   11362 102200   XLOOP SFC CMND       END-OF-RECORD?                [F]
3076   11363 027301         JMP XT.50      YES                           [F]
3077   11364 102300   XT.46 SFS DATA       NO, NEXT WORD READY?          [F]
3078   11365 027362         JMP XLOOP      NO                            [F]
3079   11366 103500   XT.43 LIA DATA,C     YES, LOAD DATA WORD           [F]
3080   11367 127361         JMP XWAIT,I                                  [F]


3082   11370 000000   XCNTR NOP                                          [F]
3083   11371 063633         LDA BUFL       USER'S BUFFER LENGTH          [F]
3084   11372 002320         CCE,SSA        WORDS?                        [F]
3085   11373 127370         JMP XCNTR,I    YES                           [F]
3086   11374 003007         CMA,INA,SZA,RSS NO, CHARACTERS               [F]
3087   11375 027121         JMP XIT        DONE IF REQUEST=0             [F]
3088   11376 001100         ARS                                          [F]
3089   11377 127370         JMP XCNTR,I                                  [F]


3091   11400 000000   XWNEC NOP                                          [F]
3092   11401 017165         JSB XSTIN      GET STATUS                    [F]
3093   11402 001310         RAR,SLA        UNIT READY?                   [F]
3094   11403 027166         JMP XS.1       NO                            [F]
3095   11404 005363         RBR,CLE,RBR    YES                           [F]
3096   11405 006011         SLB,RSS        WRITE ENABLED?                [F]
```

```
3097   11406 127400          JMP XWNEC,I   YES                           [F]
3098   11407 063603          LDA D.19      NO                            [F]
3099   11410 067700          LDB WNEA      OUTPUT                        [F]
3100   11411 117656          JSB TT35I,I      MESSAGE                    [F]
3101   11412 102033          HLT 33B       HALT                          [F]
3102   11413 017432          JSB XATCK     CHECK FOR AUTO                [F]
3103   11414 027401          JMP XWNEC+1                                 [F]


3105   11415 000000   XCMND  NOP                                         [F]
3106   11416 102600   XT.14  OTA CMND      OUTPUT COMMAND                [F]
3107   11417 106500   XS.0   LIB CMND      LOAD STATUS WORD              [F]
3108   11420 005323          RBR,RBR                                     [F]
3109   11421 005310          RBR,SLB       REQUEST REJECTED              [F]
3110   11422 027443          JMP REJCT     YES                           [F]
3111   11423 103700   XT.7   STC CMND,C    NO, INITIATE EXECUTION        [F]
3112   11424 007540          CCB,SEZ,CLE   READ OR WRITE?                [F]
3113   11425 127415          JMP XCMND,I   YES, RETURN                   [F]
3114   11426 102300   XT.15  SFS CMND                                    [F]
3115   11427 027426          JMP XT.15                                   [F]
3116   11430 017165          JSB XSTIN     GET STATUS                    [F]
3117   11431 127415          JMP XCMND,I                                 [F]
3118*                                                                    [F]
3119**   CHECK FOR TAPE UNIT IN AUTO  **                                 [F]
3120*                                                                    [F]
3121   11432 000000   XATCK  NOP                                         [F]
3122   11433 017165          JSB XSTIN     GET STATUS                    [F]
3123   11434 006111          CLE,SLB,RSS   UNIT IN AUTO?                 [F]
3124   11435 127432          JMP XATCK,I   YES                           [F]
3125   11436 063605          LDA D.25      OUTPUT                        [F]
3126   11437 067677          LDB MTLMA                                   [F]
3127   11440 117656          JSB TT35I,I      MESSAGE                    [F]
3128   11441 102044          HLT 44B       HALT                          [F]
3129   11442 027433          JMP XATCK+1                                 [F]


3131   11443 067614   REJCT  LDB DB110     LOAD CLEAR COMMAND            [F]
3132   11444 106600   O.B    OTB CMND      OUTPUT IT                     [F]
3133   11445 103700   XT.6   STC CMND,C    INITIATE IT                   [F]
3134   11446 102300   XT.0   SFS CMND      COMPLETED?                    [F]
3135   11447 027446          JMP XT.0      NO                            [F]
3136   11450 027416          JMP XT.14     YES                           [F]


3138   11451 000000   XEOTC  NOP                                         [F]
3139   11452 017165          JSB XSTIN     GET STATUS                    [F]
3140   11453 001763          ALF,CLE,RAR   SHIFT "EOT" TO A0             [F]
3141   11454 000010          SLA           AT "EOT"                      [F]
3142   11455 027124          JMP XIT1      YES                           [F]
3143   11456 127451          JMP XEOTC,I   NO                            [F]
```

```
3145*
3146*      ENTER WITH THE LOWER MAG TAPE SELECT CODE IN (B).  ALL I/O
3147*      INSTRUCTIONS IN THE MAG TAPE DRIVER ARE MODIFIED TO
3148*      REFERENCE THE GIVEN I/O PORT.
3149*
3150   11457 000000   MTDIN NOP                                            [F]
3151   11460 077640         STB MTSCD      SAVE SELECT CODE                [F]
3152   11461 067661         LDB CON1A      GET STARTING POINTER            [F]
3153   11462 160001   MTDI1 LDA 1,I        GET INSTRUCTION                 [F]
3154   11463 013563         AND DM64       MASK OUT OLD SELECT CODE        [F]
3155   11464 033640         IOR MTSCD      MERGE IN NEW SELECT CODE        [F]
3156   11465 170001         STA 1,I        SAVE IT                         [F]
3157   11466 006004         INB                                            [F]
3158   11467 057662         CPB CON2A      FINISHED DATA CHANNEL?          [F]
3159   11470 037640         ISZ MTSCD      YES, BUMP SELECT CODE           [F]
3160   11471 057663         CPB CON3A      FINISHED COMMAND CHANNEL?       [F]
3161   11472 127457         JMP MTDIN,I    YES                             [F]
3162   11473 027462         JMP MTDI1      NO                              [F]
3163*                                                                      [F]
3164   11474 010600   CON1  DEF MT.3       DATA CHANNEL INSTRUCTIONS       [F]
3165   11475 010573         DEF MT.9                                       [F]
3166   11476 011231         DEF XT.3                                       [F]
3167   11477 010643         DEF MT.43                                      [F]
3168   11500 010657         DEF MT.47                                      [F]
3169   11501 011366         DEF XT.43                                      [F]
3170   11502 010651         DEF MT.45                                      [F]
3171   11503 010666         DEF MT.49                                      [F]
3172   11504 010604         DEF MT.5                                       [F]
3173   11505 010675         DEF MT.50                                      [F]
3174   11506 011235         DEF XT.5                                       [F]
3175   11507 011301         DEF XT.50                                      [F]
3176   11510 011031         DEF XT.13                                      [F]
3177   11511 010576         DEF MT.2                                       [F]
3178   11512 010571         DEF MT.8                                       [F]
3179   11513 010641         DEF MT.42                                      [F]
3180   11514 010647         DEF MT.44                                      [F]
3181   11515 010655         DEF MT.46                                      [F]
3182   11516 010664         DEF MT.48                                      [F]
3183   11517 011227         DEF XT.2                                       [F]
3184   11520 011364         DEF XT.46                                      [F]
3185   11521 011221         DEF XT.9                                       [F]
3186   11522 011265         DEF XT.11                                      [F]
3187   11523 011203         DEF XT.12                                      [F]
3188   11524 010775   CON2  DEF MT.1       COMMAND CHANNEL INSTRUCTIONS    [F]
3189   11525 010762         DEF MT.12                                      [F]
3190   11526 010364         DEF MT.21                                      [F]
3191   11527 010531         DEF S.1                                        [F]
3192   11530 011166         DEF XS.1                                       [F]
3193   11531 010532         DEF S.2                                        [F]
3194   11532 011417         DEF XS.0                                       [F]
3195   11533 010653         DEF LOOP                                       [F]
3196   11534 010645         DEF MT.30                                      [F]
3197   11535 010662         DEF MT.51                                      [F]
3198   11536 011362         DEF XLOOP                                      [F]
3199   11537 011225         DEF XT.20                                      [F]
```

```
3200  11540 011010      DEF  MT.15                              [F]
3201  11541 011426      DEF  XT.15                              [F]
3202  11542 011446      DEF  XT.0                               [F]
3203  11543 011236      DEF  XT.10                              [F]
3204  11544 011302      DEF  XT.8                               [F]
3205  11545 010566      DEF  MT.10                              [F]
3206  11546 011007      DEF  MT.14                              [F]
3207  11547 010416      DEF  MT.20                              [F]
3208  11550 010637      DEF  MT.40                              [F]
3209  11551 011416      DEF  XT.14                              [F]
3210  11552 011034      DEF  XT.1                               [F]
3211  11553 010640      DEF  MT.41                              [F]
3212  11554 011423      DEF  XT.7                               [F]
3213  11555 011445      DEF  XT.6                               [F]
3214  11556 011444      DEF  O.B                                [F]
3215  11557 011125      DEF  XT.4                               [F]
3216  11560 011032      DEF  XT.16                              [F]
3217  11561         CON3  EQU  *                                [F]
```

