DECUS
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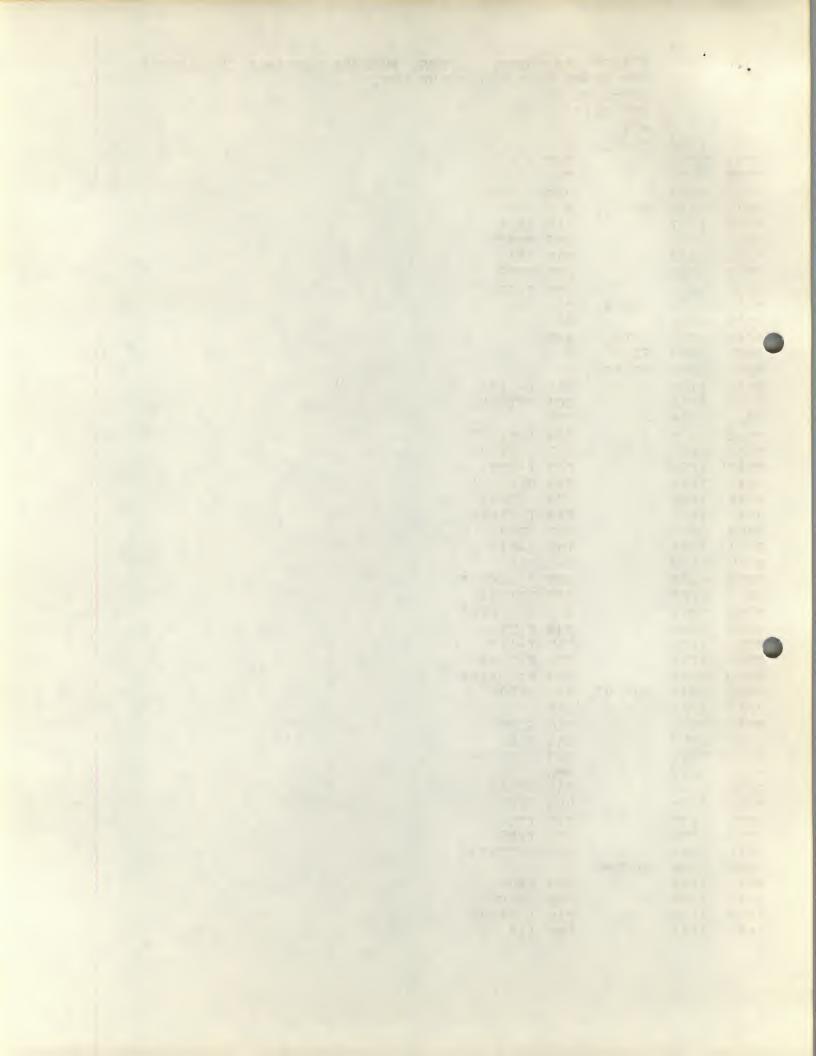|	
DECUS NO.	8-563
TITLE	TAPE
AUTHOR	Russell Lyons
COMPANY	8 Gould Road Lexington, Massachusetts
DATE	July 1, 1972
SOURCE LANGUAGE	PAL-D

TAPE

This program will punch readable characters 8 holes high and
proportional in width on paper tape using the low speed punch.
TAPE can punch all characters from 240 to 337 (ASCII). Leader and
trailer tape is punched at the beginning and at the end. It can
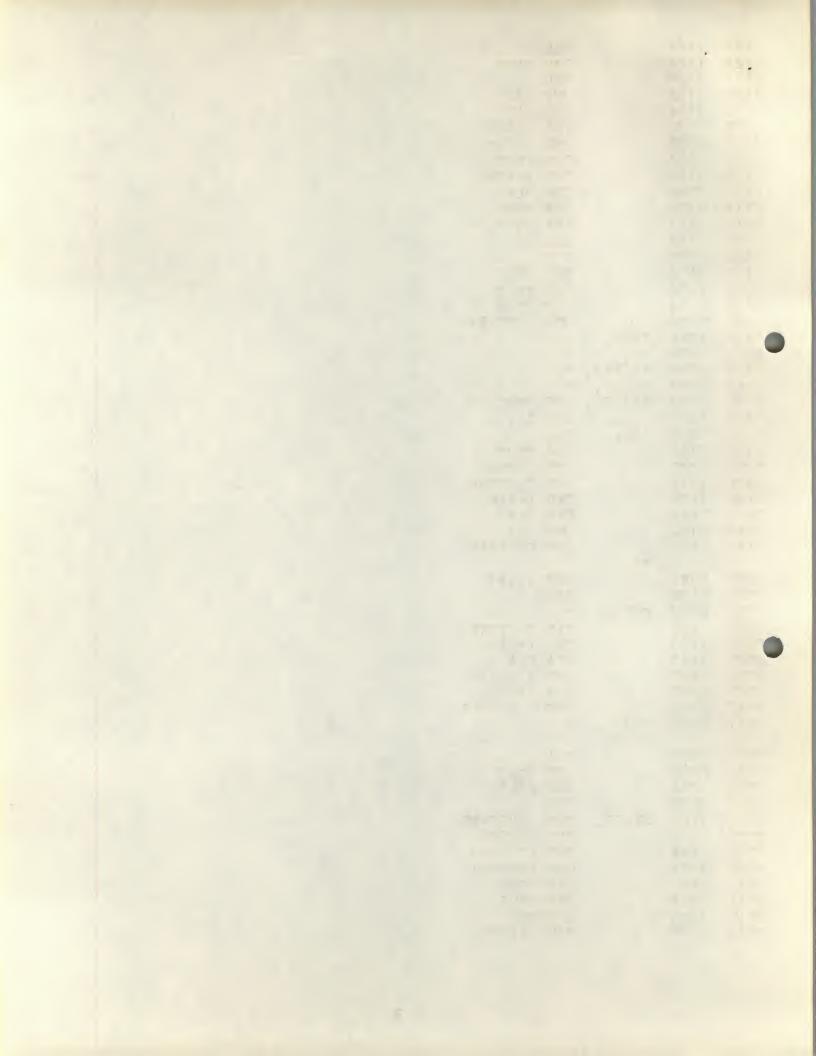punch from 0 to 409.5 inches.

