```
0001  * 0170-001-6801 (IOS-016X)   CCD NO. 70181495000       REV. A                0001
0002  *                                                                            0002
0003  *                                                                            0003
0004  *                                                                            0004
0005  * COMPUTER:  H316, DDP-516                                                   0005
0006  *                                                                            0006
0007  *                                                                            0007
0008  * CATEGORY:  ASSEMBLY                                                        0008
0009  *                                                                            0009
0010  *                                                                            0010
0011  * PROGRAM TITLE:  IOS-016X                                                   0011
0012  *                 DAP-16M2 I/O SUPERVISOR WITH DEVICE SELECTION              0012
0013  *                                                                            0013
0014  *                                                                            0014
0015  *                                                                            0015
0016  *                                                                            0016
0017  *                                                                            0017
0018  *                                                                            0018
0019  *                                                                            0019
0020  *                                                                            0020
0021  *                                                                            0021
0022  *                                                                            0022
0023  *                                                                            0023
0024  *                          APPROVAL                    DATE                  0024
0025  *                                                                            0025
0026  *                                                                            0026
0027  *                                                                            0027
0028  *                          PROG----------------------  ----------            0028
0029  *                                                                            0029
0030  *                                                                            0030
0031  *                          SUPR----------------------  ----------            0031
0032  *                                                                            0032
0033  *                                                                            0033
0034  *                          QUAL- M R Harrymon ---      16 FEB 71             0034
0035  *                                                                            0035
0036  *                                                                            0036
0037  *                                NO. OF PAGES          ---23------           0037
```

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```
0038  *                                                                            0038
0039  *                                                                            0039
0040  * AUTHOR                                                                     0040
0041  *                                                                            0041
0042  *    HONEYWELL, INC., COMPUTER CONTROL DIVISION                              0042
0043  *                                                                            0043
0044  *                                                                            0044
0045  * PURPOSE                                                                    0045
0046  *                                                                            0046
0047  *    TO CONTROL THE I/O REQUIREMENTS OF DAP-16M2                             0047
0048  *                                                                            0048
0049  *                                                                            0049
0050  * STORAGE                                                                    0050
0051  *                                                                            0051
0052  *    0570  (OCTAL)                                                           0052
0053  *    0376  (DECIMAL)                                                         0053
0054  *                                                                            0054
0055  *                                                                            0055
0056  * USE                                                                        0056
0057  *                                                                            0057
0058  *          THIS PROGRAM IS UTILIZED BY DAP-16M2 TO PERFORM                   0058
0059  *    THE NECESSARY I/O OPERATIONS FOR AN ASSEMBLY, SOURCE, OBJECT,           0059
0060  *    AND LISTING DEVICES ARE SELECTED BY PRE-SETTING THE A-REGISTER          0060
0061  *    AS FOLLOWS:                                                             0061
0062  *                                                                            0062
0063  *    .....................................................                   0063
0064  *    :  :  :  :  :  :  :  :  :  :  :  :  :  :  :  :  :  :                   0064
0065  *    :  :  :  :  :  :  :  : S : S : S : 0 : 0 : 0 : L : L : L :              0065
0066  *    :.....................................................:                   0066
0067  *                                                                            0067
0068  *                                                                            0068
0069  *    WHERE                                                                   0069
0070  *                                                                            0070
0071  *          S - SOURCE DEVICE SELECTION                                       0071
0072  *                                                                            0072
0073  *                1 = ASR INPUT                                               0073
0074  *                2 = PTR INPUT                                               0074
```

```
0075  *                3 = CARD INPUT                                          0075
0076  *                4 = MAG TAPE INPUT                                      0076
0077  *                                                                        0077
0078  *          O - OBJECT DEVICE SELECTION                                   0078
0079  *                                                                        0079
0080  *                0 = INHIBIT OBJECT OUTPUT                               0080
0081  *                1 = ASR OUTPUT                                          0081
0082  *                2 = PTP OUTPUT                                          0082
0083  *                3 = CARD OUTPUT                                         0083
0084  *                4 = MAG TAPE OUTPUT                                     0084
0085  *                                                                        0085
0086  *          L - LISTING DEVICE SELECTION                                  0086
0087  *                                                                        0087
0088  *                0 = INHIBIT LISTING OUTPUT                              0088
0089  *                1 = ASR LISTING                                         0089
0090  *                2 = PTP LISTING                                         0090
