```
CLEAR STORAGE 1     ,008015,022026,030037,044,049,053053N000000N00001026                                         1
CLEAR STORAGE 2     L068116,105106,110117B101/I9I#071029C029056B026/B001/0991,001/001117I0?                      2
BOOTSTRAP           ,008015,022029,036040,047054,061068,072/061039              ,0010011040                      3

                          MULTIPLE TAPE UTILITY PROGRAM 1401-UT-039                                      PAGE    1

 SEQ PG LIN  LABEL  OP    OPERANDS                                            SFX CT  LOCN  INSTRUCTION TYPE  CARD A-ADDR  B-ADDR

 101                JOB   MULTIPLE TAPE UTILITY PROGRAM 1401-UT-039
 102                CTL   6311
 103         *
 104         * CARD-TO-TAPE, TAPE-TO-PRINT, AND TAPE-TO-CARD OPERATIONS,
 105         * ONE AT A TIME OR ALL AT ONCE.
 106         *
 107         * SENSE SWITCHES:
 108         *  B FOR BCD CARD-TO-TAPE
 109         *  C FOR TAPE-TO-PRINT
 110         *  D FOR BCD TAPE-TO-CARD
 111         *  E INTERRUPT OPERATIONS FOR NEW SENSE-SWITCH SETTINGS
 112         *    OR NEW CONTROL CARD
 113         *  F FOR COLUMN-BINARY TAPE-TO-CARD
 114         *  G FOR COLUMN-BINARY CARD-TO-TAPE
 115         *  B&G FOR MIXED COLUMN-BINARY AND BCD CARD-TO-TAPE.
 116         *
 117         * CARD-TO-TAPE IS ALWAYS TO UNIT 1
 118         * TAPE-TO-PRINT IS ALWAYS UNIT 2.  RECORDS CAN BE OF VARIABLE
 119         *   LENGTH WITH VARIABLE BLOCKING.  LINES ARE SEPARATED BY RECORD
 120         *   MARKS.
 121         * TAPE-TO-CARD IS ALWAYS UNIT 3.  RECORDS ARE UNBLOCKED, 80
 122         *   CHARACTERS FOR BCD AND 160 CHARACTERS FOR COLUMN BINARY.
 123         *
 124         * CONTROL CARD
 125         *
 126         * COLUMN 1: PUNCH A ONE (1) IN COLUMN 1 WHEN COLUMN 2 IS PUNCHED
 127         *   OR THE PRINT STORAGE FEATURE IS NOT INSTALLED.  IF COLUMN 2
 128         *   IS NOT PUNCHED AND PRINT STORAGE FEATURE IS INSTALLED, LEAVE
 129         *   COLUMN 1 BLANK.
 130         *
 131         * COLUMN 2: TAPE-TO-PRINT FORMS CONTROL
 132         *   BLANK - SINGLE SPACE
 133         *   2     - DOUBLE SPACE
 134         *   3     - TRIPLE SPACE
 135         *   4     - PROGRAM GOVERNS FORMS CONTROL -- SPACE-SUPPRESS
 136         *           CHARACTER CAUSES SINGLE SPACING
 137         *   5     - PROGRAM GOVERNS FORMS CONTROL -- SPACE-SUPPRESS
 138         *           CHARACTER CAUSES RECORD BYPASS
 139         *   FOR 4 OR 5, THE FIRST CHARACTER OF EACH RECORD DETERMINES
 140         *   LINE SPACING.
 141         *     CHARACTER       OPERATION
 142         *       &             SUPPRESS SPACING
 143         *       BLANK         SINGLE SPACE
 144         *       0             DOUBLE SPACE
 145         *       - (11 PUNCH)  TRIPLE SPACE
 146         *       1-9 OR J-R    SKIP TO CHANNELS 1-9 BEFORE PRINTING
 147         *



                          MULTIPLE TAPE UTILITY PROGRAM 1401-UT-039                                      PAGE    2

 SEQ PG LIN  LABEL  OP    OPERANDS                                            SFX CT  LOCN  INSTRUCTION TYPE  CARD A-ADDR  B-ADDR

 148         * COLUMN 3: NOT USED (NO 705 GROUP MARK 12-5-8 SUPPORT)
 149         *
 150         * COLUMN 4: NOT USED
 151         *
 152         * COLUMNS 5-6: NUMBER OF FILES TO SKIP ON UNIT 1 BEFORE BEGINNING
 153         *   CARD-TO-TAPE OPERATION.
 154         * COLUMNS 7-8: NUMBER OF FILES TO SKIP ON UNIT 2 BEFORE BEGINNING
 155         *   TAPE-TO-PRINT OPERATION.
 156         * COLUMNS 9-10: NUMBER OF FILES TO SKIP ON UNIT 3 BEFORE BEGINNING
 157         *   TAPE-TO-CARD OPERATION.
 158         *
 159         * ASSUMES ADVANCED-PROGRAMMING AND INDEX REGISTERS.
 160         *
 161         * DOESN’T BOTHER WITH READ RELEASE, OR PUNCH RELEASE, SINCE IT
 162         * WILL PROBABLY ONLY EVER BE USED IN A SIMULATOR.
 163         *
 164         * HALTS INDICATED BY A- AND B-ADDRESS REGISTER CONTENTS:
 165         *  000: ALL DONE.  PRESS START TO READ A NEW CONTROL CARD.
 166         *  111: SENSE SWITCH E REQUESTS INTERRUPTION.  CHANGE SENSE SWITCH
 167         *       SETTINGS IF DESIRED.  LEAVE SENSE SWITCH E ON AND PRESS
 168         *       START TO READ A NEW CONTROL CARD.  OTHERWISE, JUST PRESS
 169         *       START
 170         *  222: MORE THAN TEN READ ERRORS ON UNIT 2.  PRESS START TO
 171         *       ACCEPT THE BLOCK.
 172         *  333: A NEW CONTROL CARD HAS BEEN READ.  TURN OFF SENSE SWITCH
 173         *       E AND PRESS START.
 174         *  666: MORE THAN 49 SKIPS ON UNIT 1.  TAPE IS UNUSABLE.  MOUNT
 175         *       NEW TAPE AND PRESS START.
 176         *  999: OUTPUT TAPE ON UNIT 1 IS FULL.  REWIND TAPE, MOUNT NEW
 177         *       TAPE, TAPE, AND PRESS START.