The starting address of TAPE is 0. The program will first
ask if you want instructions. Type "Y" for "yes," any other char-
acter for "no." If you want 20.3 inches of leader tape, reply "203"
to the question, "HOW MANY 1/10 THS OF INCHES OF LEADER TAPE DO
YOU WANT?" After asking how much trailer tape you want (reply the
same way), it will print, "TYPE IN YOUR MESSAGE." This can be of
any length from 0 to 2047 characters long. So that you can read
everything you type, a carriage return/line feed will automatically
be printed at the end of every line. When you're finished, hit
the RETURN key and turn on the LSP. Hit any key and the punching
will begin. When it finishes punching the trailer tape, if any,
turn off the LSP. Hit any key again and you will be able to type
a new message. RUBOUT will cause a backslash to be typed and the
previous character to be deleted. If, after typing a full line
and a carriage return/line feed has been printed, you want to de-
lete a (some) character(s), RUBOUT will work exactly as if it was
just one line. If the RUBOUT key is struck and you haven't typed
anything or have deleted everything, nothing will be typed and
it won't affect anything. CTRL/C will restart the program. Typing
more than 2047 characters (excluding the RETURN at the end) will
cause part of TAPE to be destroyed. The only way to stop the pro-
gram is to type CTRL/B.

```
                    /"TAPE" BY RUSSELL LYONS. PUNCHES READABLE CHARACTERS
                    /ON PAPER TAPE USING THE LSP.
                    UND=6403
                    SRA=6417
                    *20
0020    0000    TYPE,       0
0021    6046                TLS
0022    7200                CLA
0023    5420                JMP I TYPE
0024    0000    CRLF,       0
0025    1177                TAD (215
0026    4020                JMS TYPE
0027    1176                TAD (212
0030    4020                JMS TYPE
0031    5424                JMP I CRLF
0032    0000    INSTR,      0
0033    0000                0
0034    4000    KSTORE,     4000
0035    0000    STORE,      0
0036    0000    ACCEPT,     0
0037    1175                TAD (-110
0040    3126                DCA RETURN
0041    6036                KRB
0042    3435                DCA I STORE
0043    1435                TAD I STORE
0044    1174                TAD (-377
0045    7650                SNA CLA
0046    5062                JMP RUBOUT
0047    1435                TAD I STORE
0050    2035                ISZ STORE
0051    1173                TAD (-215
0052    7650                SNA CLA
0053    5436                JMP I ACCEPT
0054    2126                ISZ RETURN
0055    5041                JMP ACCEPT+3
0056    4024                JMS CRLF
0057    1175                TAD (-110
0060    3126                DCA RETURN
0061    5041                JMP ACCEPT+3
0062    1034    RUBOUT,     TAD KSTORE
0063    7041                CIA
0064    1035                TAD STORE
0065    7650                SNA CLA
0066    5041                JMP ACCEPT+3
0067    7040                CMA
0070    1035                TAD STORE
0071    3035                DCA STORE
0072    1172                TAD ("\
0073    4020                JMS TYPE
0074    5054                JMP RUBOUT-6
0075    0000    NUMBER,     0
0076    3124                DCA KNUM
0077    4002                JMS CHECK