0091  *                3 = LP LISTING                                          0091
0092  *                4 = MAG TAPE LISTING                                    0092
0093  *                                                                        0093
0094  *                                                                        0094
0095  *    MAG TAPE                                                            0095
0096  *                                                                        0096
0097  *          IF ANY MAG TAPES ARE BEING USED, FURTHER INFORMATION          0097
0098  *    CAN BE SUPPLIED IN THE B-REGISTER AS FOLLOWS:                       0098
0099  *                                                                        0099
0100  *                                                                        0100
0101  *    .....................................................               0101
0102  *    :   :   :   :   :   :   :   :   :   :   :   :   :   :   :   :       0102
0103  *    : A : A : B : B : C : C : D : E : E : E : E : E : E : E : E :       0103
0104  *    :...:...:...:...:...:...:...:...:...:...:...:...:...:...:...:       0104
0105  *                                                                        0105
0106  *    WHERE                                                               0106
0107  *                                                                        0107
0108  *    A (BITS 1+2)  THESE BITS ARE USED TO INDICATE WHICH MTU NUMBER      0108
0109  *                  THE INPUT SOURCE IS ON (IF THE A-REGISTER INDICATES   0109
0110  *                  MAG TAPE AS THE SOURCE INPUT FILE).                   0110
0111  *                  DEFAULT: MTU1 IS SELECTED AS THE DEFAULT OPTION.      0111
```

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```
0112  *                                                                        0112
0113  *    B (BITS 3+4)  THESE BITS ARE USED TO INDICATE WHICH MTU NUMBER      0113
0114  *                  THE OBJECT OUTPUT IS ON (IF THE A-REGISTER INDICATES  0114
0115  *                  MAG TAPE AS THE OBJECT OUTPUT FILE).                  0115
0116  *                  DEFAULT: MTU2 IS SELECTED AS THE DEFAULT OPTION.      0116
0117  *                                                                        0117
0118  *    C (BITS 5+6)  THESE BITS ARE USED TO INDICATE WHICH MTU NUMBER      0118
0119  *                  THE LISTING OUTPUT IS ON (IF THE A-REGISTER INDICATES 0119
0120  *                  MAG TAPE AS THE LISTING OUTPUT FILE).                 0120
0121  *                  DEFAULT: MTU3 IS SELECTED AS THE DEFAULT OPTION.      0121
0122  *                                                                        0122
0123  *    D (BIT 7)     THIS BIT IS USED TO INDICATE WHAT MODE                0123
0124  *                  (CONTINUOUS IF SET) THE MAG TAPE INPUT IS IN.         0124
0125  *                  DEFAULT: NON CONTINUOUS MODE                          0125
0126  *                                                                        0126
0127  *                  IF BIT 7 IS SET, THE COMPUTER WILL HALT IMMEDIATELY   0127
0128  *                  AFTER START IN ORDER TO GET A SECOND B-REGISTER        0128
0129  *                  SETTING. AT THIS TIME THE NUMBER OF FILES TO BE       0129
0130  *                  ASSEMBLED CONTINUOUSLY WILL BE SET IN THE             0130
0131  *                  B-REGISTER (IN OCTAL). IF THE B-REGISTER IS LEFT      0131
0132  *                  ZERO, ALL THE FILES WILL BE ASSEMBLED UNTIL A DOUBLE  0132
0133  *                  EOF IS SENSED. AT THE COMPLETION OF A JOB, THE INPUT  0133
0134  *                  MAG TAPE WILL BE REWOUND.                             0134
0135  *                                                                        0135
0136  *                  NOTE: AT THE COMPLETION OF ALL JOBS, THE ORGINAL A    0136
0137  *                  AND B REGISTERS ARE SAVED. IF YOU WISH TO CHANGE THE  0137
0138  *                  REGISTER SETTINGS, DO SO NOW, AND THEN PUSH START.    0138
0139  *                  (REMEMBER IF BIT 7 IS SET IN THE B-REGISTER AT THIS   0139
0140  *                  POINT, THE COMPUTER WILL COME TO A SECOND HALT FOR     0140
0141  *                  REASONS MENTIONED IN THE PREVIOUS PARAGRAPH.)         0141
0142  *                                                                        0142
0143  *    E (BITS 9-16) THESE BITS ARE USED TO INDICATE WHICH FILE OF THE     0143
0144  *                  MAG TAPE IS TO BE ASSEMBLED.                          0144
0145  *                  DEFAULT: START ASSEMBLING WHERE THE MAG TAPE IS       0145
0146  *                  CURRENTLY POSITIONED.                                 0146
0147  *                                                                        0147
0148  *    IF ANY OF THE GROUPS EQUALS ZERO, THE DEFAULT OPTIONS FOR THOSE     0148
```

```
0149                    *    PARTICULAR GROUPS WILL BE SELECTED.                                    0149
0150                    *                                                                           0150
0151                    *                                                                           0151
0152                    * METHOD                                                                    0152
0153                    *                                                                           0153
0154                    *          THIS PROGRAM CONSISTS OF TEN SUBROUTINES THAT                    0154
0155                    *    ARE UTILIZED BY DAP-16M2. THE FOLLOWING LIST GIVES                     0155
0156                    *    THE ROUTINE NAMES AND FUNCTIONS.                                       0156
0157                    *                                                                           0157
0158                    *                                                                           0158
0159                    *    1) D$IN - CALLS FOR THE INITIALIZATION OF THE                          0159
0160                    *              SYMBOL TABLE BY THE ROUTINE TABLESIZ.                        0160
0161                    *                                                                           0161
0162                    *    2) D$OL - OUTPUTS ONE LINE OF DATA.                                    0162
0163                    *                                                                           0163
0164                    *    3) D$RD - READS ONE SOURCE STATEMENT                                   0164
0165                    *                                                                           0165
0166                    *    4) D$OB - OUPUTS ONE BLOCK OF OBJECT TEXT.                             0166
0167                    *                                                                           0167
0168                    *    5) D$HD - INITIALIZES THE HEADING.                                     0168
0169                    *                                                                           0169
0170                    *    6) D$SOM - OUTPUTS LEADER.                                             0170
0171                    *                                                                           0171
0172                    *    7) D$EOM - OUTPUTS END OF MESSAGE CODE AND PUNCHS TRAILER.             0172
0173                    *                                                                           0173
0174                    *    8) D$EJ - PAGE EJECT                                                   0174
0175                    *                                                                           0175
0176                    *    9) D$PA - HALTS WHILE ADDITIONAL SOURCE STATEMENTS                     0176
0177                    *              ARE LOADED...CALLED WHEN A 'MOR' PSEUDO-OP                   0177