 178         *
 179                ORG   87                                                                 0087
 180         XXXXX1 DCW   #3                                                       3  0089                       4
 181                DC    #2                                                       2  0091                       4
 182         XXXXX2 DCW   #3                                                       3  0094                       4
 183                DC    #2                                                       2  0096                       4
 184         XXXXX3 DCW   #3                                                       3  0099                       4
 185         *
 186         * INITIALIZATION
 187         *
 188                ORG   336                                                                0336
 189         START  B     SSWICH      STORE SENSE SWITCH SETTINGS                  4  0336  B 581                5   581
 190                B     CTLCD                                                    4  0340  B 688                5   688
 191                B     INIT        INITIALIZE SOME SWITCHES                     4  0344  B 863                5   863
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                         ACTIVITY LOOP                                                                  PAGE    3

SEQ PG LIN  LABEL  OP    OPERANDS                                            SFX CT  LOCN  INSTRUCTION TYPE  CARD A-ADDR  B-ADDR

192                JOB   ACTIVITY LOOP
193         *
194         LOOP   CW    LOOPSW      DO NOT REPEAT IF NO WORK                     4  0348  ) 388                6   388
195                NOP                                                            1  0352  N                    6
196         BCD2TS B     BCD2TP      BCD-TO-TAPE -- SS B                          4  0353  B 882                6   882
197                NOP                                                            1  0357  N                    6
198         TP2PRS B     TAPE2P      TAPE-TO-PRINT -- SS C                        4  0358  B S17                6  1217
199                NOP                                                            1  0362  N                    6
200         T2BCDS B     TP2BCD      TAPE-TO-BCD -- SS D                          4  0363  B V14                6  1514
201                NOP                                                            1  0367  N                    7
202         T2CBSW B     T2CBIN      TAPE-TO-COLUMN-BINARY -- SS F                4  0368  B V66                7  1566
203                NOP                                                            1  0372  N                    7
204         CB2TSW B     CBIN2T      COLUMN-BINARY-TO-TAPE -- SS G                4  0373  B |32                7  1032
205                NOP                                                            1  0377  N                    7
206         MIXSBG B     MIXED       BOTH SS B AND SS G                           4  0378  B Y40                7  1840
207                BSS   INTRPT,E                                                 5  0382  B 819 E              7   819
208                NOP                                                            1  0387  N                    8
209         LOOPSW B     LOOP                                                     4  0388  B 348                8   348
210                NOP   000                                                      4  0392  N 000                8   000
211                H                                                              1  0396  .                    8
212                B     START                                                    4  0397  B 336                8   336
213                DCW   #1                                                       1  0401                       8
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                         ANALYZE SENSE SWITCH SETTINGS                                                  PAGE    4

SEQ PG LIN  LABEL  OP    OPERANDS                                            SFX CT  LOCN  INSTRUCTION TYPE  CARD A-ADDR  B-ADDR

214                JOB   ANALYZE SENSE SWITCH SETTINGS
215         *
216         * B MEANS BCD-TO-TAPE ON UNIT 1
217         * B AND G MEANS MIXED BCD-TO-TAPE AND COLUMN-BINARY-TO-TAPE
218         * C MEANS TAPE-TO-PRINT FROM UNIT 2
219         * D MEANS TAPE-TO-BCD FROM UNIT 3
220         * D ON DOESN'T TEST F
221         * E MEANS READ A NEW CONTROL CARD (NOT TESTED HERE)
222         * F MEANS TAPE-TO-COLUMN-BINARY FROM UNIT 3
223         * G MEANS COLUMN-BINARY-TO-TAPE ON UNIT 1
224         *
225                ORG   581                                                                0581
226         SSWICH SBR   SSWICX+3                                                 4  0581  H 666                9   666
227                SW    BCD2TS,TP2PRS  TURN ON                                   7  0585  , 353 358            9   353      358
228                SW    T2BCDS,T2CBSW    ALL ACTIVITY                            7  0592  , 363 368            9   363      368
229                SW    CB2TSW,LOOPSW      LOOP SWITCHES                         7  0599  , 373 388            9   373      388
230                CW    MIXSBG         EXCEPT MIXED BCD AND COLUMN BINARY        4  0606  ) 378                9   378
231                BSS   SSB,B       Q. BCD-TO-TAPE REQUESTED                     5  0610  B 667 B              9   667
232                CW    BCD2TS      TURN OFF BCD-TO-TAPE                         4  0615  ) 353                9   353
233                BSS   *&5,G       Q. COLUMN-BINARY-TO-TAPE REQUESTED           5  0619  B 628 G             10   628
234                CW    CB2TSW      TURN OFF COLUMN-BINARY-TO-TAPE               4  0624  ) 373               10   373
235         SSC    BSS   *&5,C       Q. TAPE-TO-PRINT REQUESTED                   5  0628  B 637 C             10   637
236                CW    TP2PRS      TURN OFF TAPE-TO-PRINT                       4  0633  ) 358               10   358
237                BSS   SSD,D       Q. TAPE-TO-BCD REQUESTED                     5  0637  B 650 D             10   650
238                CW    T2BCDS      TURN OFF TAPE-TO-BCD                         4  0642  ) 363               10   363
239                B     *&5                                                      4  0646  B 654               10   654
240         SSD    CW    T2CBSW      TURN OFF TAPE-TO-COLUMN-BINARY               4  0650  ) 368               11   368
241                BSS   *&5,F       Q. TAPE-TO-COLUMN-BINARY REQUESTED           5  0654  B 663 F             11   663
242                CW    T2CBSW      TURN OFF TAPE-TO-COLUMN-BINARY               4  0659  ) 368               11   368
243         SSWICX B     0-0                                                      4  0663  B 000               11   000
244         SSB    BSS   SSBG,G      Q. BOTH B AND G                              5  0667  B 680 G             11   680
245                CW    CB2TSW      TURN OFF COLUMN-BINARY-TO-TAPE               4  0672  ) 373               11   373
246                B     SSC         TEST FOR OTHER REQUESTS                      4  0676  B 628               11   628
247         SSBG   SW    MIXSBG                                                   4  0680  , 378               12   378
248                B     SSC         TEST FOR OTHER REQUESTS                      4  0684  B 628               12   628
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                         PROCESS CONTROL CARD                                                       PAGE    5

SEQ PG LIN  LABEL  OP    OPERANDS                                            SFX CT  LOCN  INSTRUCTION TYPE  CARD A-ADDR  B-ADDR

249                JOB   PROCESS CONTROL CARD
250         *
251         CTLCD  SBR   CTLCDX+3                                                 4  0688  H 731               13   731
252                R                                                              1  0692  1                   13
253                B     SKFILE                                                   4  0693  B 732               13   732
254                DCW   06          FILES TO SKIP BEFORE CARD-TO-TAPE            2  0698                      13
255                DCW   1           CARD-TO-TAPE UNIT                            1  0699                      13
256                B     SKFILE                                                   4  0700  B 732               13   732
257                DCW   08          FILES TO SKIP BEFORE TAPE-TO-PRINT           2  0705                      13
258                DCW   2           TAPE-TO-PRINT UNIT                           1  0706                      14
259                B     SKFILE                                                   4  0707  B 732               14   732
260                DCW   10          FILES TO SKIP BEFORE TAPE-TO-CARD            2  0712                      14
261                DCW   3           TAPE-TO-CARD UNIT                            1  0713                      14
262                MCW   2,FORMSW#1  FORMS CONTROL                                7  0714  M 002 Y27           14   002    1827
