



International Business Machines Corporation

July 16, 1963

MEMORANDUM TO: Users of 1401 Tape to Card Utility Program
SUBJECT: 1401 Tape to Card Utility Program, #1401-UT-028,
Version 1, Modification Level 2

This letter announces the availability of Version 1, Modification Level 2 of the 1401 Tape to Card Utility Program, #1401-UT-028. This modification, which is in the form of one patch card as well as a corrected listing, corrects all reported errors in the subject system. The patch card, enclosed, listed, and identified below (attachment #1) is to be inserted in the system deck as follows:

Remove Card (cc 78-80)

And replace with card (cc 77-80)

029

C 029

This patch corrects a loop encountered when punching ten or more cards per record.

The following corrections should be made to the library documentation:

| <u>Location</u> | <u>Change</u> |
|--|--------------------------|
| Page 8, paragraph 2a | I-address is 1469 |
| Page 8, paragraph 2b | I-address is 1502 |
| Page 8, paragraph 2e | I-address is 1879 |
| Page 8, paragraph 2f | I-address is 1846 |
| Page 8, paragraph E, line 9 | instruction address 1366 |
| Page 9, Example #1, number 4 under Given | columns 1 - 8 |
| Page 9, Example #1, paragraph B under Procedure | card columns 1 - 8 |
| Page 9, Example #2, number 4 under Given | columns 1 - 20 |

We appreciate your cooperation in making these changes. A list of the material distributed with this letter follows:

| <u>Item No.</u> | <u>Contents</u> |
|-----------------|---|
| 1 | One patch card |
| 2 | System listing of version 1, Modification Level 2 |
| 3 | Listing of patch card |

Initial requests for this system, which we filled after the release of this letter, will not include the card itemized above as the system deck will already reflect these changes.

The Optional Program Material, available upon request, consists of the source symbolic program deck for Version 1, Modification Level 1.

An Authorized Programming Analysis Report (APAR) should be submitted through the IBM Systems Engineer to report any difficulties encountered in the use of this system.

Any discrepancy between the material you receive and the items listed above should be directed to the attention of the Manager of the Program Information Department, IBM, 112 East Post Road, White Plains, New York.

GP PROGRAMMING SYSTEMS

Enclosures

DE93SAJ971078E51DL28,R778054A107173 ,E81,E85,E89,E931L035E99,E70,E77B039 C029

CLEAR STORAGE 1
 CLEAR STORAGE 2
 BOOTSTRAP CARD

008015,022026,030034,041,045,053,0570731026
 072116,110106,1051178101/199,027A074028H027800102708026/0991,001/00111710
 ,0240671056
 008015,022029,056063/056029

PAGE 1

| PG | LIN | CT | LABEL | OP | A OPERAND | B OPERAND | D | LOC | INSTRUCTION COMMENTS |
|----|-----|----|--------|-----|-----------|-----------|---|------|----------------------|
| 1 | 010 | | | CTL | 631 | | | 2701 | / 080 |
| 1 | 020 | | | ORG | 2701 | | | 2705 | , 001 201 |
| 1 | 030 | | START | CS | 0080 | 0201 | | 2712 | , 101 |
| 1 | 040 | | | SW | 0001 | | | 2716 | L L24 198 |
| 1 | 050 | | | SW | 0101 | 3998 | | 2723 | RD CONTL CDS |
| 1 | 060 | | | LCA | GPMK78 | | | 2724 | MV CTL CD INFO |
| 1 | 070 | | | R | | | | 2731 | STR EOF OPTION |
| 1 | 080 | | | MCM | 0080 | 0180 | | 2738 | STR NUM OF FILES |
| 1 | 090 | | | A | 0110 | ENDTYP | | 2739 | STR REC PER BLK |
| 1 | 100 | | | MCM | | | | 2740 | STR REC LNGB |
| 1 | 110 | | | A | | | | 2741 | TEST FILE SELTN |
| 1 | 120 | | | A | AUTST | 0112 | | 2749 | STORE FILE 3 |
| 1 | 130 | | | B | 0116 | SLFIL3 | | 2756 | STORE FILE 2 |
| 1 | 140 | | | A | | | | 2757 | STORE FILE 1 |
| 1 | 150 | | | A | | | | 2758 | M L25 899 |
| 1 | 160 | | | A | | | | 2765 | B A23 135 |
| 1 | 170 | | | MCM | NOP | SW1 | | 2773 | TEST AUTO SEQ |
| 1 | 180 | | AUTST | B | AUTNOP | 0135 | | 2780 | SET PUNCH COLS |
| 1 | 190 | | | SM | 0135 | 0133 | | 2787 | A 135 134 |
| 1 | 200 | | | A | 19 | 0135 | | 2794 | M 134 #46 |
| 1 | 210 | | | A | 0135 | 0134 | | 2801 | , Q31 |
| 1 | 220 | | | MCM | 0134 | AUTTOT& 6 | | 2805 | S #84 135 |
| 1 | 230 | | | SW | CNTLN& 1 | 0135 | | 2812 | Y J89 135 |
| 1 | 240 | | | S | PUNCH | 0135 | | 2819 | A 135 Q33 |
| 1 | 250 | | | MZ | BLANKS- 1 | CNTLN& 3 | | 2826 | H Q31 |
| 1 | 260 | | | A | 0135 | | | 2834 | B 133 135 |
| 1 | 270 | | | CM | CNTLN& 1 | 0135 | | 2841 | B A30 |
| 1 | 280 | | CNTLN& | SW | CDCNT - 4 | 0135 | | 2845 | B A86 141 |
| 1 | 290 | | | CM | 0133 | 0138 | | 2853 | , 136 138 |
| 1 | 300 | | FIXST | B | AUTNOP& 7 | | | 2860 | , 140 |
| 1 | 310 | | | B | FIXNOP | | | 2864 | B 104 143 1 |
| 1 | 320 | | | SW | 0136 | 0143 | | 2872 | M 141 R04 |
| 1 | 330 | | | SW | 0140 | LDFIX 3 | 1 | 2879 | A 179 141 |
| 1 | 340 | | | B | LDFIXB | | | 2886 | A 141 139 |
| 1 | 350 | | | MCM | 0141 | 0139 | | 2893 | M 139 #99 |
| 1 | 360 | | | A | 19 | GPFIX 6 | | 2901 | L 000 K92 |
| 1 | 370 | | | A | 0141 | | | 2908 | N |
| 1 | 380 | | | MCM | 0139 | FIXED | | 2913 | , 001 |
| 1 | 390 | | | R | | | | 2917 | B R39 156 |
| 1 | 400 | | LDFIX | LCA | 0000 | | | 2925 | M R07 279 |
| 1 | 410 | | | NOP | | | | | |
| 1 | 420 | | | CS | 0080 | | | | |
| 1 | 430 | | | SW | 0001 | 0156 | | | BR ND CHG ON EOF |
| 1 | 440 | | | B | ALCDFX | RDADTL& 6 | | | SET EOF TO READ |
| 1 | 450 | | | MCM | LDFIX 6 | | | | |

| PG LIN | CT | LABEL | OP | A OPERAND | B OPERAND | D | LOC | INSTRUCTION COMMENTS | 0046 |
|--------|----|--------|-----|-------------|------------|---|------|----------------------|------------------|
| 1 460 | 7 | | MCM | NOP | NEWFIX 8 | | 2932 | M L25 Z67 | NEW CARD |
| 1 470 | 8 | ALCDFX | B | FIXALL | 0137 | A | 2939 | B B04 137 A | BR ON ALL CARDS |
| 1 480 | 7 | | MCM | 0137 | FXCDNO | | 2947 | M L37 K05 | SET CARD NUM |
| 1 490 | 8 | MLTTST | B | MPLNOP | 0132 | | 2954 | B B15 132 | TEST INTRA NUM |
| 1 500 | 4 | | SW | 0131 | | | 2962 | C L31 | SET PCH LOCTN |
| 1 510 | 7 | | C | RECLNG | MPCTST | T | 2966 | C J97 I91 | |
| 1 520 | 5 | | B | MPLOC | | | 2973 | B R93 T | BR 2 POS NUM |
| 1 530 | 4 | | SW | MPLCDS | | | 2978 | L28 | |
| 1 540 | 7 | | MCM | 0132 | MOVMT 6 | | 2982 | M L32 #73 | |
| 1 550 | 4 | | B | JOBEND | | | 2989 | B B22 | |
| 1 560 | 7 | MPLOC | A | ONE80 - 2 | | | 2993 | A K06 132 | |
| 1 570 | 4 | | B | MPLOC - 11 | 0132 | | 3000 | B R82 | |
| 1 580 | 7 | LDFIXB | MCM | 0139 | | | 3004 | M L39 614 | SET FIXED RTME |
| 1 590 | 4 | | SW | 0400 | | | 3011 | C 400 | TO BINARY |
| 1 600 | 7 | | MCM | FIVE | GPFIX 6 4 | | 3015 | M A22 #97 | MODE |
| 1 610 | 4 | | CM | GPFIX 6 7 | | | 3022 | 0 /00 | |
| 1 620 | 7 | | MCM | B | GPFIX 6 7 | | 3026 | M L26 /00 | |
| 1 630 | 7 | | MCM | NOP | LDFIX - 1 | | 3033 | M L25 R00 | |
| 1 640 | 7 | | MCM | FIVE | LDFIX 6 1 | | 3040 | M A22 R02 | |
| 1 650 | 4 | | CS | 0580 | | | 3047 | / 580 | |
| 1 660 | 1 | | CS | | | | 3051 | / | |
| 1 670 | 4 | | SW | 0401 | | | 3052 | C 401 | |
| 1 680 | 2 | | R | | ROADTL- 1 | C | 3056 | L C | |
| 1 690 | 7 | | LCA | - 7 | | | 3058 | L 657 272 | RD FIX INFO BINA |
| 1 700 | 4 | | CM | LDFIX 6 7 | | | 3065 | 0 R08 | SET EOF TO RD FX |
| 1 710 | 7 | | MCM | MPLOC | LDFIX 6 7 | | 3069 | M R93 R08 | IN BINARY MODE |
| 1 720 | 7 | | SW | ALCDFX-010 | | | 3076 | C R29 R26 | |
| 1 730 | 7 | | A | ONE80 - 2 | ALCDFX- 13 | | 3083 | A K06 R31 | |
| 1 740 | 7 | | A | ONE80 - 2 | ALCDFX- 8 | | 3090 | A K06 R28 | |
| 1 750 | 7 | | MCM | LDFIX | ALCDFX- 11 | | 3097 | M R01 R25 | |
| 1 760 | 7 | | MCM | - 6 | ALCDFX- 14 | | 3104 | M A04 R01 | |
| 1 770 | 7 | | CM | ALCDFX-010 | LDFIX | | 3111 | 0 R29 R26 | |
| 1 780 | 4 | | B | FIXTST 6 27 | ALCDFX- 13 | | 3118 | 0 Q72 | |
| 1 790 | 1 | FIVE | DCM | | | | 3122 | | |
| 1 800 | 7 | AUTNOP | MCM | NOP | AUTTOT | | 3123 | M L25 #40 | NOP MAIN SEQ NUM |
| 1 810 | 8 | | B | TSTSEQ | 0160 | | 3130 | B A49 160 | BR NO SELTN |
| 1 820 | 7 | | MCM | LCSELT | SW5 6 3 | | 3138 | M I44 #08 | SET SW5 TO SELTN |
| 1 830 | 4 | | B | SELECT | | | 3145 | B C95 | |
| 1 840 | 7 | TSTSEQ | MCM | SQADD | BLARG 14 | | 3149 | M 381 482 | SET SEQ ADD RCLG |
| 1 850 | 8 | | B | NOSEQ | 0148 | | 3156 | B A68 148 | BR ON NO SEQNCE |
| 1 860 | 4 | | B | SELECT | | | 3164 | B C95 | |
| 1 870 | 7 | NOSEQ | MCM | NOP | SW4 | | 3168 | M L25 #01 | NOP SW4 |
| 1 880 | 7 | | MCM | NOP | CVTTST- 8 | | 3175 | M L25 V73 | NOP STR LST SQ |
| 1 890 | 4 | | B | FIXTST | | | 3182 | B Q45 | |
| 1 900 | 7 | FIXNOP | MCM | NOP | MOVMT- 5 | | 3186 | M L25 #62 | NOP ADTL FIX MOV |
| 1 910 | 7 | | MCM | NOP | MOVMT- 12 | | 3193 | M L25 #55 | |
| 1 920 | 4 | | B | MLTTST | | | 3200 | B R54 | |
| 1 930 | 7 | FIXALL | MCM | BLANKS- 1 | MOVMT- 1 | | 3204 | M J89 #66 | PCH FIX ALL CDS |
| 1 940 | 4 | | B | FIXNOP 6 7 | | | 3211 | B A93 | |
| 1 950 | 7 | MPLNOP | MCM | NOP | MOVMT | | 3215 | M L25 #67 | NOP INTRA CD CNT |

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| PG LIN | CT | LABEL | OP | A OPERAND | B OPERAND | D | LOC | INSTRUCTION COMMENTS | 0096 |
|--------|----|---------|-----|-------------|------------|---|------|----------------------|------------------|
| 1 960 | 8 | JOBEND | B | ENDJOB | 0158 | | 3222 | B 872 158 | |
| 1 970 | 7 | | MCW | MOV TAP | DBLCK | | 3230 | M 953 T91 | SET TAPE ERROR |
| 1 980 | 7 | | MCW | MOV TAP | DBLCK & 14 | | 3237 | M 953 U05 | |
| 1 981 | 7 | | MCW | NOP | BBLKND - 8 | | 3244 | M L25 U26 | |
| 1 990 | 7 | | MCW | LCSELT | BBLKND - 5 | | 3251 | M L44 U29 | |
| 2 000 | 7 | | MCW | NOP | FXBBLK - 4 | | 3258 | M L25 U64 | |
| 2 010 | 7 | | MCW | NOP | BINBK | | 3265 | M L25 829 | |
| 2 020 | 8 | ENDJOB | B | HDR LGH | 0147 | 4 | 3272 | B 892 147 4 | TST HDR CMPRE |
| 2 030 | 8 | | B | STOR TR | ENDTYP | 1 | 3280 | B C28 K03 1 | |
| 2 040 | 4 | | B | GP TST | | | 3288 | B C36 | |
| 2 050 | 1 | HOR LGH | R | | | | 3292 | 1 | RD & STR LABEL |
| 2 060 | 7 | | LCA | 0080 | 3880 | | 3293 | L 080 H80 | |
| 2 070 | 7 | | C | 0146 | ZER080 | | 3300 | C 146 K11 | |
| 2 080 | 5 | | B | MORE | | T | 3307 | B C16 T | |
| 2 090 | 4 | | B | ENDJOB & 8 | | | 3312 | B R80 | |
| 2 100 | 1 | MORE | R | | | | 3316 | 1 | |
| 2 110 | 7 | | MCW | 0080 | 3960 | | 3317 | M 080 160 | |
| 2 120 | 4 | | B | ENDJOB & 8 | | | 3324 | B R80 | |
| 2 130 | 1 | STOR TR | R | | | | 3328 | 1 | STR TRAIL LABEL |
| 2 140 | 7 | | LCA | 0080 | TRALOC | | 3329 | L 080 040 | TST 705 GP MK |
| 2 150 | 8 | GP TST | B | XCEPTN - 7 | 0155 | | 3336 | B C70 155 | NOP PCH REL |
| 2 160 | 7 | | MCW | NOP | PUNCH & 2 | | 3344 | M L25 #86 | |
| 2 170 | 4 | | SW | 0155 | | | 3351 | , 155 | |
| 2 180 | 7 | | NOP | 0155 | 0595 | | 3355 | M 155 595 | |
| 2 190 | 4 | | CM | 0155 | | | 3362 | 0 155 | |
| 2 200 | 4 | | B | XCEPTN | | | 3366 | B C77 | |
| 2 210 | 7 | | MCW | NOP | CONGMK | | 3370 | M L25 #75 | |
| 2 220 | 7 | XCEPTN | SW | 0024 | 0056 | | 3377 | , 024 056 | SET MD MKS TO |
| 2 230 | 7 | | SW | 0063 | 0067 | | 3384 | , 063 067 | READ EXCPT |
| 2 240 | 4 | | R | 0056 | | | 3391 | 1 056 | ROUTINE |
| 2 250 | 4 | SELECT | SW | 0048 | | | 3395 | , 048 | SELECTION TEST |
| 2 260 | 7 | | MCW | BRFIX | NOSEQ - 1 | | 3399 | M 194 A67 | |
| 2 270 | 7 | | MCW | 0048 | SEQTOT | | 3406 | M 048 N46 | STR SEQ FLD TOT |
| 2 280 | 4 | | MCW | 0060 | | | 3413 | M 060 | STR SEL FLD TOT |
| 2 290 | 4 | | MCW | 0060 | | | 3417 | M 060 | |
| 2 300 | 7 | | A | SEQTOT | FULTOT | | 3421 | A N46 N45 | STR CMB TOTAL |
| 2 310 | 4 | | CM | 0048 | | | 3428 | 0 048 | |
| 2 320 | 7 | ENTHLD | MCW | 0070 | HOLD | | 3432 | M 070 177 | MOV 1ST FIELD |
| 2 330 | 1 | | MCW | | | | 3439 | M | TO HOLD AREA |
| 2 340 | 1 | | MCW | | | | 3440 | M | |
| 2 350 | 4 | | MCW | HOLD - 8 | | | 3441 | M 169 | |
| 2 360 | 1 | | MCW | | | | 3445 | M | |
| 2 370 | 8 | | B | TWMULT | HOLD - 1 | 1 | 3446 | B E81 176 1 | |
| 2 380 | 8 | | B | TSTSEQ & 07 | HOLD - 2 | | 3454 | B A56 175 | BR ALL FLOS STRD |
| 2 390 | 7 | | A | I9 | HOLD - 12 | | 3462 | A I79 165 | |
| 2 400 | 8 | | BWZ | INSERT | HOLD | K | 3469 | V G32 177 K | BR ON FLD INSERT |
| 2 410 | 8 | | B | LNGH M | HOLD - 7 | 1 | 3477 | B G21 170 1 | BR REC LGH 1000 |
| 2 420 | 7 | ADNTRY | A | CONST1 | HOLD - 4 | | 3485 | A J93 173 | SET FLD TP LOC |
| 2 430 | 4 | | MCW | HOLD - 4 | | | 3492 | M 173 | |
| 2 440 | 7 | | A | HOLD - 12 | HOLD - 2 | | 3496 | A 165 175 | |