0178                    *              IS ENCOUNTERED.                                              0178
0179                    *                                                                           0179
0180                    *    10) D$HT - END OF PASS HALT.                                           0180
0181                    *                                                                           0181
0182                    *                                                                           0182
0183                    *    ALL ACTUAL DATA TRANSFERS ARE PERFORMED BY I/O LIBRARY                 0183
0184                    *    DRIVERS WHICH ARE CALLED ON BY THIS PROGRAM.                           0184
0185                    *                                                                           0185
```



```
0186                    *                                                                           0186
0187                    ********************************************************************        0187
0188                    *                                                                           0188
0189                         SUBR  D$IN              INITIALIZATION                                 0189
0190                         SUBR  D$RD              READ ONE SOURCE STATEMENT                      0190
0191                         SUBR  D$OL              LIST ONE SOURCE STATEMENT                      0191
0192                         SUBR  D$EJ              PAGE EJECT                                     0192
0193                         SUBR  D$HD              INITIALIZE HEADING                             0193
0194                         SUBR  D$OB              OUTPUT OBJECT TEXT BLOCK                       0194
0195                         SUBR  D$SOM             PUNCH LEADER                                   0195
0196                         SUBR  D$EOM             OUTPUT EOM CODE                                0196
0197                         SUBR  D$PA              PAUSE                                          0197
0198                         SUBR  D$HT              END OF PASS HALT                               0198
0199                         EXT   ZPT                                                              0199
0200                         EXT   ZP                                                               0200
0201                         REL                                                                    0201
0202                    *                                                                           0202
0203                    *    LIST DEVICE CALLS                                                      0203
0204                    *                                                                           0204
0205 00000   100000          SKP                     INHIBIT                                        0205
0206 00001   0 10 00000       CALL  O$LL              ASR                                            0206
0207 00002   0 10 00000       CALL  O$PL              PTP                                            0207
0208 00003   0 10 00000       CALL  O$LA              LP                                             0208
0209 00004   0 01 00274       JMP   MAGL              MAG                                            0209
0210         000005      LA    EQU   *                                                            0210
0211                    *                                                                           0211
0212                    *    HEADING INITIALIZATION CALLS                                           0212
0213                    *                                                                           0213
0214 00005   100000          SKP                     INHIBIT                                        0214
0215 00006   0 10 00000       CALL  O$HH              ASR                                            0215
0216 00007   0 10 00000       CALL  O$PH              PTP                                            0216
0217 00010   0 10 00000       CALL  O$LH              LP                                             0217
0218 00011   100000          SKP                     MAG                                            0218
0219         000012      LH    EQU   *                                                            0219
0220                    *                                                                           0220
0221                    *    PAGE EJECT CALLS                                                       0221
0222                    *                                                                           0222
```

```
0223 00012  101000          NOP                     INHIBIT                    0223
0224 00013  101000          NOP                     ASR                        0224
0225 00014  101000          NOP                     PTP                        0225
0226 00015  0 10 00000      CALL  O$LE              LP                         0226
0227 00016  101000          NOP                     MAG                        0227
0228        000017      LJ  EQU   *                                            0228
0229                    *                                                      0229
0230                    *   OBJECT OUTPUT CALLS                                0230
0231                    *                                                      0231
0232 00017  100000          SKP                     INHIBIT                    0232
0233 00020  0 10 00000      CALL  O$AB              ASR                        0233
0234 00021  0 10 00000      CALL  O$PB              PTP                        0234
0235 00022  0 10 00000      CALL  O$CB              CARD                       0235
0236 00023  0 01 00325      JMP   MAGB              MAG                        0236
0237        000024      OB  EQU   *                                            0237
0238                    *                                                      0238
0239                    *   PUNCH LEADER CALLS                                 0239
0240                    *                                                      0240
0241 00024  101000          NOP                     INHIBIT                    0241
0242 00025  101000          NOP                     ASR                        0242
0243 00026  0 10 00000      CALL  O$PLDR            PTP                        0243
0244 00027  101000          NOP                     CARD                       0244
0245 00030  101000          NOP                     MAG                        0245
0246        000031      OF  EQU   *                                            0246
0247                    *                                                      0247
0248                    *   OUTPUT EOM CALLS                                   0248
0249                    *                                                      0249
0250 00031  101000          NOP                     INHIBIT                    0250
0251 00032  0 10 00000      CALL  O$AS              ASR                        0251
0252 00033  0 10 00000      CALL  O$PS              PTP                        0252
0253 00034  0 10 00000      CALL  O$CS              CARD                       0253
0254 00035  101000          NOP                     MAG                        0254
0255        000036      OS  EQU   *                                            0255
0256                    *                                                      0256
0257                    *   SOURCE INPUT CALLS                                 0257
0258                    *                                                      0258
0259 00036  0 10 00000      CALL  I$AA              ASR                        0259
```



```