263                MCW   1,PSTORG#1  1 = NO PRINT STORAGE, OR FORMS CONTROL       7  0721  M 001 Y28           14   001    1828
264         CTLCDX B     0-0                                                      4  0728  B 000               14   000
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                         SKIP FILES                                                                 PAGE    6

SEQ PG LIN  LABEL  OP    OPERANDS                                            SFX CT  LOCN  INSTRUCTION TYPE  CARD A-ADDR  B-ADDR

265                JOB   SKIP FILES
266         *    B    SKFILE
267         *    DCW  NN        ADDRESS IN READ AREA OF COUNT
268         *    DCW  U         UNIT NUMBER
269         *
270         SKFILE SBR   XXXXX3                                                   4  0732  H 099               15   099
271                MCW   1+X3,XXXXX2  COUNT ADDRESS IN READ AREA                  7  0736  M 0?1 094           15   001+3   094
272                MCW   0+X2,COUNT#2                                             7  0743  M 0!0 Y30           15   000+2  1830
273                MN    2+X3,SKRD+3  UNIT NUMBER                                 7  0750  D 0?2 789           15   002+3   789
274                MN    2+X3,SKEND                                               7  0757  D 0?2 800           15   002+3   800
275                MN    2+X3,SKBSP                                               7  0764  D 0?2 805           15   002+3   805
276         SKLP   S     +1,COUNT                                                 7  0771  S Y31 Y30           16  1831    1830
277                BWZ   3+X3,COUNT,K                                             8  0778  V 0?3 Y30 K         16   003+3  1830
278         SKRD   CU    %U0,A       DIAGNOSTIC READ                              5  0786  U %U0 A             16   %U0
279                BEF   SKEND                                                    5  0791  B 800 K             16   800
280                B     SKRD                                                     4  0796  B 786               16   786
281         SKEND  CU    %U0,A       DIAGNOSTIC READ AGAIN TO TEST FOR 2 EOFS     5  0800  U %U0 A             16   %U0
282         SKBSP  BSP   0                                                        5  0805  U %U0 B             16   %U0
283                BEF   3+X3                                                     5  0810  B 0?3 K             17   003+3
284                B     SKLP                                                     4  0815  B 771               17   771
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                         INTERRUPT PROCESSING ROUTINE, ON SS E                                          PAGE    7

SEQ PG LIN  LABEL  OP    OPERANDS                                            SFX CT  LOCN  INSTRUCTION TYPE  CARD A-ADDR  B-ADDR

285                JOB   INTERRUPT PROCESSING ROUTINE, ON SS E
286         *
287         * READ NEW SENSE SWITCH SETTINGS.  IF SS E IS STILL ON,
288         * READ A NEW CONTROL CARD.
289         *
290         INTRPT SW    LOOPSW      REPEAT ACTIVITY LOOP                         4  0819  , 388               18   388
291                B     INIT        INITIALIZE SOME SWITCHES                     4  0823  B 863               18   863
292         INTRPH NOP   111                                                      4  0827  N 111               18   111
293                H                                                              1  0831  .                   18
294                B     SSWICH      GET NEW SENSE SWITCH SETTINGS                4  0832  B 581               18   581
295                BSS   *+5,E                                                    5  0836  B 845 E             18   845
296                B     LOOPSW                                                   4  0841  B 388               18   388
297                B     CTLCD                                                    4  0845  B 688               19   688
298                NOP   333                                                      4  0849  N 333               19   333
299                H                                                              1  0853  .                   19
300                BSS   INTRPH,E                                                 5  0854  B 827 E             19   827
301                B     LOOPSW                                                   4  0859  B 388               19   388
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                         INITIALIZE SOME SWITCHES                                                       PAGE    8

SEQ PG LIN  LABEL  OP    OPERANDS                                            SFX CT  LOCN  INSTRUCTION TYPE  CARD A-ADDR  B-ADDR

302                JOB   INITIALIZE SOME SWITCHES
303         *
304         INIT   SBR   INITX+3                                                  4  0863  H 881               20   881
305                SW    NEEDCD#1    NEED A CARD                                  4  0867  , Y32               20  1832
306                LCA   GMWMXX,81                                                7  0871  L I99 081           20  3999     081
307         INITX  B     0-0                                                      4  0878  B 000               20   000
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SEQ PG LIN  LABEL  OP    OPERANDS                                             SFX CT  LOCN  INSTRUCTION TYPE  CARD A-ADDR  B-ADDR

308                JOB   CARD-TO-TAPE
309         *
310         * BCD CARD-TO-TAPE
311         *
312                SFX   B
313         BCD2TP SBR   EXIT+3                                               B   4  0882  H 958               21   958
314                SS    $           TURN ON OVERLAP                          B   2  0886  K $                 21
315                BW    RD,NEEDCD   NEED A CARD, NOT WAITING FOR ONE         B   8  0888  V 941 Y32 1         21   941    1832
316                BIN   OUT,H       READER BUSY                              B   5  0896  B 951 H             21   951
317                SBR   SKPCT,950   9 RETRIES, 50 SKIPS                      B   7  0901  H S16 950           21  1216     950
318                BCE   WTM,1,{     TM, 7-8                                  B   8  0908  B 959 001 {         21   959     001
319         WTAPE  LCA   GMWMXX,81                                            B   7  0916  L I99 081           22  3999     081
320                WT    1,1                                                  B   8  0923  M %U1 001 W         22   %U1     001
321                BER   TPERRW      CHECK FOR ERROR                          B   5  0931  B /23 L             22  1123
322                BEF   FULL        TAPE IS FULL                             B   5  0936  B |18 K             22  1018
323         RD     BLC   LST CD                                               B   5  0941  B 976 A             22   976
324                R                 READ A CARD IN OVERLAP                   B   1  0946  1                   22
325                CW    NEEDCD                                               B   4  0947  ) Y32               22  1832
326         OUT    SW    LOOPSW      REPEAT ACTIVITY LOOP                     B   4  0951  , 388               23   388
327         EXIT   B     0-0                                                  B   4  0955  B 000               23   000
328         * CARD HAD 7-8 IN COLUMN 1.  WRITE EOF.
329         WTM    WTM   1                                                    B   5  0959  U %U1 M             23   %U1
330                DCW   @N00@       PAD OUT TO EIGHT CHARACTERS              B   3  0966                      23
331                BER   TPERRW      CHECK FOR ERROR                          B   5  0967  B /23 L             23  1123
332                B     RD                                                   B   4  0972  B 941               23   941
333         * LAST CARD SWITCH IS ON
334         LST CD WTM   1           LAST CARD, WRITE TAPE MARK               B   5  0976  U %U1 M             23   %U1
335                DCW   @N00@       PAD OUT TO EIGHT CHARACTERS              B   3  0983                      24
336                BER   TPERRW      CHECK FOR ERROR                          B   5  0984  B /23 L             24  1123
337                WTM   1           WRITE ANOTHER TAPE MARK                  B   5  0989  U %U1 M             24   %U1
338                DCW   @N00@       PAD OUT TO EIGHT CHARACTERS              B   3  0996                      24
339                BER   TPERRW      CHECK FOR ERROR                          B   5  0997  B /23 L             24  1123
340                BSP   1           BACKSPACE OVER ONE TAPE MARK             B   5  1002  U %U1 B             24   %U1
341                CW    BCD2TS,CB2TSW  TURN OFF READING                      B   7  1007  ) 353 373           24   353     373
342                B     EXIT                                                 B   4  1014  B 955               25   955
343         * TAPE FULL.  DO NOT CHECK FOR ERROR, BECAUSE THIS COULD RESULT
344         * IN 50 SKIPS, I.E., 175 INCHES, WHICH MIGHT UNSPOOL THE TAPE.