| PG | LIN | CT | LABEL | OP | A OPERAND | B OPERAND | D | LOC | INSTRUCTION | COMMENTS | 0146 |
|----|-----|----|--------|-----|-------------|------------|---|------|-------------|------------------|------|
| 2 | 450 | 7 | | A | HOLD - 12 | HOLD - 7 | | 3503 | A 165 I70 | | |
| 2 | 460 | 7 | | C | HOLD | CDSQNO | | 3510 | C I77 I63 | TST CD PCH SEQ | |
| 2 | 470 | 5 | | B | CSQERR | | | 3517 | B I20 U | | |
| 2 | 480 | 7 | FLOMOV | MCH | HOLD | FLD 1 | | 3522 | M I77 L44 | STR FLD PARAM | |
| 2 | 490 | 1 | | MCH | | | | 3529 | M | | |
| 2 | 500 | 1 | | MCH | | | | 3530 | M | | |
| 2 | 510 | 1 | | MCH | | | | 3531 | M | | |
| 2 | 520 | 7 | | A | ONE80 - 2 | FLDCNT | | 3532 | A K06 I81 | | |
| 2 | 530 | 8 | | B | MODTST- 12 | 0150 | | 3539 | B F50 I50 | BR ON NO SEQ | |
| 2 | 540 | 4 | | NOP | SETLST | | | 3547 | N E93 | | |
| 2 | 550 | 7 | LSTREC | A | ONE80 - 2 | ADCNTR | | 3551 | A K06 I84 | FIND STORE LOCTN | |
| 2 | 560 | 7 | | C | ADCNTR | RECBLK | | 3558 | C I84 K00 | OF LAST RECORD | |
| 2 | 570 | 5 | | B | SETLST | | | 3565 | B E93 S | OF BLOCK | |
| 2 | 580 | 7 | | A | REGLNG | LTHCTR | | 3570 | A J97 I87 | | |
| 2 | 590 | 4 | | B | LSTREC | | | 3577 | B E51 | | |
| 2 | 600 | 4 | TNMULT | CM | MPLCDS | | | 3581 | CM L28 | | |
| 2 | 610 | 4 | | CM | MLTTST& 23 | | | 3585 | CM R77 | | |
| 2 | 620 | 4 | | SM | ENTHLD&022 | | | 3589 | B D54 | | |
| 2 | 630 | 7 | SETLST | B | LTHCTR | HOLD - 4 | | 3593 | A I87 I73 | SET LAST RECORD | |
| 2 | 640 | 7 | | A | LTHCTR | HOLD - 7 | | 3600 | A I87 I70 | IN HOLD POSITION | |
| 2 | 650 | 7 | | MCH | B | LSTREC- 4 | | 3607 | M L26 E47 | | |
| 2 | 660 | 7 | | C | 0150 | FLDCNT | | 3614 | C I50 I81 | BR WHEN SEL FLD | |
| 2 | 670 | 5 | | B | SEQ1 | | | 3621 | B G61 S | EQUALS SEQ FLD | |
| 2 | 680 | 7 | | C | 0152 | | | 3626 | C I52 I81 | | |
| 2 | 690 | 5 | | B | SEQ2 | | | 3633 | B H07 S | | |
| 2 | 700 | 7 | | C | 0154 | | | 3638 | C I54 I81 | | |
| 2 | 710 | 5 | | B | SEQ3 | | | 3645 | B H67 S | | |
| 2 | 720 | 7 | | C | FLDCNT | FULTOT | | 3650 | C I81 N45 | | |
| 2 | 730 | 5 | | B | TSTSEQ& 07 | | | 3657 | B A56 S | | |
| 2 | 740 | 8 | MODTST | B | MODIFY | FLDCNT | | 3662 | B G03 I81 2 | BR AFT 2 FLDS | |
| 2 | 750 | 7 | | A | ONE80 - 2 | ENTHLD& 2 | | 3670 | A K06 D34 | | |
| 2 | 760 | 4 | SELWMK | SM | FLDMOV& 4 | | | 3677 | SM E26 | UPDATE FLD STOR | |
| 2 | 770 | 4 | | A | TWELVE | FLDMOV& 6 | | 3681 | A N48 E28 | INSTRUCTION AND | |
| 2 | 780 | 4 | | CM | FLDMOV& 4 | | | 3688 | CM E26 | BRANCH | |
| 2 | 790 | 7 | | MCH | HOLD | CDSQNO | | 3692 | M I77 I63 | | |
| 2 | 800 | 4 | | B | ENTHLD | | | 3699 | B D32 | | |
| 2 | 810 | 7 | MODIFY | MCH | ONE80 - 2 | ENTHLD& 2 | | 3703 | M K06 D34 | MODIFY INST | |
| 2 | 820 | 7 | | MCH | ZZERO- 2 | MODTST& 7 | | 3710 | M L04 F69 | TO STORE FLD IN | |
| 2 | 830 | 4 | | R | SELWMK | | | 3717 | R F77 | HOLD AND RD CC2 | |
| 2 | 840 | 7 | LNGH M | MZ | LNGH M | HOLD - 6 | | 3721 | Y G21 I71 | SET 1000 POS REC | |
| 2 | 850 | 4 | | B | ADNTRY | | | 3728 | B D85 | | |
| 2 | 860 | 7 | INSERT | MZ | HOLD | HOLD - 7 | | 3732 | Y I77 I70 | SET FIELD FOR | |
| 2 | 870 | 4 | | MCH | HOLD | | | 3739 | M I75 | INSERTION OF | |
| 2 | 880 | 7 | | MZ | BLANKS- 1 | | | 3743 | Y J89 I77 | CHARACTERS | |
| 2 | 890 | 7 | | A | HOLD - 12 | HOLD - 2 | | 3750 | A I65 I75 | | |
| 2 | 900 | 4 | | B | FLOMOV - 12 | | | 3757 | B E10 | | |
| 2 | 910 | 7 | SEQ1 | MCH | FLDMOV& 6 | SQFLD1 | | 3761 | M E28 O50 | SET INSTRUCTIONS | |
| 2 | 920 | 7 | | MCH | HOLD - 7 | LDREAD& 7 | | 3768 | M I70 556 | TO LOAD READ | |
| 2 | 930 | 7 | | MCH | HOLD - 4 | LDREAD& 3 | | 3775 | M I73 552 | AREA WITH LAST | |
| 2 | 940 | 7 | | MCH | HOLD - 4 | CONMOV& 14 | | 3780 | M I73 W60 | | |

INSTRUCTION COMMENTS

LOC

D

B OPERAND

A OPERAND

OP

LABEL

CT

PG LIN

| PG LIN | CT | LABEL | OP | A OPERAND | B OPERAND | D | LOC | INSTRUCTION COMMENTS |
|--------|----|--------|-----|------------|-------------------|------|------|----------------------|
| 2 950 | 7 | | MCW | HOLD - 10 | LDREADE& 10 | | 3789 | M 167 559 |
| 2 960 | 7 | | MCW | HOLD - 10 | LDCTR | | 3796 | M 167 141 |
| 2 970 | 4 | SEQ2 | B | MODTST- 12 | | | 3803 | B F50 |
| 2 980 | 7 | | MCW | FLDMOVE 6 | SQFLD2 | | 3807 | M E28 053 |
| 2 990 | 7 | | MCW | HOLD - 7 | LDREADE& 18 | | 3814 | M 170 567 |
| 3 000 | 7 | | MCW | HOLD - 4 | CONMOV& 18 | | 3821 | M 173 464 |
| 3 010 | 7 | | MCW | HOLD - 4 | LDREADE& 14 | | 3828 | M 173 563 |
| 3 020 | 7 | | A | HOLD - 10 | LDCTR | | 3835 | A 167 141 |
| 3 030 | 7 | | MCW | LDCTR | HOLD - 10 | | 3842 | M 141 167 |
| 3 040 | 7 | | MCW | LDCTR | LDREADE& 21 | | 3849 | M 141 570 |
| 3 050 | 7 | | MCW | TWO | CLSQWME 21 | | 3856 | M L29 448 |
| 3 060 | 4 | | B | MODTST- 12 | | | 3863 | B F50 |
| 3 070 | 7 | SEQ3 | MCW | FLDMOVE 6 | SQFLD3 | | 3867 | M E28 056 |
| 3 080 | 7 | | MCW | THREE | CLSQWME 21 | | 3874 | M 044 448 |
| 3 090 | 7 | | MCW | HOLD - 7 | LDREADE& 29 | | 3881 | M 170 578 |
| 3 100 | 7 | | MCW | HOLD - 4 | LDREADE& 25 | | 3888 | M 173 574 |
| 3 110 | 7 | | MCW | HOLD - 4 | CONMOV& 22 | | 3895 | M 173 468 |
| 3 120 | 7 | | A | HOLD - 10 | LDCTR | | 3902 | A 167 141 |
| 3 140 | 7 | | MCW | LDCTR | LDREADE& 32 | | 3909 | M 141 581 |
| 3 150 | 4 | CSQERR | B | MODTST- 12 | 0280 | | 3916 | B F50 |
| 3 160 | 7 | | MCW | SELCON | | | 3920 | M 161 280 |
| 3 170 | 1 | | W | | | | 3927 | 2 |
| 3 180 | 4 | | CS | 0280 | | | 3928 | / 280 |
| 3 190 | 4 | | SM | 0201 | | | 3932 | , 201 |
| 3 200 | 4 | | H | * | | | 3936 | . 136 |
| 3 210 | 2 | LDCTR | DCW | * | | | 3941 | |
| 3 220 | 3 | LCSELT | DSA | * | | | 3944 | |
| 3 230 | 17 | SELCON | DCW | * | FLDSEL | 600 | 3961 | |
| 3 240 | 2 | CDSQNO | DCW | * | FLD CD NO SEQ ERR | | 3963 | |
| 3 250 | 2 | | DCW | * | | | 3965 | |
| 3 260 | 2 | | DCW | * | | | 3967 | |
| 3 270 | 3 | | DCW | * | | | 3970 | |
| 3 280 | 3 | | DCW | * | | | 3973 | |
| 3 290 | 4 | HOLD | DCW | * | | | 3977 | |
| 3 300 | 2 | T9 | DCW | * | | 19 | 3979 | |
| 3 310 | 2 | FLDCNT | DCW | * | | | 3981 | |
| 3 320 | 3 | ADCMTR | DCW | * | | | 3984 | |
| 3 330 | 3 | LTHCTR | DCW | * | | | 3987 | |
| 3 340 | 4 | MPCTST | DCW | * | | 0720 | 3991 | |
| 3 350 | 3 | BRFIX | DSA | * | FIXTST | 045 | 3994 | |
| 3 360 | | | ORG | 0333 | | | | |
| 3 370 | 4 | FLDSEQ | NOP | ERESTR | | | 0333 | N 526 |
| 3 380 | 7 | SEQFLD | MCW | SQFLD1 | SEQMOV& 3 | | 0337 | M 050 347 |
| 3 390 | 7 | SEQMOV | MCW | 0000 | TEST | | 0344 | M 000 198 |
| 3 400 | 1 | | MCW | | | | 0351 | M |
| 3 410 | 1 | | MCW | | | | 0352 | M |
| 3 420 | 1 | | MCW | | | | 0353 | M |
| 3 430 | 1 | | MCW | | | | 0354 | M |
| 3 440 | 7 | | A | ONE80 - 2 | SEQCNT | | 0355 | A K06 057 |
| 3 450 | 7 | | C | ZZZERO | RCOUNT | | 0362 | C L06 L12 |

PRINT MESSAGE
CARD NUM FOR
FLD SEL PCHG
OUT OF SEQUENCE

RESTORE AFT SQER
SET SEQ FIELD
FOR COMPARE

TEST FOR FIRST

| PG LIN | CT | LABEL | OP | A OPERAND | B OPERAND | D | LOC | INSTRUCTION | COMMENTS | 0246 |
|--------|----|--------|-----|------------|-----------|--------|------|-------------|-------------------|------|
| 3 460 | 5 | | B | DNCE | | S | 0369 | B 493 S | RECORD OF BLOCK | |
| 3 470 | 7 | | MCH | TEST - 7 | SQINSTE 3 | | 0374 | M 191 423 | | |
| 3 480 | 7 | SQADD | A | ADLNCH | TEST - 4 | | 0381 | A L09 194 | UPDATE TAPE | |
| 3 490 | 7 | | A | ADLNCH | TEST - 7 | | 0388 | A L09 191 | LOCATION BY ONE | |
| 3 500 | 7 | | MCH | TEST - 4 | SEQMKE 3 | | 0395 | M 194 419 | RECORD LENGTH | |
| 3 510 | 7 | | MCH | TEST - 4 | CLSQME 3 | | 0402 | M 194 430 | AND COMPARE | |
| 3 520 | 7 | | MCH | TEST - 7 | SQINSTE 6 | | 0409 | M 191 426 | INSTRUCTIONS | |
| 3 530 | 4 | SEQMKE | SW | 0000 | | | 0416 | , 000 | | |
| 3 540 | 7 | SQINST | C | 0000 | 0000 | | 0420 | C 000 000 | | |
| 3 550 | 4 | CLSQME | CH | 0000 | | | 0427 | 0 000 | | |
| 3 560 | 5 | | B | BLARGR | | | 0431 | B 468 U | BR SEQ OK | |
| 3 570 | 5 | | B | ERROR1 | | | 0436 | B 504 T | BR SEQ ERR | |
| 3 580 | 8 | | B | BLARGR | | | 0441 | B 468 057 1 | BR ALL FLODS CHKO | |
| 3 590 | 4 | | SW | SEQFLD& 1 | SEQCNT | | 0449 | , 338 | SET INSTRUCTIONS | |
| 3 600 | 7 | | A | THREE | | | 0453 | A 044 340 | FOR NEXT FIELD | |
| 3 610 | 4 | | CH | SEQFLD& 1 | SEQFLD& 3 | | 0460 | 0 338 | TO BE SEQUENCED | |
| 3 620 | 4 | | B | SEQFLD& 4 | | | 0464 | B 337 | | |
| 3 630 | 7 | BLARGR | MCH | SQBASE | SEQFLD& 3 | | 0468 | M 047 340 | RESET COMPARE | |
| 3 640 | 7 | | MCH | ZZZERO - 2 | SEQCNT | | 0475 | M L04 057 | TO CHECK MAJOR | |
| 3 650 | 7 | | NOP | RECLNG | ADLNCH | | 0482 | N J97 L09 | SEQ FIELD | |
| 3 660 | 4 | | B | SW5 | | | 0489 | B #05 | BR TO MAIN RTNE | |
| 3 670 | 7 | ONCE | A | TEST - 10 | SQINSTE 3 | | 0493 | A 188 423 | | |
| 3 680 | 4 | | B | SQADD | | | 0500 | B 381 | | |
| 3 690 | 4 | ERROR1 | SW | SSD & 4 | | | 0504 | , #83 | | |
| 3 700 | 7 | | MCH | SEQERR | 0290 | | 0508 | M 591 290 | SET INST TO PRIN | |
| 3 710 | 7 | | MCH | B | FLDSEQ | | 0515 | M L26 333 | COMPLETE RECORD | |
| 3 720 | 4 | | B | BLARGR | | | 0522 | B 468 | AND ERROR MSGE | |
| 3 730 | 4 | ERESTR | CS | 0290 | | | 0526 | / 290 | RESTORE FROM | |
| 3 740 | 4 | | SW | 0201 | | | 0530 | , 201 | SEQ ERR RTNE | |
| 3 750 | 4 | | CH | SSD & 4 | | | 0534 | 0 #83 | | |
| 3 760 | 4 | | B | SEQFLD | | | 0538 | B 337 | | |
| 3 770 | 7 | | MCH | ZZZERO | SQINSTE 3 | | 0542 | M L06 423 | | |
| 3 780 | 4 | LDREAD | SW | 0001 | | | 0549 | , 001 | LOAD LAST REC | |
| 3 790 | 7 | | MCH | 0001 | 0001 | | 0553 | M 001 001 | SEQ FIELDS TO | |
| 3 800 | 4 | | SW | 0001 | | | 0560 | , 001 | READ AREA | |
| 3 810 | 7 | | MCH | 0001 | 0001 | | 0564 | M 001 001 | | |
| 3 820 | 4 | | SW | 0001 | | | 0571 | , 001 | | |
| 3 830 | 7 | | MCH | 0001 | 0001 | | 0575 | M 001 001 | | |
| 3 840 | 4 | | B | CONMOV& 11 | | | 0582 | B 001 001 | | |
| 3 850 | 6 | SEQERR | DCW | * | | | 0591 | B W57 | | |
| 3 860 | 3 | BRSEQ | DSA | * | FLDSEQ | SEQERR | 0591 | | | |
| 3 870 | 3 | | ORG | 0600 | | 333 | 0594 | | | |
| 3 880 | 7 | FLDSEL | MCH | ONE01 | | | 0600 | M L23 N50 | FIELD SELECTION | |
| 3 890 | 7 | | MCH | FLODRG | CONTRL | | 0607 | M 186 617 | | |
| 3 900 | 7 | ORG | MCH | 0000 | ORG & 3 | | 0614 | M 000 198 | MOVE FIELD | |
| 3 910 | 1 | | MCH | | TEST | | 0621 | M | PARAMETERS | |
| 3 920 | 1 | | MCH | | | | 0622 | M | TO HOLD AREA | |
| 3 930 | 1 | | MCH | | | | 0623 | M | | |
| 3 940 | 1 | | MCH | | | | 0624 | M | | |
| 3 950 | 7 | | C | SELCTR | SELTOT | | 0625 | C 096 N43 | | |

| PG LIN | CT | LABEL | OP | A OPERAND | B OPERAND | D | LDC | INSTRUCTION COMMENTS | 0296 |
|--------|----|---------|-----|------------|------------------|---|------|----------------------|------------------|
| 3 960 | 5 | | B | PCHBR1 | | S | 0632 | B 740 S | |
| 3 970 | 7 | | A | ONE80 - 2 | | | 0637 | A K06 096 | |
| 3 980 | 7 | CTLCHP | C | TEST | SELCTR CONTRL | | 0644 | C 198 N50 | |
| 3 990 | 5 | | B | PCHBR2 | | / | 0651 | B 784 / | BR FLD IN PCH |
| 4 000 | 8 | | BWZ | CHRADD | TEST - 7 | | 0656 | V 814 191 K | TST CHAR INSERT |
| 4 010 | 7 | | A | ADLNHG | TEST - 4 | | 0664 | A L09 194 | UPDATE INST |
| 4 020 | 7 | | A | ADLNHG | TEST - 7 | | 0671 | A L09 191 | BY RECORD LENGTH |
| 4 030 | 7 | | MCW | TEST - 7 | INST & 3 | | 0678 | M 191 713 | |
| 4 040 | 7 | | MCW | TEST - 4 | CMWINS& 3 | | 0685 | M 194 720 | |
| 4 050 | 7 | | MCW | TEST - 4 | WMWINS& 3 | | 0692 | M 194 702 | |
| 4 060 | 4 | WMWINS | SW | 0000 | | | 0699 | , 000 | |
| 4 070 | 7 | | MCW | TEST - 2 | INST & 6 | | 0703 | M 196 716 | |
| 4 080 | 7 | INST | MCW | 0000 | 0100 | | 0710 | M 000 100 | MOVE TAPE TO PCH |
| 4 090 | 4 | CMWINS | CM | 0000 | | | 0717 | □ 000 | |
| 4 100 | 4 | TRNFELD | SW | ORG & 1 | | | 0721 | , 615 | UPDATE INST TO |
| 4 110 | 7 | | A | TWELVE | ORG & 3 | | 0725 | A N48 617 | PICK UP NEXT FLD |
| 4 120 | 4 | | CM | ORG & 1 | | | 0732 | □ 615 | |
| 4 130 | 4 | | B | ORG | | | 0736 | B 614 | |
| 4 140 | 7 | PCHBR1 | MCW | BCLPL | SM8 & 3 | | 0740 | M N57 #92 | |
| 4 150 | 4 | | B | NUMCDS | | | 0747 | B #33 | |
| 4 160 | 4 | CLPCHI | CS | 0180 | | | 0751 | / 180 | BR TO PUNCH |
| 4 170 | 4 | | SM | 0101 | | | 0755 | , 101 | CLEAR PUNCH |
| 4 180 | 7 | | MCW | ZZZERO- 1 | CONTRL | | 0759 | M L05 N50 | AREA |
| 4 190 | 7 | | MCW | ZZZERO- 1 | SELCTR | | 0766 | M L05 096 | RESET COUNT |
| 4 200 | 7 | | A | RECLNG | ADLNHG | | 0773 | A J97 L09 | UPDATE REC CTR |
| 4 210 | 4 | | B | BLKTST- 14 | | | 0780 | B V25 | |
| 4 220 | 7 | PCHBR2 | MCW | BCLP2 - 2 | SM8 & 3 | | 0784 | M N60 #92 | BR TO PUNCH |
| 4 230 | 7 | | A | ONE80 - 2 | CONTRL | | 0791 | A K06 N50 | |
| 4 240 | 4 | | B | NUMCDS | | | 0798 | B #33 | |
| 4 250 | 4 | CLPCH2 | CS | 0180 | | | 0802 | / 180 | CLEAR PUNCH |
| 4 260 | 4 | | SW | 0101 | | | 0806 | , 101 | AREA |
| 4 270 | 4 | | B | CTLCHP | | | 0810 | B 644 | |
| 4 280 | 7 | CHRADD | MCW | TEST - 8 | ZMWINS& 3 | | 0814 | M 190 838 | INSERT CHAR |
| 4 290 | 7 | | MCW | TEST - 8 | ZINST & 14 | | 0821 | M 190 879 | FIELD IN |
| 4 300 | 7 | | MCW | TEST - 2 | ZINST & 6 | | 0828 | M 196 871 | PUNCH LOCATION |
| 4 310 | 4 | ZMWINS | SW | 0100 | | | 0835 | , 100 | |
| 4 320 | 7 | | MCW | TEST - 2 | ZINST & 10 | | 0839 | M 196 875 | |
| 4 330 | 7 | | C | ONE01 | TEST - 10 | | 0846 | C L23 188 | |
| 4 340 | 5 | | B | ZINST | | U | 0853 | B 865 U | |
| 4 350 | 7 | | MCW | NOP | ZINST & 7 | | 0858 | M L25 872 | |
| 4 360 | 7 | ZINST | MCW | TEST - 6 | 0100 | | 0865 | M 192 100 | |
| 4 370 | 4 | | MCW | 0100 | | | 0872 | M 100 | |
| 4 380 | 4 | | CM | 0100 | | | 0876 | □ 100 | |
| 4 390 | 7 | | MCW | CHRADD | ZINST & 7 | | 0880 | M 814 872 | |
| 4 400 | 4 | | B | TRNFELD | | | 0887 | B 721 | |
| 4 410 | 4 | | CS | 0180 | | | 0891 | / 180 | |
| 4 420 | 4 | | SW | 0101 | | | 0895 | , 101 | SWITCH 1 |
| 4 430 | 4 | SW1 | B | SW2 | | | 0899 | B 949 | SELECT FILE |
| 4 440 | 7 | SELFIL | A | ONE80 - 2 | FILNUM | | 0903 | A K06 J82 | |
| 4 450 | 7 | FILCMP | C | FILNUM | SLFILI | | 0910 | C J82 J84 | TO BE PCHED |