0100    1435                TAD I STORE
0101    0171                AND (17
```
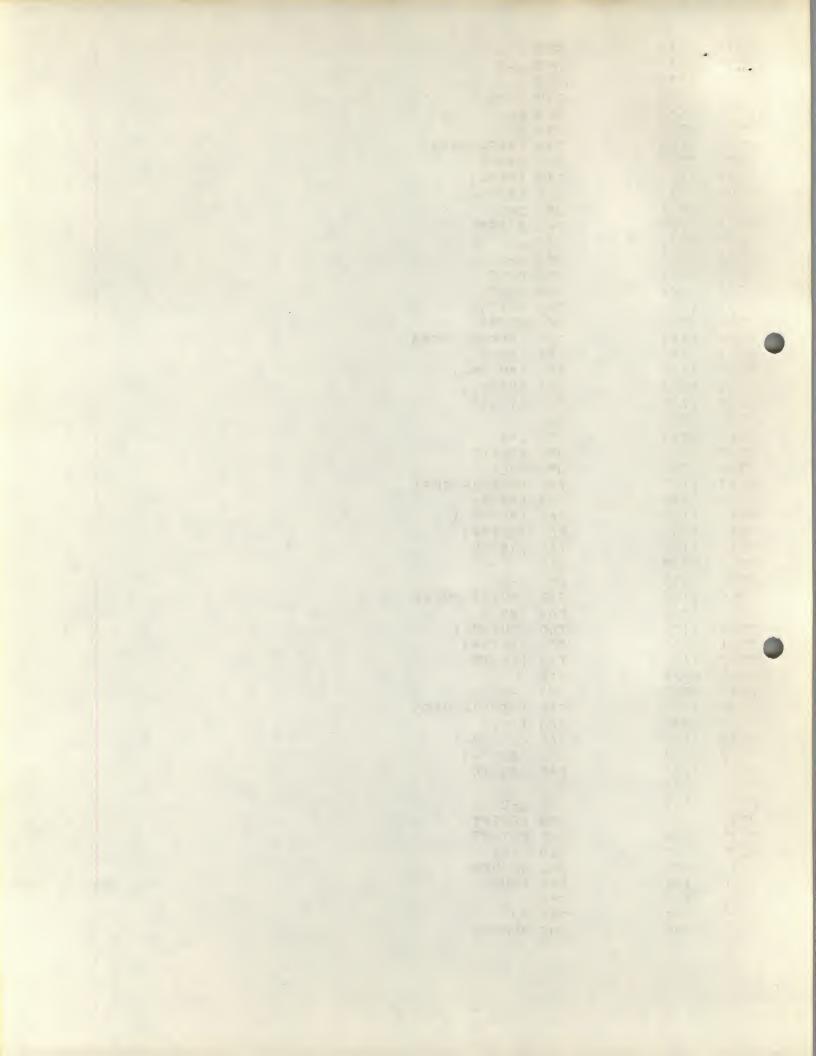
```
0102   7100           CLL
0103   1124           TAD KNUM
0104   7430           SZL
0105   5132           JMP MAX
0106   3124           DCA KNUM
0107   2035           ISZ STORE
0110   4002           JMS CHECK
0111   1124           TAD KNUM
0112   1170           TAD (-632
0113   7700           SMA CLA
0114   5132           JMP MAX
0115   1124           TAD KNUM
0116   7104           CLL RAL
0117   7006           RTL
0120   1124           TAD KNUM
0121   1124           TAD KNUM
0122   3124           DCA KNUM
0123   5100           JMP NUMBER+3
0124   0000   KNUM,   0
0125   0000   KJ,     0
0126   0000   RETURN, 0
0127   0000   PLACE,  0
0130   4020   FINISH, JMS TYPE
0131   5527           JMP I .-2
0132   7240   MAX,    STA
0133   3124           DCA KNUM
0134   2035           ISZ STORE
0135   1435           TAD I STORE
0136   1173           TAD (-215
0137   7640           SZA CLA
0140   5134           JMP .-4
0141   5007           JMP CHECK+5
               *0
0000   5401           JMP I .+1
0001   2400           2400
0002   0000   CHECK,  0
0003   1435           TAD I STORE
0004   1173           TAD (-215
0005   7640           SZA CLA
0006   5402           JMP I CHECK
0007   2035           ISZ STORE
0010   5475           JMP I NUMBER
0011   0000   TEMP,   0
               *200
0200   7200           CLA
0201   4024           JMS CRLF
0202   4024           JMS CRLF
0203   6402           DUP
0204   1167   START,  TAD [QUES-YES
0205   3032           DCA INSTR
0206   1166           TAD [QUES-1
0207   3033           DCA INSTR+1
0210   4024           JMS CRLF
0211   4024           JMS CRLF
0212   4024           JMS CRLF
0213   1165           TAD [INSTR
```
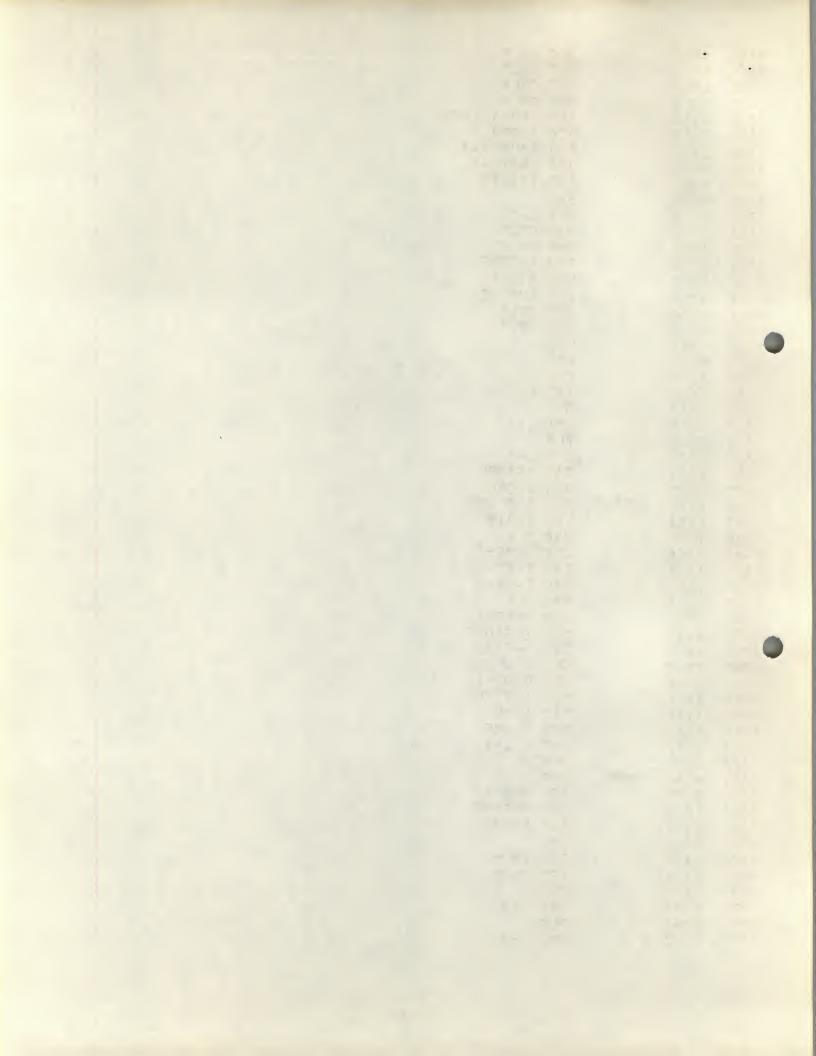
```
0214  6040         SAS
0215  5213         JMP .-2
0216  6036         KRB
0217  1164         TAD [-"Y
0220  7640         SZA CLA
0221  5233         JMP NO
0222  1163         TAD [YES-QUES2
0223  3032         DCA INSTR
0224  1162         TAD [YES-1
0225  3033         DCA INSTR+1
0226  4024         JMS CRLF
0227  1165         TAD [INSTR
0230  6040         SAS
0231  5227         JMP .-2
0232  4024         JMS CRLF
0233  4024    NO,  JMS CRLF
0234  1034         TAD KSTORE
0235  3035         DCA STORE
0236  1161         TAD [QUES2-QUES3
0237  3032         DCA INSTR
0240  1160         TAD [QUES2-1
0241  3033         DCA INSTR+1
0242  1165         TAD [INSTR
0243  6040         SAS
0244  5242         JMP .-2
0245  4036         JMS ACCEPT
0246  4024         JMS CRLF
0247  1157         TAD [QUES2-STOP1
0250  3032         DCA INSTR
0251  1160         TAD [QUES2-1
0252  3033         DCA INSTR+1
0253  1165         TAD [INSTR
0254  6040         SAS
0255  5253         JMP .-2
0256  1156         TAD [QUES3-QUES4
0257  3032         DCA INSTR
0260  1155         TAD [QUES3-1
0261  3033         DCA INSTR+1
0262  1165         TAD [INSTR
0263  6040         SAS
0264  5262         JMP .-2
0265  1154         TAD [STOP2-QUES3
0266  3032         DCA INSTR
0267  1153         TAD [STOP2-1
0270  3033         DCA INSTR+1
0271  1165         TAD [INSTR
0272  6040         SAS
0273  5271         JMP .-2
0274  4036         JMS ACCEPT
0275  1034         TAD KSTORE
0276  3035         DCA STORE