345         FULL   WTM   1                                                    B   5  1018  U %U1 M             25   %U1
346                NOP   999         TAPE FULL                                B   4  1023  N 999               25   999
347                H                                                          B   1  1027  .                   25
348                B     WTAPE                                                B   4  1028  B 916               25   916
349         *
350         * COLUMN BINARY CARD-TO-TAPE
351         *
352         CBIN2T SBR   EXIT+3                                               B   4  1032  H 958               25   958
353                BLC   LST CD                                               B   5  1036  B 976 A             25   976
354         RCB    RCB                                                        B   2  1041  1 C                 26
355                BCE   WTMB,1,{    TM, 7-8                                  B   8  1043  B |92 001 {         26  1092     001
356                SW    401                                                  B   4  1051  , 401               26   401
357         WTAPEC LCA   GMWMXX,BINBUF+160                                    B   7  1055  L I99 L89           26  3999    2389
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SEQ PG LIN  LABEL  OP    OPERANDS                                             SFX CT  LOCN  INSTRUCTION TYPE  CARD A-ADDR  B-ADDR

358                MBD   580,BINBUF+159                                       B   8  1062  M 580 L88 D         26   580    2388
359                WTB   1,BINBUF                                             B   8  1070  M %B1 K29 W         26   %B1    2229
360                BER   TPERRW                                               B   5  1078  B /23 L             27  1123
361                BEF   FULLB                                                B   5  1083  B /09 K             27  1109
362                B     OUT                                                  B   4  1088  B 951               27   951
363         * CARD HAD 7-8 IN COLUMN 1.  WRITE EOF.
364         WTMB   WTM   1                                                    B   5  1092  U %U1 M             27   %U1
365                DCW   @N00@       PAD OUT TO EIGHT CHARACTERS              B   3  1099                      27
366                BER   TPERRW      CHECK FOR ERROR                          B   5  1100  B /23 L             27  1123
367                B     RCB                                                  B   4  1105  B |41               27  1041
368         * TAPE FULL.  DO NOT CHECK FOR ERROR, BECAUSE THIS COULD RESULT
369         * IN 50 SKIPS, I.E., 175 INCHES, WHICH MIGHT UNSPOOL THE TAPE.
370         FULLB  WTM   1                                                    B   5  1109  U %U1 M             28   %U1
371                NOP   999         TAPE FULL                                B   4  1114  N 999               28   999
372                H                                                          B   1  1118  .                   28
373                B     WTAPEC                                               B   4  1119  B |55               28  1055
374         *
375         * TAPE OUTPUT ERROR HANDLER, CLOBBERS X3
376         *
377         TPERRW SBR   XXXXX3                                               B   4  1123  H 099               28   099
378                BSP   1                                                    B   5  1127  U %U1 B             28   %U1
379                S     +1,ERCNT                                             B   7  1132  S Y31 S14           28  1831    1214
380                BWZ   *+5,ERCNT,K  SKIP TAPE AFTER NINE ERRORS             B   8  1139  V /51 S14 K         29  1151    1214
381                B     15987+X3      OTHERWISE TRY AGAIN                    B   4  1147  B IHG               29 15987+3
382                A     +1,SKPCT                                             B   7  1151  A Y31 S16           29  1831    1216
383                BAV   SKIPS       ERROR IF MORE THAN 50 SKIPS              B   5  1158  B /84 Z             29  1184
384                SKP   1                                                    B   5  1163  U %U1 E             29   %U1
385                BEF   FULL        TAPE IS FULL                             B   5  1168  B |18 K             29  1018
386                MCW   +9,ERCNT    RESET ERROR COUNT                        B   7  1173  M Y33 S14           30  1833    1214
387                B     15987+X3    AND TRY AGAIN                            B   4  1180  B IHG               30 15987+3
388         SKIPS  NOP   666         TOO MANY SKIPS                           B   4  1184  N 666               30   666
389                H                                                          B   1  1188  .                   30
390                SBR   SKPCT,950   9 RETRIES, 50 SKIPS                      B   7  1189  H S16 950           30  1216     950
391                B     15987+X3    TRY AGAIN                                B   4  1196  B IHG               30 15987+3
392         * TAPE IS FULL.  DO NOT CHECK FOR ERROR HERE SO AS NOT TO UNSPOOL
393         * THE TAPE.
394         ERFULL WTM   1                                                    B   5  1200  U %U1 M             30   %U1
395                NOP   999                                                  B   4  1205  N 999               31   999
396                H                                                          B   1  1209  .                   31
397                B     15987+X3    TRY AGAIN                                B   4  1210  B IHG               31 15987+3
398         ERCNT  DCW   #1          TAPE ERROR COUNT                         B   1  1214                      31
399         SKPCT  DCW   #2          SKIP COUNT                               B   2  1216                      31
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SEQ PG LIN  LABEL  OP    OPERANDS                                            SFX CT  LOCN  INSTRUCTION TYPE  CARD A-ADDR  B-ADDR

400                JOB   TAPE-TO-PRINT
401         *
402                SFX   P
403         TAPE2P SBR   T2PX+3                                               P   4  1217  H T59               32  1359
404                SW    LOOPSW      REPEAT ACTIVITY LOOP                     P   4  1221  , 388               32   388
405                BCE   PRTPOS,PSTORG,  SKIP BUSY TESTS IF NO PRINT STORAGE  P   8  1225  B S43 Y28           32  1243    1828
406                BIN   T2PX,P      PRINTER BUSY                             P   5  1233  B T56 P             32  1356
407                BPCB  T2PX        PRINTER CARRIAGE BUSY                    P   5  1238  B T56 R             32  1356
408         PRTPOS SBR   XXXXX3,GMWMXX+1                                      P   7  1243  H 099 00|           32   099    4000
409                BCE   READ,15999+X3,}  GM 12-7-8                           P   8  1250  B U38 III } GMARK   33  1438   15999+3
410                SBR   XXXXX2,200                                           P   7  1258  H 094 200           33   094     200
411                BBE   USE200,FORMSW,4  4 OR 5                              P   8  1265  W S80 Y27 4         33  1280    1827
412                SBR   XXXXX2,201                                           P   7  1273  H 094 201           33   094     201
413         USE200 MCW   PRTPOS&6,XXXXX3                                      P   7  1280  M S49 099           33  1249     099
414                MCM   0&X3,0&X2                                            P   7  1287  P 0?0 0!0           34   000+3   000+2
415                MCW   @  @        CLEAR RECORD MARK                        P   4  1294  M Y35               34  1835
416                MCM   0&X3                                                 P   4  1298  P 0?0               34   000+3
417                SAR   PRTPOS+6    UPDATE BUFFER ADDRESS                    P   4  1302  Q S49               34  1249
418                BBE   PRCTL,FORMSW,4  4 OR 5                               P   8  1306  W T60 Y27 4         34  1360    1827
419         PRINT  W                                                          P   1  1314  2                   34
420                CS                                                         P   1  1315  /                   34
421                CS                                                         P   1  1316  /                   35
422                BCE   *&5,FORMSW,2                                         P   8  1317  B T29 Y27 2         35  1329    1827