0260 00037  0 10 00000      CALL  I$PA              PTR                        0260
0261 00040  0 10 00000      CALL  I$CA              CARD                       0261
0262 00041  0 01 00231      JMP   MAGI              MAG                        0262
0263        000042      IB  EQU   *                                            0263
0264                    *                                                      0264
0265 00042  0 10 00000 AJSH CALL  O$AH                                         0265
0266 00043  0 10 00000 AJSL CALL  O$AL                                         0266
0267                    *                                                      0267
0268                        EJCT  . . . . . .                                  0268
```

```
0269                        *                                                          0269
0270                        *     D$IN: INITIALIZATION                                 0270
0271                        *                                                          0271
0272                        *                                                          0272
0273 00044   0 000000   D$IN DAC   **                                                  0273
0274 00045   0 04 00536        STA   T111          SAVE A REGSITER SETTING             0274
0275 00046   0 04 00537        STA   DEVD                                              0275
0276 00047   0 10 00000        CALL  TBLSIZ        SET UP THE SYMBOL TABLE             0276
0277 00050   0 02 00000        LDA   ZPT           CHECK FOR ASSEMBLY PASS             0277
0278 00051   101400           SMI                                                      0278
0279 00052   0 01 00056        JMP   SPEC          GO FIND THE FILE                    0279
0280 00053   0 02 00000        LDA   ZP            CHECK FOR SPECIAL                   0280
0281 00054   101400           SMI                                                      0281
0282 00055   0 01 00127        JMP   GOAS          GO ASSEMBLE                         0282
0283 00056   000201     SPEC  IAB                 GET THE B REGISTER SETTING          0283
0284 00057   0 04 00540        STA   TMP2          SAVE IT                             0284
0285 00060   0414 72           LGL   6             GET THE CONTINUATION BIT            0285
0286 00061   0 04 00541        STA   B7            SAVE IT                             0286
0287 00062   101400           SMI                 IS IT  ON                           0287
0288 00063   0 01 00101        JMP   EEE           NO - OMIT CONTINUATION PROCESSOR    0288
0289 00064   0 02 00542        LDA   TAB           IS THIS THE FIRST TIME THROUGH      0289
0290 00065   100040           SZE                 SKIP IF IT IS                       0290
0291 00066   0 01 00127        JMP   GOAS          NO - GO ASSEMBLE                    0291
0292 00067   140040     HHH   CRA                 YES - GET SECOND B REGISTER SETTING 0292
0293 00070   000201           IAB                                                      0293
0294 00071   000000           HLT                 ALLOW OPERATOR TO SET FILE COUNT    0294
0295 00072   000201           IAB                 PLACE IT IN A                       0295
0296 00073   0 04 00543        STA   TTT           SAVE IT FOR FUTURE REFERENCE        0296
0297 00074   140407           TCA                                                      0297
0298 00075   0 04 00544        STA   COUN          SAVE IT FOR COUNTING                0298
0299 00076   0 02 00227        LDA   NOP1                                             0299
0300 00077   0 04 00407        STA   HL1                                              0300
0301 00100   0 04 00542        STA   TAB           MAKE TAB NON ZERO                   0301
0302 00101   0 02 00537 EEE    LDA   DEVD          PICK UP THE I/O OPTIONS             0302
0303 00102   0414 71           LGL   7             A(1) WILL BE SET IF MAG INPUT WAS SELECTED 0303
0304 00103   101400           SMI                 SKIP IF MAG INPUT                   0304
```



```
0305 00104   0 01 00127        JMP   GOAS          NO - GET OUT                        0305
0306 00105   0 02 00540        LDA   TMP2          GET THE B REGISTER SETTING          0306
0307 00106   0404 62           LGR   14            PUT MTU NUMBER IN BITS 15 AND 16    0307
0308 00107   101040           SNZ                 IF ZERO, USE MTU 1                  0308
0309 00110   141206           AOA                                                      0309
0310 00111   0 04 00125        STA   KEM5          SAVE MTU NUMBER                     0310
0311 00112   0 02 00540        LDA   TMP2          GET B AGAIN                         0311
0312 00113   0 03 00573        ANA   =^777         ISOLATE STARTING FILE NUMBER        0312
0313 00114   101040           SNZ                 IF ZERO, WE ARE AT THE RIGHT PLACE  0313
0314 00115   0 01 00127        JMP   GOAS          NO POSITIONING REQUIRED             0314
0315 00116   0 04 00545        STA   TMP3          STORE FILE NUMBER                   0315
0316 00117   140407           TCA                 COMPLEMENT FILE NUMBER FOR COUNTING 0316
0317 00120   0 04 00546        STA   KEM6          SET COUNTER                         0317
0318 00121   0 12 00546 TT     IRS   KEM6          ARE WE AT THE DESIRED FILE          0318
0319 00122   100000           SKP                 NO - FORWARD SPACE A FILE           0319
0320 00123   0 01 00127        JMP   GOAS          YES - START ASSEMBLY                0320
0321 00124   0 10 00000 GAT    CALL  C$FF          FORWARD FILE                        0321
0322 00125   0 00 00000 KEM5   ***   **            ON SPECIFIED MTU                    0322
0323 00126   0 01 00121        JMP   TT                                               0323
0324 00127   0 02 00537 GOAS   LDA   DEVD          GET THE A REGISTER SETTING          0324
0325 00130   0 03 00557        ANA   C7            MASK FOR LIST DEVICE CODE           0325
0326 00131   0 07 00560        SUB   C5            IF VALID CODE, IT NOW WILL BE NEGATIVE 0326
0327 00132   101400           SMI                 SKIP IF VALID CODE                  0327
0328 00133   0 02 00561        LDA   M4            INVALID CODE - FORCE ASR LISTING    0328
0329 00134   0 04 00547        STA   LDEV          SAVE LIST DEVICE CODE               0329
0330 00135   0 04 00000        STA   0             PLACE DEVICE CALL POINTER IN INDEX  0330
0331 00136   1 02 00012        LDA   LH,1          PICK UP HEADING INITIALIZATION CALL 0331
0332 00137   0 04 00347        STA   LHP           PLACE THE CALL IN THE D$HD ROUTINE  0332
0333 00140   1 02 00005        LDA   LA,1          PICK UP LISTING CALL                0333
0334 00141   0 04 00271        STA   LAP           PLACE THE CALL IN THE D$OL ROUTINE  0334
0335 00142   1 02 00017        LDA   LJ,1          PICK UP PAGE EJECT CALL             0335
0336 00143   0 04 00353        STA   LJP           PUT THE CALL IN THE D$EJ ROUTINE    0336
0337 00144   0 02 00537        LDA   DEVD          PICK UP THE DEVICE CODES            0337
0338 00145   0404 75           LGR   3             POSITION OBJECT DEVICE SELECTION CODE 0338
0339 00146   0 03 00557        ANA   C7            ELIMINATE ANY OTHER BITS            0339
0340 00147   0 07 00560        SUB   C5            IF GOOD CODE, A IS NOW NEGATIVE     0340
0341 00150   101400           SMI                 SKIP IF VALID CODE                  0341
```

```
0342 00151   0 02 00561       LDA   M4          INVALID CODE - FORCE ASR OBJECT                    0342
0343 00152   0 04 00000       STA   0           INDEX¤MODIFIED DEVICE CALL POINTER                 0343
0344 00153   1 02 00024       LDA   OB,1        PICK UP OUTPUT OBJECT BLOCK CALL                   0344
0345 00154   0 04 00320       STA   OBP         PUT CALL IN D$OB ROUTINE                           0345
0346 00155   1 02 00031       LDA   OF,1        PICK UP OBJECT INITIALIZATION CALL                 0346