0277  4075         JMS NUMBER
0300  1124         TAD KNUM
0301  7040         CMA
0302  3125         DCA KJ
0303  4075         JMS NUMBER
```
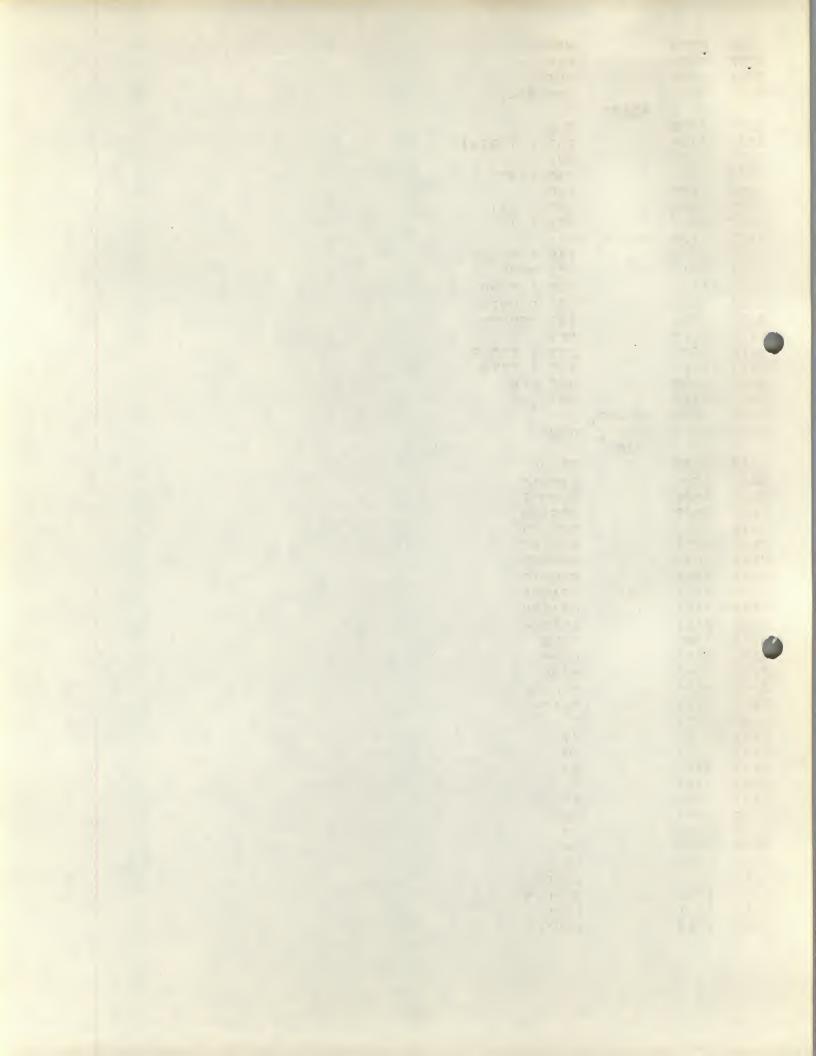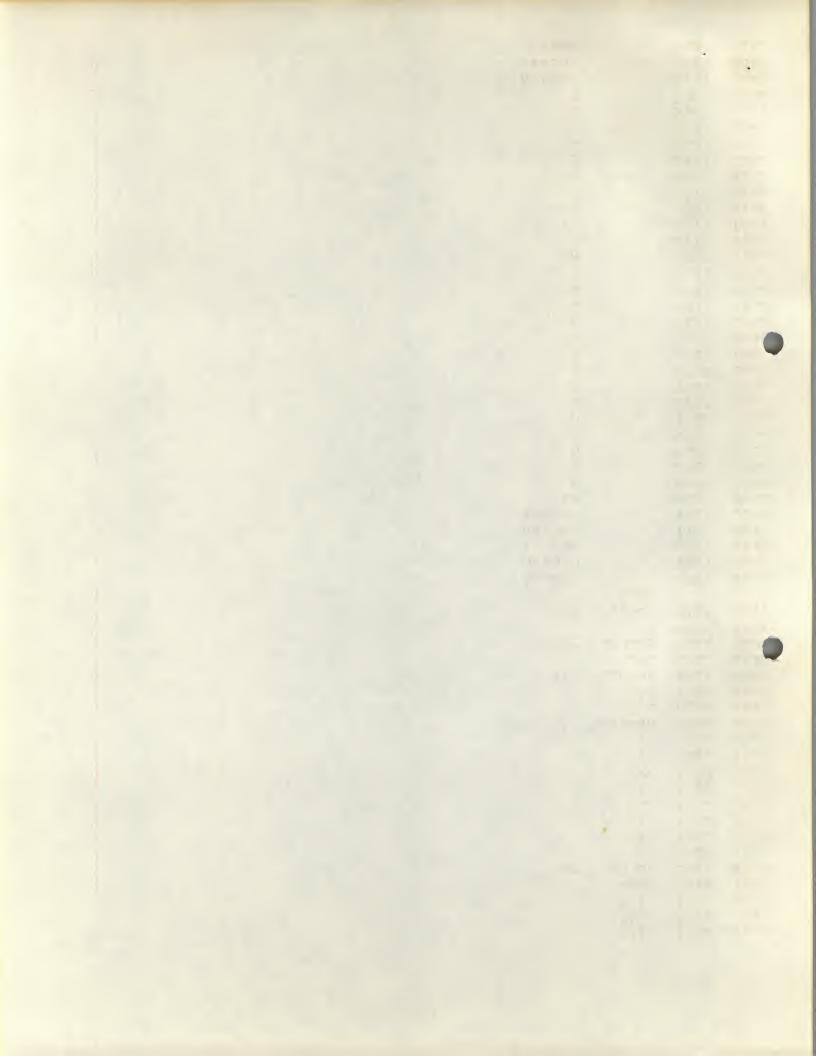
```
0304    4024                    JMS CRLF
0305    4024                    JMS CRLF
0306    4024                    JMS CRLF
0307    4024                    JMS CRLF
0310    1152                    TAD [QUES4-END
0311    3032                    DCA INSTR
0312    1151                    TAD [QUES4-1
0313    3033                    DCA INSTR+1
0314    1165                    TAD [INSTR
0315    6040                    SAS
0316    5314                    JMP .-2
0317    4024                    JMS CRLF
0320    4024                    JMS CRLF
0321    1034                    TAD KSTORE
0322    3035                    DCA STORE
0323    4036                    JMS ACCEPT
0324    4024                    JMS CRLF
0325    4024                    JMS CRLF
0326    6403                    UND
0327    6036                    KRB
0330    7200                    CLA
0331    2125                    ISZ KJ
0332    7410                    SKP
0333    5336                    JMP .+3
0334    6046                    TLS
0335    5331                    JMP .-4
0336    1034                    TAD KSTORE
0337    3035                    DCA STORE
0340    1435        NTDONE,     TAD I STORE
0341    1173                    TAD [-215
0342    7650                    SNA CLA
0343    5364                    JMP DONE+3
0344    1435                    TAD I STORE
0345    1150                    TAD [-240
0346    7710                    SPA CLA
0347    5362                    JMP DONE+1
0350    1435                    TAD I STORE
0351    1147                    TAD [-337
0352    7740                    SMA SZA CLA
0353    5362                    JMP DONE+1
0354    1435                    TAD I STORE
0355    1146                    TAD [200
0356    3127                    DCA PLACE
0357    5760                    JMP I .+1
0360    2407                    PUNCH
0361    6046        DONE,       TLS
0362    2035                    ISZ STORE
0363    5340                    JMP NTDONE
0364    1124                    TAD KNUM
0365    7040                    CMA
0366    3124                    DCA KNUM
0367    2124                    ISZ KNUM
0370    7410                    SKP
0371    5374                    JMP .+3
0372    6046                    TLS
0373    5367                    JMP .-4
```

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```
0374    6036              KRB
0375    7200              CLA
0376    6402              DUP
0377    5232              JMP NO-1
                *2400
2400    7200              CLA
2401    1145              TAD [START-1
2402    6417              SRA
2403    1144              TAD [4000
2404    6400              KSB
2405    5606              JMP I .+1
2406    0203              START-1
2407    7040   PUNCH,     CMA
2410    1527              TAD I PLACE
2411    3011              DCA TEMP
2412    1411              TAD I TEMP
2413    3222              DCA COUNTR
2414    2222              ISZ COUNTR
2415    7410              SKP
2416    5623              JMP I IDONE
2417    1411              TAD I TEMP
2420    4020              JMS TYPE
2421    5214              JMP .-5