423                B     *&3                                                  P   4  1325  B T31               35  1331
424                CC    J           IMMEDIATE SKIP ONE SPACE                 P   2  1329  F J                 35
425                BCE   *&5,FORMSW,3                                         P   8  1331  B T43 Y27 3         35  1343    1827
426                B     *&3                                                  P   4  1339  B T45               35  1345
427                CC    K           IMMEDIATE SKIP TWO SPACES                P   2  1343  F K                 35
428                BCV   *&5         Q. PAGE FULL                             P   5  1345  B T54 @             36  1354
429                B     *&3         NO                                       P   4  1350  B T56               36  1356
430                CC    1           YES, SKIP TO CHANNEL 1                   P   2  1354  F 1                 36
431         T2PX   B     0-0                                                  P   4  1356  B 000               36   000
432         *
433         * PROGRAM CONTROLS PRINT SPACING
434         *
435         PRCTL  BCE   SUPPRS,200,+                                         P   8  1360  B U22 200 +         36  1422     200
436                BCE   PRINT,200,  SINGLE SPACE                             P   8  1368  B T14 200           36  1314     200
437                BCE   *&5,200,0                                            P   8  1376  B T88 200 0         36  1388     200
438                B     *&6                                                  P   4  1384  B T93               37  1393
439                CCB   PRINT,J     IMMEDIATE SKIP ONE SPACE                 P   5  1388  F T14 J             37  1314
440                BCE   *&5,200,-                                            P   8  1393  B U05 200 -         37  1405     200
441                B     *&6                                                  P   4  1401  B U10               37  1410
442                CCB   PRINT,K     IMMEDIATE SKIP TWO SPACES                P   5  1405  F T14 K             37  1314
443                MN    200,*&5     IMMEDIATE SKIP TO CHANNEL                P   7  1410  D 200 U21           37   200    1421
444                CCB   PRINT,0                                              P   5  1417  F T14 0             37  1314
445         *
446         * & IN COLUMN 1
447         *
448         SUPPRS BCE   T2PX,FORMSW,5  SKIP THE RECORD                       P   8  1422  B T56 Y27 5         38  1356    1827
449                   2S             PRINT WITHOUT SPACING                    P   2  1430  2 S                 38
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SEQ PG LIN  LABEL  OP    OPERANDS                                            SFX CT  LOCN  INSTRUCTION TYPE  CARD A-ADDR  B-ADDR

450                CS                                                         P   1  1432  /                   38
451                CS                                                         P   1  1433  /                   38
452                B     T2PX                                                 P   4  1434  B T56               38  1356
453         *
454         * READ A BLOCK FOR PRINTING
455         *
456         READ   SBR   READX+3                                              P   4  1438  H U77               38  1477
457                SBR   PRTPOS+6,PRTBUF                                      P   7  1442  H S49 N75           38  1249    2575
458                CW    15999+X3    TURN OFF GMWM FROM PREVIOUS READ         P   4  1449  ) III               39 15999+3
459                SW    GMWMXX      THE FIRST CALL CLEARS THIS               P   4  1453  , I99               39  3999
460                B     READIT                                               P   4  1457  B X08               39  1708
461                RT    2,PRTBUF                                             P   8  1461  M %U2 N75 R         39   %U2    2575
462                BEF   DONE                                                 P   5  1469  B U78 K             39  1478
463         READX  B     0-0                                                  P   4  1474  B 000               39   000
464         *
465         * END OF FILE
466         *
467         DONE   CC    1                                                    P   2  1478  F 1                 39
468                B     READIT                                               P   4  1480  B X08               40  1708
469                RT    2,PRTBUF                                             P   8  1484  M %U2 N75 R         40   %U2    2575
470                BEF   *&5                                                  P   5  1492  B V01 K             40  1501
471                B     READX                                                P   4  1497  B U74               40  1474
472         * TWO END-OF-FILE MARKS IN A ROW.  TURN OFF PRINTING
473                CW    TP2PRS                                               P   4  1501  ) 358               40   358
474                RWU   2                                                    P   5  1505  U %U2 U             40   %U2
475                B     T2PX                                                 P   4  1510  B T56               40  1356
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SEQ PG LIN  LABEL  OP    OPERANDS                                            SFX CT  LOCN  INSTRUCTION TYPE  CARD A-ADDR  B-ADDR

476                JOB   TAPE-TO-CARD
477         *
478         * TAPE-TO-BCD CARD
479         *
480                SFX   4
481         TP2BCD SBR   EXIT+3                                               4   4  1514  H V64               41  1564
482                SS    $           TURN ON OVERLAP                          4   2  1518  K $                 41
483                BIN   EXIT,I      PUNCH BUSY                               4   5  1520  B V61 I             41  1561
484                LCA   GMWMXX,81                                            4   7  1525  L I99 081           41  3999     081
485                B     READIT                                               4   4  1532  B X08               41  1708
486                RT    3,101                                                4   8  1536  M %U3 101 R         41   %U3     101
487                BEF   DONE                                                 4   5  1544  B W21 K             41  1621
488                MCW   @ @,15999+X1  IN CASE OF SHORT RECORD                4   7  1549  M Y36 IZI           42  1836   15999+1
489                P                                                          4   1  1556  4                   42
490         OUT    SW    LOOPSW      REPEAT ACTIVITY LOOP                     4   4  1557  , 388               42   388
491         EXIT   SSB   0-0,2                                                4   5  1561  K 000 2             42   000
492         *
493         * TAPE-TO-COLUMN-BINARY CARD
494         *
495         T2CBIN SBR   EXIT+3                                               4   4  1566  H V64               42  1564
496                SS    .           TURN OFF OVERLAP                         4   2  1570  K .                 42
497                LCA   GMWMXX,BINBUF+181                                    4   7  1572  L I99 M10           42  3999    2410
498                B     READIT                                               4   4  1579  B X08               43  1708
499                RTB   3,BINBUF                                             4   8  1583  M %B3 K29 R         43   %B3    2229
500                BEF   DONECB                                               4   5  1591  B W41 K             43  1641
501                MCW   @ @,15999+X1  IN CASE OF SHORT RECORD                4   7  1596  M Y36 IZI           43  1836   15999+1
502                SW    401                                                  4   4  1603  , 401               43   401
503                MBC   BINBUF+159,580                                       4   8  1607  M L88 580 B         43  2388     580
504                PCB                                                        4   2  1615  4 C                 43
505                B     OUT                                                  4   4  1617  B V57               44  1557
506         *
507         * END OF FILE
508         *
509         DONE   SBR   XXXXX3                                               4   4  1621  H 099               44   099
510                B     READIT                                               4   4  1625  B X08               44  1708