```
3219   11561 165300   N5440 DEC -5440
3220   11562 177401   DM255 DEC -255
3221   11563 177700   DM64  DEC -64
3222   11564 177766   DM10  DEC -10
3223   11565 177773   DM5   DEC -5
3224   11566 177774   DM4   DEC -4
3225   11567 177775   DM3   DEC -3                                [F]
3226   11570 177777   DM1   DEC -1
3227   11571 000003   D.3   OCT 3
3228   11572 000004   D.4   DEC 4
3229   11573 000005   D.5   DEC 5
3230   11574 000006   D.6   DEC 6
3231   11575 000007   DB7   OCT 7
3232   11576 000010   DB10  OCT 10
3233   11577 000011   DB11  OCT 11
3234   11600 000012   D.10  DEC 10                               [F]
3235*                                                            [F]
3236   11601 000015   DB15  OCT 15
3237*                                                            [F]
3238   11602 000017   DB17  OCT 17                               [F]
3239   11603 000023   DB23  OCT 23
3240   11603           D.19  EQU DB23
3241   11604 000030   D.24  DEC 24
3242   11605 000031   DB31  OCT 31
3243   11605           D.25  EQU DB31
3244*                                                            [F]
3245   11606 000035   DB35  OCT 35
3246   11607 000040   DB40  OCT 40
3247   11610 000041   DB41  OCT 41
3248*                                                            [F]
3249   11611 000100   DB100 OCT 100
3250   11612 000101   DB101 OCT 101
3251   11613 000105   DB105 OCT 105                              [F]
3252*                                                            [F]
3253   11614 000110   DB110 OCT 110                              [F]
3254   11615 000215   DB215 OCT 215                              [F]
3255*                                                            [F]
3256   11616 000200   DB200 OCT 200
3257   11617 000201   DB201 OCT 201
3258   11620 000300   DB300 OCT 300
3259   11621 000400   DB400 OCT 400
3260   11622 000733   DB733 OCT 733
3261   11623 000757   DB757 OCT 757
3262   11624 012500   D5440 DEC 5440
3263*                                                            [F]
3264   11625 100000   B100K OCT 100000
3265*                                                            [F]
```

```
3267*                                                                   [F]
3268   11626 000000   DTMP0 BSS  1
3269   11627 000000   DTMP1 BSS  1
3270   11630 000000   DTMP2 BSS  1
3271*                                                                   [F]
3272   11631 000000   CCNT  BSS  1           TTY CHARACTER COUNT
3273*                                                                   [F]
3274   11632 000000   BUFA  BSS  1           MTD BUFFER ADDRESS
3275   11633 000000   BUFL  BSS  1           MTD BUFFER LENGTH
3276   11634 000000   WCNT  BSS  1           MTD WORD COUNT
3277   11635 000000   CNT   BSS  1           MTD RECORD COUNT
3278   11636 000000   EOTF  BSS  1           END-OF-TAPE FLAG
3279   11637 000000   ECNT  BSS  1           MTD RETRY COUNTER
3280   11640 000000   MTSCD BSS  1                                      [F]
3281   11641 000000   EBUF  BSS  2
3282   11643 026040         ASC  1,,
3283*
3284   11644 000116   .N    OCT  116                                    [F]
3285   11645 000131   .Y    OCT  131                                    [F]
3286   11573         BSPGA EQU  D.5           BASE PAGE DISC ADDRESS
3287   11646 100200   BASPG OCT  100200       BASE PAGE CORE ADDRESS
3288   11647 002501   JSYS2 DEF  BSYS2                                  [F]
3289   11650 002504   JDRTT DEF  LDRTT                                  [F]
3290   11651 002507   JSAD2 DEF  BSAD2                                  [F]
3291   11652 002502   JSYS3 DEF  BSYS3                                  [F]
3292   11653 002505   JDRT1 DEF  LDRTT+1                                [F]
3293   11654 002510   JSAD3 DEF  BSAD3                                  [F]
3294   11655 007233   MGTCA DEF  GETCR                                  [F]
3295   11656 002010   TT35I DEF  TTY35                                  [F]
3296   11657 002145   DISCN DEF  DISCD                                  [F]
3297   11660 002423   WORDN DEF  WORDC                                  [F]
3298   11661 111474   CON1A DEF  CON1,I                                 [F]
3299   11662 111524   CON2A DEF  CON2,I                                 [F]
3300   11663 111561   CON3A DEF  CON3,I                                 [F]
3301   11664 004002   COM6A DEF  COM6
3302   11665 004027   DULTT DEF  ULTTA        => USER LIRARY TRACK TABLE
3303   11666 006000   DULTB DEF  6000B        DUMP BUFFER ADDRESS FOR ULTTB
3304   11611         DDIRA EQU  DB100
3305   11667 012500   DTRKB DEF  IDTBL        DUMP TRACK BUFFER ADDRESS
3306   11670 112500   DTRKR ABS  IDTBL+100000B  DISC READ FORM OF DTRKB
3307   11671 003003   DMTRL DEF  MTRLT        => SYSTEM LIBRARY LENGTHS BUFFER
3308   11672 173400   MSTOC STA  XWNEC,I      WORD TO RESTORE READ       [F]
3309   11673 153400   MCPAC CPA  XWNEC,I      WORD READ MATCH BUFFER?    [F]
3310*                                                                   [F]
3311*
3312   11674 011702   DONEA DEF  DONEM
3313   11675 011706   ILINM DEF  ILIN                                   [F]
3314   11676 011716   TAPMA DEF  TAPMS
3315*                                                                   [F]
3316   11677 011742   MTLMA DEF  MTLM
3317   11700 011757   WNEA  DEF  WNE
3318   11701 011771   VRFYA DEF  VRFY                                   [F]
3319*
3320   11702 006412   DONEM OCT  6412
3321   11703 042117         ASC  2,DONE
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3322   11705 006412              OCT 6412
3323   11706 005111      ILIN    OCT 5111
3324   11707 046114              ASC 6,LLEGAL INPUT
3325   11715 006400              OCT 6400
3326   11716 005124      TAPMS   OCT 5124
3327   11717 040520              ASC 10,APE BAD OR TOO SHORT
3328   11731 006412              OCT 6412
3329   11732 005104      DISCF   OCT 5104
3330   11733 044523              ASC 7,ISC FAILURE:
3331   11742 005103      MTLM    OCT 5103
3332   11743 044101              ASC 11,HANGE MAG TAPE TO AUTO
3333   11756 006400              OCT 6400
3334   11757 005127      WNE     OCT 5127                                    [E]
3335   11760 051111              ASC 8,RITE NOT ENABLED
3336   11770 006400              OCT 6400
3337   11771 005126      VRFY    OCT 5126                                    [F]
3338   11772 042522              ASC 4,ERIFY ?                               [F]
```