2422    0000   COUNTR,    0
2423    0361   IDONE,     DONE
                *440
0440    0600              SPACE
0441    0602              EXCLAM
0442    0604              DQUOTE
0443    0607              NOSIGN
0444    0620              DOLLAR
0445    0626              PERCNT
0446    0635              AMPRSD
0447    0645              SQUOTE
0450    0647              OPAREN
0451    0654              CPAREN
0452    0661              ASTRSK
0453    0667              PLUS
0454    0675              COMMA
0455    0700              MINUS
0456    0705              PERIOD
0457    0707              SLASH
0460    1174              0
0461    0716              K1
0462    0724              K2
0463    0732              K3
0464    0740              K4
0465    0746              K5
0466    0754              K6
0467    0762              K7
0470    0770              K8
0471    0776              K9
0472    1004              COLON
0473    1006              SCOLON
0474    1011              LESS
0475    1016              EQUALS
```
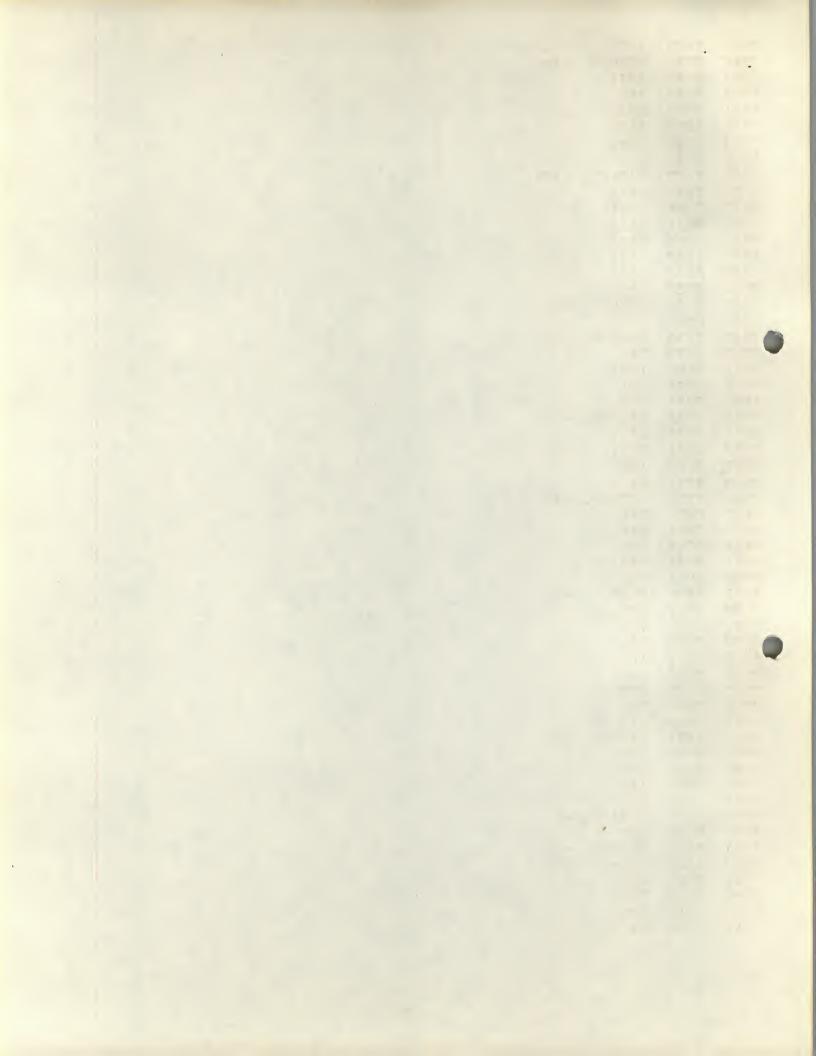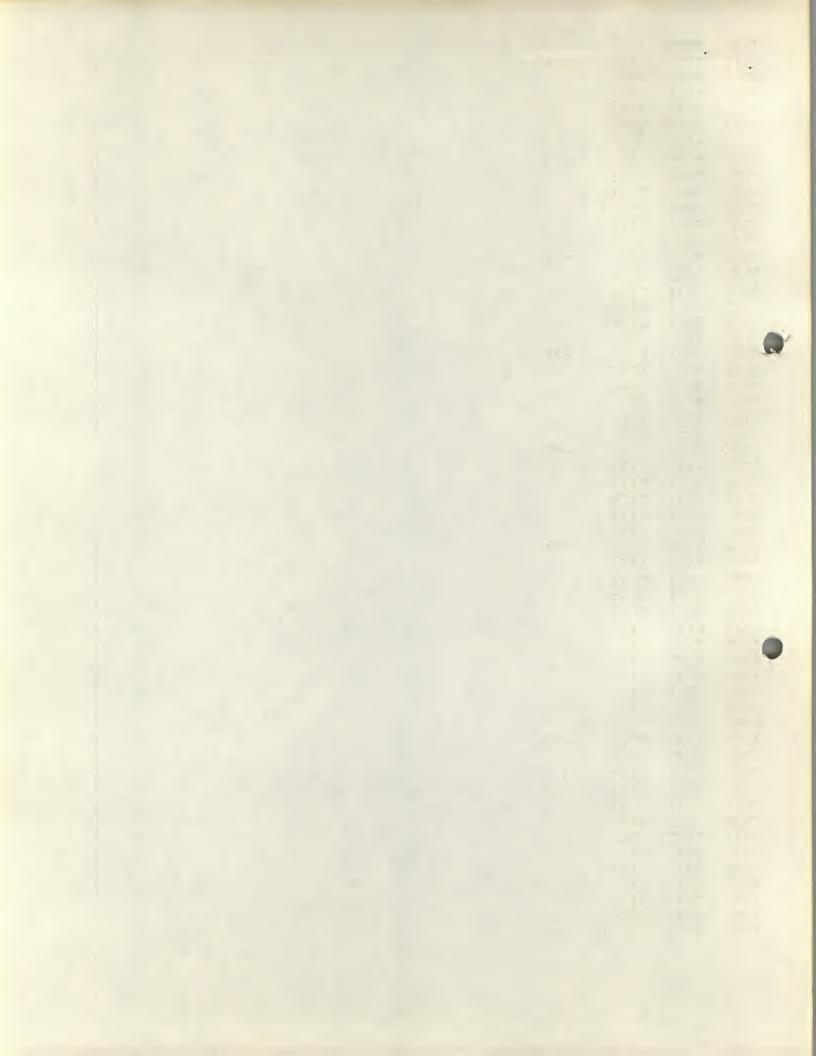
```
0476    1024              MORE
0477    1031              QUESTN
0500    1037              ATSIGN
0501    1051              A
0502    1056              B
0503    1064              C
0504    1072              D
0505    1100              E
0506    1106              F
0507    1114              G
0510    1122              H
0511    1130              KI
0512    1136              J
0513    1144              K
0514    1152              L
0515    1160              M
0516    1166              N
0517    1174              O
0520    1202              P
0521    1210              Q
0522    1216              R
0523    1224              S
0524    1232              T
0525    1240              U
0526    1246              V
0527    1254              W
0530    1262              X
0531    1270              Y
0532    1276              KZ
0533    1304              OBRACK
0534    1311              BSLASH
0535    1320              CBRACK
0536    1325              UARROW
0537    1333              BARROW
                *600
0600    7776    SPACE,   -2;
0601    0000    0
0602    7776    EXCLAM,  -2;
0603    0237    237
0604    7775    DQUOTE,  -3;
0605    0007    7;
0606    0007    7
0607    7767    NOSIGN,  -11;
0610    0064    64;
0611    0024    24;
0612    0034    34;
0613    0064    64;
0614    0026    26;
0615    0034    34;
0616    0024    24;
0617    0026    26
0620    7772    DOLLAR,  -6;
0621    0106    106;
0622    0211    211;
0623    0377    377;
0624    0211    211;
```
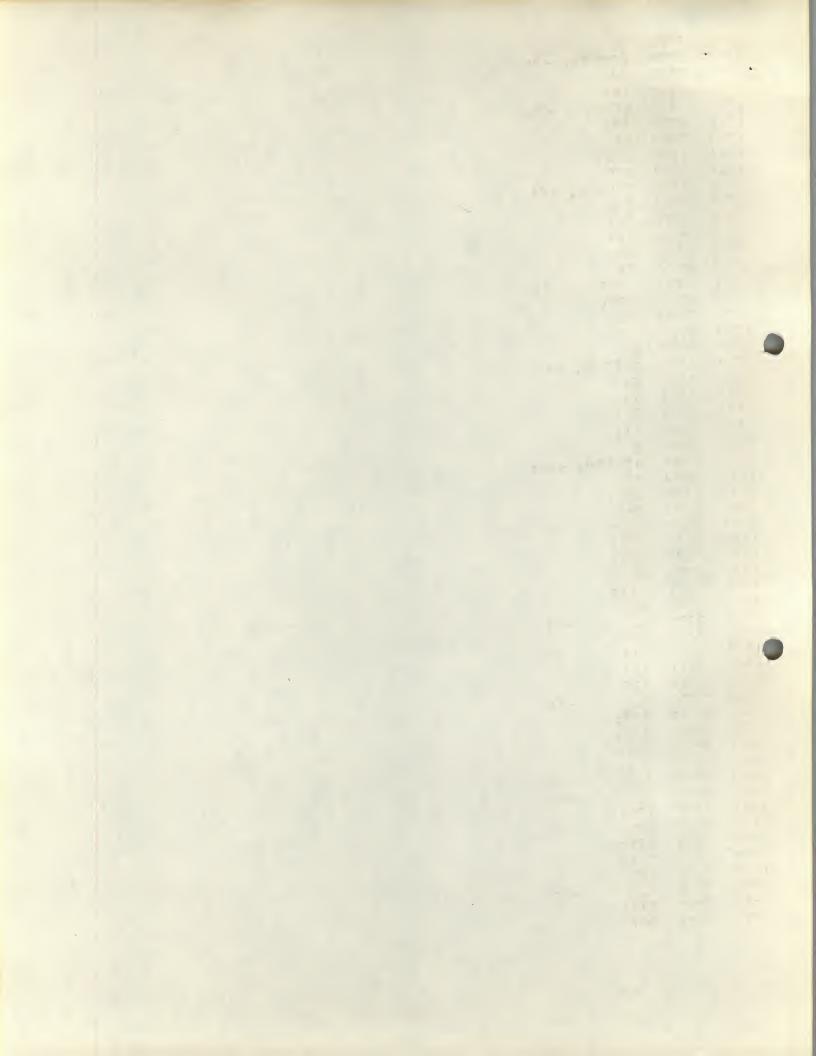
```
0625    0162    162
0626    7771    PERCNT, -7;
0627    0307    307;
0630    0045    45;
0631    0027    27;
0632    0350    350;
0633    0244    244;
0634    0343    343
0635    7770    AMPRSD, -10;
0636    0142    142;
0637    0225    225;
0640    0211    211;
0641    0226    226;
0642    0140    140;
0643    0140    140;
0644    0220    220
0645    7776    SQUOTE, -2;
0646    0007    7
0647    7773    OPAREN, -5;
0650    0074    74;
0651    0102    102;
0652    0201    201;
0653    0201    201
0654    7773    CPAREN, -5;
0655    0201    201;
0656    0201    201;
0657    0102    102;
0660    0074    74
0661    7772    ASTRSK, -6;
0662    0052    52;
0663    0034    34;
0664    0010    10;
0665    0034    34;