511                RT    3,101                                                4   8  1629  M %U3 101 R         44   %U3     101
512                B     TEST                                                 4   4  1637  B W57               44  1657
513         DONECB SBR   XXXXX3                                               4   4  1641  H 099               44   099
514                B     READIT                                               4   4  1645  B X08               44  1708
515                RTB   3,BINBUF                                             4   8  1649  M %B3 K29 R         45   %B3    2229
516         TEST   BEF   FINAL                                                4   5  1657  B W92 K             45  1692
517                BCE   TWO,EXIT+4,2                                         4   8  1662  B W81 V65 2         45  1681    1565
518                MCW   @2@,EXIT+4  CHANGE SELECTED STACKER                  4   7  1670  M Y37 V65           45  1837    1565
519                B     0+X3                                                 4   4  1677  B 0?0               45   000+3
520         TWO    MCW   @4@,EXIT+4  CHANGE SELECTED STACKER                  4   7  1681  M Y38 V65           45  1838    1565
521                B     0+X3                                                 4   4  1688  B 0?0               46   000+3
522         FINAL  CW    T2BCDS,T2CBSW  TURN OFF PUNCHING                     4   7  1692  ) 363 368           46   363     368
523                RWU   3                                                    4   5  1699  U %U3 U             46   %U3
524                B     EXIT                                                 4   4  1704  B V61               46  1561
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SEQ PG LIN  LABEL  OP    OPERANDS                                            SFX CT  LOCN  INSTRUCTION TYPE  CARD A-ADDR  B-ADDR

525                JOB   TAPE READ ROUTINE
526         *
527         * CLOBBERS ALL INDEX REGISTERS
528         * LEAVES GMWM ADDRESS +1 IN X1
529         *
530                SFX   R
531         READIT SBR   XXXXX3                                               R   4  1708  H 099               47   099
532                MCW   7+X3,RDTP+7                                          R   7  1712  M 0?7 X30           47   007+3  1730
533                ZA    ERRCT#1                                              R   4  1719  ? Y39               47  1839
534         RDTP   RT    0,0                                                  R   8  1723  M %U0 000 R         47   %U0     000
535                SBR   XXXXX1                                               R   4  1731  H 089               47   089
536                SW    15999+X1    TURN ON GMWM FROM THIS READ              R   4  1735  , IZI               47 15999+1
537                BEF   8+X3                                                 R   5  1739  B 0?8 K             47   008+3
538                MCW   RDTP+6,XXXXX2                                        R   7  1744  M X29 094           48  1729     094
539                BCE   RDTP,12+X2,}  GM                                     R   8  1751  B X23 0J2 } GMARK   48  1723     012+2
540                CHAIN 12                                                                            MACRO
541                BCE                                                        R   1  1759  B           GEN     48
542                BCE                                                        R   1  1760  B           GEN     48
543                BCE                                                        R   1  1761  B           GEN     48
544                BCE                                                        R   1  1762  B           GEN     48
545                BCE                                                        R   1  1763  B           GEN     48
546                BCE                                                        R   1  1764  B           GEN     49
547                BCE                                                        R   1  1765  B           GEN     49
548                BCE                                                        R   1  1766  B           GEN     49
549                BCE                                                        R   1  1767  B           GEN     49
550                BCE                                                        R   1  1768  B           GEN     49
551                BCE                                                        R   1  1769  B           GEN     49
552                BCE                                                        R   1  1770  B           GEN     49
553                BER   TPERRR                                               R   5  1771  B X80 L             50  1780
554                B     8+X3                                                 R   4  1776  B 0?8               50   008+3
555         TPERRR A     *-5,ERRCT                                            R   7  1780  A X81 Y39           50  1781    1839
556                BCE   HALT,ERRCT,I      Q. IS COUNT +9                     R   8  1787  B Y11 Y39 I         50  1811    1839
557                MN    RDTP+4,*+4                                           R   7  1795  D X27 Y05           50  1727    1805
558                BSP   2                                                    R   5  1802  U %U2 B             50   %U2
559                B     RDTP                                                 R   4  1807  B X23               51  1723
560         HALT   MN    RDTP+4,*+4                                           R   7  1811  D X27 Y21           51  1727    1821
561                NOP   222                                                  R   4  1818  N 222               51   222
562                H                                                          R   1  1822  .                   51
563                B     8+X3                                                 R   4  1823  B 0?8               51   008+3
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                         WORK AREAS                                                            PAGE   15

SEQ PG LIN  LABEL  OP    OPERANDS                                            SFX CT  LOCN  INSTRUCTION TYPE  CARD A-ADDR  B-ADDR

564                JOB   WORK AREAS
565                LTORG *                                                   R              1827
            FORMSW DCW   #01                                                 R    1  1827              AREA    52
            PSTORG DCW   #01                                                 R    1  1828              AREA    52
            COUNT  DCW   #02                                                 R    2  1830              AREA    52
                   DCW   +1                                                  R    1  1831              LIT     52
            NEEDCD DCW   #01                                                 R    1  1832              AREA    52
                   DCW   +9                                                  R    1  1833              LIT     52
                   DCW   @  @                                                R    2  1835              LIT     52
                   DCW   @ @                                                 R    1  1836              LIT     53
                   DCW   @2@                                                 R    1  1837              LIT     53
                   DCW   @4@                                                 R    1  1838              LIT     53
            ERRCTR DCW   #01                                                 R    1  1839              AREA    53
566                SFX
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                         MIXED BCD AND BINARY CARD-TO-TAPE                                     PAGE   16

SEQ PG LIN  LABEL  OP    OPERANDS                                            SFX CT  LOCN  INSTRUCTION TYPE  CARD A-ADDR  B-ADDR

567                JOB   MIXED BCD AND BINARY CARD-TO-TAPE
568         *
569         * MIXED BCD AND BINARY CARD-TO-TAPE NEEDS TWO BUFFERS.  EACH ONE
570         * INCLUDES LOOKAHEAD TO TELL WHAT THE NEXT BUFFER IS.  THE LOOKAHEADS
571         * ARE-
572         *   9977 IN 81-84 IF PREVIOUS IS BCD AND CURRENT IS BINARY
573         *   BBBB IN 81-84 IF PREVIOUS IS BCD AND CURRENT IS BCD
574         *   B5B1B5B4 IN 161-168 IF PREVIOUS IS BINARY AND CURRENT IS BCD
575         *   B4BBB1BB IN 168-168 IF PREVIOUS IS BINARY AND CURRENT IS BINARY.
576         * THE LAST RECORD IN THE FILE IS ALWAYS MARKED AS IF THE NEXT RECORD
577         * IS THE SAME FORMAT.