| PG LIN | CT | LABEL | OP | A OPERAND | B OPERAND | D | LDC | INSTRUCTION COMMENTS | 0346 |
|--------|----|---------|-----|-----------|-----------|---|------|----------------------|------------------|
| 4 460 | 5 | | B | SW2 | | S | 0917 | B 949 S | |
| 4 470 | 5 | | B | ENDFIL | | T | 0922 | B Y57 T | BR EOF ON UNEQUA |
| 4 480 | 8 | TAPMOV | MCH | XU1 | TPNTRY | R | 0927 | M XU1 P01 R | |
| 4 490 | 4 | | MCH | BLANK | | | 0935 | M L03 | |
| 4 500 | 1 | | CH | | | | 0939 | □ | |
| 4 510 | 5 | | B | SELFIL | | K | 0940 | B 903 K | |
| 4 520 | 4 | | B | TAPMOV | | | 0945 | B 927 | |
| 4 530 | 4 | SW2 | NOP | COLBIN | | | 0949 | N 699 | BR ON COLBIN |
| 4 540 | 8 | MOV TAP | MCH | XU1 | TPNTRY | R | 0953 | M XU1 P01 R | READ TAPE |
| 4 550 | 4 | | MCH | BLANK | | | 0961 | M L03 | |
| 4 560 | 1 | | CH | | | | 0965 | □ | |
| 4 570 | 5 | | B | TAPERR | | L | 0966 | B S88 L | BR ON TRAN ERR |
| 4 580 | 4 | SW3 | NOP | ERESET | | | 0971 | N T66 | |
| 4 590 | 5 | EDF | B | FILEND | | K | 0975 | B W73 K | BR EOF |
| 4 600 | 5 | | B | XTRPCH | | C | 0980 | B #20 C | |
| 4 610 | 7 | | MCH | CONSTI | RECORD | | 0985 | M J93 183 | |
| 4 620 | 5 | | B | NO SPF | | F | 0992 | B #09 F | |
| 4 630 | 4 | TSTXCP | NOP | EXCPIN | | | 0997 | N /28 | BR EXCEPT RTNE |
| 4 640 | 4 | SW4 | B | FLDSEQ | | | 1001 | B 333 | BR SEQ RTNE |
| 4 650 | 4 | SW5 | B | CREG | | | 1005 | B 600 | BR FX VAR FLD SL |
| 4 660 | 7 | NO SPF | MCH | NOP | PUNCH & 2 | | 1009 | M L25 #86 | NOP PCH RL ON F |
| 4 670 | 4 | | B | TSTXCP | | | 1016 | B 997 | |
| 4 680 | 1 | XTRPCH | P | | | | 1020 | 4 | BYPASS RECORDS |
| 4 690 | 1 | | NOP | | | | 1021 | N | ON SENSE SWITCH |
| 4 700 | 7 | | MCH | NOP | XTRPCH | | 1022 | M L25 #20 | C CONTROL |
| 4 710 | 4 | | B | MOV TAP | | | 1029 | B 953 | |
| 4 720 | 7 | MUMCDS | A | ONE80 - 2 | | | 1033 | A K06 L16 | UPDATE CD CNT |
| 4 730 | 7 | AUTTOT | MCH | CD CNT | 0100 | | 1040 | M L16 100 | MOVE CD CNT |
| 4 740 | 1 | | NOP | | | | 1047 | N | TO PUNCH |
| 4 750 | 7 | | A | ONE80 - 2 | | | 1048 | A K06 L28 | UPDATE INTRA CNT |
| 4 760 | 7 | | C | FXCDND | | | 1055 | C K05 L28 | TEST CD NUM FOR |
| 4 770 | 5 | | B | GPFIX | | S | 1062 | B #93 S | ADDTL INFO |
| 4 780 | 7 | MOVNCT | MCH | MPLCDS | 0100 | | 1067 | M L28 100 | MOVE INTRA TO PC |
| 4 790 | 1 | | NOP | | | | 1074 | N | |
| 4 800 | 4 | CONGMK | B | CVTTST | | | 1075 | B V81 | BR CVT 705 GM |
| 4 810 | 5 | SSD | B | PRTPCH | | D | 1079 | B /05 D | BR PRTPCH ON D |
| 4 820 | 1 | PUNCH | P | | | | 1084 | 4 | PUNCH CARD |
| 4 830 | 1 | | NOP | | | | 1085 | N | |
| 4 840 | 1 | | SPF | | | | 1086 | 9 | PUNCH RELEASE |
| 4 850 | 2 | SW8 | SS | | | 4 | 1087 | K 4 | STACKER SELECT |
| 4 860 | 4 | | B | CMP | | | 1089 | B 607 | BR TO REC SEG |
| 4 870 | 7 | GPFIX | MCH | FIXED | 0100 | | 1093 | M K92 100 | MOVE ADDTL INFO |
| 4 880 | 1 | | NOP | | | | 1100 | N | TO PUNCH |
| 4 890 | 4 | | B | MOVNCT | | | 1101 | B #67 | |
| 4 900 | 7 | PRTPCH | MCH | 0180 | 0280 | | 1105 | M 180 280 | MOVE PUNCH INFO |
| 4 910 | 1 | | P | | | | 1112 | 4 | TO PRINT AREA |
| 4 920 | 1 | | M | | | | 1113 | 2 | PRINT AND PUNCH |
| 4 930 | 5 | | B | FRMCTL | | a | 1114 | B /23 a | |
| 4 940 | 4 | | B | SW8 - 3 | | | 1119 | B #86 | BR TO NEXT SEG |
| 4 950 | 5 | FRMCTL | CC | SW8 - 3 | | 1 | 1123 | F #86 1 | |

| PG LIN | CT | LABEL | OP | A OPERAND | B OPERAND | D | LOC | INSTRUCTION | COMMENTS |
|--------|----|---------|-----|------------|------------|---|------|-------------|------------------|
| 4 970 | 7 | EXCPTN | LCA | RECORD | TSTCH1& 3 | | 1128 | L 183 /73 | TEST TAPE REC |
| 4 980 | 7 | EXCEPT | LCA | RECORD | TSTCH2& 3 | | 1135 | L 183 /96 | LOCATION FOR |
| 4 981 | 7 | EXCEPT | A | RECLNG | RECORD | | 1142 | A J97 183 | EXCEPTION CODES |
| 4 990 | 7 | | A | ADDEX1 | TSTCH1& 3 | | 1149 | A 083 /73 | |
| 5 000 | 7 | | A | ADDEX2 | TSTCH2& 3 | | 1156 | A 087 /96 | |
| 5 010 | 7 | | CM | TSTCH1& 1 | TSTCH2& 1 | | 1163 | 0 /71 /94 | |
| 5 020 | 7 | TSTCH1 | CM | 0000 | FIRSTX | | 1170 | M 000 072 | COMPARE FIRST |
| 5 030 | 7 | | C | FIRSTX | XCHAR1 | / | 1177 | C 072 080 | CHARACTER |
| 5 040 | 5 | | B | TSTCH2 | | | 1184 | B /93 / | |
| 5 050 | 4 | | B | XC PFND | | | 1189 | B S12 | |
| 5 060 | 7 | TSTCH2 | CMW | 0000 | SECNDX | | 1193 | M 000 073 | COMPARE SECOND |
| 5 070 | 7 | | C | SECNDX | XCHAR2 | / | 1200 | C 073 084 | CHARACTER |
| 5 080 | 5 | | B | SW4 | | | 1207 | B #01 / | SET INST TO |
| 5 090 | 7 | XC PFND | SW | NUMDSE& 4 | NUMDSE& 3 | | 1212 | M 076 #36 | PROCESS EXCEPT |
| 5 100 | 7 | | CMW | LCPTPN | | | 1223 | M L26 | RECORD |
| 5 110 | 4 | | CMW | B | | | 1227 | M L26 | |
| 5 120 | 4 | | SW | BLKTST& 11 | | | 1227 | M V50 | |
| 5 130 | 7 | | CMW | BRXEND | BLKTST& 10 | | 1231 | M 079 V49 | |
| 5 140 | 7 | OPTION | CMW | NOP | PRTPCHE& 7 | | 1238 | M L25 /12 | |
| 5 150 | 7 | | CMW | NOP | PRTPCHE& 8 | | 1245 | M L25 /13 | |
| 5 160 | 4 | | B | SW5 | | | 1252 | B #05 | |
| 5 170 | 7 | XC PFND | LCA | NUMDSE& 6 | NUMDSE& 6 | | 1256 | L 091 #39 | RESET INST FOR |
| 5 180 | 7 | | LCA | NMDCW& 4 | BLKTST& 11 | | 1263 | L 096 V50 | NORMAL PROCESS |
| 5 190 | 7 | | LCA | FOUR | PRTPCHE& 7 | | 1270 | L 094 /12 | |
| 5 200 | 7 | | LCA | TWO | PRTPCHE& 8 | | 1277 | L L29 /13 | |
| 5 210 | 4 | | B | BLKTST& 7 | | | 1284 | B V46 | |
| 5 220 | 4 | TAPERR | NOP | TPECNT | | | 1288 | N T10 | TAPE ERROR |
| 5 230 | 1 | | P | | | | 1292 | 4 | DUMMY PUNCH |
| 5 240 | 8 | | B | ERRSTK | SW8 - 2 | N | 1293 | B T55 #87 N | FOR PCH REL |
| 5 250 | 7 | | CMW | NOP | * & 1 | | 1301 | M L25 T08 | |
| 5 260 | 2 | | SS | | | | 1308 | K 4 | |
| 5 270 | 5 | TPECNT | B | 1673 | | | 1310 | B W73 K | |
| 5 271 | 2 | | NOP | | | | 1315 | N 0 | |
| 5 272 | 7 | | CMW | B | TAPERR | | 1317 | M L26 S88 | |
| 5 280 | 7 | | A | ONEBO - 2 | ERRCNT | | 1324 | A K06 V03 | |
| 5 290 | 8 | | B | BDBLCK | ERRCNT- 1 | 1 | 1331 | B T91 V02 1 | |
| 5 291 | 5 | | CU | 8U1 | | B | 1339 | U 8U1 B | |
| 5 300 | 7 | | CMW | B | SW3 | | 1344 | M L26 971 | |
| 5 310 | 4 | | B | MOVTAP | | | 1351 | B 953 | |
| 5 320 | 7 | ERRSTK | CMW | KEIGHT- 1 | TPECNT- 2 | | 1355 | M 070 T08 | RESET FOR NORMAL |
| 5 330 | 4 | | B | TPECNT- 2 | | | 1362 | B T08 | TAPE TRANS |
| 5 340 | 7 | ERESET | CMW | ZZZERO | ERRCNT | | 1366 | M L06 V03 | |
| 5 350 | 7 | | CMW | NOP | TAPERR | | 1373 | M L25 S88 | |
| 5 360 | 7 | | CMW | NOP | SW3 | | 1380 | M L25 971 | |
| 5 370 | 4 | | B | EOF | | | 1387 | B 975 | |
| 5 380 | 7 | BDBLCK | NOP | NOP | PRTPCHE& 7 | | 1391 | N L25 /12 | BLOCK OPTION |
| 5 390 | 7 | | NOP | NOP | PRTPCHE& 8 | | 1398 | N L25 /13 | |
| 5 400 | 7 | | NOP | CDCNT | 8BLKCT | | 1405 | N L16 V07 | |
| 5 410 | 7 | | SW | SSD & 4 | BLKTST& 11 | | 1412 | M #83 V50 | |
| 5 420 | 7 | | CMW | LOCBND | BLKTST& 10 | | 1419 | M V10 V49 | |

| PG LIN | CT | LABEL | OP | A OPERAND | B OPERAND | D | LOC | INSTRUCTION | COMMENTS |
|--------|----|--------|-----|-------------|------------|-----|------|-------------|---|
| 5 430 | 4 | | B | ERESET | | | 1426 | B T66 | RESET INST |
| 5 431 | 4 | | B | FXBBLK | | | 1430 | B U68 | |
| 5 435 | 5 | BBLKND | B | FLDSEL | | | 1434 | B 600 T | |
| 5 440 | 7 | | MCH | TWO | PRTPCHE 8 | T | 1439 | M L29 /13 | FOR NORMAL PROCESSING |
| 5 450 | 4 | | MCH | FOUR | | | 1446 | M 094 | |
| 5 460 | 7 | | CW | SSD & 4 | BLKTST& 11 | | 1450 | □ #83 V50 | |
| 5 470 | 7 | | MCH | BLKDCHE & 4 | BLKTST& 11 | | 1457 | M 096 V50 | |
| 5 480 | 4 | | B | BLKTST | | | 1464 | B V39 | CORRECT TAPE READ AREA |
| 5 490 | 1 | FXBBLK | H | | | | 1468 | . | |
| 5 491 | 7 | | MCH | ZZZERO | RCOUNT | | 1469 | M L06 L12 | |
| 5 500 | 7 | | MCH | BBLKCT | CDCNT | | 1476 | M V07 L16 | BY HAND |
| 5 510 | 5 | | CU | XU1 | | | 1483 | U XU1 B | |
| 5 520 | 8 | | MCH | XU1 | TPNTRY | B | 1488 | M XU1 P01 R | |
| 5 530 | 5 | | B | ERESET | | G | 1496 | B T66 G | |
| 5 540 | 1 | | H | * | | | 1501 | . | |
| 5 550 | 2 | ERRCNT | DCW | * | | | 1503 | . | |
| 5 560 | 4 | BBLKCT | DCW | * | | | 1507 | . | |
| 5 570 | 3 | LOCBND | DSA | * | | | 1510 | . | |
| 5 580 | 7 | UPCNT | MCH | ONE80 | BBLKND | U34 | 1511 | M K08 693 | UPDATE RECORD COUNT |
| 5 590 | 7 | | MCH | BRCMP | PCHMOV& 6 | | 1518 | M K95 #92 | |
| 5 600 | 7 | | A | ONE80 - 2 | SWB & 3 | | 1525 | A K06 L12 | |
| 5 610 | 7 | | MCH | ZZZERO | RCOUNT | | 1532 | M L06 L28 | |
| 5 620 | 7 | BLKTST | C | REC8LK | MPLCDS | | 1539 | C K00 L12 | |
| 5 630 | 5 | | B | TSTXCP | RCOUNT | | 1546 | B 997 T | TEST FOR END OF BLOCK |
| 5 640 | 7 | | A | REC8LK | RECTOT | T | 1551 | A K00 L20 | UPDATE REC TOT |
| 5 650 | 7 | | MCH | ZZZERO | RCOUNT | | 1558 | M L06 L12 | |
| 5 660 | 4 | | MCH | ZZZERO | | | 1565 | M L06 | RESET RECORD COUNTER AND ADD COUNTER |
| 5 670 | 4 | | MCH | ZZZERO | | | 1569 | M L06 | |
| 5 680 | 4 | | B | LDREAD- | | | 1573 | B 542 | |
| 5 690 | 4 | | B | MOVTAP- | | | 1577 | B 949 | |
| 5 700 | 8 | CVTTST | B | CONVRT | O101 | | 1581 | B W31 L01 | |
| 5 710 | 4 | | B | CONVRT | | | 1589 | □ V85 | |
| 5 720 | 7 | | A | ONE80 - 2 | CVTTST& 6 | | 1593 | A K06 V87 | FOR CONVERSION OF 705 GPMK TO 1401 GPMK |
| 5 730 | 4 | | CW | CVTTST& 4 | | | 1600 | □ V85 | |
| 5 740 | 7 | | C | CVTTST& 6 | ONE80 | | 1604 | C V87 K08 | |
| 5 750 | 5 | | B | * & 5 | | | 1611 | B W20 T | |
| 5 760 | 4 | | B | CVTTST | | T | 1616 | B V81 | |
| 5 770 | 7 | | MCH | ONE01 | CVTTST& 6 | | 1620 | M L23 V87 | |
| 5 780 | 4 | | B | SSD | | | 1627 | B #79 | |
| 5 790 | 4 | CONVRT | SW | CVTTST& 4 | | | 1631 | □ V85 | |
| 5 800 | 7 | | MCH | CVTTST& 6 | CONMOV& 6 | | 1635 | M V87 W52 | |
| 5 810 | 4 | | CW | CVTTST& 4 | | | 1642 | □ V85 | |
| 5 820 | 7 | CONMOV | MCH | O595 | 0000 | | 1646 | M 595 000 | |
| 5 830 | 4 | | B | CVTTST& 8 | | | 1653 | B V89 | |
| 5 840 | 4 | | CW | 0001 | | | 1657 | □ 001 | |
| 5 850 | 4 | | CW | 0001 | | | 1661 | □ 001 | |
| 5 860 | 4 | | CW | 0001 | | | 1665 | □ 001 | |
| 5 870 | 4 | | B | MOVTAP- | | | 1669 | B 949 | |
| 5 880 | 4 | FILEND | CS | O299 | | | 1673 | / 299 | CLEAR PRINT PUNCH AND |
| 5 890 | 4 | | CS | O180 | | | 1677 | / 180 | |

| PG LIN | CT | LABEL | OP | A OPERAND | B OPERAND | D | LOC | INSTRUCTION | COMMENTS |
|--------|----|--------|-----|------------|------------|---|------|-------------|------------------|
| 5 900 | 4 | | CS | 0080 | | | 1681 | / 080 | READ AREAS |
| 5 910 | 1 | | P | | | | 1685 | 4 | DUMMY PUNCH |
| 5 920 | 7 | | MCH | CONST3 | 0225 | | 1686 | M N41 225 | MOVE REC TOT |
| 5 930 | 4 | | MCH | RECTOT | | | 1693 | M L20 | AND CD CNT TO |
| 5 940 | 4 | | MCH | CONST2 | | | 1697 | M N32 | PRINT AREA |
| 5 950 | 4 | | MCH | CDCNT | | | 1701 | M L16 | |
| 5 960 | 1 | | W | | | | 1705 | 2 | PRINT |
| 5 970 | 2 | | CC | | | 1 | 1706 | F 1 | CLEAR PRINT AREA |
| 5 980 | 4 | | CS | 0225 | | | 1708 | / 225 | |
| 5 990 | 4 | | SW | 0201 | | | 1712 | , 201 | |
| 6 000 | 7 | | SW | 0101 | | | 1716 | , 101 001 | |
| 6 010 | 7 | | MCH | 0225 | RECTOT | | 1723 | M 225 L20 | RESET REC TOT |
| 6 020 | 1 | | MCH | | | | 1730 | M | AND CD CNT CNTRS |
| 6 030 | 1 | | MCH | PRTPC& 7 | | | 1731 | M | |
| 6 040 | 7 | | MCH | ALTSTK | XTRPCH | | 1732 | M /12 #20 | |
| 6 050 | 8 | | B | NOP | PUNCH & 3 | N | 1739 | B Y46 #87 N | ALTERNATE STACKR |
| 6 060 | 7 | | MCH | SWB ON | PUNCH & 3 | B | 1747 | M L25 #87 | |
| 6 070 | 5 | TSTALL | B | ALLTAP | | | 1754 | B Y75 B | BR HALT ON B |
| 6 080 | 4 | | B | TYPFIL | NUMFIL | | 1759 | B Y79 K02 | BR TRAIL EOR |
| 6 090 | 4 | | B | MLTFIL | | | 1767 | B Z93 | |
| 6 100 | 4 | TSTNUM | B | FILCPE 4 | | | 1771 | B X94 | BR TO SPEC FILES |
| 6 110 | 4 | | SW | FILCPE 4 | | | 1775 | , 914 | UPDATE SELECT |
| 6 120 | 7 | | A | TWO | FILCPE & 6 | | 1779 | A L29 916 | FILE COUNT |
| 6 130 | 4 | | SW | FILCPE 4 | | | 1786 | B 914 | |
| 6 140 | 4 | | SW | MEMFX | | | 1790 | B Z59 | BR NEW FIX INFO |
| 6 150 | 7 | MLTFIL | A | ONE80 - 2 | FILTOT | | 1794 | A K06 L32 | UPDATE SPECIFIED |
| 6 160 | 7 | | C | NUMFIL | FILTOT | | 1801 | C K02 L32 | FILE COUNT |
| 6 170 | 5 | | B | NEWFX | | / | 1808 | B Z59 / | BR ON MORE FILES |
| 6 180 | 4 | PROSND | CS | ZZZERO- 1 | FILTOT | | 1813 | / 299 | RESET FILE COUNT |
| 6 190 | 7 | | MCH | 0201 | | | 1817 | M L05 L32 | |
| 6 200 | 4 | | SW | TPNTRY& 98 | | | 1824 | , 201 | |
| 6 210 | 4 | | CS | FILE | | | 1828 | / P99 | |
| 6 220 | 5 | | B | NUMFIL | | E | 1832 | B Y42 E | NO REWIND |
| 6 230 | 5 | REEL | CU | LETR K | PUNCH & 3 | R | 1837 | U XUI R | REWIND TAPE |
| 6 240 | 4 | FILE | H | TSTALL- 5 | | | 1842 | , Z59 | HALT BR NEW FIX |
| 6 250 | 7 | ALTSTK | MCH | ZZZERO- 1 | | | 1846 | M L30 #87 | |
| 6 260 | 4 | | B | LOCSLF | FILNUM | | 1853 | B X54 | |
| 6 270 | 7 | ENDFIL | MCH | PROSND | FILCPE & 6 | | 1857 | M L05 J82 | RESET SELECT |
| 6 280 | 7 | | MCH | TSTALL | | | 1864 | M 099 916 | FILE COUNTER |
| 6 290 | 4 | | B | GMK78 | | | 1871 | B Y13 | |
| 6 300 | 4 | SWB ON | H | LCA | TPNTRY& 80 | | 1875 | , X59 | |
| 6 310 | 7 | ALLTAP | LCA | LCA | TPNTRY | R | 1879 | L L24 P81 | |
| 6 320 | 8 | | LCA | XUI | | | 1886 | L XUI P01 R | |
| 6 330 | 4 | | MCH | BLANKS | | | 1894 | M J90 | |
| 6 340 | 4 | | B | TRAILR | | | 1898 | B Z16 | BR TO TRAILER |
| 6 350 | 5 | | B | PROSND | | K | 1902 | B Y13 K | BR ON 2 TPMKS |
| 6 360 | 5 | BKSPSE | CU | XUI | | B | 1907 | U XUI B | |
| 6 370 | 4 | | B | TYPFIL | | | 1912 | B Z93 | |
| 6 380 | 8 | TRAILR | B | TRALOK | TPNTRY& 80 | | 1916 | B Z40 P81 | TEST TRAILER LAB |
| 6 390 | 7 | | C | TPNTRY& 79 | TRALOC | | 1924 | C P80 040 | ON TAPE TO LABEL |