```
3340*
3341*   UPON ENTRY (A) HOLDS THE NUMBER OF CHARACTERS TO BE OUTPUT OR
3342*   IS ZERO TO REQUEST INPUT.  FOR OUTPUT REQUESTS (B) POINTS TO
3343*   THE FIRST WORD OF THE BUFFER.  A LINE FEED, RUBOUT, NULL, OR
3344*   X-OFF IS IGNORED BY INPUT.  ON INPUT A CARRIAGE RETURN ENDS THE
3345*   RECORD, A _ BACKSPACES ONE CHARACTER, AND AN ESCAPE OR ALT-MODE
3346*   DELETES THE INPUT RECORD.
3347*
3348   02010              ORG 2010B                                    [F]
3349   02010 000000  TTY35 NOP
3350   02011 072351        STA CCNTY     SET CHARACTER COUNT           [F]
3351   02012 002003        SZA,RSS       OUTPUT REQUEST?
3352   02013 026120        JMP TTY6      NO
3353   02014 005000        BLS           YES, INITIALIZE
3354   02015 076416        STB BUFAD        CHARACTER POINTER
3355   02016 003400        CCA           SET FLAG
3356   02017 072417        STA TFLAG        AS 'OUTPUT'
3357   02020 062343        LDA B120K     SEND BITS FOR
3358   02021 102611        OTA TTYSC        'PRINT ONLY'
3359   02022 062351  TTY1  LDA CCNTY     ALL CHARACTERS               [F]
3360   02023 002003        SZA,RSS          OUTPUT?
3361   02024 126010        JMP TTY35,I   YES
3362   02025 042316        ADA NM1       NO, CORRECT                  [F]
3363   02026 072351        STA CCNTY        CHARACTER COUNT           [F]
3364   02027 066416        LDB BUFAD     COMPUTE
3365   02030 036416        ISZ BUFAD        WORD-CHARACTER
3366   02031 004065        CLE,ERB          ADDRESS
3367   02032 160001        LDA 1,I       LOAD WORD
3368   02033 002041        SEZ,RSS       POSITION
3369   02034 001727        ALF,ALF          CHARACTER
3370   02035 012335        AND DB177     EXTRACT CHARACTER
3371   02036 032336        IOR NB200     ADD IN BIT 7                 [F]
3372   02037 102611        OTA TTYSC     OUTPUT IT
3373   02040 103711  TTY2  STC TTYSC,C   REQUEST CHARACTER TRANSFER
3374   02041 102311        SFS TTYSC     WAIT FOR
3375   02042 026041        JMP *-1          COMPLETION FLAG
3376   02043 062417        LDA TFLAG
3377   02044 002002        SZA           OUTPUT?
3378   02045 026022        JMP TTY1      YES
3379   02046 102511        LIA TTYSC     NO, EXTRACT
3380   02047 012335        AND DB177        CHARACTER
3381   02050 052322        CPA DB12      LINE FEED?
3382   02051 026040        JMP TTY2      YES
3383   02052 052335        CPA DB177     NO, RUBOUT?
3384   02053 026040        JMP TTY2      YES
3385   02054 002002        SZA           NO, NULL
3386   02055 052325        CPA NB23         OR X-OFF?                 [F]
3387   02056 026040        JMP TTY2      YES
3388   02057 052340        CPA BKSPC     NO, '_' ?
3389   02060 026110        JMP TTY4      YES
3390   02061 007400        CCB           NO
3391   02062 052327        CPA DB33      EXIT ON
3392   02063 026112        JMP TTY5         VARIOUS
3393   02064 052341        CPA ALTMD          FORMS OF
3394   02065 026112        JMP TTY5            ESCAPE
```

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3395  02066 052334          CPA DB176           OR
3396  02067 026112          JMP TTY5              ALT MODE
3397  02070 072420          STA TTYTM       SAVE CHARACTER
3398  02071 066351          LDB CCNTY       BACKSPACE                  [F]
3399  02072 056333          CPB D.72          IF BUFFER
3400  02073 016126          JSB BKSP            IS FULL
3401  02074 066416          LDB BUFAD       COMPUTE
3402  02075 036416          ISZ BUFAD         NEXT BUFFER
3403  02076 004065          CLE,ERB             ADDRESS
3404  02077 002041          SEZ,RSS         POSITION
3405  02100 001737          ALF,SLA,ALF       AND FORM
3406  02101 130001          IOR 1,I             BUFFER WORD
3407  02102 170001          STA 1,I         STORE AND
3408  02103 036351          ISZ CCNTY         COUNT CHARACTER          [F]
3409  02104 062420          LDA TTYTM       WAS IT A
3410  02105 052323          CPA NB15          CARRIAGE RETURN?         [F]
3411  02106 126010          JMP TTY35,I     YES
3412  02107 026040          JMP TTY2        NO
3413  02110 016126   TTY4   JSB BKSP        BACKSPACE
3414  02111 026040          JMP TTY2
3415  02112 076417   TTY5   STB TFLAG       SET TO OUTPUT MODE
3416  02113 046010          ADB TTY35       SET RETURN
3417  02114 076010          STB TTY35         TO INPUT CALL
3418  02115 062317          LDA N.3         OUTPUT '\' AND             [F]
3419  02116 066427          LDB RVRSA         CARRIAGE RETURN -
3420  02117 026011          JMP TTY35+1       LINE FEED
3421  02120 066426   TTY6   LDB IBUFA       SET UP INPUT
3422  02121 176430          STB BADRA,I       BUFFER
3423  02122 076416          STB BUFAD           POINTERS
3424  02123 072417          STA TFLAG       SET TO INPUT MODE
3425  02124 062345          LDA B160K       SEND INPUT BITS
3426  02125 026037          JMP TTY2-1        TO ASR 35


3428*                            *
3429**   BACKSPACE ONE CHARACTER   **
3430*                            *
3431  02126 000000   BKSP   NOP
3432  02127 066351          LDB CCNTY       DECREMENT                  [F]
3433  02130 006003          SZB,RSS           CHARACTER
3434  02131 126126          JMP BKSP,I          COUNT
3435  02132 046316          ADB NM1              IF                    [F]
3436  02133 076351          STB CCNTY              NON-ZERO            [F]
3437  02134 007400          CCB             BACKSPACE
3438  02135 046416          ADB BUFAD         CHARACTER
3439  02136 076416          STB BUFAD           ADDRESS
3440  02137 004065          CLE,ERB         INSURE
3441  02140 160001          LDA 1,I           NEXT CHARACTER
3442  02141 012346          AND HIMSK           WILL NOT BE
3443  02142 170001          STA 1,I               GARBLED
3444  02143 062420          LDA TTYTM       RETRIEVE CHARACTER FOR CALLS
3445  02144 126126          JMP BKSP,I        FROM BUFFER OVERFLOW
```

```
3447*
3448*    UPON ENTRY (A) HOLDS THE DISC ADDRESS (BITS 15-14 DETERMINE
3449*    THE DISC REFERENCED) AND (B) HOLDS THE CORE ADDRESS.  BIT 15
3450*    OF (B) IS 1 FOR A TRANSFER TO CORE, 0 FOR A TRANSFER TO DISC.
3451*    IT IS ASSUMED THAT WORDC HOLDS THE NEGATIVE TRANSFER LENGTH
3452*    IN WORDS.
3453*
3454    02145 000000   DISCD NOP
3455    02146 072422         STA DADDR     SAVE DISC AND
3456    02147 076421         STB CORE        CORE ADDRESSES
3457    02150 062423         LDA WORDC     EXIT ON
3458    02151 002003         SZA,RSS         WORD COUNT
3459    02152 126145         JMP DISCD,I       OF ZERO
3460    02153 006021         SSB,RSS       ROUND UP
3461    02154 012314         AND NM64        TO FULL SECTOR              [F]
3462    02155 072423         STA WORDC         ON WRITE
3463    02156 062422         LDA DADDR     LOAD
3464    02157 001222         RAL,RAL         DISC
3465    02160 012317         AND N.3           SELECT                   [F]
3466    02161 072424         STA DISC#           CODE
3467    02162 042431         ADA DSTBL             WORD
3468    02163 160000         LDA 0,I
3469    02164 072425         STA FAIL      SAVE IT
3470    02165 012331         AND DB77      EXTRACT SELECT CODE
3471    02166 064000         LDB 0         COPY INTO (B)
3472    02167 042342         ADA DCHN      OUTPUT DMA/DISC
3473    02170 102607         OTA DMA         LINKAGE CONTROL WORD
3474    02171 022344         XOR DSTC      COMPUTE
3475    02172 072237         STA DISC3
3476    02173 002004         INA               AND
3477    02174 022336         XOR NB200                                  [F]
3478    02175 072220         STA DISC1           STORE
3479    02176 072242         STA DISC4
3480    02177 072251         STA DISC5             I/O
3481    02200 042332         ADA NB100                                  [F]
3482    02201 072227         STA DISC2               COMMANDS
3483    02202 066421         LDB CORE      SET B[0]
3484    02203 007000         CMB             TO PROPER
3485    02204 005200         RBL               DIRECTION BIT
3486    02205 062425         LDA FAIL      SET B[2:0]
3487    02206 001727         ALF,ALF         TO PROPER
3488    02207 100042         LSL 2             ADDRESS PREFIX
3489    02210 062422         LDA DADDR     EXTRACT
3490    02211 001222         RAL,RAL         TRACK
3491    02212 100046         LSL 6             NUMBER
3492    02213 001200         RAL           REMOVE BIT 7
3493    02214 101051         LSR 9         SHIFT HARDWARE ADDRESS INTO (A)
3494    02215 072422         STA DADDR
3495    02216 066315         LDB NM10      SET RETRY                    [F]
3496    02217 076425         STB FAIL        COUNTER
3497    02220 102500   DISC1 LIA 0         WAIT FOR
3498    02221 000010         SLA             DISC CONTROLLER
3499    02222 026220         JMP DISC1         FREE AND
3500    02223 001727         ALF,ALF             DISC
3501    02224 002021         SSA,RSS               UP TO
```

```
3502   02225 026220          JMP DISC1              SPEED
3503   02226 062422          LDA DADDR      OUTPUT
3504   02227 102600   DISC2  OTA 0           DISC ADDRESS
3505   02230 106703          CLC MAR        OUTPUT
3506   02231 062421          LDA CORE          CORE
3507   02232 102603          OTA MAR             ADDRESS
3508   02233 102703          STC MAR        OUTPUT
3509   02234 062423          LDA WORDC         TRANSFER
3510   02235 102603          OTA MAR             LENGTH
3511   02236 103707          STC DMA,C      INITIATE
3512   02237 102700   DISC3  STC 0             TRANSFER
3513   02240 102307          SFS DMA        WAIT FOR
3514   02241 026240          JMP *-1          COMPLETION FLAG
3515   02242 102500   DISC4  LIA 0          ABORT
3516   02243 012321          AND NB10          BIT                    [F]
3517   02244 002002          SZA                 SET?
3518   02245 026255          JMP DISC6      YES
3519   02246 062421          LDA CORE       NO
3520   02247 002021          SSA,RSS        READ?
3521   02250 026312          JMP DISC7      NO
3522   02251 102500   DISC5  LIA 0          YES
3523   02252 012326          AND DB32          FAULTY
3524   02253 002003          SZA,RSS           TRANSFER?
3525   02254 026312          JMP DISC7      NO
3526   02255 036425   DISC6  ISZ FAIL       YES, TRY AGAIN?