0666    0052    52
0667    7772    PLUS,   -6;
0670    0010    10;
0671    0010    10;
0672    0076    76;
0673    0010    10;
0674    0010    10
0675    7775    COMMA,  -3;
0676    0200    200;
0677    0140    140
0700    7773    MINUS,  -5;
0701    0010    10;
0702    0010    10;
0703    0010    10;
0704    0010    10
0705    7776    PERIOD, -2;
0706    0200    200
0707    7771    SLASH,  -7;
0710    0300    300;
0711    0040    40;
0712    0020    20;
0713    0010    10;
0714    0004    4;
```

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```
0715    0003    3
0716    7772    K1,        -6:
0717    0204    204:
0720    0202    202:
0721    0377    377:
0722    0200    200:
0723    0200    200
0724    7772    K2,        -6:
0725    0302    302:
0726    0241    241:
0727    0221    221:
0730    0211    211:
0731    0206    206
0732    7772    K3,        -6:
0733    0102    102:
0734    0211    211:
0735    0211    211:
0736    0211    211:
0737    0166    166
0740    7772    K4,        -6:
0741    0017    17:
0742    0010    10:
0743    0010    10:
0744    0010    10:
0745    0377    377
0746    7772    K5,        -6:
0747    0117    117:
0750    0211    211:
0751    0211    211:
0752    0211    211:
0753    0161    161
0754    7772    K6,        -6:
0755    0176    176:
0756    0221    221:
0757    0221    221:
0760    0221    221:
0761    0142    142
0762    7772    K7,        -6:
0763    0003    3:
0764    0341    341:
0765    0021    21:
0766    0011    11:
0767    0007    7
0770    7772    K8,        -6:
0771    0166    166:
0772    0211    211:
0773    0211    211:
0774    0211    211:
0775    0166    166
0776    7772    K9,        -6:
0777    0006    6:
1000    0011    11:
1001    0011    11:
1002    0011    11:
1003    0376    376
1004    7776    COLON,     -2:
```

```
1005    0024    24
1006    7775    SCOLON, -3:
1007    0200    200:
1010    0150    150
1011    7773    LESS,     -5:
1012    0020    20:
1013    0050    50:
1014    0104    104:
1015    0202    202
1016    7772    EQUALS, -6:
1017    0024    24:
1020    0024    24:
1021    0024    24:
1022    0024    24:
1023    0024    24
1024    7773    MORE,     -5:
1025    0202    202:
1026    0104    104:
1027    0050    50:
1030    0020    20
1031    7772    QUESTN, -6:
1032    0006    6:
1033    0001    1:
1034    0261    261:
1035    0011    11:
1036    0006    6
1037    7766    ATSIGN, -12:
1040    0074    74:
1041    0102    102:
1042    0231    231:
1043    0245    245:
1044    0245    245:
1045    0275    275:
1046    0221    221:
1047    0111    111:
1050    0046    46
1051    7773    A,          -5:
1052    0376    376:
1053    0011    11:
1054    0011    11:
1055    0376    376
1056    7772    B,          -6:
1057    0377    377:
1060    0211    211:
1061    0211    211:
1062    0211    211:
1063    0166    166
1064    7772    C,          -6:
1065    0176    176:
1066    0201    201:
1067    0201    201:
1070    0201    201:
1071    0102    102
1072    7772    D,          -6:
1073    0377    377:
1074    0201    201:
```

```
1075    0201    201:
1076    0102    102:
1077    0074    74
1100    7772    E,          -6:
1101    0377    377:
1102    0211    211:
1103    0211    211:
1104    0211    211:
1105    0201    201
1106    7772    F,          -6:
1107    0377    377:
1110    0011    11:
1111    0011    11:
1112    0011    11:
1113    0001    1
1114    7772    G,          -6:
1115    0176    176:
1116    0201    201:
1117    0221    221:
1120    0221    221:
1121    0362    362
1122    7772    H,          -6:
1123    0377    377:
1124    0010    10:
1125    0010    10:
1126    0010    10:
1127    0377    377
1130    7772    KI,         -6:
1131    0201    201:
1132    0201    201:
1133    0377    377:
1134    0201    201:
1135    0201    201
1136    7772    J,          -6:
1137    0301    301:
1140    0201    201:
1141    0377    377:
1142    0001    1:
1143    0001    1
1144    7772    K,          -6:
1145    0377    377:
1146    0030    30:
1147    0044    44:
1150    0102    102:
1151    0201    201
1152    7772    L,          -6:
1153    0377    377:
1154    0200    200:
1155    0200    200:
1156    0200    200:
1157    0200    200
1160    7772    M,          -6:
1161    0377    377:
1162    0002    2:
1163    0004    4:
1164    0002    2:
```

```
1165  .0377  377
1166   7772  N,         -6:
1167   0377  377:
1170   0002  2:
1171   0074  74:
1172   0100  100:
1173   0377  377
1174   7772  0,         -6:
1175   0176  176:
1176   0201  201:
1177   0201  201:
1200   0201  201:
1201   0176  176
1202   7772  P,         -6:
1203   0377  377:
1204   0011  11:
1205   0011  11:
1206   0011  11:
1207   0006  6
1210   7772  0,         -6:
1211   0176  176:
1212   0201  201:
1213   0241  241:
1214   0301  301:
1215   7276  276
1216   7772  P,         -6:
1217   0377  377:
1220   0011  11:
1221   0031  31:
1222   0051  51:
1223   0306  306
1224   7772  S,         -6:
1225   0106  106:
1226   0211  211:
1227   0211  211:
1230   0211  211:
1231   0162  162
1232   7772  T,         -6:
1233   0001  1:
1234   0001  1:
1235   0377  377:
1236   0001  1:
1237   0001  1
1240   7772  U,         -6:
1241   0377  377:
1242   0200  200:
1243   0200  200:
1244   0200  200:
1245   0377  377
1246   7772  V,         -6:
1247   0077  77:
1250   0100  100:
1251   0200  200:
1252   0100  100:
1253   0077  77
1254   7772  W,         -6:
```

```
1255   .0377   377;
1256    0100   100;
1257    0040   40;
1260    0100   100;
1261    0377   377
1262    7772   X,        -6;
1263    0201   201;
1264    0146   146;
1265    0030   30;
1266    0146   146;
1267    0201   201
1270    7772   Y,       . -6;
1271    0001   1;
1272    0002   2;
1273    0374   374;
1274    0002   2;
1275    0001   1
1276    7772   XZ,       -6;
1277    0301   301;
1300    0241   241;
1301    0231   231;
1302    0205   205;
1303    0203   203
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1305    0377   377;
1306    0201   201;
1307    0201   201;
1310    0201   201
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1313    0004   4;
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1315    0020   20;
1316    0040   40;
1317    0300   300
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1335    0070   70;
1336    0124   124;
1337    0020   20;
1340    0020   20;
1341    0020   20;
1342    0020   20;
1343    0020   20
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13

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1347    0331              "Y
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1364    0322              "R
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1374    0277              "?