0347 00156   0 04 00356       STA   BEGF        PLACE IT IN D$SOM ROUTINE                          0347
0348 00157   1 02 00036       LDA   OS,1        PICK UP OUTPUT EOM CALL                            0348
0349 00160   0 04 00363       STA   ENDF        PLACE IT IN D$EOM ROUTINE                          0349
0350 00161   0 02 00537       LDA   DEVD        GET DEVICE SELECTION CODES                         0350
0351 00162   0404 72          LGR   6           POSITION SOURCE SELECTION CODE                     0351
0352 00163   0 03 00557       ANA   C7          CLEAR OTHER BITS                                   0352
0353 00164   101040           SNZ               SKIP IF A DEVICE HAS BEEN SELECTED                 0353
0354 00165   141206           AOA               OTHERWISE SOURCE IS FROM ASR                       0354
0355 00166   0 07 00560       SUB   C5          A SHOULD BE MINUS IF VALID CODE                    0355
0356 00167   101400           SMI               SKIP IF VALID CODE                                 0356
0357 00170   0 02 00561       LDA   M4          OTHERWISE INPUT FROM THE ASR                       0357
0358 00171   0 04 00000       STA   0           INDEX¤MODIFIED DEVICE SELECTION CODE               0358
0359 00172   1 02 00042       LDA   IB,1        PICK UP INPUT SOURCE CALL                          0359
0360 00173   0 04 00225       STA   IBP         PLACE IT IN D$RD ROUTINE                           0360
0361 00174   0 02 00000       LDA   0           CHECK FOR SOURCE FROM ASR                          0361
0362 00175   0 06 00562       ADD   C4                                                             0362
0363 00176   100040           SZE               SKIP IF IT IS                                      0363
0364 00177   0 01 00210       JMP   AJGO        NO - NO SPECIAL MODIFICATIONS REQUIRED             0364
0365 00200   0 06 00547       ADD   LDEV        CHECK FOR LISTING ALSO ON ASR                      0365
0366 00201   0 06 00562       ADD   C4                                                             0366
0367 00202   100040           SZE               SKIP IF IT IS                                      0367
0368 00203   0 01 00210       JMP   AJGO        LISTING IS ON SOMETHING ELSE                       0368
0369 00204   0 02 00042       LDA   AJSH        BOTH SOURCE AND LISTING USE                        0369
0370 00205   0 04 00347       STA   LHP         ASR - MODIFY THE LISTING                           0370
0371 00206   0 02 00043       LDA   AJSL        CALLS TO OBTAIN A PROPERLY                         0371
0372 00207   0 04 00271       STA   LAP         FORMATTED LISTING.                                 0372
0373 00210   0 02 00537 AJGO  LDA   DEVD        FETCH PARAMETER SETTINGS                           0373
0374 00211   140401   .       CMA               COMPLEMENT ALL THE FLAGS                           0374
0375 00212   0 03 00565       ANA   MASK        ISOLATE HALT FLAG                                  0375
0376 00213   100040           SZE               SKIP IF HALTS ARE REQUESTED                        0376
0377 00214   0 02 00227       LDA   NOP1        OTHERWISE THE SWITCH WILL BE A NOP                 0377
0378 00215   0 04 00503       STA   STOP        SET THE SWITCH TO NOP OR HLT                       0378
```

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```
0379 00216   140040           CRA               CLEAR THE MAG. TAPE FLAGS                          0379
0380 00217   0 04 00550       STA   MTF1                                                           0380
0381 00220   0 04 00551       STA   MTF2                                                           0381
0382 00221   0 04 00552       STA   MWF1                                                           0382
0383 00222   0 04 00553       STA   MWF2                                                           0383
0384 00223  -0 01 00044       JMP*  D$IN          RETURN TO THE ASSEMBLER                        0384
0385                     *                                                                       0385
0386                     *     D$RD: READ ONE SOURCE STATEMENT                                   0386
0387                     *                                                                       0387
0388 00224   0 000000   D$RD  DAC   **                                                          0388
0389 00225   0 00 00000 IBP   ***   **            CALL TO SOURCE INPUT DEVICE                    0389
0390 00226   0 000000         XAC   INPB          BUFFER ADDRESS                                 0390
0391 00227   101000     NOP1  NOP                                                               0391
0392 00230  -0 01 00224       JMP*  D$RD          RETURN                                         0392
0393                     *                                                                       0393
0394 00231   0 12 00550 MAGI  IRS   MTF1          SET READ FLAG                                  0394
0395 00232   0 02 00125       LDA   KEM5          FETCH MTU NO.                                  0395
0396 00233   0 04 00243       STA   MTIN          PUT IN CALLING SEQUENCE                        0396
0397 00234   0 04 00415       STA   DIP           SAVE FOR BACKSPACING FILES                     0397
0398 00235   0 04 00437       STA   DIP1          SAVE FOR BACKSPACING RECORDS                   0398
0399 00236   0 04 00442       STA   DIP2          SAVE FOR FORWARD FILING                        0399
0400 00237   0 04 00500       STA   REWI          SAVE FOR TAPE REWIND                           0400
0401 00240   0 10 00000       CALL  I$MA          READ RECORD FROM MAG TAPE                      0401
0402 00241   0 000000         XAC   INPB          INPUT BUFFER                                   0402
0403 00242   000050           DEC   40            40 WORD BUFFER                                 0403
0404 00243   0 00 00000 MTIN  ***   **            MTU NO.                                        0404
0405 00244   0 01 00530       JMP   PERR          UNREADABLE RECORD                              0405
0406 00245   0 01 00255       JMP   EOTR          END OF TAPE RETURN                             0406
0407 00246   0 01 00257       JMP   MTU           END OF FILE RETURN                             0407
0408 00247   140040           CRA                                                               0408
0409 00250   0 04 00554       STA   ETAB          RESET EOF FLAG                                 0409
0410 00251   0 10 00000       CALL  C$6TO8        CONVERT INPUT DATA TO ASCII CODE               0410
0411 00252   0 000000         XAC   INPB          INPUT BUFFER ADDRESS                           0411
0412 00253   0 000050         DAC   40                                                          0412
0413 00254  -0 01 00224       JMP*  D$RD          RETURN                                         0413
0414                     *                                                                       0414
0415 00255   0 10 00505 EOTR  JST   EOT           REPORT EOT CONDITION TO OPERATOR               0415
```

```
0416 00256   0 01 00247        JMP   MTIN+4            GO FINISH PROCESSING THE RECORD                0416
0417                      *                                                                           0417
0418                      *                                                                           0418
0419                      *    MTU : END OF FILE PROCESSOR                                            0419
0420                      *                                                                           0420
0421                      *                                                                           0421
0422 00257   0 02 00554 MTU  LDA   ETAB               CHECK FOR PRECEEDING EOF                       0422