3527   02256 026220          JMP DISC1      YES
3528   02257 062324          LDA D.16       NO, PRINT
3529   02260 066435          LDB DISFA         'DISC
3530   02261 016010          JSB TTY35           FAILURE'
3531   02262 062424          LDA DISC#      STORE
3532   02263 042330          ADA DB60          DISC NUMBER
3533   02264 001727          ALF,ALF             AND '/'
3534   02265 042337          ADA SLASH            IN
3535   02266 172433          STA EBFDA,I            BUFFER             [F]
3536   02267 006400          CLB            COMPUTE
3537   02270 062422          LDA DADDR
3538   02271 001727          ALF,ALF           ASCII
3539   02272 001200          RAL                                      [F]
3540   02273 012331          AND DB77
3541   02274 100400          DIV DB12              FOR
3542   02276 046330          ADB DB60
3543   02277 002003          SZA,RSS                 TRACK
3544   02300 026303          JMP *+3
3545   02301 042330          ADA DB60                  NUMBER
3546   02302 001727          ALF,ALF
3547   02303 030001          IOR 1
3548   02304 172434          STA EB1DA,I    STORE IT                  [F]
3549   02305 062320          LDA N.6        PRINT                     [F]
3550   02306 062320          LDA N.6        PRINT                     [F]
3551   02307 066433          LDB EBFDA         'X/XX, '
3552   02310 016010          JSB TTY35
3553   02311 126432          JMP ERRIA,I    TERMINATE LOAD/DUMP
3554   02312 107707   DISC7  CLC DMA,C      CLEAN UP
3555   02313 126145          JMP DISCD,I
```

```
3557  02314 177700  NM64  DEC -64                                        [F]
3558  02315 177766  NM10  DEC -10                                        [F]
3559  02316 177777  NM1   DEC -1                                         [F]
3560  02317 000003  N.3   DEC 3                                          [F]
3561  02320 000006  N.6   DEC 6                                          [F]
3562  02321 000010  NB10  OCT 10                                         [F]
3563  02322 000012  DB12  OCT 12
3564  02323 000015  NB15  OCT 15                                         [F]
3565  02324 000020  D.16  DEC 16
3566  02325 000023  NB23  OCT 23                                         [F]
3567  02326 000032  DB32  OCT 32
3568  02327 000033  DB33  OCT 33
3569  02330 000060  DB60  OCT 60
3570  02331 000077  DB77  OCT 77
3571  02332 000100  NB100 OCT 100                                        [F]
3572  02333 000110  D.72  DEC 72
3573  02334 000176  DB176 OCT 176
3574  02335 000177  DB177 OCT 177
3575  02336 000200  NB200 OCT 200                                        [F]
3576  02337 000057  SLASH OCT 57           '/'
3577  02340 000137  BKSPC OCT 137          '_'
3578  02341 000175  ALTMD OCT 175
3579  02342 020000  DCHN  OCT 20000
3580  02343 120000  B120K OCT 120000       'PRINT ONLY' TTY CONTROL BITS
3581  02344 122700  DSTC  OCT 122700
3582  02345 160000  B160K OCT 160000       'INPUT' T  CONTROL BITS
3583  02346 177400  HIMSK OCT 177400
3584  00011          TTYSC EQU 11B           ASR35 SELECT CODE
3585  02347 056015  RVRSL OCT 56015,5000 '\ CR LF' FOR LINE DELETION
3586  02351 000000  CCNTY BSS 1                                          [F]
3587  02352 000000  INBUF BSS 36            TTY INPUT BUFFER
3588  02416 000000  BUFAD BSS 1             TTY CHARACTER ADDRESS
3589  02417 000000  TFLAG BSS 1             TTY I/O MODE
3590  02420 000000  TTYTM BSS 1             TTY TEMPORARY
3591  02421 000000  CORE  BSS 1             CORE ADDRESS FOR DISC
3592  02422 000000  DADDR BSS 1             DISC ADDRESS
3593  02423 000000  WORDC BSS 1             BLOCK WORD COUNT FOR DISC
3594  02424 000000  DISC# BSS 1             DISC NUMBER
3595  02425 000000  FAIL  BSS 1             DISC RETRY COUNTER
3596  02426 004724  IBUFA ABS INBUF+INBUF
3597  02427 002347  RVRSA DEF RVRSL
3598  02430 007423  BADRA DEF BADDR         ADDRESS OF CHARACTER POINTER
3599  02431 000160  DSTBL DEF DTBL          DISC SELECT CODE TABLE ADDRESS
3600  02432 005427  ERRIA DEF ERRIN         ADDRESS OF ABORT MESSAGE CODE
3601  02433 011641  EBFDA DEF EBUF          ADDRESS OF ERROR BUFFER
3602  02434 011642  EB1DA DEF EBUF+1                                     [F]
3603  02435 011732  DISFA DEF DISCF
```

```
3605*
3606*   HLT 2 IF A SYSTEM READ IS BAD.  PRESS 'RUN' TO RETRY SYSTEM
3607*   LOADING.
3608*
3609    02436 107700    BSLDR CLC 0,C
3610    02437 062477          LDA BLINK      OUTPUT DMA/DISC
3611    02440 102607          OTA DMA          LINKAGE
3612    02441 062500          LDA BSYS1      OUTPUT
3613    02442 102703          STC WCR          FIRST SEGMENT
3614    02443 102603          OTA WCR            WORD COUNT
3615    02444 066506          LDB BSAD1      FIRST CORE ADDRESS
3616    02445 062503          LDA BDAD       ESTABLISH
3617    02446 102615          OTA BDISC+1      DISC ADDRESS
3618    02447 106703          CLC MAR        ESTABLISH
3619    02450 106603          OTB MAR          CORE ADDRESS
3620    02451 103707          STC DMA,C      INITIATE DMA
3621    02452 102714          STC BDISC      START TRANSFER
3622    02453 102307          SFS DMA        WAIT FOR
3623    02454 026453          JMP *-1          END OF TRANSFER
3624    02455 102515          LIA BDISC+1    TRANSFER
3625    02456 012512          AND BSL32
3626    02457 002003          SZA,RSS        OK?
3627    02460 026463          JMP *+3        YES
3628    02461 102002          HLT 2          NO
3629    02462 026436          JMP BSLDR      TRY AGAIN ON 'RUN'
3630    02463 062501          LDA BSYS2      READ
3631    02464 072423          STA WORDC
3632    02465 062504          LDA LDRTT        SECOND
3633    02466 066507          LDB BSAD2
3634    02467 016145          JSB DISCD      SEGMENT
3635    02470 062502          LDA BSYS3      READ
3636    02471 072423          STA WORDC
3637    02472 062505          LDA LDRTT+1      THIRD
3638    02473 066510          LDB BSAD3
3639    02474 016145          JSB DISCD        SEGMENT
3640    02475 107700          CLC 0,C        GET DATE
3641    02476 126511          JMP DATEP,I      AND TIME
3642*
3643    02477 020014    BLINK ABS 20000B+BDISC
3644    02500 166000    BSYS1 ABS -12000B              SEGMENT
3645    02501 165300    BSYS2 ABS 14000B-26500B         WORD
3646    02502 167200    BSYS3 ABS 26500B-37300B          COUNTS
3647    02503 000003    BDAD  OCT 3               SEGMENT
3648    02504 000000    LDRTT OCT 0,0                 DISC ADDRESSES
3649    02506 100000    BSAD1 OCT 100000        SEGMENT
3650    02507 114000    BSAD2 OCT 114000          CORE
3651    02510 126500    BSAD3 OCT 126500           ADDRESSES
3652    02511 005306    DATEP DEF LDR59        ENTRY POINT TO DATE-TIME CODE
3653    02512 000032    BSL32 OCT 32
3654*
3655    00007           DMA   EQU 7             DMA CHANNEL
3656    00014           BDISC EQU 14B           DISC SELECT CODE (LOWER)
3657    00003           MAR   EQU 3             MEMORY ADDRESS REGISTER
3658    00003           WCR   EQU 3             WORD COUNT REGISTER
```

```
3660*
3661*  THE FOLLOWING IS THE FORMAT FOR THE PORTION OF THE
3662*  BOOTSTRAP LOADER TO BE SET IN 0,0.  THIS SECTION OF THE
3663*  BOOTSTRAP IS LOADED INTO 2 TO 77B BY THE PROTECTED BINARY
3664*  LOADER.  WHEN IT IS READ COMPLETELY INTO CORE IT CHECKS FOR
3665*  READ PARITY ERRORS DURING ITS INPUT.  FOLLOWING THIS, A HALT
3666*  INSTRUCTION PERMITS THE OPERATOR TO PROTECT THE BASIC
3667*  BINARY LOADER AND SET SWITCH 0 OF THE SWITCH REGISTER
3668*  TO 0 (EITHER REAL TIME EXECUTIVE OR TIME-SHARED BASIC)
3669*  OR 1 (DISC MONITOR SYSTEM).  PRESSING 'RUN' READS THE
3670*  SELECTED SYSTEM LOADER FROM 0,1 OR 0,2 RESPECTIVELY.  THIS
3671*  PORTION OF THE BOOTSTRAP OPERATION WILL THEN LOAD INTO
3672*  CORE THE SELECTED SYSTEM AND TRANSFER CONTROL TO IT.
3673*
3674   00000          BSBS0 EQU 0
3675   00000                ORG BSBS0          ASSEMBLY ORIGIN
3676*
3677   00000 000000   RLOAD OCT 0,0            DON'T USE (A) AND (B)
3678   00002 000000   RT/TS OCT 0              REAL TIME EXEC/TIME-SHARED BASIC
3679   00003 000000   DMS   OCT 0              DISC MONITOR SYSTEM
3680   00004 103004         HLT 4,C            IN CASE OF POWER FAIL
3681*
3682   00005 070044   BSLD0 STA BSLD2-BSBS0+1  CHANGE IRRECOVERABLE HLT 0
3683   00006 034043         ISZ BSLD2-BSBS0         INTO RECOVERABLE HLT 1
3684   00007 102077         HLT 77B            PROTECT BBL, SET SWR FOR SYSTEM
3685   00010 060047         LDA LINKG-BSBS0      SET UP DISC/DMA
3686   00011 102606         OTA 6                   LINKAGE
3687*
3688   00012 102501   BSLD1 LIA 1              SELECT SYSTEM LOADER
3689   00013 006404         CLB,INB               FROM SWITCH REGISTER:
3690   00014 000010         SLA                     SWR = 0 IMPLIES SECTOR 1
3691   00015 006004         INB                     SWR = 1 IMPLIES SECTOR 2
3692   00016 106600   DSK7  OTB 0              OUTPUT DISC ADDRESS
3693   00017 006304         CCE,INB            SAVE
3694   00020 160001         LDA 1,I            CHOSEN LOADER'S
3695   00021 070046         STA CORAD-BSBS0     ENTRY POINT
3696   00022 001225         RAL,ERA            OUTPUT 'READ' FORM
3697   00023 106702         CLC 2                 OF LOADER'S
3698   00024 102602         OTA 2                   CORE ADDRESS
3699   00025 060051         LDA .N64-BSBS0        OUTPUT
3700   00026 102702         STC 2                   TRANSFER
3701   00027 102602         OTA 2                     LENGTH
3702   00030 103706         STC 6,C            START DMA
3703   00031 102700   DSK8  STC 0              START DISC TRANSFER
3704   00032 014034         JSB TSTAT-BSBS0     VALIDATE READ
3705   00033 124046         JMP CORAD-BSBS0,I   TRANSFER TO SYSTEM LOADER
3706*
3707   00034 000005   TSTAT DEF BSLD0-BSBS0    (INITIAL EXIT)
3708   00035 102500   DSK9  LIA 0              WAIT FOR
3709   00036 000010         SLA                  TRANSFER
3710   00037 024035         JMP *-BSBS0-2        COMPLETION
3711   00040 010050         AND BSB32-BSBS0      TRANSFER
3712   00041 002003         SZA,RSS                OK?
3713   00042 124034         JMP TSTAT-BSBS0,I   YES
3714   00043 102000   BSLD2 HLT 0                NO (HLT 1, NOP AFTER CHECK
```