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1401    0323              "S
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1405    0317              "O
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1423    0303              "C
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14

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1452    0317        "O
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1461    0322        "R
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1463    0324        "T
1464    0301        "A
1465    0320        "P
1466    0305        "E
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1471    0212        212
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1473    0310        "H
1474    0305        "E
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1476    0240        240
1477    0322        "R
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1503    0305        "E
1504    0323        "S
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1547	0240	240
1550	0322	"R
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1571	0325	"U
1572	0322	"R
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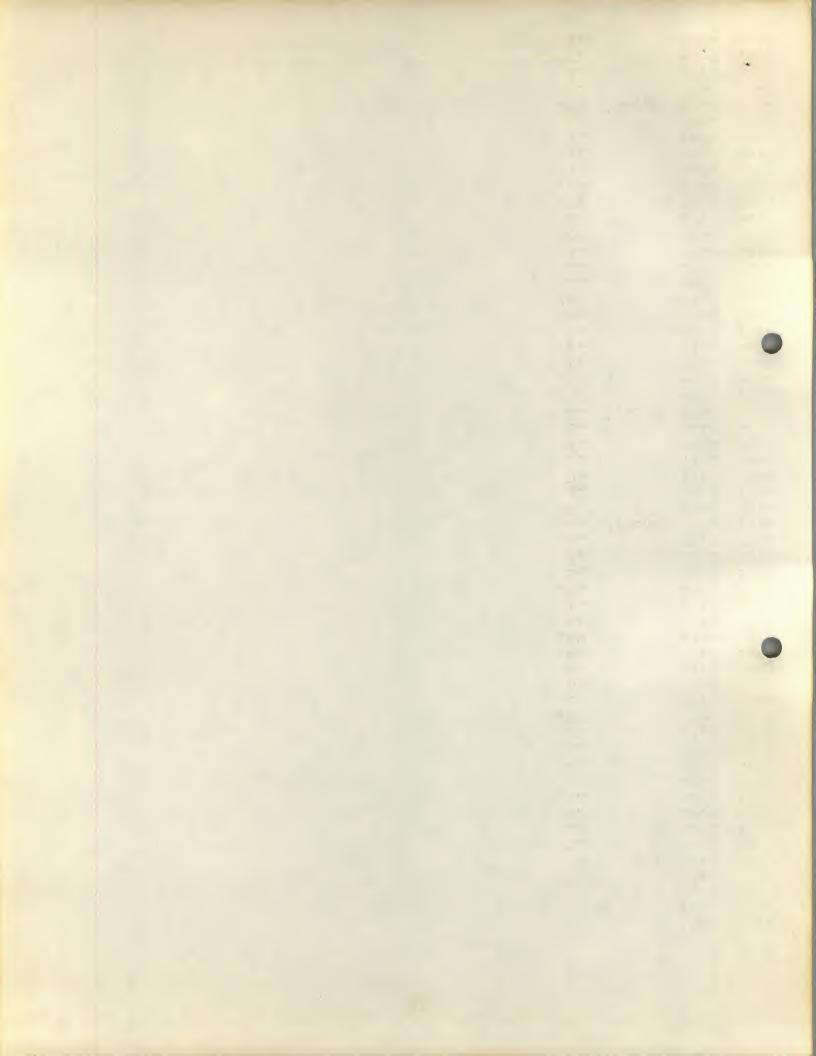|		
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2007	0324	"T
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2013	0305	"E
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2015	0304	"D
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19
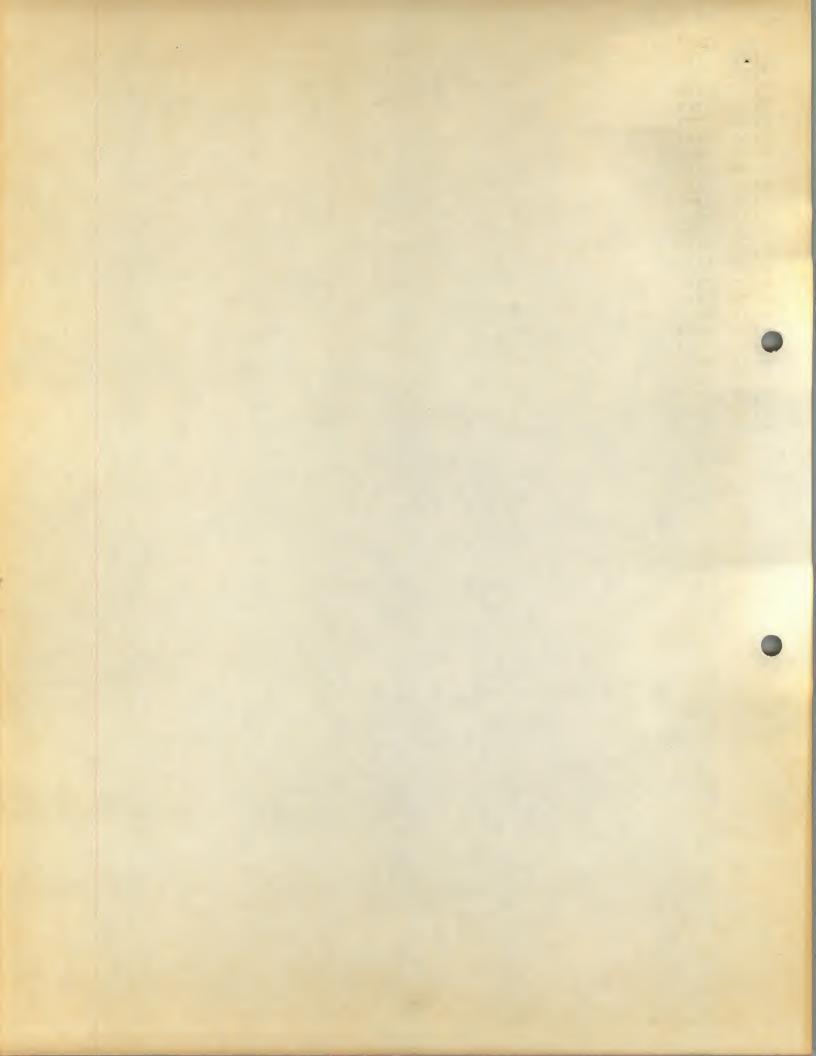
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2167    0304                "D
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0176    0212
0177    0215
↑BS
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ATSIGN	1037	B	1056	BARROW	1333	BSLASH	1311
C	1064	CBRACK	1320	CHECK	0002	COLON	1004
COMMA	0675	COUNTR	2422	CPAREN	0654	CRLF	0024
D	1072	DOLLAR	0620	DONE	0361	DQUOTE	0604
F	1100	END	2240	EQUALS	1016	EXCLAM	0602
G	1106	FINISH	0130	G	1114	H	1122
IDONE	2423	INSTR	0032	J	1136	K	1144
KI	1130	KJ	0125	KNUM	0124	KSTORE	0034
KZ	1276	K1	0716	K2	0724	K3	0732
K4	0740	K5	0746	K6	0754	K7	0762
K8	0770	K9	0775	L	1152	LESS	1011
M	1160	MAX	0132	MINUS	0700	MORE	1024
N	1166	NO	0233	NOSIGN	0607	NTDONE	0340
NUMBER	0075	O	1174	OBRACK	1304	OPAREN	0647
P	1202	PERCNT	0626	PERIOD	0705	PLACE	0127
PLUS	0667	PUNCH	2407	Q	1210	QUES	1344
QUESTN	1031	QUES2	2115	QUES3	2204	QUES4	2213
	1216	RETURN	0126	RUBOUT	0062	S	1224
SCOLON	1006	SLASH	0707	SPACE	0600	SQUOTE	0645
SRA	6417	START	0204	STOP1	2153	STOP2	2161
STORE	0035	T	1232	TEMP	0011	TYPE	0020
U	1240	UARROW	1325	UND	6403	V	1246
W	1254	X	1262	Y	1270	YES	1376