0423 00260   100040         SZE                      IF ZERO, THIS IS FIRST EOF                     0423
0424 00261   0 01 00266      JMP   FIX1               DOUBLE EOF - WRAP UP JOB                       0424
0425 00262   140401         CMA                      SET ETAB NON ZERO                              0425
0426 00263   0 04 00554      STA   ETAB                                                              0426
0427 00264   0 12 00551      IRS   MTF2               INCREMENT FILE/PROGRAM COUNTER                 0427
0428 00265   0 01 00240      JMP   MTIN-3             GO READ NEXT RECORD                            0428
0429 00266   0 04 00555 FIX1 STA   LOC                SET DOUBLE EOF INDICATOR                       0429
0430 00267   0 01 00453      JMP   E222               JOB IS DONE                                    0430
0431                      *                                                                           0431
0432                      *                                                                           0432
0433                           EJCT  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .                       0433
```



```
0434                      *                                                                           0434
0435                      *    D$OL: LIST ONE LINE OF DATA                                            0435
0436                      *                                                                           0436
0437 00270   0 000000   D$OL DAC   **                                                                0437
0438 00271   0 00 00000 LAP  ***   **               CALL TO LISTING DEVICE DRIVER                  0438
0439 00272   0 000000       XAC   OTPB               LIST BUFFER ADDRESS                            0439
0440 00273  -0 01 00270      JMP*  D$OL               RETURN                                         0440
0441                      *                                                                           0441
0442 00274   0 02 00540 MAGL LDA   TMP2               FETCH INITIAL B REGISTER SETTING               0442
0443 00275   0404 66        LGR   10                 ISOLATE LIST MTU NO.                           0443
0444 00276   0 03 00572      ANA   =3                                                               0444
0445 00277   101040         SNZ                      IF ZERO, USE MTU 3                             0445
0446 00300   0 02 00572      LDA   =3                                                                0446
0447 00301   0 04 00312      STA   MTLN               PLACE MTU NO. IN CALLING SEQUENCE              0447
0448 00302   0 04 00432      STA   MTEL               SAVE IT FOR EOF CALL                           0448
0449 00303   0 12 00553      IRS   MWF2               SET BCD WRITE FLAG                             0449
0450 00304   0 10 00000      CALL  C$BT06             CONVERT TO 6 BIT CODE                          0450
0451 00305   0 000000       XAC   OTPB               BUFFER ADDRESS                                 0451
0452 00306   000074         DEC   60                 60 WORD BUFFER                                 0452
0453 00307   0 10 00000      CALL  O$MA               WRITE BCD                                      0453
0454 00310   0 000000       XAC   OTPB               BUFFER ADDRESS                                 0454
0455 00311   000074         DEC   60                 60 WORD BUFFER                                 0455
0456 00312   0 00 00000 MTLN ***   **               LIST MTU NO.                                   0456
0457 00313   0 10 00505      JST   EOT                END OF TAPE RETURN                             0457
0458 00314  -0 01 00270      JMP*  D$OL               RETURN                                         0458
0459                      *                                                                           0459
0460                      *                                                                           0460
0461                           EJCT  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .                       0461
```

```
0462                        *
0463                        *     D$OB: OUTPUT OBJECT TEXT BLOCK
0464                        *
0465 00315    0 000000   D$OB LAC   **
0466 00316    0 02 00563      LDA   HIGH            SET A(1-8) TO INDICATE PUNCH ON
0467 00317    0 10 00502      JST   HALT
0468 00320    0 00 00000 OBP  ***   **              CALL TO OBJECT TEXT DEVICE
0469 00321    0 000000        XAC   OUTB            ADDRESS OF OBJECT TEXT BUFFER
0470 00322    0 02 00564      LDA   LOW             SET A(9-16) TO INDICATE PUNCH OFF
0471 00323    0 10 00502      JST   HALT            HALT IF ASR-33 IS USED
0472 00324   -0 01 00315      JMP*  D$OB            RETURN
0473                        *
0474 00325    0 02 00540 MAGB LDA   TMP2            FETCH FIRST B REGISTER SETTING
0475 00326    0404 64         LGR   12              ISOLATE OBJECT MTU NO.
0476 00327    0 03 00572      ANA   =3
0477 00330    101040          SNZ                   IF ZERO, USE MTU NO. 2
0478 00331    0 02 00571      LDA   =2
0479 00332    0 04 00342      STA   MTBN            PLACE IT IN CALLING SEQUENCE
0480 00333    0 04 00425      STA   MTEB            SAVE IT FOR EOF OUTPUT
0481 00334    0 12 00552      IRS   MWF1            SET BINARY WRITE FLAG
0482 00335   -0 02 00345      LDA*  MBXC            FETCH WORD COUNT OF BLOCK
0483 00336    0 04 00341      STA   MWB             PLACE IT IN THE CALLING SEQUENCE
0484 00337    0 10 00000      CALL  O$MC            WRITE IN BINARY MODE
0485 00340    0 000000        XAC   OTBX            BUFFER ADDRESS
0486 00341    0 00 00000 MWB  ***   **              WORD COUNT OF BLOCK
0487 00342    0 00 00000 MTBN ***   **              MTU NO.
0488 00343    0 10 00505      JST   EOT             END OF TAPE RETURN
0489 00344   -0 01 00315      JMP*  D$OB            EXIT
0490                        *
0491 00345    0 000000   MBXC XAC   OUTB            ADDRESS OF WORD CONTAINING BLOCK COUNT
0492                        *
0493                        *
0494                        EJCT  ....................................................
```



```
0495                        *
0496                        *     D$HD: INITIALIZE HEADING
0497                        *
0498 00346    0 000000   D$HD DAC   **
0499 00347    0 00 00000 LHP  ***   **              CALL TO HEADING INITIALIZATION ROUTINE
0500 00350    0 000000        XAC   OTPB            BUFFER ADDRESS
0501 00351   -0 01 00346      JMP*  D$HD            RETURN
0502                        *
0503                        *
0504                        *     D$EJ: PAGE EJECT
0505                        *
0506                        *
0507 00352    0 000000   D$EJ DAC   **
0508 00353    0 00 00000 LJP  ***   **              CALL TO PAGE EJECT ROUTINE
0509 00354   -0 01 00352      JMP*  D$EJ            EXIT
0510                        *
0511                        *
0512                        *     D$SOM: OUTPUT LEADER IF PTP IS OBJECT DEVICE
0513                        *
0514 00355    0 000000   D$SO DAC   **
0515 00356    0 00 00000 BEGF ***   **              NOP OR CALL O$PLDR
0516 00357   -0 01 00355      JMP*  D$SO            EXIT
0517                        *
0518                        *
0519                        *     D$EOM: OUTPUT EOM CODE TO OBJECT DEVICE
0520                        *
0521 00360    0 000000   D$EO DAC   **
0522 00361    0 02 00563      LDA   HIGH            TURN ON PUNCH INDICATOR
0523 00362    0 10 00502      JST   HALT            HALT IF ASR-33 IS OBJECT DEVICE
0524 00363    0 00 00000 ENDF ***   **              OUTPUT EOM CODE GOES HERE
0525 00364    0 02 00564      LDA   LOW             TURN OFF PUNCH INDICATOR
0526 00365    0 10 00502      JST   HALT