3715   00044 024043   JMP *-BSBS0-1   ON BOOTSTRAP ITSELF)
3716   00045 024012   JMP BSLD1-BSBS0   RETRY LOAD
3717*
3718   00046 000000   CORAD OCT 0   SYSTEM LOADER ENTRY ADDRESS
3719   00047 020000   LINKG OCT 20000   DISC/DMA LINKAGE TEMPLATE
3720   00050 000032   BSB32 OCT 32   TRANSFER VALIDATION MASK
3721   00051 177700   .N64 DEC -64
3722*
3723   00077   ORG BSBS0+77B
3724   00077 024035   JMP DSK9-BSBS0   TEST BOOTSTRAP LOAD
3725   END
**   NO ERRORS *TOTAL **RTE ASMB 92067-16011**

**ORG	*****	00005	00009	00023	00030	00044	02070
	03348	03675	03723				
.12	01140	00083	01141				
.13	01142	00761	01143				
.15	01144	00094	00172	00258	00378	00423	00955
	00984						
.17	01145	00801					
.19	01146	00241					
.2	01134	00298	00339	00452	00564	00573	00676
.20	01147	00567	01029				
.21	01148	00276					
.22	01149	00226	01025				
.23	01150	00271					
.24	01151	00412	00950				
.26	01152	00118	01119				
.3	01135	00915					
.32	01153	00437	01154				
.38	01155	00357	01020				
.4	01136	00128	00334	01192			
.5440	01162	00592	00704				
.6	01137	00659	00668				
.600	01161	00979					
.7	01138	00212	00502	00640	00642	00644	00657
.8	01139	00936	00967				
.85	01159	00609					
.N	03284	02280					
.N64	03721	03699					
.Y	03285	02278					

?BEND	00056	00884				
?BGIN	00055	00880				
?BHED	00053	00872				
?BSTR	00054	00876				
?ID	00057	00888				
?MASK	00052	00864				
A	01166	00373				
ABS	02598	02549	02559	02607	02608	
ADD2K	02315	02301				
ADD3K	02316	02302				
ADD4K	02317	02303				
ADLEN	00014	00162	00169	00323	00555	00705	00728
	01413	01419	01421	01666	01870	01884	01885
ADLOC	00013	00167	00478	00727			
ADTBA	01199	00165	00289	00322	00337	00558	00710
	00730						
ADTBF	02012	01417	01669	01851	01872	
ADTBL	01198	01199	01200	02012		
ADVA1	01815	01799	01805	01811		
ADVAL	01794	01239	01802	01808	01814	
ADVLA	01239	00778	00781			
ALTMD	03578	03393				
ASR35	01235	00085	00087	00096	00120	00122	00174
	00228	00230	00243	00359	00361	00380	00414
	00416	00425	00439	00569	00763	00803	00938
	00940	00957	00969	00971	00986	01022	01027
	01031	01121					
ASRDA	02017	01371	01484	01498	01542	01565	01573
	01623	01817	01836	01943	01945	01958	
AUTCK	02801	02510	02796	02805			
B100	01157	01190	01193				