| PG LIN | CT | LABEL | DP | A OPERAND | B OPERAND | D | LOC | INSTRUCTION | COMMENTS | 0545 |
|--------|----|--------|-----|------------|------------|---|------|-------------|------------------|------|
| 6 400 | 5 | TRALRT | B | BKSPSE | | | 1931 | B Z07 / | STORED FROM CARD | |
| 6 410 | 4 | PROSND | B | PROSND | | | 1936 | B Y13 | | |
| 6 420 | 7 | TRALOK | C | TWO | TWO | | 1940 | C L29 L29 | | |
| 6 430 | 7 | | MCH | TPNTRY& 79 | TRALOC | | 1947 | M P80 040 | | |
| 6 440 | 1 | | C | | | | 1954 | C | | |
| 6 450 | 4 | | B | TRALRT | | | 1955 | B Z31 | | |
| 6 460 | 4 | NEWFIX | CS | TPNTRY& 80 | | | 1959 | / P81 | | |
| 6 470 | 4 | | NOP | TPNTRY | | | 1963 | N P01 | | |
| 6 480 | 4 | | B | HDRPRO | | | 1967 | B -83 | | |
| 6 490 | 1 | | R | | | | 1971 | 1 | INSERT NEW | |
| 6 500 | 1 | | NOP | | | | 1972 | N | INFORMATION IN | |
| 6 510 | 7 | ROADTL | NOP | 0000 | 0000 | | 1973 | N 000 000 | FIXED INFO AREA | |
| 6 520 | 1 | | NOP | | | | 1980 | N | | |
| 6 530 | 4 | | CS | 0080 | | | 1981 | / 080 | | |
| 6 540 | 4 | | SW | 0001 | | | 1985 | , 001 | | |
| 6 550 | 4 | | B | HDRPRO | | | 1989 | B -83 | | |
| 6 560 | 4 | TYPFIL | B | TSTNUM | | | 1993 | B X71 | | |
| 6 570 | 7 | | LCA | GPMK78 | TPNTRY& 80 | | 1997 | L L24 P81 | PROCESS TRAILER | |
| 6 580 | 8 | | MCH | XU1 | TPNTRY | R | 2004 | M XU1 P01 R | LABELS | |
| 6 590 | 4 | | MCH | BLANKS | | | 2012 | M J90 | BETWEEN FILES | |
| 6 600 | 4 | | CS | 0180 | | | 2016 | / 180 | | |
| 6 610 | 4 | | SW | 0101 | | | 2020 | , 101 | | |
| 6 620 | 5 | | B | TSTNUM | | | 2024 | B X71 K | | |
| 6 630 | 8 | | B | TRALES | TPNTRY& 80 | K | 2029 | B -71 P81 | | |
| 6 640 | 7 | | MCH | TPNTRY& 79 | 0280 | | 2037 | M P80 280 | | |
| 6 650 | 7 | TRAMRC | MCH | 0280 | 0180 | | 2044 | M 280 180 | | |
| 6 660 | 1 | | M | | | | 2051 | 2 | | |
| 6 670 | 4 | | CS | 0280 | | | 2052 | / 280 | | |
| 6 680 | 4 | | CS | TPNTRY& 81 | | | 2056 | / P82 | | |
| 6 690 | 7 | | SW | 0201 | TPNTRY | | 2060 | , 201 P01 | | |
| 6 700 | 4 | | B | TYPFIL& 11 | | | 2067 | B -04 | | |
| 6 710 | 7 | TRALES | MCH | TPNTRY& 79 | 0280 | | 2071 | M P80 280 | | |
| 6 720 | 1 | | MCH | | | | 2078 | M | | |
| 6 730 | 4 | | B | TRAMRC | | | 2079 | B -44 | | |
| 6 740 | 4 | HDRPRO | B | SW1 - 8 | | | 2083 | B 891 | PROCESS HEADER | |
| 6 750 | 8 | | MCH | XU1 | TPNTRY | R | 2087 | M XU1 P01 R | LABELS BETWEEN | |
| 6 760 | 4 | | MCH | BLANK | | | 2095 | M L03 | FILES | |
| 6 770 | 1 | | CH | | | | 2099 | 0 | | |
| 6 780 | 5 | | B | SW1 - 8 | | | 2100 | B 891 K | | |
| 6 790 | 4 | | NOP | INITL | | | 2105 | N J65 | | |
| 6 800 | 7 | PART1 | NOP | TPNTRY& 79 | 0280 | | 2109 | N P80 280 | FIRST 80 CHAR | |
| 6 810 | 7 | | NOP | 0280 | 0180 | | 2116 | N 280 180 | | |
| 6 820 | 1 | | NOP | | | | 2123 | N | | |
| 6 830 | 4 | | NOP | 0280 | | | 2124 | N 280 | | |
| 6 840 | 7 | PART2 | MCH | TPNTRY& 79 | 0200 | | 2128 | M P80 200 | SECOND 80 CHAR | |
| 6 850 | 7 | | NOP | 0280 | 0180 | | 2135 | N 280 180 | | |
| 6 860 | 1 | | M | | | | 2142 | 2 | | |
| 6 870 | 4 | | CS | 0280 | | | 2143 | / 280 | | |
| 6 880 | 7 | | SW | 0201 | 0200 | | 2147 | , 201 200 | | |
| 6 890 | 7 | | MCH | 0280 | PART1 - 4 | | 2154 | M L26 J05 | | |

| PG LIN | CT | LABEL | OP | A OPERAND | B OPERAND | D | LOC | INSTRUCTION COMMENTS |
|--------|----|---------|-----|-----------|-----------|-----|------|----------------------|
| 6 900 | 4 | | B | HDRPROG 4 | | | 2161 | B -87 |
| 6 910 | 7 | INITL | MCW | NOP | PART1 - 4 | | 2165 | M L25 J05 |
| 6 920 | 5 | | CU | XU1 | | B | 2172 | U XU1 B |
| 6 930 | 4 | | B | SW1 - 8 | | | 2177 | B 891 |
| 6 940 | 2 | FILNUM | DCW | * | | | 2182 | |
| 6 950 | 2 | SLFILI | DCW | * | | | 2184 | |
| 6 960 | 2 | SLFIL2 | DCW | * | | | 2186 | |
| 6 970 | 2 | SLFIL3 | DCW | * | | | 2188 | |
| 6 980 | 2 | BLANKS | DCW | * | | | 2190 | |
| 6 990 | 3 | TPNTRY | DS | 2701 | | | 2701 | |
| 7 000 | 3 | CONSTI | DCW | * | | P00 | 2193 | |
| 7 010 | 4 | RECLNG | DCW | * | | | 2197 | |
| 7 020 | 3 | RECLBK | DCW | * | | | 2200 | |
| 7 030 | 2 | NUMFIL | DCW | * | | | 2202 | |
| 7 040 | 1 | ENDTYP | DCW | * | | | 2203 | |
| 7 050 | 2 | FXCDND | DCW | * | | | 2205 | |
| 7 060 | 3 | ONE80 | DCW | * | | | 2208 | |
| 7 070 | 3 | ZER080 | DCW | * | | | 2211 | |
| 7 080 | 1 | SIX | DCW | * | | | 2212 | |
| 7 090 | 80 | FIXED | DS | * | | | 2292 | |
| 7 100 | 3 | BRCMP | DSA | * | | | 2295 | |
| 7 110 | 3 | BRUPCT | DSA | * | | | V11 | 2298 |
| 7 120 | 1 | UNITNO | DCW | * | | | 1 | 2299 |
| 7 130 | 3 | SXTEEN | DCW | * | | | 016 | 2302 |
| 7 140 | 1 | BLANK | DCW | * | | | 2303 | |
| 7 150 | 3 | ZZZERO | DCW | * | | | 000 | 2306 |
| 7 160 | 3 | ADLNHG | DCW | * | | | 2309 | |
| 7 170 | 3 | RDCOUNT | DCW | * | | | 2312 | |
| 7 180 | 4 | CDGNT | DCW | * | | | 2316 | |
| 7 190 | 4 | RECTOT | DCW | * | | | 2320 | |
| 7 200 | 3 | ONE01 | DCW | * | | | 101 | 2323 |
| 7 210 | 1 | GPMK78 | DCW | * | | | 2324 | |
| 7 220 | 1 | NOP | DCW | * | | | N | 2325 |
| 7 230 | 1 | B | DCW | * | | | 8 | 2326 |
| 7 240 | 2 | MPLCDS | DCW | * | | | 2328 | |
| 7 250 | 1 | TWO | DCW | * | | | 2 | 2329 |
| 7 260 | 1 | LETR K | DCW | * | | | K | 2330 |
| 7 270 | 2 | FILTOT | DCW | * | | | 2332 | |
| 7 280 | 12 | FLD 1 | DCW | * | | | 2344 | |
| 7 290 | 12 | | DCW | * | | | 2356 | |
| 7 300 | 12 | | DCW | * | | | 2368 | |
| 7 310 | 12 | | DCW | * | | | 2380 | |
| 7 320 | 12 | | DCW | * | | | 2392 | |
| 7 330 | 12 | | DCW | * | | | 2404 | |
| 7 340 | 12 | | DCW | * | | | 2416 | |
| 7 350 | 12 | | DCW | * | | | 2428 | |
| 7 360 | 12 | | DCW | * | | | 2440 | |
| 7 370 | 12 | | DCW | * | | | 2452 | |
| 7 380 | 12 | | DCW | * | | | 2464 | |
| 7 390 | 12 | | DCW | * | | | 2476 | |

CMP
UPCNT

| PG LIN | CT | LABEL | OP | A OPERAND | B OPERAND | D | LOC | INSTRUCTION COMMENTS | 0695 |
|--------|----|--------|-----|-----------|------------|---|------|----------------------|------|
| 7 900 | 7 | | MCW | NOP | PUNCH & 2 | | 2748 | M L25 #86 | |
| 7 910 | 4 | | B | SETXCP | | | 2755 | B Q31 | |
| 7 920 | 7 | PRINTX | MCW | NOP | PUNCH & 2 | | 2759 | M L25 #86 | |
| 7 930 | 7 | | MCW | NOP | OPTION& 7 | | 2766 | M L25 S45 | |
| 7 940 | 4 | | B | SETXCP | | | 2773 | B Q31 | |
| 7 950 | 7 | FIXCPT | MCW | NOP | EXCEPT | | 2777 | M L25 /42 | |
| 7 960 | 4 | | B | OPTST | | | 2784 | B P24 | |
| 7 970 | 4 | ERROR | H | * - 3 | | | 2788 | . P88 | |
| 7 980 | 7 | PTPCHX | MCW | NOP | OPTION | | 2792 | M L25 S38 | |
| 7 990 | 4 | | B | PRINTX& 7 | | | 2799 | B P66 | |
| 8 000 | 7 | STKSLX | MCW | STKX & 6 | OPTION& 6 | | 2803 | M A35 S44 | |
| 8 010 | 7 | | MCW | XCPSTK& 6 | OPTION& 13 | | 2810 | M A42 S51 | |
| 8 020 | 7 | | MCW | REPSTK& 6 | XCPEND& 20 | | 2817 | M A49 S76 | |
| 8 030 | 7 | | MCW | NOP | XCPEND& 21 | | 2824 | M L25 S77 | |
| 8 040 | 7 | SETXCP | C | 0117 | FOUR | | 2831 | C 117 094 | |
| 8 050 | 5 | | B | ERROR | | T | 2838 | B P88 T | |
| 8 060 | 7 | | MCW | 0118 | XCHAR1 | | 2843 | M 118 080 | |
| 8 070 | 8 | | B | XLOC1M | 0121 | 1 | 2850 | B A07 121 1 | |
| 8 080 | 7 | | A | 0124 | ADDEX1 | | 2858 | A 124 083 | |
| 8 090 | 8 | | B | NOCHR2 | 0126 | | 2865 | B &63 126 | |
| 8 100 | 7 | STORE2 | MCW | 0125 | XCHAR2 | | 2873 | M 125 084 | |
| 8 110 | 8 | | B | XLOC2M | 0127 | 1 | 2880 | B A18 127 1 | |
| 8 120 | 7 | | A | 0130 | ADDEX2 | | 2888 | A 130 087 | |
| 8 130 | 8 | | BWZ | ZNCHR1 | 0120 | B | 2895 | V &85 120 B | |
| 8 140 | 8 | | BWZ | DGCHR1 | 0120 | 2 | 2903 | V R26 120 2 | |
| 8 150 | 8 | | BWZ | ERROR | 0120 | S | 2911 | V P88 120 S | |
| 8 160 | 7 | | MCW | MVDIGT | TSTCH1 | | 2919 | M 088 /70 | |
| 8 170 | 7 | DGCHR1 | MZ | BLANK | 0120 | | 2926 | Y L03 120 | |
| 8 180 | 8 | | B | ANDOR | 0120 | 1 | 2933 | B R60 120 1 | |
| 8 190 | 8 | | B | * & 5 | | 2 | 2941 | B R53 120 2 | |
| 8 200 | 4 | | B | ERROR | | | 2949 | B P88 | |
| 8 210 | 7 | | MCW | LETR S | TSTCH1& 18 | | 2953 | M 089 /88 | |
| 8 220 | 7 | ANDOR | B | OR | 0119 | 2 | 2960 | B R94 119 2 | |
| 8 230 | 8 | | B | * & 5 | 0119 | 1 | 2968 | B R80 119 1 | |
| 8 240 | 4 | | NOP | ERROR | | | 2976 | N P88 | |
| 8 250 | 7 | | MCW | NOP | TSTCH1& 19 | | 2980 | M L25 /89 | |
| 8 260 | 7 | | MCW | LOC&M4 | TSTCH1& 17 | | 2987 | M 092 /87 | |
| 8 270 | 8 | OR | BWZ | ZNCHR2 | 0126 | 2 | 2994 | V &96 126 2 | |
| 8 280 | 8 | | BWZ | DGCHR2 | 0126 | 2 | 3002 | V &25 126 2 | |
| 8 290 | 8 | | BWZ | ERROR | 0126 | S | 3010 | V P88 126 S | |
| 8 300 | 7 | | MCW | MVDIGT | TSTCH2 | | 3018 | M 088 /93 | |
| 8 310 | 7 | DGCHR2 | MZ | BLANK | 0126 | | 3025 | Y L03 126 | |
| 8 320 | 8 | | B | TPUNIT | 0126 | 1 | 3032 | B A50 126 1 | |
| 8 330 | 8 | | B | * & 5 | 0126 | 2 | 3040 | B &52 126 2 | |
| 8 340 | 4 | | B | ERROR | | | 3048 | B P88 | |
| 8 350 | 7 | | MCW | LETR S | TSTCH2& 18 | | 3052 | M 089 S11 | |
| 8 360 | 4 | | B | TPUNIT | | | 3059 | B A50 | |
| 8 370 | 4 | NOCHR2 | SW | 0125 | | | 3063 | , 125 | |
| 8 380 | 7 | | MCW | 0124 | 0130 | | 3067 | M 124 130 | |
| 8 390 | 7 | | MCW | 0118 | 0125 | | 3074 | M 118 125 | |

PICK UP PARAMTRS
FOR EXCEPT OPTS
ANALYZE AND
MODIFY INST
TO PROCESS
EXCEPTION RECORD

| PG | LIN | CT | LABEL | OP | A OPERAND | B OPERAND | D | LDC | INSTRUCTION COMMENTS |
|----|-----|----|--------|-----|------------|------------|---|------|---------------------------|
| 8 | 400 | 4 | | B | STORE2 | | | 3081 | B Q73 |
| 8 | 410 | 7 | ZNCHR1 | MCH | LETR Y | TSTCHI | | 3085 | M 093 /70 |
| 8 | 420 | 8 | | B | DGCHR1 | | | 3092 | B R26 |
| 8 | 430 | 7 | ZNCHR2 | MCH | LETR Y | TSTCH2 | | 3096 | M 093 /93 |
| 8 | 440 | 4 | | B | DGCHR2 | | | 3103 | B 625 |
| 8 | 450 | 7 | XLOC1M | MZ | LETR Y | 0122 | | 3107 | Y 093 122 |
| 8 | 460 | 4 | | B | STORE2- 15 | | | 3114 | B 058 |
| 8 | 470 | 7 | XLOC2M | MZ | LETR Y | 0128 | | 3118 | Y 093 128 |
| 8 | 480 | 4 | | B | STORE2& 15 | | | 3125 | B 088 |
| 8 | 490 | 7 | STKX | MCH | SW8 - 1 | STKHL0 | | 3129 | M #88 069 |
| 8 | 500 | 7 | XCPSTK | MCH | KEIGHT | SW8 - 1 | | 3136 | M 071 #88 |
| 8 | 510 | 7 | RETSTK | MCH | STKHL0 | SW8 - 1 | | 3143 | M 069 #88 |
| 8 | 520 | 8 | TPUNIT | B | PGMSEL | 0142 | | 3150 | B 846 142 |
| 8 | 530 | 4 | | SW | 0142 | | | 3158 | Y 142 |
| 8 | 540 | 7 | | MCH | 0142 | UNITNO | | 3162 | M 142 K99 |
| 8 | 550 | 7 | | MCH | UNITNO | ALLTAP& 10 | | 3169 | M K99 Y89 |
| 8 | 551 | 7 | | MCH | UNITNO | TPECNT& 32 | | 3176 | M K99 T42 |
| 8 | 560 | 7 | | MCH | UNITNO | TYPEIL& 14 | | 3183 | M K99 -07 |
| 8 | 570 | 7 | | MCH | UNITNO | REEL & 3 | | 3190 | M K99 Y40 |
| 8 | 580 | 7 | | MCH | UNITNO | BKSPSE& 3 | | 3197 | M K99 Z10 |
| 8 | 590 | 7 | | MCH | UNITNO | MOVTAP& 3 | | 3204 | M K99 956 |
| 8 | 600 | 7 | | MCH | UNITNO | TAPMOVE& 3 | | 3211 | M K99 930 |
| 8 | 610 | 7 | | MCH | UNITNO | FXBBLK& 18 | | 3218 | M K99 U86 |
| 8 | 620 | 7 | | MCH | UNITNO | FXBBLK& 23 | | 3225 | M K99 U91 |
| 8 | 630 | 7 | | MCH | UNITNO | HDRPRO& 7 | | 3232 | M K99 -90 |
| 8 | 640 | 7 | | MCH | UNITNO | INITL & 10 | | 3239 | M K99 J75 |
| 8 | 650 | 4 | PGMSEL | CS | 0080 | | | 3246 | / 080 |
| 8 | 660 | 7 | | SW | 0024 | 0056 | | 3250 | Y 024 056 |
| 8 | 670 | 7 | | SW | 0063 | 0067 | | 3257 | Y 063 067 |
| 8 | 680 | 1 | | R | | | | 3264 | 1 |
| 8 | 690 | 8 | | B | SELPGM | 0160 | | 3265 | B 877 160 |
| 8 | 700 | 4 | | B | RUNOUT | | | 3273 | B 897 |
| 8 | 710 | 8 | SELPGM | B | 0056 | RECLNG- 3 | V | 3277 | B 056 J94 Y READ VARIABLE |
| 8 | 720 | 8 | | B | 0056 | 0076 | 2 | 3285 | B 056 076 2 READ FIXED |
| 8 | 730 | 4 | | R | SELPGM& 8 | | | 3293 | 1 885 |
| 8 | 740 | 8 | RUNOUT | B | 0056 | 0076 | | 3297 | B 056 076 RD ANAL |
| 8 | 750 | 4 | | R | RUNOUT | | | 3305 | 1 897 |
| 8 | 760 | 1 | | NOP | | | | 3309 | N |
| 8 | 770 | | | EX | OPTST - 23 | | | | B P01 |
| 8 | 780 | | | ORG | 0600 | | | | |
| 8 | 790 | 7 | VARECD | MCH | CONST1 | VARS& 10 | | 0600 | M J93 690 |
| 8 | 800 | 7 | | MCH | VCONST | VNDTST& 6 | | 0607 | M 737 662 |
| 8 | 810 | 7 | | MCH | ONE00 | VARS& 13 | | 0614 | M 061 693 |
| 8 | 820 | 7 | | SW | VARS& 8 | VNDTST& 4 | | 0621 | Y 688 660 |
| 8 | 830 | 7 | | A | ONE80 - 2 | VARS& 13 | | 0628 | A K06 693 |
| 8 | 840 | 7 | | A | ONE80 - 2 | VARS& 10 | | 0635 | A K06 690 |
| 8 | 850 | 7 | | A | ONE80 - 2 | VNDTST& 6 | | 0642 | A K06 662 |
| 8 | 860 | 7 | | CH | VARS& 8 | VNDTST& 4 | | 0649 | Y 688 660 |
| 8 | 870 | 8 | VNDTST | BWZ | VAREND | 0000 | 1 | 0656 | V 698 000 1 |
| 8 | 880 | 7 | | C | VARS& 13 | ONE80 | | 0664 | C 693 K08 |
| 8 | 890 | 5 | | B | VARS | | S | 0671 | B 680 S |