0527 00366    0 10 00355      JST   D$SO            OUTPUT TRAILER IF PTP IS OBJECT DEVICE
0528 00367   -0 01 00360      JMP*  D$EO            EXIT
0529                        *
0530                        *
```

```
0531                        EJCT  .     .     .     .     .     .     .           .        0531
```

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```
0532                        *                                                          0532
0533                        *     D$PA: PAUSE                                          0533
0534                        *                                                          0534
0535                        *                                                          0535
0536 00370   0 000000   D$PA DAC   **                                                  0536
0537 00371   0 02 00550      LDA   MTF1        IF INPUT HAS BEEN COMING FROM MAG,      0537
0538 00372   101040         SNZ               THE 'MOR' CARD SHOULD BE IGNORED        0538
0539 00373   000000         HLT               HALT - NOT MAG INPUT                    0539
0540 00374  -0 01 00370     JMP*  D$PA        EXIT                                    0540
0541                        *                                                          0541
0542                        *                                                          0542
0543                        *     D$HT: END OF PASS HALT                               0543
0544                        *                                                          0544
0545                        *                                                          0545
0546 00375   0 000000   D$HT DAC   **                                                  0546
0547 00376   0 02 00000     LDA   ZP          FETCH PASS INDICATOR                    0547
0548 00377   101400         SMI               SKIP IF PASS ONE OF A TWO PASS ASSEMBLY 0548
0549 00400   0 01 00421     JMP   EN2         GO WRAP UP OUTPUT PASS                  0549
0550 00401   0 02 00550     LDA   MTF1        CHECK FOR INPUT FROM MAG TAPE           0550
0551 00402   100040         SZE               SKIP IF NOT                             0551
0552 00403   0 01 00411     JMP   BKSP        GO POSITION MAG TAPE FOR NEXT PASS      0552
0553 00404   0 02 00540 HLT1 LDA   TMP2        BEFORE WE HALT, SET THE A + B REGISTERS 0553
0554 00405   000201         IAB               TO THEIR INITIAL SETTINGS               0554
0555 00406   0 02 00536     LDA   T111                                                0555
0556 00407   000000     HL1 HLT               END OF PASS HALT                        0556
0557 00410  -0 01 00375     JMP*  D$HT        RETURN FOR PASS TWO                     0557
0558 00411   0 02 00551 BKSP LDA   MTF2        MTF2 CONTAINS NUMBER OF FILES PASSED    0558
0559 00412   140401         CMA               THROUGH BEFORE 'END' CARD               0559
0560 00413   0 04 00551     STA   MTF2        SAVE POSITIONING COUNTER                0560
0561 00414   0 10 00000     CALL  C$BF        BACKSPACE ONE FILE                      0561
0562 00415   0 00 00000 DIP ***   **          INPUT MTU NO.                           0562
0563 00416   0 12 00551     IRS   MTF2        INCREMENT POSITIONING COUNTER           0563
0564 00417   0 01 00414     JMP   *-3         IF NO OVERFLOW, BACKSPACE ANOTHER FILE  0564
0565 00420  -0 01 00375     JMP*  D$HT        RETURN FOR PASS TWO                     0565
0566 00421   0 02 00552 EN2  LDA   MWF1        TEST FOR MAG TAPE OBJECT                0566
0567 00422   101040         SNZ               SKIP IF OBJECT HAS GONE TO MAG          0567
```

```
0568 00423   0 01 00426       JMP   P1              NO                                                    0568
0569 00424   0 10 00000       CALL  O$ME            PLACE AN EOF MARK AT END OF OBJECT                    0569
0570 00425   0 00 00000 MTEB  ***   **              OBJECT TEXT MTU N3.                                   0570
0571 00426   0 02 00553 P1    LDA   MWF2            FETCH MAG LISTING FLAG                                0571
0572 00427   101040           SNZ                   SKIP IF LISTING IS FROM MAG TAPE                      0572
0573 00430   0 01 00433       JMP   P2              NO                                                    0573
0574 00431   0 10 00000       CALL  O$ME            YES - PLACE EOF MARK AT END OF LISTING                0574
0575 00432   0 00 00000 MTEL  ***   **              LIST MTU NO.                                          0575
0576 00433   0 02 00550 P2    LDA   MTF1            CHECK FOR MAG INPUT                                   0576
0577 00434   101040           SNZ                   SKIP IF INPUT HAS BEEN FROM MAG                       0577
0578 00435   0 01 00443       JMP   AJT1                                                                  0578
0579 00436   0 10 00000 FSKF  CALL  C$BR            BACKSPACE OVER END CARD                               0579
0580 00437   0 00 00000 DIP1  ***   ***             INPUT MTU NO.                                         0580
0581 00440   101000           NOP                   IGNORE EOF RETURN                                     0581
0582 00441   0 10 00000       CALL  C$FF            FORWARD SPACE TO NEXT FILE                            0582
0583 00442   0 00 00000 DIP2  ***   **                                                                    0583
0584 00443   0 02 00566 AJT1  LDA   CRLF            ADVANCE LINE ON ASR                                   0584
0585 00444   0 10 00515       JST   TYPE                                                                  0585
0586 00445   0 02 00567       LDA   AC              PRINT END OF ASSEMBLY MESSAGE                         0586
0587 00446   0 10 00515       JST   TYPE                                                                  0587
0588 00447   0 02 00566       LDA   CRLF            ADVANCE LINE ON ASR                                   0588
0589 00450   0 10 00515       JST   TYPE                                                                  0589
0590 00451   14 0102          OCP   '102            ENSURE THAT THE PUNCH POWER IS OFF                    0590
0591 00452   101000     EHLT  NOP                                                                        0591
0592 00453   0 02 00541 E222  LDA   B7              FETCH CONTINUOUS ASSEMBLY FLAG                        0592
0593 00454   101400           SMI                   SKIP IF IN CONTINUOUS MODE                            0593
0594 00455   0 01 00473       JMP   MR              NO - REWIND THE TAPE AND HALT                         0594
0595 00456   0 02 00543       LDA   TTT             FETCH FILE COUNT                                      0595
0596 00457   101040           SNZ                   SKIP IF A FIXED LIMIT                                 0596
0597 00460   0 01 00464       JMP   ECHK            NO GO TO DOUBLE EOF CHECK                             0597
0598 00461   0 12 00544       IRS   COUN            INCREMENT FILE COUNTER                                0598
0599 00462   0 01 00404       JMP   HLT1            COUNT NOT ZERO - EXIT                                 0599
0600 00463   0 01 00467       JMP   FIX             GO WRAP UP PROCESSING                                 0600
0601 00464   0 02 00555 ECHK  LDA   LOC             GET EOF FLAG                                          0601
0602 00465   101040           SNZ                   SKIP IF DOUBLE EOF                                    0602
0603 00466   0 01 00404       JMP   HLT1            SINGLE EOF - CONTINUE                                 0603
0604 00467   140040     FIX   CRA                                                                        0604
```



```
0605 00470   0 04 00555       STA   LOC             CLEAR EOF FLAG                                        0605
0606 00471   0 04 00407       STA   HL1             RESET HALT INSTRUCTION                                0606