CROSS-REFERENCE SYMBOL TABLE   12:13 PM TUE., 23 OCT., 1979

```
B100K   03264    02248

B106    01158    01194

B120K   03580    03357

B14     01141    00116    00143    00269

B15     01143    00960

B160K   03582    03425

B40     01154    00693    00840

B400    01160    00305    00547    00621

B60     01156    00251

B6400   02002    01494

BADAD   02051    02043

BADD    02054    02044

BADDA   02044    01572

BADDR   02038    01916    01917    03598

BADP    02057    02045

BADPA   02045    01835

BADRA   03598    03422

BASPG   03287    02116

BDAD    03647    03616

BDADA   02043    01816

BDDL    01293    01258    02040

BDDLA   02040    01370    01564

BDISC   03656    03617    03621    03624    03643

BDLA    01258    00259

BIT15   01163    00166    00432    00687

BKSP    03431    03400    03413    03434    03445

BKSPC   03577    03388

BLANK   01999    01923
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BLDRA   01263    00438

BLDRC   01307    01263

BLINK   03643    03610

BMASK   02003    02015

BMSKA   02015    01394

BPAGA   02009    01806

BPLEN   02372    02113

BSAD1   03649    03615

BSAD2   03650    03290    03633

BSAD3   03651    03293    03638

BSB32   03720    03711

BSBSA   01216    00431    00461

BSBSO   03674    01216    03675    03682    03683    03685    03695
        03699    03704    03705    03707    03710    03711    03713
        03715    03716    03723    03724

BSL32   03653    03625

BSLD0   03682    03707

BSLD1   03688    03716

BSLD2   03714    03682    03683

BSLDR   03609    01217    03629

BSPGA   03286    02115

BSY1A   01210    00913

BSY2A   01211    00918

BSY3A   01212    00923

BSYS1   03644    01210    03612

BSYS2   03645    01211    03288    03630

BSYS3   03646    01212    03291    03635

BUFA    03274    02503    02558    02561    02581    02656    02697
        02750    02884    02887    02973    03003    03036    03050
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           03068

BUFAD   03588      03354      03364      03365      03401      03402      03423
        03438      03439

BUFL    03275      02502      02532      02548      02551      02660      02760
        02772      02776      02872      02882      02901      02974      03049
        03060      03066      03067      03071      03083

C       01167      00376

CCNT    03272      02162      02165

CCNTY   03586      03350      03359      03363      03398      03408      03432
        03436

CEQTA   01191      00148

CHKSA   01265      00802

CHKSM   01312      01265

CMAND   02812      02512      02575      02590      02616      02635      02642
        02675      02680      02682      02733      02748      02817

CMND    02382      02507      02536      02623      02624      02659      02701
        02702      02707      02713      02720      02788      02802      02813
        02814      02835      02837      02902      02938      02976      02985
        03022      03075      03106      03107      03111      03114      03132
        03133      03134

CNT     03277      02556      02566      02579      02585      02594      02605
        02654      02686      02695      02696

CNTR    02775      02650      02692      02785

COM6    00048      01066      03301

COM6A   03301      02241

COMMA   01164      00256

CON1    03164      03298

CON1A   03298      03152

CON2    03188      03299

CON2A   03299      03158

CON3    03217      03300

CON3A   03300      03160

CORAD   03718      03695      03705
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CORE	03591	03456	03483	03506	03519	
COUNT	01224	00554	00561	00584	00595	00606	00766
	00789						
D	01168	00233				
D.10	03234	02271				
D.16	03565	03528				
D.19	03240	02792	03098			
D.24	03241	02334				
D.25	03243	02806	03125			
D.3	03227	02599	02917			
D.4	03228	02789				
D.5	03229	02784	03286			
D.6	03230	02187				
D.72	03572	03399				
D5440	03262	02159	02167			
DADDR	03592	03455	03463	03489	03494	03503	03537
DASH	02001	01557				
DATA	02383	02662	02664	02667	02669	02673	02703
	02705	02709	02711	02715	02717	02722	02724
	02731	02834	02957	02972	02978	02980	02984
	03009	03021	03077	03079			
DATE	00061	00951	00989	00990		
DATEA	01266	00937				
DATEP	03652	03641				
DATER	01315	01266				
DB10	03232	02309				
DB100	03249	02571	02591	03304		
DB101	03250	02541	02862			
DB105	03251	02860				

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DB11    03233     02634     02681

DB110   03253     02844     03131

DB12    03563     03381     03541

DB15    03236     02947     02993

DB17    03238     02283       .

DB176   03573     03395

DB177   03574     03370     03380     03383

DB200   03256     02357     02576     02617     02643     02740     02873

DB201   03257     02535

DB215   03254     02958

DB23    03239     02700     03007     03240

DB300   03258     02511

DB31    03242     02658     02970     03243

DB32    03567     03523

DB33    03568     03391

DB35    03245     02641

DB40    03246     02508     02612     02683

DB400   03259     02149     02172     02803

DB41    03247     02601     02679     02747     02919     02953     02991
        03033

DB60    03569     03532     03542     03545

DB7     03231     02515     02840     02841

DB733   03260     02676     02737

DB757   03261     02734        .

DB77    03570     03470     03540

DCHN    03579     03472

DDIRA   03304     02119     02185

DEQTA   01192     00147
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DEST   02035   01869   01877   01879

DIGCK   01896   01511   01520   01721   01750   01757   01900
        01903   01905   01906

DIRBA   01203   00510

DIRBF   01279   01203

DIRE6   01194   00206   00496   00508

DIREA   01193   00635

DIREC   00010   00105

DISC   01236   00149   00168   00433   00455   00459   00462
        00511   00525   00605   00619   00681   00688   00731
        00903   00917   00922   00927   01104

DISC#   03594   03466   03531

DISC1   03497   03478   03499   03502   03527

DISC2   03504   03482

DISC3   03512   03475

DISC4   03515   03479

DISC5   03522   03480

DISC6   03526   03518

DISC7   03554   03521   03525

DISCD   03454   01236   03296   03459   03555   03634   03639

DISCF   03329   03603

DISCN   03296   02117   02128   02156   02194   02217   02222
        02249   02256

DISFA   03603   03529

DISMA   01256   00227

DISMD   01288   01256

DM1   03226   02653   02657   02698   02968

DM10   03222   02690

DM255   03220   02085   02135

DM3   03225   02998

DM4	03224	02183				
DM5	03223	02350	02652	02694	02753	03039
DM64	03221	02118	02243	03154		
DMA	03655	03473	03511	03513	03554	03611	03620
	03622					
DMS	03679	00454				
DMTRL	03307	02246				
DONEA	03312	02310				
DONEM	03320	03312				
DSK7	03692	00434	00443			
DSK8	03703	00445				
DSK9	03708	00447	03724			
DSTBL	03599	03467				
DSTC	03581	03474				
DTBL	00016	00144	01196	02014	03599	
DTBLA	01196	00481				
DTMP0	03268	02086	02094	02136	02174	02184	02200
	02227	02232	02251	02262		
DTMP1	03269	02088	02091	02093	02138	02150	02173
	02190	02198	02224	02228	02229	02230	02242
	02245	02254	02260			
DTMP2	03270	02154	02171	02247	02250	02252	02257
	02261					
DTRKB	03305	02130	02157	02166	02196	02258	02351
DTRKR	03306	02127	02155	02193	02255	
DULTB	03303	02087	02137			
DULTT	03302	02089				
DZMBA	01259	00272				
DZMBF	01296	01259				
EB1DA	03602	03548				

EBFDA	03601	03535	03551			
EBUF	03281	02016	03601	03602		
EBUFA	02016	01495	01497			
ECNT	03279	02691	02744			
ENDR	02759	02708	02714	02721		
ENDR1	02772	02764	02767	02769		
EOFER	01020	00198	00519	00545	00601	00615	00694
	00826	00841				
EOFM	01325	01270				
EOFMA	01270	01021				
EOTC	02819	02633	02648	02689	02824	
EOTF	03278	02509	02644	02821		
EOTM	01309	01264				
EOTMA	01264	00762				
EQTA	01190	00109	00195			
EQTLN	01178	00106				
ERR	02826	02685	02756			
ERR.1	02900	02842	03042			
ERR1	00094	00089				
@ERR2	00172					
ERR3	00241	00235	00238	00260	00273	00278
ERR4	00378	00363	00369	00372		
ERR5	00567	02022				
ERR5A	02022	01678				
ERR6	00955	00944	00948	00962	00966	
ERR7	00984	02023				
ERR7A	02023	01749	01751	01756	01758	01765
ERRIA	03600	03553				

ERRIN	01029	00440	00570	01023	01122	03600
EXIT	02529	02560	02568	02583	02596	02636	02647
	02678	02739	02778				
FADT1	01852	01857				
FADTP	01847	01422	01466	01854		
