IBM 1401 Program Library

1401 Tape-to-Card Utility Program

1401-UT-028

IBM

General Products Division
Development Laboratory
Endicott, New York

Pioneer 8-2211

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:

Location	Change
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:

Item No.	Contents
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

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BE93SAJ971878E51BL28,R77BD54A187173  ,E81,E85,E89,E931L035E99,E70,E77B039  C029
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CLEAR STORAGE 1     ,008015,022026,030034,041,045,053,0570731026
CLEAR STORAGE 2     L072116,110106,105117B101/I99,027A074028¤027B0010270B026/0991,001/00111710
BOOTSTRAP CARD      ,008015,022029,056063/056029                              ,0240671056
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PG	LIN	CT	LABEL	OP	A OPERAND	B OPERAND	D	LOC	INSTRUCTION	COMMENTS
1	010			CTL	631					
1	020			ORG	2701					
1	030	4	START	CS	0080			2701	/ 080	CLEAR READ AREA
1	040	7		SW	0001	0201		2705	, 001 201	SET WD MKS RD PT
1	050	4		SW	0101			2712	, 101	PCH AREAS
1	060	7		LCA	GPMK78	3998		2716	L L24 I98	MOVE GPMK TO I99
1	070	1		R				2723	1	RD CONTL CDS
1	080	7		MCW	0080	0180		2724	M 080 180	MV CTL CD INFO
1	090	7		A	0110	ENDTYP		2731	A 110 K03	STR EOF OPTION
1	100	1		MCW				2738	M	STR NUM OF FILES
1	110	1		A				2739	A	STR REC PER BLK
1	120	1		A				2740	A	STR REC LNGH
1	130	8		B	AUTST	0112		2741	B P65 112	TEST FILE SELTN
1	140	7		A	0116	SLFIL3		2749	A 116 J88	STORE FILE 3
1	150	1		A				2756	A	STORE FILE 2
1	160	1		A				2757	A	STORE FILE 1
1	170	7		MCW	NOP	SW1		2758	M L25 899	
1	180	8	AUTST	B	AUTNOP	0135		2765	B A23 135	TEST AUTO SEQ
1	190	7		SW	0135	0133		2773	, 135 133	
1	200	7		A	I9 - 1	0135		2780	A I78 135	SET PUNCH COLS
1	210	7		A	0135	0134		2787	A 135 134	
1	220	7		MCW	0134	AUTTOT& 6		2794	M 134 ¢46	
1	230	4		SW	CNTLNG& 1			2801	, Q31	SET NUM OF COLS
1	240	7		S	PUNCH	0135		2805	S ¢84 135	TO BE PUNCHED
1	250	7		MZ	BLANKS- 1	0135		2812	Y J89 135	
1	260	7		A	0135	CNTLNG& 3		2819	A 135 Q33	
1	270	4		CW	CNTLNG& 1			2826	¤ Q31	
1	280	4	CNTLNG	SW	CDCNT - 4			2830	, L12	
1	290	7		CW	0133	0135		2834	¤ 133 135	
1	300	4		B	AUTNOP& 7			2841	B A30	
1	310	8	FIXTST	B	FIXNOP	0141		2845	B A86 141	TST FIXED INFO
1	320	7		SW	0136	0138		2853	, 136 138	
1	330	4		SW	0140			2860	, 140	
1	340	8		B	LDFIXB	0143	1	2864	B &04 143 1	BR BINARY OUTPUT
1	350	7		MCW	0141	LDFIX & 3		2872	M 141 R04	SET NO OF COLS
1	360	7		A	I9	0141		2879	A I79 141	AND PUNCH K1OCTN
1	370	7		A	0141	0139		2886	A 141 139	
1	380	7		MCW	0139	GPFIX & 6		2893	M 139 ¢99	
1	390	1		R				2900	1	RD ADDTL INFO CD
1	400	7	LDFIX	LCA	0000	FIXED		2901	L 000 K92	
1	410	1		NOP				2908	N	
1	420	4		CS	0080			2909	/ 080	
1	430	4		SW	0001			2913	, 001	
1	440	8		B	ALCDFX	0156		2917	B R39 156	BR NO CHG ON EOF
1	450	7		MCW	LDFIX & 6	RDADTL& 6		2925	M R07 Z79	SET EOF TO READ

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PG LIN  CT  LABEL   OP   A OPERAND      B OPERAND      D      LOC   INSTRUCTION COMMENTS    0046