| PG LIN | CT | LABEL | OP | A OPERAND | B OPERAND | D | LOC | INSTRUCTION COMMENTS |
|--------|----|--------|-----|------------|------------|-----|------|----------------------|
| 8 900 | 4 | | B | VARECD& 21 | | | 0676 | B 621 |
| 8 910 | 7 | VARINS | MCW | BRVAR | SWB & 3 | | 0680 | M 067 #92 |
| 8 920 | 7 | | MCW | 0000 | 0000 | | 0687 | M 000 000 |
| 8 930 | 4 | | B | NUMCDS | | | 0694 | B #33 |
| 8 940 | 7 | VAREND | MCW | BRUP | SWB & 3 | | 0698 | M 064 #92 |
| 8 950 | 4 | | CS | 0180 | | | 0705 | / 180 |
| 8 960 | 7 | | SW | VNDTST& 4 | | | 0709 | , 660 101 |
| 8 970 | 7 | | MCW | VNDTST& 6 | | | 0716 | M 662 730 |
| 8 980 | 4 | | CW | VNDTST& 4 | | | 0723 | □ 660 |
| 8 990 | 4 | VARCWH | CW | 0000 | | | 0727 | □ 000 |
| 9 000 | 4 | | B | VARINS& 7 | | | 0731 | B 687 |
| 9 010 | 3 | VCONST | DCM | * | | P01 | 0737 | B 897 |
| 9 020 | | | EX | RUNOUT | | | | |
| 9 030 | | | ORG | 0600 | | | | |
| 9 040 | 7 | CREG | MCW | RECLNG | CHAREG | | 0600 | M J97 084 |
| 9 050 | 7 | CMP | C | ZZ80 | CHAREG | U | 0607 | C N54 084 |
| 9 060 | 5 | | B | ADD80 | | | 0614 | B 659 U |
| 9 070 | 4 | | CS | 0180 | | | 0619 | / 180 |
| 9 080 | 7 | | SW | 0101 | PCHMOV& 5 | | 0623 | , 101 692 |
| 9 090 | 7 | | MCW | BRUPCT | SWB & 3 | | 0630 | M K98 #92 |
| 9 100 | 7 | SETPCH | MCW | CHAREG | PCHMOV& 6 | | 0637 | M 084 693 |
| 9 110 | 7 | | A | CHAREG | RECORD | | 0644 | A 084 183 |
| 9 120 | 4 | | CW | PCHMOV& 5 | | | 0651 | □ 692 |
| 9 130 | 4 | | B | RECMOV | | | 0655 | B 680 |
| 9 140 | 7 | ADD80 | A | ZZ80 | RECORD | | 0659 | A N54 183 |
| 9 150 | 7 | | S | BLANKS- 1 | CHAREG | | 0666 | S N54 084 |
| 9 160 | 7 | | MZ | RECORD | CHAREG | | 0673 | Y J89 084 |
| 9 170 | 7 | RECMOV | MCW | 0000 | PCHMOV& 3 | | 0680 | M 183 690 |
| 9 180 | 7 | PCHMOV | MCW | | 0180 | | 0687 | M 000 180 |
| 9 190 | 1 | | NOP | | | | 0694 | N |
| 9 200 | 4 | | B | NUMCDS | | | 0695 | B #33 |
| 9 210 | 8 | COLBIN | MCW | 8B1 | TPNTRY | R | 0699 | M 81 P01 R |
| 9 220 | 5 | | B | TAPERB | | L | 0707 | B 793 L |
| 9 230 | 7 | | MCW | ZZZERO | BERCNT | | 0712 | M L06 854 |
| 9 240 | 5 | | B | FILMK | | K | 0719 | B 773 K |
| 9 250 | 8 | | MCW | TPNTRY&159 | | B | 0724 | M Q60 580 B |
| 9 260 | 7 | | A | ONE80 - 2 | | | 0732 | A K06 L16 |
| 9 270 | 7 | | A | ONE80 - 2 | | | 0739 | A K06 L20 |
| 9 280 | 7 | | MCW | SWB - 2 | | | 0746 | M #87 755 |
| 9 290 | 2 | | P | | | C | 0753 | 4 C |
| 9 300 | 2 | | NOP | | | 4 | 0755 | N 4 |
| 9 310 | 4 | | CW | TPNTRY&168 | | | 0757 | □ G69 |
| 9 320 | 8 | | B | COLBIN | TPNTRY&161 | 5 | 0761 | B 699 Q62 5 |
| 9 330 | 4 | | B | MOVTAP | | | 0769 | B 953 |
| 9 340 | 4 | FILMK | CW | TPNTRY& 1 | | | 0773 | □ P02 |
| 9 350 | 4 | | B | FILEND | | | 0777 | B #73 |
| 9 360 | 8 | TSTBIN | B | MOVTAP | TPNTRY& 80 | | 0781 | B 953 P81 |
| 9 370 | 4 | | B | COLBIN | | | 0789 | B 699 |
| 9 38 | 8 | TAPERB | B | BINBBK | BERCNT- 1 | 1 | 0793 | B 829 853 1 |
| 9 39 | 5 | | CU | 8U1 | | B | 0801 | U 8U1 B |

| PG LIN | CT | LABEL | OP | A OPERAND | B OPERAND | D | LOC | INSTRUCTION COMMENTS |
|--------|----|--------|-----|-------------|------------|---|------|-----------------------------|
| 9 391 | 8 | | BWZ | BNTPER | TPNTRY&168 | 1 | 0806 | V 818 Q69 1 |
| 9 400 | 4 | | B | MOVTAP | | | 0814 | B 953 |
| 9 410 | 7 | BNTPER | A | ONE80 - 2 | | | 0818 | A K06 854 SET FOR |
| 9 430 | 4 | | B | COLBIN | | | 0825 | B 699 |
| 9 440 | 4 | BIMBBK | B | COLBING& 13 | | | 0829 | B 712 SET INST FOR BIN |
| 9 450 | 1 | | H | | | | 0833 | |
| 9 460 | 5 | | CU | ZU1 | | | 0834 | U ZU1 B |
| 9 470 | 8 | | MCW | Z81 | TPNTRY | B | 0839 | M X81 P01 R PROCEDURE |
| 9 480 | 5 | | B | COLBING& 13 | | R | 0847 | B 712 G |
| 9 490 | 1 | | H | | | G | 0852 | |
| 9 500 | 2 | BERCNT | DCW | | | | 0854 | |
| 9 510 | | | EX | RUNOUT | | | | B 897 |
| 9 520 | | | DRG | 2701 | | | | |
| 9 530 | 8 | VARTST | B | VRAMAL | RECLNG- 3 | V | 2701 | B F05 J94 V BR VAR LNG ANAL |
| 9 540 | 8 | | B | FINISH | 0143 | | 2709 | B R22 143 BR ON NO BINARY |
| 9 550 | 4 | | CS | 0599 | | | 2717 | / 599 |
| 9 560 | 1 | | CS | | | | 2721 | / |
| 9 570 | 4 | | SM | 0401 | | | 2722 | , 401 |
| 9 580 | 8 | | B | MIXED | | | 2726 | B D43 143 2 BR MIXED BINARY |
| 9 590 | 7 | | MCW | | | | 2734 | M L26 955 |
| 9 591 | 7 | | MCW | | | | 2741 | M P48 T98 |
| 9 600 | 7 | | MCW | | | | 2748 | M L26 929 |
| 9 610 | 7 | | MIN | NOP | | | 2755 | D L25 +44 |
| 9 620 | 7 | | MIN | NOP | | | 2762 | D L25 +97 |
| 9 630 | 7 | | CM | GPFIX & 7 | | | 2769 | D /00 +47 |
| 9 640 | 7 | | MCW | | | | 2776 | M L26 +47 |
| 9 650 | 7 | | MCW | | | | 2783 | M L26 /00 |
| 9 660 | 7 | | LCA | BINPCH | | | 2790 | L G04 #85 |
| 9 670 | 7 | | LCA | BINPCH | | | 2797 | L G04 +21 |
| 9 671 | 7 | | LCA | BINPCH | | | 2804 | L G04 /13 |
| 9 672 | 7 | | MCW | NOP | | | 2811 | M L25 U39 |
| 9 673 | 7 | | MCW | NOP | | | 2818 | M L25 U46 |
| 9 674 | 7 | | MCW | NOP | | | 2825 | M L25 T91 |
| 9 675 | 7 | | MCW | NOP | | | 2832 | M L25 T98 |
| 9 680 | 7 | | MCW | NOP | | | 2839 | M L25 607 |
| 9 690 | 7 | | MCW | NOP | | | 2846 | M L25 614 |
| 9 700 | 7 | | C | RECLNG | | | 2853 | C J97 F91 |
| 9 710 | 5 | | B | FULLCD | | S | 2860 | B E73 S |
| 9 720 | 7 | | MCW | RECLNG | | | 2865 | M J97 G02 |
| 9 730 | 4 | | A | CVTPCH | | | 2872 | A G02 |
| 9 740 | 4 | | A | CVTPCH | | | 2876 | A G02 |
| 9 750 | 7 | | A | RECLNG | | | 2880 | A J97 G02 |
| 9 760 | 7 | | MCW | CVTPCH- 1 | | | 2887 | M G01 F98 |
| 9 770 | 7 | | MCW | NOP | | | 2894 | M L25 637 |
| 9 780 | 7 | PCHSET | LCA | BPCHMV | | | 2901 | L F99 694 |
| 9 790 | 7 | | MCW | NOP | | | 2908 | M L25 V11 |
| 9 800 | 7 | | MCW | NOP | | | 2915 | M L25 V18 |
| 9 810 | 7 | FINISH | MCW | UNITNO | | | 2922 | M K99 633 |
| 9 820 | 7 | | MCW | UNITNO | | | 2929 | M K99 E67 |
| 9 830 | 8 | | B | NOSEL | | | 2936 | B R62 J84 BR NO FILE SEL |

| PG LIN | CT | LABEL | OP | A OPERAND | B OPERAND | D | LOC | INSTRUCTION COMMENTS | 0896 |
|--------|----|--------|-----|------------|------------|---|------|----------------------|------------------|
| 9 840 | 7 | | MCW | NOP | INSTALL | | 2944 | M L25 X59 | SET INSTRUCTIONS |
| 9 850 | 7 | | MCW | NOP | TSTNUM | | 2951 | M L25 X71 | FOR SEL EOR |
| 9 860 | 4 | | B | HEADR | | | 2958 | B 606 | |
| 9 870 | 8 | MOSEL | B | REELND | MJMFIL | | 2962 | B R77 K02 | SET INST FOR |
| 9 880 | 4 | | B | HEADR | | | 2970 | B 606 | SPECIFIC FILE NU |
| 9 890 | 3 | LCNMF | DSA | * | NEWFIX | | 2976 | M R76 Z96 | |
| 9 900 | 7 | REELND | MCW | LCNMF | TYPFIL 3 | | 2977 | M R76 Z96 | SET INST FOR |
| 9 910 | 7 | | MCW | LCNMF | TRANRC- 17 | | 2984 | M R76 -27 | TRAIL OR 2 TP |
| 9 920 | 8 | | B | HEADR | ENDTYP | 1 | 2991 | B 606 K03 1 | MKS EOR |
| 9 930 | 7 | | MCW | HEADR | BKSPSE- 9 | | 2999 | M L25 Y98 | |
| 9 940 | 3 | HEADR | B | NOHDR | 0147 | | 3006 | B E84 147 | |
| 9 950 | 7 | CLRTPE | LCA | GPWK78 | TPNTRY&199 | | 3014 | L L24 R00 | |
| 9 960 | 4 | | CS | TPNTRY&198 | | | 3021 | / 099 | |
| 9 970 | 1 | | CS | | | | 3025 | / | |
| 9 980 | 4 | | SW | TPNTRY | | | 3026 | * P01 | |
| 9 990 | 8 | | MCW | XU1 | TPNTRY | R | 3030 | M XUI P01 R | |
| 10 000 | 4 | | MCW | BLANK | | | 3038 | M L03 | |
| 10 010 | 1 | | CM | | | | 3042 | □ | |
| 10 020 | 5 | | B | LDCLER | | | 3043 | B F50 K | |
| 10 030 | 4 | | B | BACKUP | | | 3048 | M E64 | |
| 10 040 | 4 | | SW | 0144 | | | 3052 | * 144 | |
| 10 050 | 7 | | LCA | 0157 | | | 3056 | L 157 097 | |
| 10 060 | 8 | | B | PRTHDR | 0097 | 1 | 3063 | B A44 087 1 | |
| 10 070 | 8 | | B | PCMHDR | 0087 | 2 | 3071 | B C00 087 2 | |
| 10 080 | 8 | | B | HDCMP | 0087 | 4 | 3079 | B C89 087 4 | |
| 10 090 | 4 | | B | SETEND | | | 3087 | B D05 | |
| 10 100 | 7 | AFT1ST | MCW | B | CLRTPE& 34 | | 3091 | M L26 648 | SET INSTRUCTIONS |
| 10 110 | 8 | | B | CLRTPE& 16 | 0097 | | 3098 | B 630 097 | FOR HEADER AND |
| 10 120 | 8 | | B | HDPTR | 0097 | 2 | 3106 | B A29 097 2 | TRAILER LABEL |
| 10 130 | 7 | | MCW | NOP | HDRPRO | | 3114 | M L25 -83 | PROCESSING |
| 10 140 | 8 | | B | CLRTPE& 16 | 0097 | 1 | 3121 | B 630 097 1 | BETWEEN FILES |
| 10 150 | 7 | HDPTR | MCW | NOP | TYPFIL | | 3129 | M L25 Z93 | |
| 10 160 | 4 | | B | CLRTPE& 16 | | | 3136 | B 630 | |
| 10 170 | 4 | | B | CLRTPE& 16 | | | 3140 | B 630 | |
| 10 180 | 7 | PRTHDR | C | 0086 | ZER080 | | 3144 | C 086 K11 | PRINT HEADER |
| 10 190 | 5 | | B | DBLINE | | | 3151 | B B20 T | AND TRAILER |
| 10 200 | 7 | | SW | PRTINS& 1 | PRTINS& 5 | | 3156 | * A85 A89 | |
| 10 210 | 7 | | MCW | 0086 | PRTINS& 6 | | 3163 | M 086 A90 | |
| 10 220 | 7 | | A | 0086 | PRTINS& 3 | | 3170 | A 086 A87 | |
| 10 230 | 7 | | CM | PRTINS& 1 | PRTINS& 5 | | 3177 | □ A85 A89 | |
| 10 240 | 7 | PRTINS | MCW | TPNTRY- 1 | 0200 | | 3184 | M P00 200 | |
| 10 250 | 7 | | MCW | PRTINS& 6 | PART2 & 6 | | 3191 | M A90 J34 | |
| 10 260 | 7 | | NOP | 0280 | 0180 | | 3198 | M 280 180 | |
| 10 270 | 1 | | W | | | | 3205 | 2 | |
| 10 280 | 2 | | CC | | | | 3206 | F 1 | |
| 10 290 | 4 | | CS | 0280 | | | 3208 | / 280 | |
| 10 300 | 4 | | SW | 0201 | | | 3212 | * 201 | |
| 10 310 | 4 | | B | AFT1ST | | | 3216 | B 691 | |
| 10 320 | 7 | DBLINE | MCW | PRTINS& 21 | PART1 & 14 | | 3220 | M 805 J23 | |
| 10 330 | 7 | | MCW | DBLINE | PART1 | | 3227 | M 820 J09 | |

| PG LIN | CT | LABEL | OP | A OPERAND | B OPERAND | D | LOC | INSTRUCTION COMMENTS |
|--------|----|--------|-----|------------|------------|---|------|----------------------|
| 10 340 | 7 | | MCH | DBLINE- 12 | PART1 & 15 | | 3234 | M B08 J24 |
| 10 350 | 4 | | CS | 0280 | | | 3241 | / 280 |
| 10 360 | 7 | | MCH | TPNTRY& 79 | 0280 | | 3245 | M P80 280 |
| 10 370 | 7 | | NOP | 0280 | 0180 | | 3252 | N 280 180 |
| 10 380 | 1 | | W | | | | 3259 | Z |
| 10 390 | 4 | | CS | 0280 | | | 3260 | / 280 |
| 10 400 | 4 | | SW | 0201 | | | 3264 | , 201 |
| 10 410 | 7 | | S | ZERO80 | 0086 | | 3268 | S K11 086 |
| 10 420 | 7 | | MZ | BLANKS- 1 | 0086 | | 3275 | Y J89 086 |
| 10 430 | 7 | | MCH | DBLINE& 28 | PRTINSE 3 | | 3282 | M B48 A87 |
| 10 440 | 7 | | MCH | DBLINE | PART1 & 7 | | 3289 | M B20 J16 |
| 10 450 | 4 | | B | PRTHDR& 12 | | | 3296 | B A56 |
| 10 460 | 7 | PCHHDR | MCH | PCHHDR | DBLINE& 32 | | 3300 | M C00 B52 |
| 10 470 | 7 | | MCH | SIX | DBLINE& 39 | | 3307 | M K12 B59 |
| 10 480 | 7 | | MCH | PCHHDR | PRTINSE 14 | | 3314 | M C00 A98 |
| 10 490 | 7 | | MCH | SIX | PRTINSE 21 | | 3321 | M K12 B05 |
| 10 500 | 7 | | MCH | PCHHDR | PART2 & 7 | | 3328 | M C00 J35 |
| 10 510 | 7 | | MCH | SIX | PART2 & 14 | | 3335 | M K12 J42 |
| 10 520 | 7 | | MCH | SIX | TRANRC | | 3342 | M K12 -44 |
| 10 530 | 4 | | CS | 0180 | | | 3349 | / 180 |
| 10 540 | 4 | | SW | 0101 | | | 3353 | , 101 |
| 10 550 | 4 | | B | PRTHDR | | | 3357 | B A44 |
| 10 560 | 7 | | SW | HDCMP & 1 | HDCMP & 4 | | 3361 | , C90 C93 |
| 10 570 | 7 | | A | 0086 | HDCMP & 6 | | 3368 | A 086 C95 |
| 10 580 | 7 | | A | 0086 | HDCMP & 3 | | 3375 | A 086 C92 |
| 10 590 | 7 | | CH | HDCMP & 1 | HDCMP & 4 | | 3382 | □ C90 C93 |
| 10 600 | 7 | HDCMP | C | 3801 | TPNTRY | | 3389 | C H01 P01 |
| 10 610 | 5 | | B | SETEND | | | 3396 | B D05 S |
| 10 620 | 4 | | B | HDRMSG | | | 3401 | B D23 |
| 10 630 | 7 | SETEND | MCH | NOP | PART2 & 14 | | 3405 | M L25 J42 |
| 10 640 | 7 | | MCH | NOP | TRANRC& 7 | | 3412 | M L25 -51 |
| 10 650 | 4 | | B | AFTIST | | | 3419 | B E91 |
| 10 660 | 7 | HDRMSG | MCH | HDERR | 0220 | | 3423 | M F85 220 |
| 10 670 | 1 | | W | | | | 3430 | Z |
| 10 680 | 4 | | CS | 0220 | | | 3431 | / 220 |
| 10 690 | 4 | | SW | 0201 | | | 3435 | , 201 |
| 10 700 | 4 | | H | SETEND | | | 3439 | , D05 |
| 10 710 | 7 | MIXED | MCH | B | SW2 | | 3443 | M L26 949 |
| 10 720 | 7 | | MCH | NOP | UPCNT & 7 | | 3450 | M L25 V18 |
| 10 730 | 7 | | MCH | UNITNO | BINBBK& 13 | | 3457 | M K99 842 |
| 10 740 | 8 | | B | * & 8 | 0158 | | 3464 | B D79 158 |
| 10 750 | 7 | | MCH | NOP | BINBBK | | 3472 | M L25 829 |
| 10 760 | 7 | | MCH | UNITNO | BINBBK& 8 | | 3479 | M K99 837 |
| 10 770 | 7 | | MCH | UNITNO | TAPER& 11 | | 3486 | M K99 804 |
| 10 780 | 7 | | MCH | UNITNO | COLBING 3 | | 3493 | M K99 702 |
| 10 790 | 7 | | MCH | NOP | PUNCH & 2 | | 3500 | M L25 #86 |
| 10 800 | 7 | | MCH | BINBR | SW8 & 3 | | 3507 | M F88 #92 |
| 10 810 | 7 | | MCH | BINBR | NUMCDS- 1 | | 3514 | M F88 #32 |
| 10 820 | 7 | | MCH | BINBR | CVTIST- 1 | | 3521 | M F88 V80 |
| 10 830 | 7 | | MCH | NOP | XTRPCH | | 3528 | M L25 #20 |