FAIL	03595	03469	03486	03496	03526	
GAP	02632	02526				
GETCA	01249	00088	00231	00234	00237	00249	00274
	00362	00368	00371	00417	00982		
GETCR	01915	01249	01518	01527	01555	01719	01748
	01755	01924	01926	01927	01928	01946	01960
	03294						
GETMT	01940	01250	01947	01950	01959	01966	01967
GTDN1	01555	01559				
GTDN2	01563	01556				
GTDN3	01567	01562				
GTDN4	01571	01581				
GTDN5	01575	01570				
GTDN6	01583	01576				
GTDNA	01240	00246				
GTDNO	01553	01240	01349	01566	01574	01583	01584
GTMT1	01956	01962				
GTMT2	01960	01955				
GTMT3	01966	01953				
GTMTA	01250	00182				
GTTR1	01670	01677				
GTTR2	01679	01674				
GTTRA	01241	00394	00476	00499		
GTTRK	01663	01241	01684	01690		

HIMSK	03583	03442				
HLT22	02318	02304				
I	01169	00236				
IBUFA	03596	03421				
IDLEN	00012	00515	00521	00702	00722	02124	02129
IDLOC	00011	00477	00523	00725	02126		
IDTBA	01201	00516	00524	01202			
IDTBL	01200	01201	03305	03306			
ILDTA	01267	00956					
ILDTE	01317	01267					
ILIN	03323	01253	03313				
ILINA	01253	00095	00173	00379	00424		
ILINM	03313	02284					
ILSCA	01260	00277					
ILSCD	01299	01260	02041				
ILSCL	02041	01541	01957				
ILTIA	01269	00985					
ILTIM	01322	01269					
ILTRA	02042	01622					
ILTRL	02048	02042					
INBUF	03587	03596	03596				
INCRE	00050	00892	00898				
INF	01996	01732	01737				
INRPA	02010	01809					
INTG1	01718	01731					
INTG2	01734	01720	01722				
INTGA	01242	00941	00959				
INTGR	01714	01242	01354	01373	01560	01618	01733

	01736	01738			
ISOTA	01243	00349	01078	01082	
ISOTL	01698	01243	01439	01471	01671	01705
JDRT1	03292	02220			
JDRTT	03289	02215			
JMPM1	02319	02307			
JSAD2	03290	02216			
JSAD3	03293	02221			
JSYS2	03288	02213			
JSYS3	03291	02218			
L	01170	00367			
L.10	01980	01487	01725	01753	01981
L.13	01982	01834	01983		
L.15	01984	01369	01563		
L.17	01985	01571	01815		
L.2	01977	01665	01686	01856	01880
L.20	01986	01482			
L.21	01987	01540	01956		
L.23	01988	01621			
L.24	01989	01941			
L.3	01978	01496	01700		
L.39	01990	01629			
L22A	02020	01350	01372	01453	01837
L46A	02021	01820			
LABOA	01272	01030			
LABOR	01329	01272			
LB100	01993	01638			
LB11	01979	01812			

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LB12    01981    01901

LB15    01983    01367    01374    01619    01925    01952

LB377   01994    01644    01704    01922

LB400   01995    01448

LB54    01991    01364    01561

LB60    01992    01488    01491

LBRY    01282    01252

LBRYA   01252    00084

LD72    01972    01898

LD77    01971    01530

LDR     00079    00045    00097    02317

LDR1    00104    00093

LDR10   00262    00257    00275

LDR11   00266    00270

LDR12   00269    00265

LDR13   00274    00252

LDR14   00287    00232

LDR15   00300    00314

LDR16   00304    00299

LDR17   00313    00308

LDR18   00334    00170

LDR19   00339    00344

LDR2    00110    00113

LDR20   00343    00353

LDR21   00346    00342

LDR22   00357    00345    00381    02020

LDR23   00389    00374
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LDR24   00393   00398

LDR25   00412   00426

LDR26   00423   00418

LDR27   00428   00420

LDR28   00442   00422

LDR29   00456   00436

LDR3   00118   00124

LDR30   00482   00487

LDR31   00497   00504

LDR32   00548   00624

LDR33   00560   00566

LDR34   00571   00580

LDR35   00577   00563

LDR36   00587   00576

LDR37   00621   00550

LDR38   00646   00691

LDR39   00654   00662

LDR4   00130   00133

LDR40   00663   00655

LDR41   00668   00678

LDR42   00693   00650

LDR43   00702   00466   00514

LDR44   00711   00715   00721

LDR45   00722   00707

LDR46   00753   00765   00794   00807   02021

LDR47   00756   00760

LDR48   00766   00758

LDR49   00782   00777   00790

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LDR5    00143     00183

LDR50   00817     00738

LDR51   00823     00831

LDR52   00832     00839

LDR53   00840     00836

LDR54   00845     00772

LDR58   00863     00905

LDR59   00936     00958     03652

LDR6    00158     00033

LDR60   00959     00954

LDR61   00967     00987

LDR62   00988     00983

LDR63   01013     01001

LDR7    00182     00091

LDR8    00226     00135     00244     00247     00255     00267     00268

LDR9    00245     00240

LDRE1   00611     00594

LDRTA   01209     00400

LDRTT   03648     01209     03289     03292     03632     03637

LDTBL   02014     01578     01600     01639     01701

LIA15   01183     00446

LIBRA   00047     00782     00799     00833     01064     01068     01103
        01105

LINKA   01184     00448

LINKG   03719     00449     03685

LKUN1   01369     01376

LKUN2   01373     01365

LKUN3   01387     01368     01452
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LKUN4	01429	01436				
LKUN5	01447	01410	01415	01465	01480	01499
LKUN6	01464	01400				
LKUN7	01482	01470	01474			
LKUN8	01493	01490				
LKUNA	01234	00366	00377			
LKUNL	01347	01234				
LM1	01976	01681				
LM129	01969	01626				
LM2	01975	01420	01429	01868		
LM4	01974	01568	01605	01641		
LM64	01970	01831				
LM8	01973	01513	01522			
LNKAD	01197	00776				
LOOP	02713	03195				
LSLTB	00046	01197	02374	02375		
LSLTE	00071	02374				
LTMP0	02027	01358	01427	01435	01554	01575	01577
	01582	01850	01855				
LTMP1	02028	01353	01391	01517	01525	01526	01529
	01536	01606	01613	01633	01650	01664	01683
	01754	01759	01795	01818			
LTMP2	02029	01357	01379	01450	01486	01617	01635
	01651	01668	01676	01685	01689		
LTMP3	02030	01355	01363	01382	01451	01640	01643
	01647						
LTMP4	02031	01362	01387	01437	01447	01449	01467
	01642	01648	01848				
LTMP5	02032	01392	01397	01411	01412	01418	01423
	01428	01432	01434	01438	01440	01441	01477
	01479	01716	01723	01727	01735		

LTMP6	02033	01396	01430	01431	01433	01478	01718
	01724	01734					
LTRAX	02013	01352	01609				
LULC	01302	01261					
LULCA	01261	00358					
M1	01133	00578					
M10	01131	00754					
M12	01130	00125					
M16	01129	00104	00855				
M20	01128	00389					
M255	01126	00296	00539				
M256	01125	00670	00819	00832	01085		
M4	01132	00204	00479	00682	01089	01107	
M5440	01124	00596	00646				
M64	01127	00145	00163	00194	00428	00450	00506
	00703						
MAGSC	00017	00189	00201	02071	02504		
MAR	03657	03505	03507	03508	03510	03618	03619
MAXAD	02006	01797					
MAXBA	02008	01803					
MAXYR	01177	00964					
MBIAS	01179	00980					
MCNT	02037	01875	01882				
MCPAC	03309	02289					
MFLAG	02034	01347	01398				
MGTCA	03294	02276					
MLTBA	02379	02211	02223				
MLTBE	02378	02380					
MLTBL	02369	02225	02379	02380			

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MOVU1   01876     01883

MOVUA   01244     00575     00718

MOVUP   01866     01244     01476     01688     01886

MSTOC   03308     02097

MT.1    02802     02810     03188

MT.10   02659     03205

MT.12   02788     02797     03189

MT.14   02813     03206

MT.15   02814     03200

MT.2    02667     03177

MT.20   02536     02542     03207

MT.21   02507     03190

MT.3    02669     03164

MT.30   02707     03196

MT.40   02701     03208

MT.41   02702     03211

MT.42   02703     03179

MT.43   02705     03167

MT.44   02709     03180

MT.45   02711     03170

MT.46   02715     02728     03181

MT.47   02717     03168

MT.48   02722     03182

MT.49   02724     03171

MT.5    02673     03172

MT.50   02731     03173

MT.51   02720     03197
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@MT.52  02511

  MT.8  02662     03178

  MT.9  02664     03165

  MTAPE  01237    00192    00196    00517    00543    00599    00613
         00648    00824    00834    00842

  MTBLN  02380    02210

  MTD    02501    01237    02103    02105    02268    02294    02299
         02323    02344    02352    02513    02514    02530    02531
         02533    02539    02586    02593    02614    02628    02646
         02742    02823    02828    02829    02839    02847    02898
         02900    02903

  MTDE1  02169    02161

  MTDER  02333    02296    02297    02326    02327    02346    02347
         02355    02356    02359    02730    03020

  MTDI1  03153    03162

  MTDIA  01238    00191

  MTDIN  03150    01238    02075    03161

  MTDM0  02090    02095

  MTDM1  02096    02313    02338

  MTDM2  02150    02175

  MTDM3  02172    02152

  MTDM4  02186    02201

  MTDM5  02199    02189

  MTDM6  02228    02233

  MTDM7  02252    02263

  MTDM8  02301    02073

@MTDMP  02071