0607 00472   0 04 00542       STA   TAB             RESET TAB                                             0607
0608 00473   0 02 00536 MR    LDA   T111            FETCH A REGISTER SETTING                              0608
0609 00474   0414 71          LGL   7               A(1)=MAG TAPE INPUT BIT                               0609
0610 00475   101400           SMI                   SKIP IF MAG INPUT                                     0610
0611 00476   0 01 00404       JMP   HLT1            NO - SKIP THE REWIND                                  0611
0612 00477   0 10 00000       CALL  C$MR            REWIND THE INPUT TAPE                                 0612
0613 00500   0 00 00000 REWI  ***   **              INPUT MTU NO.                                         0613
0614 00501   0 01 00404       JMP   HLT1            END OF ASSEMBLY                                       0614
0615                          *                                                                           0615
0616                          *     HALT: HALT IF ASR-33 IS USED                                          0616
0617                          *                                                                           0617
0618                          *                                                                           0618
0619 00502   0 000000   HALT  DAC   **                                                                    0619
0620 00503   0 00 00000 STOP  ***                   HLT OR NOP                                            0620
0621 00504  -0 01 00502       JMP*  HALT            RETURN                                                0621
0622                          *                                                                           0622
0623                          *                                                                           0623
0624                          *     EOT : END OF TAPE DETECTED                                            0624
0625                          *                                                                           0625
0626 00505   0 000000   EOT   DAC   **                                                                    0626
0627 00506   0 02 00514       LDA   EOTM            PRINT EOT MESSAGE                                     0627
0628 00507   0 10 00515       JST   TYPE                                                                  0628
0629 00510   0 02 00566       LDA   CRLF            ADVANCE LINE                                          0629
0630 00511   0 10 00515       JST   TYPE                                                                  0630
0631 00512   000000           HLT                   WAIT FOR OPERATOR ACTION                              0631
0632 00513  -0 01 00505       JMP*  EOT             RETURN IF RESTARTED                                   0632
0633                          *                                                                           0633
0634 00514   142724     EOTM  BCI   1,ET                                                                 0634
0635                          *                                                                           0635
0636                          *                                                                           0636
0637                          *                                                                           0637
0638                          *     TYPE: TYPE TWO CHARACTERS ON ASR                                      0638
0639                          *                                                                           0639
0640                          *                                                                           0640
0641 00515   0 000000   TYPE  DAC   **                                                                    0641
```

```
0642 00516   34 0104          SKS   '104              WAIT FOR ASR TO GO NOT BUSY
0643 00517   0 01 00516       JMP   *-1
0644 00520   14 0104          OCP   '104              ENABLE ASR IN OUTPUT MODE
0645 00521   141340          ICA                     POSITION FIRST CHARACTER
0646 00522   74 0004         OTA   '4                OUTPUT FIRST CHARACTER
0647 00523   0 01 00522      JMP   *-1
0648 00524   141340          ICA                     POSITION SECOND CHARACTER
0649 00525   74 0004         OTA   '4                OUTPUT SECOND CHARACTER
0650 00526   0 01 00525      JMP   *-1
0651 00527  -0 01 00515      JMP*  TYPE               RETURN
0652                        *
0653                        *
0654                        *
0655                        *     PERR: INPUT PARITY ERROR DETECTED
0656                        *
0657 00530   0 02 00570  PERR LDA   PAR              OUTPUT PARITY ERROR MESSAGE
0658 00531   0 10 00515      JST   TYPE
0659 00532   0 02 00566      LDA   CRLF             ADVANCE LINE
0660 00533   0 10 00515      JST   TYPE
0661 00534   000000         HLT                    WAIT FOR OPERATOR ACTION
0662 00535   0 01 00247      JMP   MTIN+4           RETURN TO PROCESS BAD RECORD
0663                        *
0664                        *
0665 00536   000000     T111 BSZ   1
0666 00537   000000     DEVD BSZ   1
0667 00540   000000     TMP2 BSZ   1
0668 00541   000000     B7   BSZ   1
0669 00542   000000     TAB  BSZ   1
0670 00543   000000     TTT  BSZ   1
0671 00544   000000     COUN BSZ   1
0672 00545   000000     TMP3 BSZ   1
0673 00546   000000     KEM6 BSZ   1
0674 00547   000000     LDEV BSZ   1
0675 00550   000000     MTF1 BSZ   1
0676 00551   000000     MTF2 BSZ   1
0677 00552   000000     MWF1 BSZ   1
0678 00553   000000     MWF2 BSZ   1
```



```
0679 00554   000000     ETAB BSZ   1
0680 00555   000000     LOC  BSZ   1
0681 00556   000001     ONE  OCT   1
0682 00557   000007     C7   OCT   7
0683 00560   000005     C5   OCT   5
0684 00561   177774     M4   OCT   -4
0685 00562   000004     C4   OCT   4
0686 00563   177400     HIGH HEX   FF00
0687 00564   000377     LOW  HEX   00FF
0688 00565   004000     MASK HEX   800
0689 00566   106612     CRLF VFD   8,'215,8,'212
0690 00567   140703     AC   BCI   1,AC
0691 00570   150305     PAR  BCI   1,PE
0692 00571   000002          END                    END OF IOS-016X
     00572   000003
     00573   000777
```

```
AC      000567   AJGO    000210   AJSH    000042   AJSL    000043
AJT1    000443   B7      000541   BEGF    000356   BKSP    000411
C4      000562   C5      000560   C7      000557   COUN    000544
CRLF    000566   D$EJ    000352   D$EO    000360   D$HD    000346
D$HT    000375   D$IN    000044   D$OB    000315   D$OL    000270
D$PA    000370   D$RD    000224   D$SO    000355   DEVD    000537
DIP     000415   DIP1    000437   DIP2    000442   E222    000453
ECHK    000464   EEE     000101   EHLT    000452   EN2     000421
ENDF    000363   EOT     000505   EOTM    000514   EOTR    000255
ETAB    000554   FIX     000467   FIX1    000266   FSKP    000436
GAT     000124   GOAS    000127   HALT    000502   HHH     000067
HIGH    000563   HL1     000407   HLT1    000404   IB      000042
IBP     000225   KEM5    000125   KEM6    000546   LA      000005
LAP     000271   LDEV    000547   LH      000012   LHP     000347
LJ      000017   LJP     000353   LOC     000555   LOW     000564
M4      000561   MAGB    000325   MAGI    000231   MAGL    000274
MASK    000565   MBXC    000345   MR      000473   MTBN    000342
MTEB    000425   MTEL    000432   MTF1    000550   MTF2    000551
MTIN    000243   MTLN    000312   MTU     000257   MWB     000341
```

MAF1	000552	MAF2	000553	NOP1	000227	OB	000024
OBP	000320	OF	000031	ONE	000556	OS	000036
P1	000426	P2	000433	PAR	000570	PERR	000530
REWI	000500	SPEC	000056	STOP	000503	T111	000536
TAB	000542	TMP2	000540	TMP3	000545	TT	000121
TTT	000543	TYPE	000515	ZP	000000E	ZPT	000000E

0000 WARNING OR ERROR FLAGS
DAP-16 MOD 2 REV. C 08-24-70