PUNCH HEADER
AND TRAILER

COMPARE HEADER

SET MAIN ROUTINE

| PG LIN | CT | LABEL | OP | A OPERAND | B OPERAND | D | LOC | INSTRUCTION COMMENTS | 0996 |
|--------|----|---------|-----|-----------|----------------|-----|------------|----------------------|------------------|
| 10 840 | 7 | | MCH | ZZ80 | RECLNG | | 3535 | M N54 J97 | |
| 10 841 | 8 | | B | FINISH | 0158 | | 3542 | B R22 158 | |
| 10 842 | 7 | | MCH | NOP | BINBK | | 3550 | M L25 829 | |
| 10 850 | 4 | | B | FINISH | | | 3557 | B R22 | |
| 10 860 | 3 | BRPCH | DSA | * | PUNCH | #84 | 3563 | U XUI B | |
| 10 870 | 5 | BACKUP | CU | XUI | | B | 3564 | B F50 | |
| 10 880 | 4 | | B | LDCLER | | | 3569 | M G07 J93 | |
| 10 890 | 7 | FULLCD | MCH | BNCNST | CONSTI | | 3573 | M Q94 | |
| 10 900 | 4 | | B | PCHSET | | | 3580 | M F04 A01 | |
| 10 910 | 7 | NOHDR | MCH | LCLDCL | AFT1ST& 10 | | 3584 | L 157 097 | |
| 10 920 | 7 | | LCA | 0157 | 0097 | | 3591 | B E91 | |
| 10 930 | 4 | | B | AFT1ST | | | 3598 | B R22 | |
| 10 940 | 3 | LCLDCL | DSA | * | LDCLER | F50 | 3604 | M Y86 953 | SET MAIN PROGRAM |
| 10 950 | 7 | VRANAL | MCH | ALLTAP& 7 | MOVTAPE | | 3605 | M F46 #08 | FOR VARIABLE |
| 10 960 | 7 | | MCH | LCVRCD | SW5 & 3 | | 3612 | M L25 #86 | LENGTH RECORDS |
| 10 970 | 7 | | MCH | NOP | PUNCH & 2 | | 3619 | M E91 961 | |
| 10 980 | 7 | | MCH | NOHDR& 7 | MOVTAPE & 8 | | 3626 | M F49 964 | |
| 10 990 | 7 | | MCH | LBLNKS | MOVTAPE & 11 | | 3633 | B R22 | |
| 11 000 | 4 | | B | FINISH | | | 3640 | | |
| 11 010 | 3 | LCVRCD | DSA | * | VARECD | 600 | 3646 | | |
| 11 020 | 3 | LBLNKS | DSA | * | BLANKS | J90 | 3649 | / 080 | |
| 11 030 | 4 | LDCLER | CS | 0080 | | | 3650 | * 024 056 | |
| 11 040 | 7 | | SM | 0024 | 0056 | | 3654 | * 063 067 | |
| 11 050 | 7 | | SM | 0063 | 0067 | | 3661 | 1 056 | |
| 11 060 | 4 | | R | 0056 | | | 3668 | | |
| 11 070 | 14 | HDERR | DCM | * | HEAD COMP UMEQ | | 3685 | | |
| 11 080 | 3 | BIMBR | DSA | * | TSTBIN | | 781 | | |
| 11 090 | 3 | ONE68 | DCM | * | | | 168 | | |
| 11 100 | 8 | BPCHMV | DCM | * | | | M0005808 | | |
| 11 110 | 3 | CVTPCH | DCM | * | | | 3702 | | |
| 11 120 | 2 | BINPCH | DCM | * | | | 4C 3704 | | |
| 11 130 | 3 | BNCNST | DCM | * | | | 092 3707 | | |
| 11 140 | 3 | BRHDR | DSA | * | HDRPRD | | -83 3710 | B P01 | |
| 11 150 | | | EX | VARTST | | | | | |
| 11 160 | | | ORG | 0181 | | | | | |
| 11 170 | 3 | RECORD | DCM | * | | | 0183 | | |
| 11 180 | 3 | FLDORG | DSA | * | FLD 1 | L44 | 0186 | | |
| 11 190 | 2 | CHTEST | DCM | * | | | 0188 | | |
| 11 200 | 3 | HITEST | DCM | * | | | 0191 | | |
| 11 210 | 3 | LOTEST | DCM | * | | | 0194 | | |
| 11 220 | 2 | PNTTEST | DCM | * | | | 0196 | | |
| 11 230 | 2 | TEST | DCM | * | | | 0198 | | |
| 11 240 | | | ORG | 0081 | | | | | |
| 11 250 | 4 | CHAREG | DCM | * | | | 0084 | | |
| 11 260 | 7 | NMCDCH | A | ONE80 - 2 | CDCNT | | 0085 | A K06 L16 | |
| 11 270 | 5 | BLKDCM | B | TSTXCP | | T | 0092 | B 997 T | |
| 11 280 | 3 | LOCSLF | DSA | * | SLFILL | J84 | 0099 | | |
| 11 290 | | | ORG | 2901 | | | | | |
| 11 300 | 4 | CLEAR | CS | 3997 | | | 2901 / 197 | CLEAR TAPE | |
| 11 310 | 1 | | CS | | | | 2905 / | READ-IN AREA | |

| PG | LIN | CT | LABEL | OP | A OPERAND | B OPERAND | D | LOC | INSTRUCTION COMMENTS |
|----|-----|----|-------|-----|------------|------------|---|------|----------------------|
| 11 | 320 | 1 | | CS | | | | 2906 | / |
| 11 | 330 | 1 | | CS | | | | 2907 | / |
| 11 | 340 | 1 | | CS | | | | 2908 | / |
| 11 | 350 | 1 | | CS | | | | 2909 | / |
| 11 | 360 | 1 | | CS | | | | 2910 | / |
| 11 | 370 | 1 | | CS | | | | 2911 | / |
| 11 | 380 | 1 | | CS | | | | 2912 | / |
| 11 | 390 | 1 | | CS | | | | 2913 | / |
| 11 | 400 | 4 | | CS | TPNTRY&I98 | | | 2914 | / Q99 |
| 11 | 410 | 1 | | CS | | | | 2918 | / |
| 11 | 420 | 4 | | MOP | TPNTRY | | | 2919 | N P01 |
| 11 | 430 | 4 | | CS | 0080 | | | 2923 | / 080 |
| 11 | 440 | 4 | | SW | 0001 | | | 2927 | , 001 |
| 11 | 450 | 7 | | CS | SW1 | TPNTRY&298 | | 2931 | / 891 R99 |
| 11 | 460 | | | END | CLEAR | | | | / R01 080 |

1063 CARDS



General Products Division
Development Laboratory
Endicott, New York

International Business Machines Corporation

Pioneer 8-2211

December 17, 1962

MEMORANDUM TO: Users of 1401 Tape-to-Card Utility Program

SUBJECT: 1401 Tape-to-Card Utility Program, #1401-UT-028,
Version 1, Modification Level 1

This letter announces the availability of Version 1, Modification Level 1 of the 1401 Tape-to-Card Utility Program, #1401-UT-028. This modification, which is in the form of three (3) patch cards as well as complete documentation, corrects all reported errors in the subject system. These patch cards, enclosed, listed, and identified below (Attachment #1) are to be inserted in the system decks as follows:

Remove cards (cc 78-80)

and replace with cards (cc 77-80)

067
068
119

C067
C068
C119

Cards C067, C068 and C119 correct an error regarding the checking of blocked records in the exception routine.

We appreciate your cooperation in making these changes. A list of the material distributed with this letter follows:

| <u>Item No.</u> | <u>Contents</u> |
|-----------------|--|
| 1 | Three patch cards |
| 2 | System listing of Version <u>1</u> , Modification Level <u>1</u> , heretofore known as the Initial Availability Version with its addendums |

- 3 New documentation for the 1401 Tape-To-Card system replacing all previous documentation.
- 4 List of three corrections to Preliminary Specifications Bulletin, #J24-1411-1

Initial requests for this system, which are filled after the release of this letter, will not include the cards itemized above as the system deck will already reflect these changes.

The Optional Program Material, available upon request, consists of the source symbolic program deck.

An Applied Programming Analysis Report (APAR) should be submitted through the IBM Systems Engineer to report any difficulties encountered in the use of this system. The APAR should be addressed to:

APAR Processing
IBM Programming Systems
Department 302, Building 647
Endicott, New York

Any discrepancy between the material you receive and the items above should be directed to the attention of the Manager of the Program Information Department, IBM, 112 East Post Road, White Plains, New York.

GP Programming Systems
Attachment

cc: Branch Office

Version 1 Modification Level 1 - Patch Cards

M18028042B/232B+86F+861L183/73 ,/14,/19,/23,/281L030/34,/12,/138039 C067

L183/96AJ97183A083/73A087/96P/71/94 ,/56,/631056 L035/69,/42,/498039 C068

ML25S458Q31ML25/42BP24.P88ML25S388P66 ,P84,P88,P92,P991L037Q02,P73,P77B039 C119

December 17, 1962

MEMORANDUM TO: Users of 1401 Tape-to-Card Utility Program

SUBJECT: 1401 Tape-to-Card Utility Program, #1401-UT-028

This letter transmits 1401-UT-028, Version 1, Modification Level 0.

Abstract for 1401 Tape-to-Card Utility Program

Purpose:

This program performs various tape-to-card operations in accordance with the users' specifications punched in a maximum of three control cards. Thus, output operations that were performed on the IBM 722 Card Punch and IBM 758 Card Punch Control can now be performed on the 1401 Card Read-Punch.

Machine Configuration

1. 4000 positions of core storage
2. High-Low-Equal Compare
3. IBM 1403 Printer, Model 2
4. One IBM 729 II, IV, V, VI or 7330 Tape Unit
5. IBM 1402 Card Read-Punch

In accordance with the program request you submitted, the Basic Program Material being forwarded is:

1. The condensed program deck which is sequentially numbered in columns 78-80.
2. The documentation of 1401 Tape-to-Card including flow charts, a symbolic listing of the program and a listing of the program deck.

The Optional Program Material being forwarded upon request is the symbolic source deck of the 1401 Tape-to-Card Program.

When corrections are to be included or substituted in the symbolic deck, caution must be observed with respect to column 76, which is used as an overlay control during loading of the program. Cards numbered 784-808 contain a one (1) and represent the variable length program. Cards numbered 809-857 contain a two (2) and represent the fixed length, no field selection program. Any inclusions or substitutions within these series of numbers must be appropriately punched in column 76. All other cards must be left blank in column 76.

The following information will be helpful in implementing this system:

IBM 1401 Data Processing System Bulletin: Utility Programs for IBM 1401 Tape Systems, Form number J24-1411-1.

NOTE: The following changes affect bulletin J24-1411-1:

Page 14 - under Control Cards, paragraph 2: Line 4 should read:

"... 300 characters per record in the input..."

Page 14 - Figure 12: Card columns 1-4 should read:

"characters per record"

Page 15 - under Record Blocking, columns 1-4: Line 2 should read:

"characters per fixed-length input record."

Page 17 - under Column 17 (4-punch):

"Select excepted records into stacker 8 after punching."

The 1401 Tape-to-Card Utility Program will be maintained through the use of modification letters. Whenever modifications are made to the program, a serially numbered letter, starting with number 1, accompanied by the appropriate change cards will be mailed to all users. When the program is requested and the modification level is other than 0, all letters will be supplied with the material, but no change cards will be forwarded since the program deck will always reflect the latest changes. Should the nature or quantity of changes make a reassembly necessary, this will be distributed as a new version and modification letters to this new version will begin at 1.

An Applied Programming Analysis Report (APAR) should be submitted through the IBM Systems Engineer to report any difficulties encountered in the use of this system. The APAR should be addressed to:

APAR Processing
IBM Programming Systems
Department 302, Building 646
Endicott, New York

Any discrepancy between the material you receive and the items listed above should be directed to the attention of the Manager of the Program Information Department, IBM, 112 East Post Road, White Plains, New York.

GP PROGRAMMING SYSTEMS

Attachments

cc: Branch Offices
(No attachments sent with carbons)

TAPE TO CARD

1401-UT-028

Version 1

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General Products Division
Programming Systems
August 29, 1962

1401 Tape-to-Card Utility Program

1. Introduction

The 1401 Tape-to-Card Utility Program will operate upon a variety of tape record arrangements to produce cards punched in a variety of output forms. The parameters of the particular tape to be processed and the output desired are specified by the user through a series of control cards, which are read into the 1401 with this program deck. The minimum 1401 system necessary to utilize this program includes:

- 1) 1401 Model C 3
- 2) High-Low-Equal Compare
- 3) 1403 Model 2 printer
- 4) One (1) 729 Model II, IV, V, VI, or 7330 Tape Unit
- 5) 1402 Card Read-Punch

2. Specifications

1. Tapes may contain either fixed length records with fixed blocking, or variable length records singly blocked, in completely BCD mode. Tapes written in completely column binary mode may be fixed length records with fixed blocking; mixed binary and BCD records must be singly blocked.
2. The maximum block length allowed is 1197 characters.
3. A maximum of 99 separate, adjacent files, within one (1) reel of tape may be processed during one pass of the program; or up to three (3) files may be selected from a tape. If there are more reels of tape to be processed containing the identical input and output specifications, the user need not reload the program unless Header Label comparison is required for each reel of tape. In addition, a file may be bypassed during the running of the program under control of Sense Switch C. Sense Switch B will halt the program after each file has been processed regardless of control card specification. The program will revert back to the control card specification when Sense Switch B is in the off position.
4. Up to two (2) characters of a record may be used to detect exception records. These may either be printed; printed and punched; printed, punched, and selected to stacker (8), after punching; or bypassed entirely.
5. When more than one card is to be punched per record, intra-record numbering may be punched into the cards (BCD only).
6. Sequence numbering of other than exception cards is permitted (BCD only).
7. Additional information not present on tape records may be punched into all cards or a specific card for each tape record. A maximum of 80 consecutive characters is allowed.
8. Additional information may be changed for each file provided that the length and the punch location and card number designations remain the same as has originally been specified in the control card (BCD and completely column binary).
9. Any Tape Unit Number can be specified. If none is specified, unit number one (1) will be assumed.
10. 705 group mark configuration (12-5-8) may be converted to 1401 configuration (12-7-8).
11. Fixed length records may be punched in either of two (2) modes (BCD records only).
 - a) Tape image - the records would be punched exactly as they appear on tape, in groupings of 80 characters per card. Where the number of characters of the last group is less than 80, punching will start in column one (1) and punch through as many columns as necessary.

b) Field Selection - up to sixteen (16) portions of the record may be punched into a maximum of 99 cards in any order. Each field may consist of 80 characters or less in length and may be punched exactly as it appears in the record, or may contain any single valid 1401 character, which will be punched, through the length of the field (i. e., a field of three (3) positions containing ***).

12. Variable length records are punched in the same manner as fixed length tape image.
13. Three (3) fields up to a combined total of 80 characters in length may be specified for sequence checking of records within a file.
14. At the end of each file, the number of records processed (including exception records) and the number of cards that have been punched (excluding exception records) will be printed.
15. If a tape contains a header label as its first record, the label may be: 1) printed, 2) punched, 3) bypassed, or 4) compared. If a header label precedes each file within the reel to be processed, all subsequent labels will be processed similarly to the first label except for label compare. Subsequent labels in this case will be bypassed. A tape mark following the header label of a file is acceptable, but not necessary.
16. The following options are allowed the user in specifying a method to halt the program when all processing has been completed:
 - a) Specifying the number of files to be punched.
 - b) Selecting up to three (3) files for punching.
 - c)
 1. Where (a) is unknown, and (b) is not used, specifying the presence of a trailer label and allowing the program to check for it.
 2. Specifying the presence of two (2) consecutive END-OF-FILE marks on the tape.
 - d) Under control of Sense Switch B, halt at the end of each file.
17. Where a trailer label is present after each file, the program will follow the same procedure specified in the handling of header labels between files. A tape mark must precede, as well as follow, a trailer label.
18. Under control of Sense Switch D, the program will print the exact image of what is being punched into cards.
19. With reference to items 5, 6, 7, and 8, when punching cards in a tape image mode, the information that is not present in the tape record, but is to be punched into cards, will replace the data normally punched from the tape record. If the entire tape record and items 5, 6, 7 are to be punched, the field selection option is suggested.