578         * THE CURRENT CARD IS CONSIDERED TO BE COLUMN BINARY IF AND ONLY IF
579         * IT HAS BOTH 7 AND 9 PUNCHES IN COLUMN 1.
580         * ONCE WE GET STARTED, CURRENT BUFFER ADDRESS IS IN X2, AND PREVIOUS
581         * BUFFER ADDRESS IS IN X1
582         *
583         MIXED  EQU   *+1                                                          1840
584                SFX   M
585                SBR   MIXEDX+3                                            M    4  1840  H Z56               54  1956
586                SS    .              TURN OFF OVERLAP                     M    2  1844  K .                 54
587                MCW   CURMIX,XXXXX2  CURRENT BUFFER                       M    7  1846  M K28 094           54  2228     094
588                MCW   OTHBUF+X2,XXXXX1  PREVIOUS BUFFER                   M    7  1853  M 1P2 089           54   172+2   089
589         RCM    BLC   WTMM           Q. LAST CARD -- MIXED                M    5  1860  B !59 A             54  2059
590                RCB                                                       M    2  1865  1 C                 54
591                BCE   WTMM,1,{       Q. COLUMN 1 TAPE MARK?               M    8  1867  B !59 001 {         54  2059     001
592                SBR   CURMIX,0+X1    SWAP BUFFERS                         M    7  1875  H K28 0|0           55  2228   000+1
593                BBE   BIN1,501,1     Q. COLUMN 1 HAS 9 PUNCH, BROWNIE P 90 M   8  1882  W Z89 501 1         55  1989     501
594         * CURRENT CARD IS BCD
595         BCD    LCA   GMWMXX,85+X2                                        M    7  1890  L I99 0Q5           55  3999   085+2
596                MCW   80,80+X2                                            M    7  1897  M 080 0Q0           55   080   080+2
597                SW    BCD SW+X2      MARK CURRENT RECORD AS BCD           M    4  1904  , 1P3               55   173+2
598                NOP                                                       M    1  1908  N                   55
599         MIXEDS B     FIRSTM         FIRST-CARD SWITCH                    M    4  1909  B Z45               55  1945
600                BW    BCDBCD,BCD SW+X1    Q. PREVIOUS BCD                 M    8  1913  V Z57 1X3 1         56  1957   173+1
601         * CURRENT BCD, PREVIOUS BINARY
602                LCA   GMWMXX,169+X1                                       M    7  1921  L I99 1W9           56  3999   169+1
603                MCW   @ 5 1 5 4@     PREVIOUS BINARY, CURRENT BCD         M    4  1928  M K01               56  2201
604         BINOUT WTB   1,0+X1                                              M    8  1932  M %B1 0|0 W         56   %B1   000+1
605                BER   TPERRW         OUTPUT ERROR HANDLER                 M    5  1940  B /23 L             56  1123
606         FIRSTM CW    MIXEDS         TURN OFF FIRST-CARD SWITCH           M    4  1945  ) Z09               56  1909
607         OUT    SW    LOOPSW         TURN ON LOOP                         M    4  1949  , 388               57   388
608         MIXEDX B     0-0                                                 M    4  1953  B 000               57   000
609         * CURRENT AND PREVIOUS BOTH BCD
610         BCDBCD LCA   GMWMXX,85+X1                                        M    7  1957  L I99 0Y5           57  3999   085+1
611                MCW   @    @         PREVIOUS BINARY, CURRENT BCD         M    4  1964  M K05               57  2205
612         BCDOUT WT    1,0+X1                                              M    8  1968  M %U1 0|0 W         57   %U1   000+1
613                BER   TPERRW         OUTPUT ERROR HANDLER                 M    5  1976  B /23 L             57  1123
614                CW    85+X1                                               M    4  1981  ) 0Y5               57   085+1
615                B     FIRSTM                                              M    4  1985  B Z45               58  1945
616         * PASSED FIRST TEST FOR BINARY -- COLUMN 1 HAS 9 PUNCH
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                         MIXED BCD AND BINARY CARD-TO-TAPE                                              PAGE   17

SEQ PG LIN  LABEL  OP    OPERANDS                                            SFX CT  LOCN  INSTRUCTION TYPE  CARD A-ADDR  B-ADDR

617         BIN1   BBE   BIN2,501,4     Q. COLUMN 1 HAS 7 PUNCH, BROWNIE P 90 M   8  1989  W !01 501 4        58  2001     501
618                B     BCD            COLUMN 1 NOT 7-9, SO NOT BINARY       M   4  1997  B Y90              58  1890
619         * CURRENT CARD IS BINARY
620         BIN2   MBD   580,160+X2     ARRANGE FOR BINARY WRITING            M   8  2001  M 580 1O0 D        58   580   160+2
621                CW    BCD SW+X2                                            M   4  2009  ) 1P3              58   173+2
622                BW    FIRSTM,MIXEDS  Q. FIRST CARD                         M   8  2013  V Z45 Z09 1        58  1945    1909
623                BW    BINBCD,BCD SW+X1  Q. PREVIOUS BCD                    M   8  2021  V !44 1X3 1        59  2044   173+1
624         * CURRENT AND PREVIOUS CARDS BOTH BINARY
625                LCA   GMWMXX,169+X1                                        M   7  2029  L I99 1W9          59  3999   169+1
626                MCW   @ 4   1  @                                           M   4  2036  M K13              59  2213
627                B     BINOUT                                               M   4  2040  B Z32              59  1932
628         * CURRENT BINARY, PREVIOUS BCD
629         BINBCD LCA   GMWMXX,85+X1                                         M   7  2044  L I99 0Y5          59  3999   085+1
630                MCW   @9977@                                               M   4  2051  M K17              59  2217
631                B     BCDOUT                                               M   4  2055  B Z68              59  1968
632         * CARD HAS 7-8 IN COLUMN 1.  WRITE PREVIOUS RECORD, THEN EOF.