  MTDMU  02292    02281

  MTDMV  02298    02267

  MTENR  02282    02277

  MTESQ  02270    02286
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MTFLA	02019	01951	01963	01965		
MTFLG	01225	00134	00159	00188	00200	00203	00464
	00512	00736	02019				
MTGVT	02287	02279				
MTLM	03331	03316				
MTLMA	03316	02807	03126			
MTRLA	01208	00820	00830			
MTRLT	00035	01208	03307			
MTRWD	02103	02109				
MTSC	01286	02018				
MTSCA	02018	01942				
MTSCD	03280	03151	03155	03159		
MTVFL	02324	02100	02265	02342		
MTVFS	02099	02290				
MTVLC	02725	02101				
MTVLQ	03015	02102				
MTWF	02340	02202	02264	02322	02328	02348	02358
MTWFY	02349	02343				
MTWFZ	02357	02354				
MTWR	02321	02120	02131	02139	02164	02170	02197
	02212	02231	02259	02329			
MXADT	01998	01414				
MXDAY	01176	00946				
N	01171	00092	00421			
N.3	03560	03418	03465			
N.6	03561	03549	03550			
N5440	03219	02163				
NB10	03562	03516				

CROSS-REFERENCE SYMBOL TABLE   12:13 PM TUE., 23 OCT., 1979

NB100	03571	03481	
NB15	03564	03410	
NB200	03575	03371	03477
NB23	03566	03386	
NM1	03559	03362	03435
NM10	03558	03495	
NM64	03557	03461	
NOISE	03030	03048	
O	01172	00370	
O.B	03132	03214	
OODSA	01274	00568	
OODSP	01333	01274	
OTB15	01181	00435	00442
OUT	02661	02672	
P.1	02558	02550	02582	02587
P.2	02570	02553	02578	02580
P.3	02589	02563	02595	
P.4	02585	02573	
PARC1	01834	01381	
PARCK	01829	01356	01377	01833
PH1	01186	01003	
PH2	01187	01006	
PHIN1	00065	01004	
PHIN2	00066	01007	
PHIN3	00067	01009	
PHIN4	00068	01012	
PHNSC	00018	00999	
POS	02548	02524	

PWRFL	00069	01013			
RDMS	01305	01262			
RDMSA	01262	00413			
READ	01774	01245	01782		
READ1	01776	01784			
READA	01245	00756	00769	00770	00785	00792
READT	02689	02520	02755		
READX	02736	02773			
REJCT	03131	03110			
RERED	02696	02749			
RES	02541	02525			
RETRY	02655	02687			
REW	02535	02523			
@RLOAD	03677				
RQSTA	01257	00242			
RQSTD	01290	01257			
RSSA	01188	01008			
RSYA1	01213	00921			
RSYA2	01214	00926			
RT/TS	03678	00457			
RVRSA	03597	03419			
RVRSL	03585	03597			
RWEOF	02958	02955			
S	01173	00239			
S.1	02623	03191			
S.2	02624	03193			
S/TD0	01284	01254			

S/TDA   01254   00119

SELC1   01538   01543

SELC2   01540   01512   01515   01519   01521   01524   01532
        01535

SELCA   01246   00253

SELCD   01510   01246   01533   01537   01538   01539   01948

SETD1   01605   01653

SETD2   01611   01614

SETD3   01617   01603

SETD4   01621   01628   01631

SETD5   01625   01620

SETD6   01638   01646

SETD7   01643   01649

SETDA   01247   00123   00266

SETDS   01598   01247   01615   01616   01624

SGNBT   01997   01964

SHORT   02750   02746

SL0   02894   02836

SLASH   03576   03534

SLDIR   01231   01067   01087   01100   01101

SLSH   01165   00953

SOURC   02036   01867   01876   01878   01881

SPACE   02610   02554   02564   02619   02620

STAR   02000   01954

STAT   02627   02527

STC14   01182   00444

STIN   02622   02529   02570   02611   02625   02627   02736
        02816   02820   02826

SWPAA   00060   00902

SWPIA	00058	00863				
SWPLN	00059	00900				
SYSL	01331	01273				
SYSL1	01070	01075				
SYSL2	01085	01062				
SYSL4	01100	01118				
SYSL5	01107	01092				
SYSL6	01119	01110				
SYSLA	01273	01120				
SYSLB	01052	00783	00838	00845	01055	01106
SYSLF	01226	00081	00082	00160	00161	00209	00484
	00488	00489	00491	00493	00734	00735	00800
	00818	01053	01061	01065	01074		
SYSS1	01229	01079	01090	01094	01095	
SYSS2	01230	01083	01108	01112	01113	
SYST1	01227	01077	01096	01098	01099	
SYST2	01228	01081	01114	01116	01117	
SYSTA	02007	01800				
TAPEA	01271	01026				
TAPER	01327	01271				
TAPMA	03314	02335				
TAPMS	03326	03314				
TBASE	02519	02516				
TEMP0	01219	00107	00112	00126	00132	00205	00213
	00288	00303	00306	00336	00343	00390	00397
	00480	00486	00495	00503	00540	00623	00636
	00656	00658	00663	00685	00709	00720	00774
	00787	00788	00856	00904	00942	00952	00974
	00988						
TEMP1	01220	00115	00248	00264	00295	00309	00310
	00311	00312	00315	00392	00395	00396	00497
	00500	00501	00542	00548	00590	00622	00666

		00677	00716	00719	00768	00780	00795	00804
		00858	00896	00897	00899	02024		
TEMP2	01221	00117	00262	00297	00313	00552	00587
		00620	00796	00805	00860	00894	00895	02025
TEMP3	01222	00300	00304	00557	00565	00572	00582
		00589	00603	00608	00610	00617	00775	00798
		00862	00865	00873	00877	00881	00885	00889
		00891	00893					
TEMP4	01223	00509	00653	00661	00679	00684	00690
		00821	00823	00828	00829	01069	01070	01072
TFLAG	03589	03356	03376	03415	03424		
TIME	00062	00981					
TIMEA	01268	00968					
TIMER	01320	01268					
TMP1A	02024	01599	01607				
TMP2A	02025	01601	01636				
TPERR	01025	00199	00520	00546	00602	00616	00651
		00827	00837					
TRAX	00015	01195	02013				
TRAXA	01195	00127	00287				
TRKNA	02046	01483					
TRKNL	02060	02046					
TRKTA	01206	00391					
TRKTB	01232	00399	00920	00925	01076	01080	01206
		01207						
TSB	00064	01015					
TSBBA	01217	00453	00456				
TSTAT	03707	03704	03713				
TT35I	03295	02273	02275	02285	02311	02336	02794
		02808	03100	03127				
TTY1	03359	03378					
TTY2	03373	03382	03384	03387	03412	03414	03426

TTY35	03349	01235	02017	03295	03361	03411	03416
	03417	03420	03530	03552			
TTY4	03413	03389					
TTY5	03415	03392	03394	03396			
TTY6	03421	03352					
TTYDA	00051	00857					
TTYSC	03584	03358	03372	03373	03374	03379	
TTYTM	03590	03397	03409	03444			
TWODA	01248	00972	00975				
TWODG	01747	01248	01761	01762	01764		
U	01174	00365					
ULTM1	01205	00638	00672				
ULTTA	00070	03302					
ULTTB	01204	00541					
UPRBA	01202	00598	00604	00612	00618	00647	00667
	00680						
USTRA	01207	00859					
VRFY	03337	03318					
VRFYA	03318	02272					
WCNT	03276	02574	02589	02602	02615	02655	02671
WCR	03658	03613	03614				
WEOF	02640	02522					
WNE	03334	03317					
WNEA	03317	02793	03099				
WNEC	02787	02632	02640	02649	02791		
WORD	01215	00146	00164	00429	00451	00507	00522
	00551	00591	00597	00607	00611	00652	00683
	00729	00901	00914	00919	00924	01086	
WORDC	03593	01215	03297	03457	03462	03509	03631
	03636						

WORDN	03297	02114	02125	02153	02158	02169	02191
	02195	02214	02219	02244	02253		

| WRITE | 02648 | 02521 |

XABS	02915	02712	02759	02843	02846	02874	02889
	02923	02925	03006	03012	03046		

| XATCK | 03121 | 02838 | 03102 | 03124 | 03129 |

| XBASE | 02851 | 02848 |

XCMND	03105	02845	02864	02930	02948	02954	02959
	02971	02992	02994	03008	03034	03113	03117

XCNTR	03082	02880	02895	02911	02924	02967	03000
	03001	03010	03085	03089			

| XEND1 | 03060 | 03055 |

| XEND2 | 03057 | 03052 |

| XENDR | 03046 | 03029 |

XEOTC	03138	02928	02946	02962	02966	02995	02997
	03143						

| XGAP | 02945 | 02858 |

XIT	02898	02886	02890	02949	02963	02990	03072
	03087						

| XIT1 | 02901 | 02866 | 02912 | 02934 | 03026 | 03142 |

| XLOOP | 03075 | 03018 | 03078 | 03198 |

| XMTD | 02831 | 02506 |

| XOUT | 02975 | 02983 |

| XP.0 | 02891 | 02896 |

| XP.1 | 02887 | 02875 | 02913 |

| XP.2 | 02905 | 02877 | 02892 | 02909 |

| XP.5 | 02876 | 02879 | 02881 |

| XPOS | 02872 | 02856 |

| XREAD | 02997 | 02852 | 03041 |

| XRERD | 03002 | 03035 |

| XRES | 02860 | 02857 |

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XREW    02862    02855

XS.0    03107    03194

XS.1    02938    02833    03094    03192

XSHRT   03036    03032

XSPCE   02926    02878    02893    02932    02935    02999    03030

XSTIN   02937    02831    02865    02899    02906    02941    02987
        03024    03092    03116    03122    03139

XT.0    03134    03135    03202

XT.1    02837    03210

XT.10   02985    02986    03203

XT.11   03009    03186

XT.12   02957    03187

XT.13   02834    03176

XT.14   03106    03136    03209

XT.15   03114    03115    03201

XT.16   02835    03216

XT.2    02978    03183

XT.20   02976    02979    03199

XT.3    02980    03166

XT.4    02902    03215

XT.43   03079    03169

XT.46   03077    03184

XT.5    02984    02977    03174

XT.50   03021    03076    03175

XT.6    03133    03213

XT.7    03111    03212

XT.8    03022    03023    03204

XT.9    02972    03185
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XWAIT	03074	03011	03013	03080		
XWEOF	02956	02854				
XWEOR	02953	02961				
XWNEC	03091	02699	02719	02725	02752	02920	02929
	02945	02956	02965	02969	02982	03004	03014
	03015	03038	03097	03103	03308	03309	
XWRTE	02965	02853				
Y	01175	00090	00419			
YEAR	00063	00963				