Format of Control Cards

As has been previously noted control card punching will follow directly from the input and output parameters present on the record and required as an output result. Although punching is not required for features which are not used, there are two fields which must always be punched for proper operation:

- 1) Record Length (1-4)
- 2) Blocking (5-7)

NOTE: *signifies columns that should be considered for the minimum job in BCD.

| <u>Control Card No.</u> | <u>Columns</u> | <u>Meaning</u> |
|-------------------------|----------------|---|
| 1 | 1-4 | * <u>Record Length</u> - number of characters (including record mark if present). Enter VVVV in columns 1-4 for variable length records. |
| 1 | 5-7 | * <u>Records per block</u> - number of actual records constituting a physical tape record. For variable length records, or mixed binary and BCD records, this must be 001. |
| 1 | 8-9 | * <u>Files within one tape reel to be punched</u> - actual number of files, exclusive of Header and Trailer Labels, that are to be punched. If unknown leave blank, but entry must be made in column 10 or columns 11-12. |
| 1 | 10 | * <u>End of Reel</u> designation - leave blank for double tape mark, enter 1 for trailer label indication if punching entire reel. A trailer label of up to 80 columns in one card must be punched, which will be compared to the trailer label written on tape. An exact comparison will halt the program. |
| 1 | 11-12 | <u>Enter First selected file</u> number for punching. |
| 1 | 13-14 | <u>Enter Second selected file</u> number for punching. |
| 1 | 15-16 | <u>Enter Third selected file</u> number for punching. |
| 1 | 17 | <u>Exception Record Procedure</u> - a record may be processed in other than the normal manner. It may be bypassed (punch 1), printed (punch 2), printed and punched (punch 3), or printed, punched, and selected to stack (3), (punch 4). If no exception record processing is required, leave blank. |
| 1 | 18 | <u>First exception character</u> - character, digit, or zone. |
| 1 | 19 | <u>Exception code type</u> - up to 2 columns of a record may be designated to denote exceptions. If an "and" condition between the columns is desired, punch a 1. If an "or" condition is desired, punch a 2. If only one exception character is used, columns 19, 25-30 are blank. |
| 1 | 20 | <u>Exception disposition</u> for the presence of a character punch a (1), absence punch a (2), for the presence of a zone punch an (A), absence punch a (B), for the presence of a digit punch a (J), absence punch a (K). |
| 1 | 21-24 | <u>First exception character</u> location on tape, punch actual character location within a record; i. e., each record within a block could be excepted if the appropriate code applied. |
| 1 | 25 | <u>Second</u> exception character |
| 1 | 26 | <u>Second</u> exception disposition. |

| <u>Control Card No.</u> | <u>Columns</u> | <u>Meaning</u> |
|-------------------------|----------------|---|
| 1 | 27-30 | <u>Second exception character location on tape.</u> |
| 1 | 31-32 | <u>Intra record card numbering</u> - where multiple cards are produced per record, each card may be sequence numbered. This numbering will replace the corresponding information read from the actual record. Enter high order position of up to 2 columns on the card into which numbering is to be punched. Leave blank if no numbering is desired. |
| 1 | 33-34 | <u>Inter-record card numbering</u> - all cards punched within a file may be consecutively numbered. This numbering will replace the corresponding information read from the actual tape record. Enter high order position of up to 4 columns on the card, into which numbering is to be punched. If no numbering is desired, leave blank. |
| 1 | 35 | <u>Number of Columns</u> - reserved for file sequence numbering. Enter number of columns to be reserved. If numbering exceeds column allowance, high order position will contain zone overflow information. |
| 1 | 36-37 | <u>Insertion of Additional Information</u> - fixed information not present in the tape record may be punched into all of the cards, or into a particular card within each record (for multiple cards per record) through the use of another card accompanying the control card (s). This information will replace corresponding information read from the actual tape record. Punch actual card number within a record into which the information is to be punched. Punch an (AA) for insertion in all cards. |
| 1 | 38-39 | <u>High order location</u> - that fixed information is to be punched into, on card(s). |
| 1 | 40-41 | <u>Number of Columns</u> - to be reserved for fixed information (Maximum 80 columns). |
| 1 | 42 | <u>*Tape Unit Selection</u> - any tape unit may be specified, if left blank, unit (1) will be assumed. |
| 1 | 43 | <u>Column Binary records</u> - if all binary records are to be processed, punch (1), if mixed binary and BCD punch (2), Mixed binary and BCD records must contain "look ahead" feature (last 4 columns of 84 character BCD record, last 8 characters of 168 character binary record) indicating mode of the record following. If all records are BCD, leave blank. |
| 1 | 44-46 | <u>*Header label length</u> - Punch actual number of up to 160 characters contained in a header label. If no header, leave blank. |
| 1 | 47 | <u>*Header label processing</u> - the header label may be printed, punch (1), punched, punch (2), bypassed, punch (3), compared against up to two cards (160 characters) accompanying control card(s), punch (4). Indication will be given for lack of comparison. |
| 1 | 48 | <u>Field Sequence Checking</u> - up to 3 fields to a maximum of 80 characters within a record may be designated to be checked for correct sequence in a M, I, M arrangement, between records. Punch number of sequence fields to be checked, whose parameters differ from those of field selection. If all agree punch zero. If not used, leave blank. |

*Signifies columns that should be considered for the minimum job in BCD.

| <u>Control Card No.</u> | <u>Columns</u> | <u>Meaning</u> |
|-------------------------|----------------|---|
| 1 | 49-50 | <u>Sequence field 1</u> - punch the actual field number which coincides with the parameters used in field selection. If other than field selection parameters are desired, fill in the control fields of the selection number directly following the last true selection field number. Enter the number of characters, high order location on tape, and a series of 9's for the remaining two fields. |
| 1 | 51-52 | <u>Sequence field 2</u> - same as above. |
| 1 | 53-54 | <u>Sequence field 3</u> - same as above. |
| 1 | 55 | <u>Group Mark Conversion</u> - if it is desired to change 705 group mark to a 1401 group mark punch a (1), if not desired, leave blank. |
| 1 | 56 | <u>Change fixed information</u> - Where parameters of columns 36-41 of the control card remain the same for all files, fixed information may be changed for each file. If desired, punch (1); if it is not wanted, leave blank. |
| 1 | 57 | <u>*Header or Trailer</u> - between files - if a header and/or a trailer is interposed between files, the same options allowed for the first header on a file (with the exception of header compare) will hold true for labels between succeeding files. Header label compare will take the same path as bypassed headers. Punch a (1) for a header between files, a (2) for a trailer between files, a (3) for both. |
| 1 | 58 | <u>If hand correcting</u> redundant tape transmission is desired, punch a (1), if not wanted, leave blank. |
| 1 | 59-60 | <u>Field selection</u> - up to 16 fields may be designated to be selected from an actual tape record to be selectively punched into one or more cards. The only restriction is that record field numbers must be related to output field numbers sequentially; e. g., field number 1 cannot be assigned to output card number 5, and record field number 9 assigned to output card number 1. Enter number of fields to be used for field selection. |
| 1 | 61-62 | <u>First field number</u> of characters - punch total number representing field. |
| 1 | 63-66 | <u>High order</u> location on tape record - if a repetitive single character field is desired (i. e., MMMM) overpunch with an 11 punch the units position of the card number field (69-70). |
| 1 | 67-68 | <u>High order</u> output field location - punch high order location on card into which selected field is to be punched. |
| 1 | 69-70 | <u>First Field</u> card number - punch number of the card into which the field is to be inserted. |
| 1 | 71-72 | <u>Second field</u> number of characters |
| 1 | 73-76 | <u>Second field</u> high order location on tape record. |
| 1 | 77-78 | <u>Second field</u> high order punch location. |
| 1 | 79-80 | <u>Second field</u> card number. |

*Signifies columns that should be considered for the minimum job in BCD.

| <u>Control Card No.</u> | <u>Columns</u> | <u>Meaning</u> |
|-----------------------------|----------------|---------------------|
| 2,3 | 1-2 | <u>Field 3</u> , 11 |
| 2,3 | 3-6 | |
| 2,3 | 7-8 | |
| 2,3 | 9-10 | |
| 2,3 | 11-12 | <u>Field 4</u> , 12 |
| 2,3 | 13-16 | |
| 2,3 | 17-18 | |
| 2,3 | 19-20 | |
| 2,3 | 21-22 | <u>Field 5</u> , 13 |
| 2,3 | 23-26 | |
| 2,3 | 27-28 | |
| 2,3 | 29-30 | |
| 2,3 | 31-32 | <u>Field 6</u> , 14 |
| 2,3 | 33-36 | |
| 2,3 | 37-38 | |
| 2,3 | 39-40 | |
| 2,3 | 41-42 | <u>Field 7</u> , 15 |
| 2,3 | 43-46 | |
| 2,3 | 47-48 | |
| 2,3 | 49-50 | |
| 2,3 | 51-52 | <u>Field 8</u> , 16 |
| 2,3 | 53-56 | |
| 2,3 | 57-58 | |
| 2,3 | 59-60 | |
| 2 | 61-62 | <u>Field 9</u> |
| 2 | 63-66 | |
| 2 | 67-68 | |
| 2 | 69-70 | |
| 2 | 71-72 | <u>Field 10</u> |
| 2 | 73-76 | |
| 2 | 77-78 | |
| 2 | 79-80 | |

Operating Instructions

A. The most critical part of the operation is the proper punching of the set of control cards and their insertion point in the main program deck. Refer to the DECK COMPLEMENT section of this write-up for the order and insertion point of the control cards. Punch entire field of only those options that are to be used.

B. To run the program, use the following procedure:

- 1) Set proper card form in punch hopper.
- 2) Set carriage tape on printer and any paper form desired.
- 3) Ready printer.
- 4) Ready Reader-Punch.
- 5) Place control cards in deck between 114 and 115 which are the last three digits in columns 78-80 of deck.
- 6) Place tape to be punched on tape drive and set drive to unit number specified in control card. When not specified, set to (1).
- 7) Ready tape at load point.
- 8) Set mode switch to run.
- 9) Press Start Reset switch.
- 10) Set desired sense switches.
- 11) Press load button.

C. Sense Switch Operating Control

- 1) Switch B - when in the on position, program will stop after each data file has been processed, regardless of control card specification for file processing.
- 2) Switch C - when in the on position, program will bypass records continuously regardless of control card specification. To halt bypass operation at the end of a file, sense switch B must also be turned on.
- 3) Switch D - when in the on position, all cards punched, including exception records, will be printed with the punched card image.
- 4) Switch E - when in the on position, the program will not rewind the tape reel at the conclusion of all processing of a tape reel. When control card specification shows that only one file is to be processed, switch G must be turned on to prevent rewinding after processing the file.
- 5) Switch F - when in the on position, will cause the punch release feature to become inoperable for the remainder of the job run.
- 6) Switch G - when in the on position, will allow program to continue after a ten redundancy read attempts. When turned off, hand correction will be possible.

D. Program Halts

The following errors are checked for to insure correct operation of the program.

1) Assignment Phase

| | <u>I-Address Displayed</u> | <u>Course of Action</u> |
|---|--------------------------------|---|
| a) Incorrect punching columns 17-30. | 2792 | Repunch control cards and restart. |
| b) Field Selection card number designation not in correct sequence - Message printed. | 3941 | Repunch and Restart. |
| c) Header label compare is unequal - Message printed. | 3443 | Repunch and restart or continue if desired. |

2) Object Phase of Program

| | <u>I-Address Displayed</u> | <u>Course of Action</u> |
|---|--------------------------------|---|
| a) Tape redundancy (BCD tape read) when control card column 58 contains a (1). | 1467 | Set sense switch G off and mode switch to "D", or press Start button. |
| b) Tape redundancy (BCD tape read) sense switch G off. | 1500 | After Storage Scan set mode switch to "N" and restart at 1364. |
| c) Tape redundancy (binary tape read and control card column 58 contains a (1). | 0834 | Same as BCD tape action a. |
| d) Tape redundancy (binary tape read) and sense switch G off. | 0853 | Same as BCD tape action b. |
| e) Sense switch B in the on position. | 1877 | Press Start button. |
| f) End of processing of data file. | 1844 | Press Start button. |

E. Redundancy - ten tries are made to read a redundant record. If after ten tries, the record is still redundant, there are two courses of action possible, depending upon the punch in column 58 of the control card, and the setting of Sense Switch G. If the user desires, redundancies may be disregarded and a print, as well as the normal punching of other than exception cards, will occur if column 58 is left blank. On exception records, exception routine option will prevail. If column 58 contains a (1) and switch G is off, the record will be printed and the program will halt. The operator will then set the Tape Select switch to "D" and press Start. The record will then be re-read and stop due to the redundant character(s) in storage. Set mode switch to Storage Scan to find the redundant character(s) and manually correct storage. Reset the mode switch to "N" and restart the program at instruction address 1364* If no manual correction is desired, set sense switch G to on. Press Start Reset button to restart program.

*For col. binary tape, restart at address 0712.

During the first of the ten tries, an extra card will be punched (to eliminate a punch check due to punch release). This card will fall into the alternate file stacker ("N" or four) that is not accepting currently processed cards.

NOTES:

1. When the sequence checking option has been taken and a sequence error occurs, the entire record will be printed and a notation of the sequence error given.
2. When the exception option is taken, the card count total will have excluded the total number of exception cards punched. The total number of records processed will include the number of exception records processed.
3. During normal processing of files, cards that are punched will be selected into pocket four on alternate files; otherwise into the "N" pocket.

ExamplesExample #1

Given:

1. Tape reel containing 16 files
2. Three records per block
3. Eighty characters per record
4. Added card with current month punched in columns 3-10
5. No header or trailer label
6. Use tape unit #1

Result desired:

1. Punch files #3, 10, 16
2. Except from punching records with an 8 in the 27th position
3. Sequence check 2 fields
4. Add current month in columns 37-44 of output card

Procedure:

Punch control and added cards as follows:

A. Control Card

| | <u>Card col.</u> | <u>Punch</u> | <u>Description</u> |
|----|------------------|--------------|------------------------------|
| 1. | 1-4 | 0080 | Record length |
| 2. | 5-7 | 003 | Records per block |
| 3. | 11-16 | 031016 | Selected files |
| 4. | 17-24 | 18bJ0027 | Exception coding |
| 5. | 36-41 | AA3708 | Added card information |
| 6. | 48-52 | 00212 | Field sequence numbers |
| 7. | 61-70 | 1500646601 | Sequence field #1 parameters |
| 8. | 71-80 | 0200457901 | Sequence field #2 parameters |

B. Additional Card

| | | |
|------|----------|---------------|
| 3-10 | JUL 1960 | Current month |
|------|----------|---------------|

Example #2

Given:

1. Tape reel containing 11 files
2. Five records per block
3. Two hundred and fifty characters per record
4. Additional card with information punched in columns 61-80
5. Header label containing 120 characters
6. Trailer label containing 60 characters
7. Use tape unit #3

Result desired:

1. Punch all files (excluding header and trailer label)
2. Except records with a zone x in position 1 or without a letter Z in the 12th position, bypass exceptions
3. Sequence check 3 fields
4. Field select 9 fields
5. Add "Remit to our address" into columns 1-20 of first card of each record
6. Sequence number each file
7. Compare Header Label to Header Card

Procedure:

Punch Header Label, Control Cards, added card and Trailer Label as follows:

A. Header Label

| | <u>Card Col.</u> | <u>Punch</u> | <u>Description</u> |
|----|------------------|----------------------|----------------------|
| 1. | 1-80 | First part of label | Card #1 header label |
| 2. | 1-40 | Second part of label | Card #2 header label |

B. Control Cards

card #1

| | <u>Card Col.</u> | <u>Punch</u> | <u>Description</u> |
|-----|------------------|--------------|---------------------------|
| 1. | 1-4 | 0250 | Record Length |
| 2. | 5-7 | 005 | Records per block |
| 3. | 10 | 1 | Trailer label |
| 4. | 17-24 | 1X2A0001 | First exception coding |
| 5. | 25-30 | Z20012 | Second exception coding |
| 6. | 33-35 | 774 | File sequencing numbering |
| 7. | 36-41 | 010120 | Added card information |
| 8. | 42 | 3 | Tape unit used |
| 9. | 44-46 | 120 | Header label |
| 10. | 47 | 4 | Compared |
| 11. | 48-54 | 3080510 | Field Sequence numbers |
| 12. | 59-60 | 09 | Field Selection number |
| 13. | 61-70 | 1502362101 | Select Field #1 |
| 14. | 71-80 | 1002015101 | Select Field #2 |

card #2

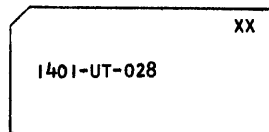
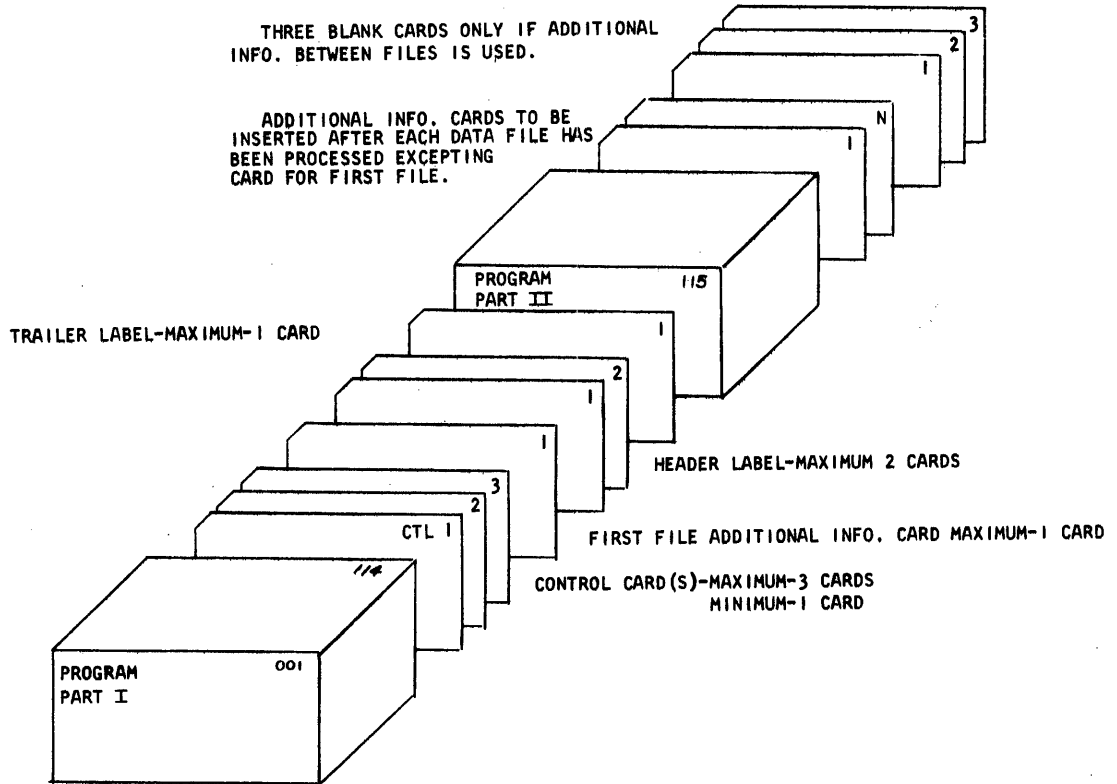
| | | | |
|-----|-------|------------|-----------------------------------|
| 15. | 01-10 | 1500013601 | Select Field #3 |
| 16. | 11-20 | 1601016101 | Select Field #4 Sequence Field #3 |
| 17. | 21-30 | 3000164702 | Select Field #5 Sequence Field #2 |
| 18. | 31-40 | 4700460102 | Select Field #6 |
| 19. | 41-50 | 7601170103 | Select Field #7 |
| 20. | 51-60 | 0800940104 | Select Field #8 Sequence Field #1 |
| 21. | 61-70 | 2702100904 | Select Field #9 |

C. Trailer Label

| | | | |
|----|------|---------------------------|--------------------|
| 1. | 1-60 | Trailer label information | Trailer Label Card |
|----|------|---------------------------|--------------------|

THREE BLANK CARDS ONLY IF ADDITIONAL
INFO. BETWEEN FILES IS USED.

ADDITIONAL INFO. CARDS TO BE
INSERTED AFTER EACH DATA FILE HAS
BEEN PROCESSED EXCEPTING
CARD FOR FIRST FILE.

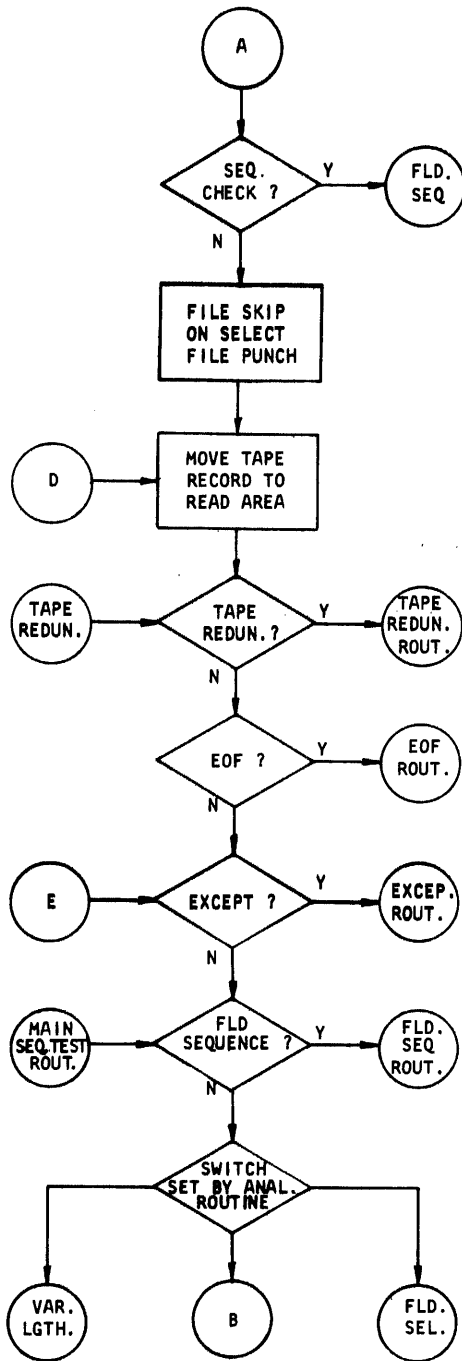
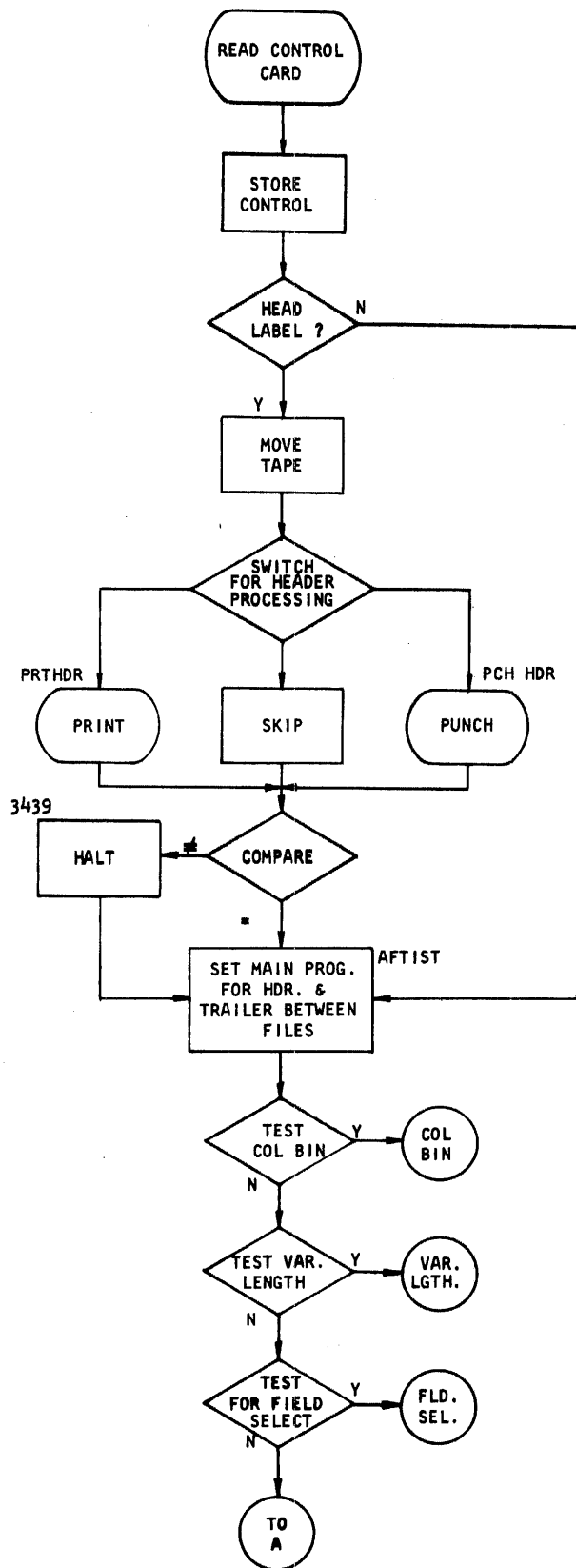