633         WTMM   BW    WTMBCD,BCD SW+X1                                     M   8  2059  V J18 1X3 1        60  2118   173+1
634                LCA   GMWMXX,169+X1                                        M   7  2067  L I99 1W9          60  3999   169+1
635                MCW   @ 4   1  @                                           M   4  2074  M K25              60  2225
636                WTB   1,0+X1                                               M   8  2078  M %B1 0|0 W        60   %B1   000+1
637                BER   TPERRW         OUTPUT ERROR HANDLER                  M   5  2086  B /23 L            60  1123
638                BEF   FULL                                                 M   5  2091  B J76 K            60  2176
639         WTMMIX WTM   1                                                    M   5  2096  U %U1 M            61   %U1
640                DCW   @N00@       PAD OUT TO EIGHT CHARACTERS              M   3  2103                     61
641                BER   TPERRW      CHECK FOR ERROR                          M   5  2104  B /23 L            61  1123
642                BLC   MIXEND                                               M   5  2109  B J51 A            61  2151
643                B     RCM                                                  M   4  2114  B Y60              61  1860
644         WTMBCD LCA   GMWMXX,85+X1                                         M   7  2118  L I99 0Y5          61  3999   085+1
645                MCW   @    @                                               M   4  2125  M K05              61  2205
646                WT    1,0+X1                                               M   8  2129  M %U1 0|0 W        62   %U1   000+1
647                BER   TPERRW                                               M   5  2137  B /23 L            62  1123
648                BEF   FULL                                                 M   5  2142  B J76 K            62  2176
649                B     WTMMIX                                               M   4  2147  B !96              62  2096
650         MIXEND WTM   1                                                    M   5  2151  U %U1 M            62   %U1
651                DCW   @N00@       PAD OUT TO EIGHT CHARACTERS              M   3  2158                     62
652                BER   TPERRW      CHECK FOR ERROR                          M   5  2159  B /23 L            62  1123
653                SW    MIXEDS      TURN ON FIRST CARD SWITCH                M   4  2164  , Z09              63  1909
654                CW    MIXSBG      TURN OFF MIXED INPUT                     M   4  2168  ) 378              63   378
655                B     OUT                                                  M   4  2172  B Z49              63  1949
656         * TAPE IS FULL.  DO NOT CHECK FOR ERROR BECAUSE THIS MIGHT CAUSE
657         * FIFTY TAPE SKIPS, THEREBY UNSPOOLING THE TAPE
658         FULL   SBR   FULLX+3                                              M   4  2176  H J93              63  2193
659                WTM   1                                                    M   5  2180  U %U1 M            63   %U1
660                NOP   999                                                  M   4  2185  N 999              63   999
661                H                                                          M   1  2189  .                  63
662         FULLX  B     0-0                                                  M   4  2190  B 000              64   000
663                LTORG *                                                    M             2194
                   DCW   @ 5 1 5 4@                                           M   8  2201              LIT    64
                   DCW   @    @                                               M   4  2205              LIT    64
                   DCW   @ 4   1  @                                           M   8  2213              LIT    64
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                         MIXED BCD AND BINARY CARD-TO-TAPE                                              PAGE   18

SEQ PG LIN  LABEL  OP    OPERANDS                                            SFX CT  LOCN  INSTRUCTION TYPE  CARD A-ADDR  B-ADDR

                   DCW   @9977@                                               M   4  2217              LIT    64
                   DCW   @ 4   1  @                                           M   8  2225              LIT    64
664                SFX
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SEQ PG LIN  LABEL  OP    OPERANDS                                            SFX CT  LOCN  INSTRUCTION TYPE  CARD A-ADDR  B-ADDR

665                JOB   WORK AREAS
666         CURMIX DSA   BINBUF      CURRENT MIXED-OUTPUT BUFFER                  3  2228  K29                 65  2229
667         OTHBUF EQU   172         OFFSET FROM BUF TO OTHER BUF ADDR               0172
668         BCD SW EQU   173         OFFSET FROM BUF TO BCD SWITCH                   0173
669         BINBUF DA    1X168,G     COLUMN BINARY TAPE BUFFER                       2229   2396               65
669                DCW   @}@                                                      1  2397             GMARK   66
670                DSA   BINBF2      SECOND BUFFER ADDRESS                        3  2400  M02                 66  2402
671                DCW   #1          WM FOR BCD                                   1  2401                      66
672         BINBF2 DA    1X168,G     OTHER COLUMN BINARY TAPE BUFFER                 2402   2569               66
672                DCW   @}@                                                      1  2570             GMARK   67
673                DSA   BINBUF      FIRST BUFFER ADDRESS                         3  2573  K29                 67  2229
674                DCW   #1          WM FOR BCD                                   1  2574                      67
675         PRTBUF EQU   *+1         PRINTER TAPE BLOCK BUFFER                       2575
676                ORG   3999                                                                 3999
677         GMWMXX DCW   @}@                                                      1  3999             GMARK   68
678                END   START                                                          / 336 080                336
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SYMBOL   ADDRESS    SYMBOL   ADDRESS    SYMBOL   ADDRESS    SYMBOL   ADDRESS    SYMBOL   ADDRESS    SYMBOL   ADDRESS
BCD  M   1890: 0    BCD SW   0173: 0    BCD2TP   0882: 0    BCD2TS   0353: 0    BCDBCD   1957: 0    BCDOUT   1968: 0
BIN1 M   1989: 0    BIN2 M   2001: 0    BINBCD   2044: 0    BINBF2   2402: 0    BINBUF   2229: 0    BINOUT   1932: 0
CB2TSW   0373: 0    CBIN2T   1032: 0    COUNT    1830: 0    CTLCD    0688: 0    CTLCDX   0728: 0    CURMIX   2228: 0
DONE 4   1621: 0    DONE P   1478: 0    DONECB   1641: 0    ERCNTB   1214: 0    ERFULL   1200: 0    ERRCTR   1839: 0
EXIT 4   1561: 0    EXIT B   0955: 0    FINAL4   1692: 0    FIRSTM   1945: 0    FORMSW   1827: 0    FULL B   1018: 0
FULL M   2176: 0    FULLBB   1109: 0    FULLXM   2190: 0    GMWMXX   3999: 0    HALT R   1811: 0    INIT     0863: 0
INITX    0878: 0    INTRPH   0827: 0    INTRPT   0819: 0    LOOP     0348: 0    LOOPSW   0388: 0    LST CD   0976: 0
MIXED    1840: 0    MIXEDS   1909: 0    MIXEDX   1953: 0    MIXEND   2151: 0    MIXSBG   0378: 0    NEEDCD   1832: 0
OTHBUF   0172: 0    OUT  4   1557: 0    OUT  B   0951: 0    OUT  M   1949: 0    PRCTLP   1360: 0    PRINTP   1314: 0
PRTBUF   2575: 0    PRTPOS   1243: 0    PSTORG   1828: 0    RCB  B   1041: 0    RCM  M   1860: 0    RD   B   0941: 0
RDTP R   1723: 0    READ P   1438: 0    READIT   1708: 0    READXP   1474: 0    SKBSP    0805: 0    SKEND    0800: 0
SKFILE   0732: 0    SKIPSB   1184: 0    SKLP     0771: 0    SKPCTB   1216: 0    SKRD     0786: 0    SSB      0667: 0
SSBG     0680: 0    SSC      0628: 0    SSD      0650: 0    SSWICH   0581: 0    SSWICX   0663: 0    START    0336: 0
SUPPRS   1422: 0    T2BCDS   0363: 0    T2CBIN   1566: 0    T2CBSW   0368: 0    T2PX P   1356: 0    TAPE2P   1217: 0
TEST 4   1657: 0    TP2BCD   1514: 0    TP2PRS   0358: 0    TPERRR   1780: 0    TPERRW   1123: 0    TWO  4   1681: 0
USE200   1280: 0    WTAPEB   0916: 0    WTAPEC   1055: 0    WTM  B   0959: 0    WTMB B   1092: 0    WTMBCD   2118: 0
WTMM M   2059: 0    WTMMIX   2096: 0    XXXXX1   0089: 0    XXXXX2   0094: 0    XXXXX3   0099: 0

UNREFERENCED SYMBOLS
ERFULL
```