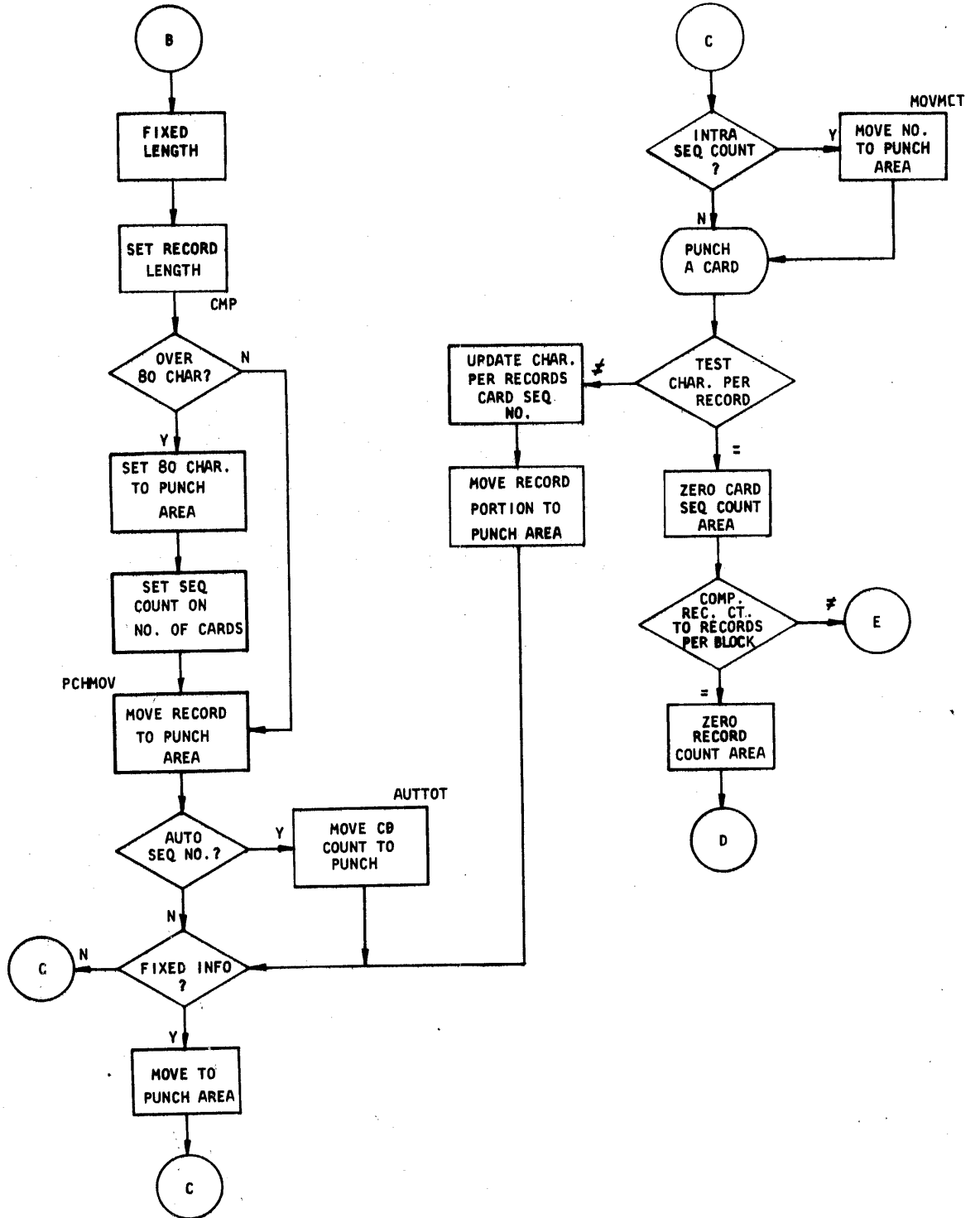
CARD FORMAT

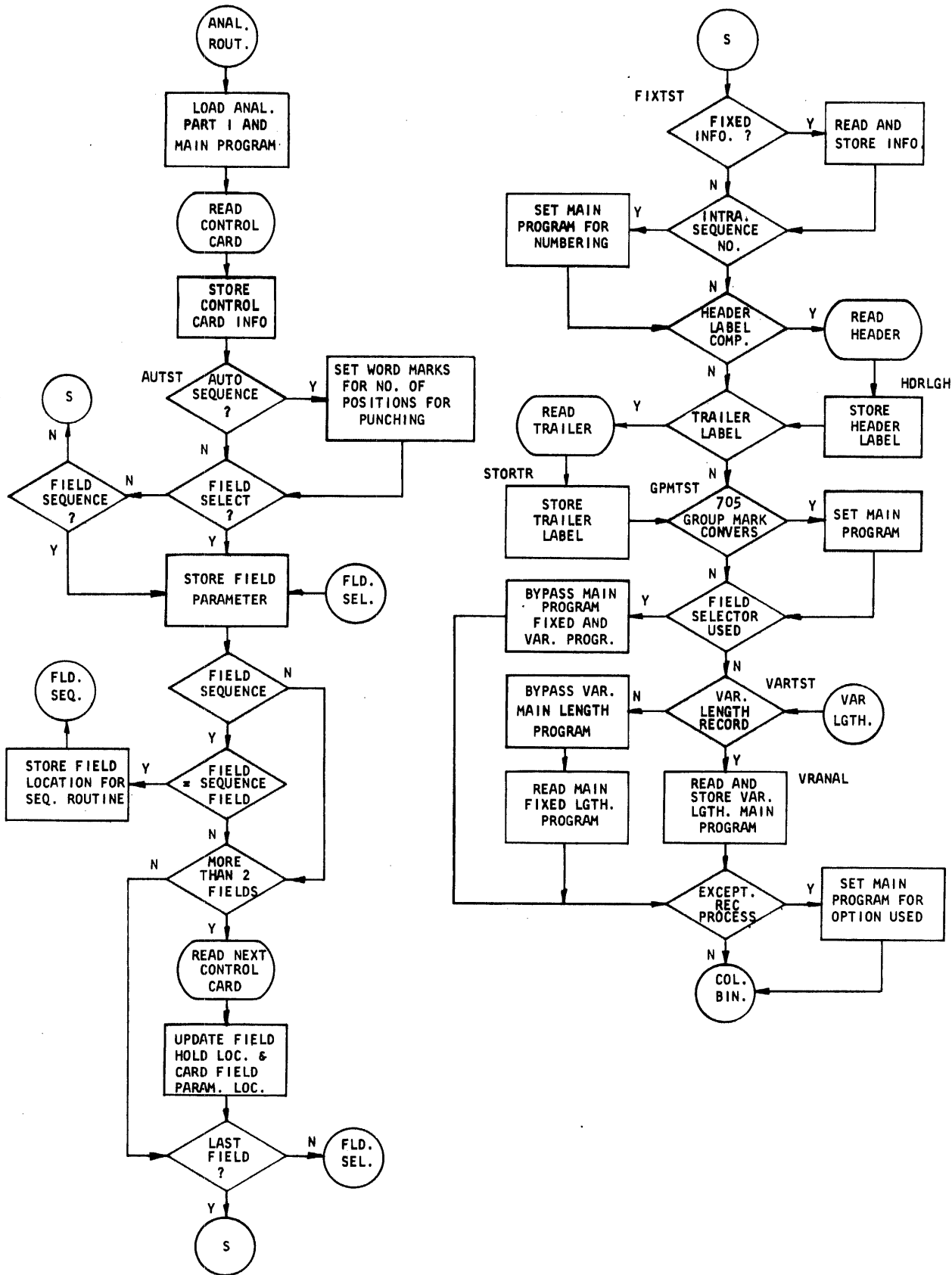
IDENTIFICATION FIELD

| <u>COLUMN</u> | <u>MEANING</u> |
|---------------|----------------|
|---------------|----------------|

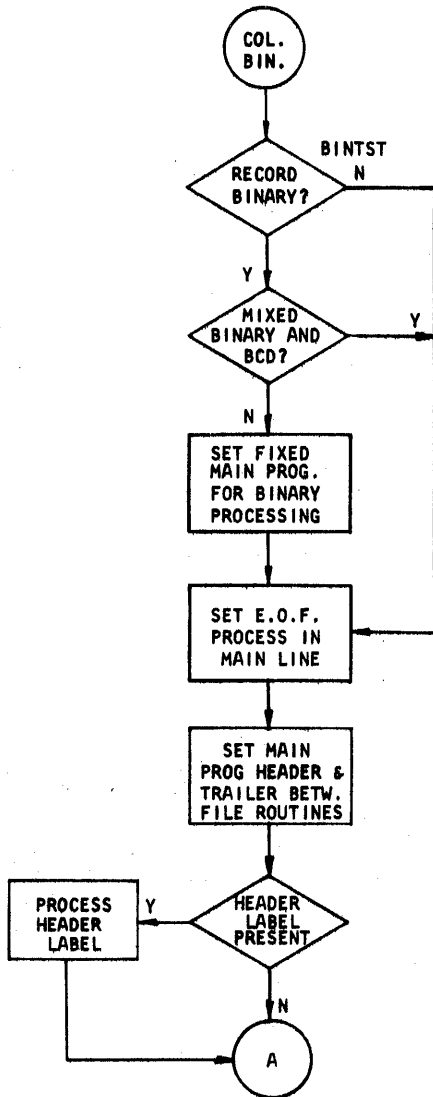
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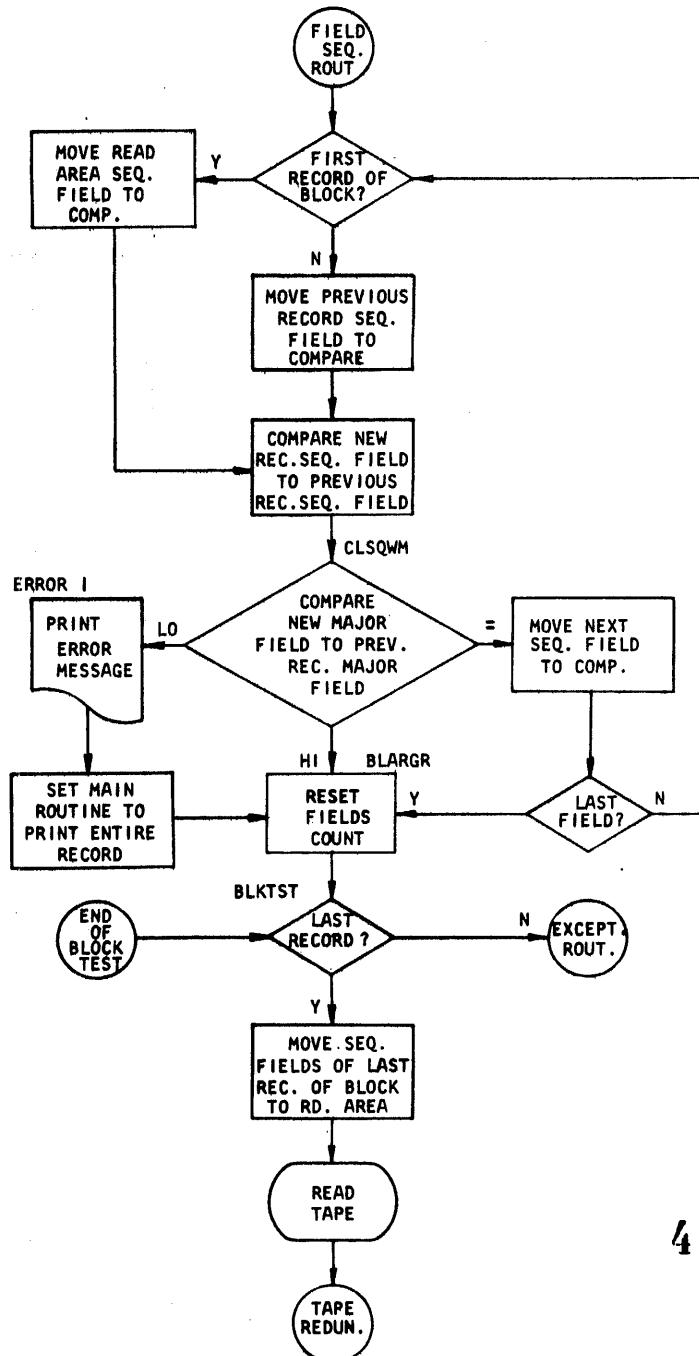


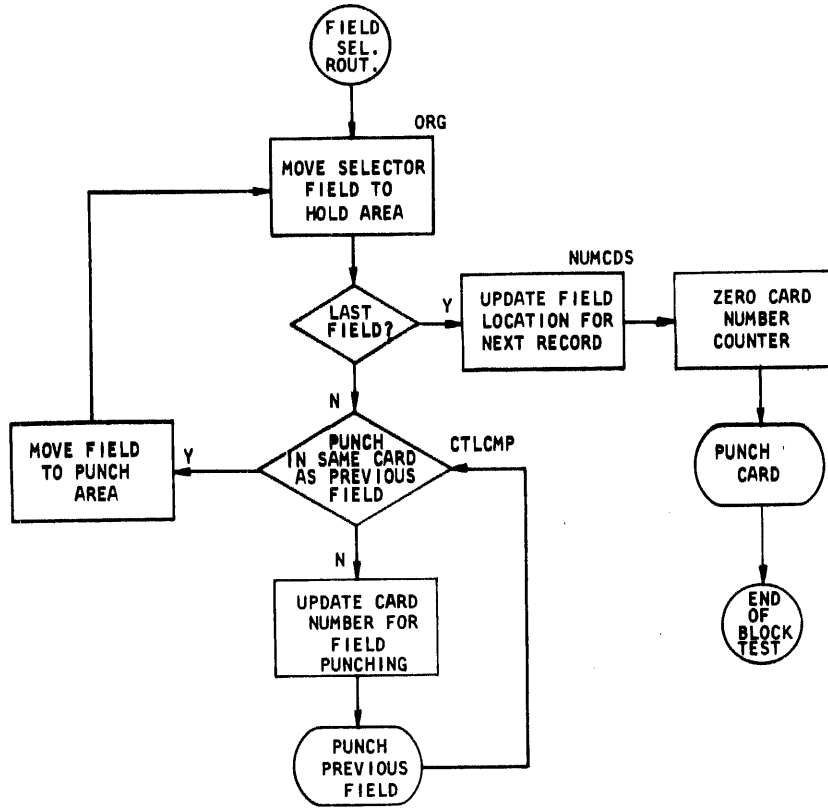


PAGE 2 ANALYZE ROUTINE

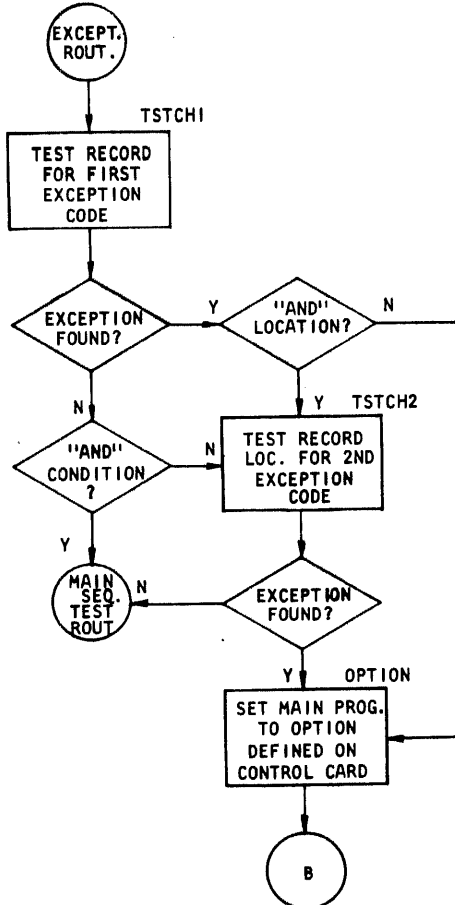


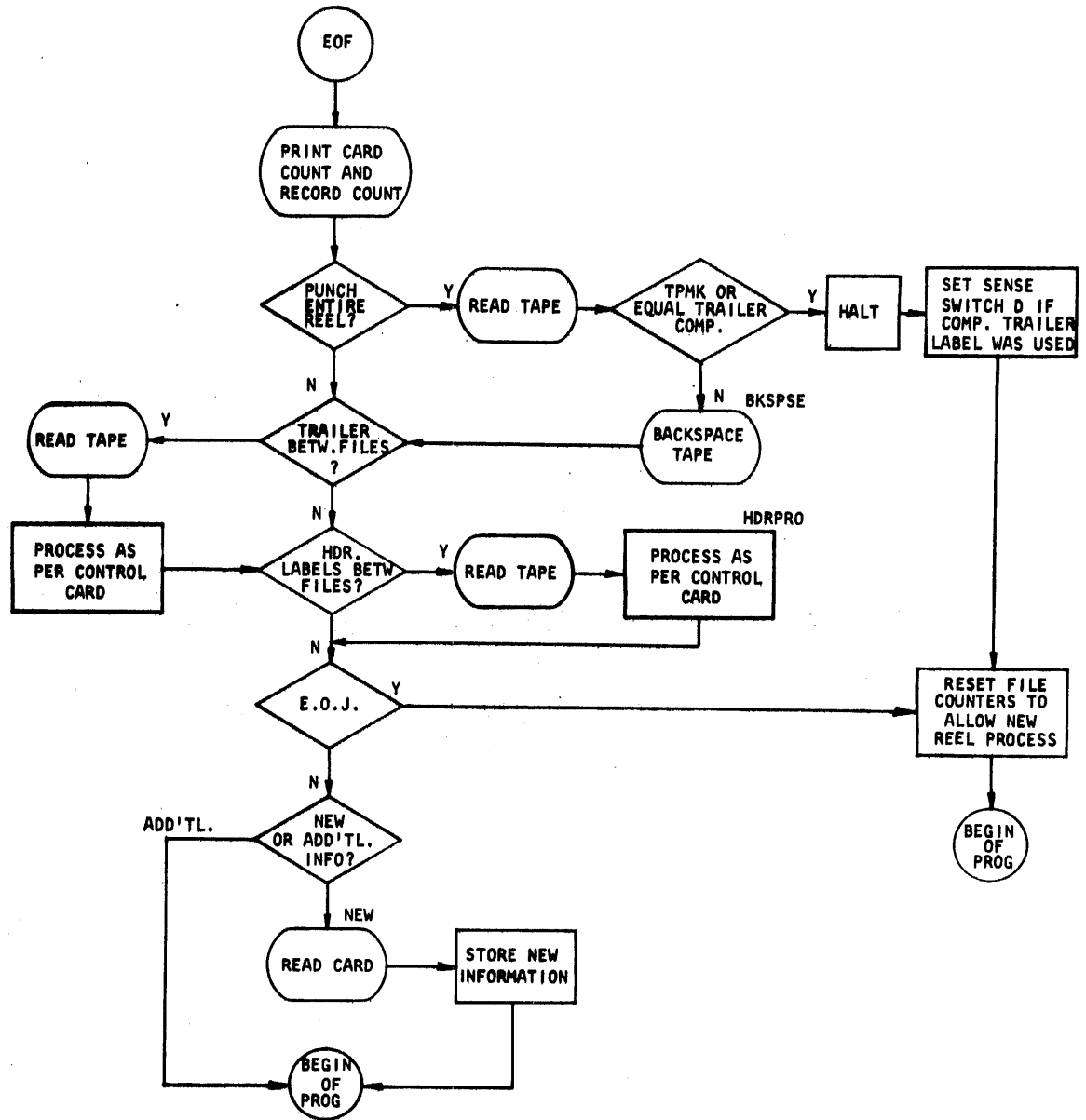
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