 1 460   7          MCW  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          MCW  0137           FXCDNO                2947  M 137 K05   SET CARD NUM
 1 490   8  MLTTST  B    MPLNOP         0132                  2954  B B15 132   TEST INTRA NUM
 1 500   4          SW   0131                                 2962  , 131       SET PCH LOCTN
 1 510   7          C    RECLNG         MPCTST                2966  C J97 I91
 1 520   5          B    MPLOC                         T      2973  B R93 T     BR 2 POS NUM
 1 530   4          SW   MPLCDS                               2978  , L28
 1 540   7          MCW  0132           MOVMCT&  6            2982  M 132 ‡73
 1 550   4          B    JOBEND                               2989  B B22
 1 560   7  MPLOC   A    ONE80 -  2     0132                  2993  A K06 132
 1 570   4          B    MPLOC - 11                           3000  B R82
 1 580   7  LDFIXB  MCW  0139           *     &  4            3004  M 139 &14   SET FIXED RTNE
 1 590   4          SW   0400                                 3011  , 400       TO BINARY MODE
 1 600   7          MCW  FIVE           GPFIX &  4            3015  M A22 ‡97
 1 610   4          CW   GPFIX &  7                           3022  ¤ /00
 1 620   7          MCW  B              GPFIX &  7            3026  M L26 /00
 1 630   7          MCW  NOP            LDFIX -  1            3033  M L25 R00
 1 640   7          MCW  FIVE           LDFIX &  1            3040  M A22 R02
 1 650   4          CS   0580                                 3047  / 580
 1 660   1          CS                                        3051  /
 1 670   4          SW   0401                                 3052  , 401
 1 680   2          R                                C        3056  1 C         RD FIX INFO BINA
 1 690   7          LCA  *     -  7    RDADTL-  1            3058  L &57 Z72   SET EOF TO RD FX
 1 700   4          CW   LDFIX &  7                           3065  ¤ R08       IN BINARY MODE
 1 710   7          MCW  MPLOC          LDFIX &  7            3069  M R93 R08
 1 720   7          SW   ALCDFX-010     ALCDFX- 13            3076  , R29 R26
 1 730   7          A    ONE80 -  2     ALCDFX-  8            3083  A K06 R31
 1 740   7          A    ONE80 -  2     ALCDFX- 11            3090  A K06 R28
 1 750   7          MCW  LDFIX          ALCDFX- 14            3097  M R01 R25
 1 760   7          MCW  *     -  6    LDFIX                 3104  M A04 R01
 1 770   7          CW   ALCDFX-010     ALCDFX- 13            3111  ¤ R29 R26
 1 780   4          B    FIXTST& 27                           3118  B Q72
 1 790   1  FIVE    DCW  *                                5  3122
 1 800   7  AUTNOP  MCW  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          MCW  LCSELT         SW5   &  3            3138  M I44 ‡08   SET SW5 TO SELTN
 1 830   4          B    SELECT                               3145  B C95
 1 840   7  TSTSEQ  MCW  SQADD          BLARGR& 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   MCW  NOP            SW4                   3168  M L25 ‡01   NOP SW4
 1 880   7          MCW  NOP            CVTTST-  8            3175  M L25 V73   NOP STR LST SQ
 1 890   4          B    FIXTST                               3182  B Q45
 1 900   7  FIXNOP  MCW  NOP            MOVMCT-  5            3186  M L25 ‡62   NOP ADTL FIX MOV
 1 910   7          MCW  NOP            MOVMCT- 12            3193  M L25 ‡55
 1 920   4          B    MLTTST                               3200  B R54
 1 930   7  FIXALL  MCW  BLANKS-  1     MOVMCT-  1            3204  M J89 ‡66   PCH FIX ALL CDS
 1 940   4          B    FIXNOP&  7                           3211  B A93
 1 950   7  MPLNOP  MCW  NOP            MOVMCT                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 B72 158
 1 970   7          MCW   MOVTAP         BDBLCK                 3230  M 953 T91    SET TAPE ERROR
 1 980   7          MCW   MOVTAP         BDBLCK& 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 I44 U29
 2 000   7          MCW   NOP            FXBBLK-  4             3258  M L25 U64
 2 010   7          MCW   NOP            BINBBK                 3265  M L25 B29
 2 020   8  ENDJOB  B     HDRLGH         0147            4      3272  B B92 147 4 TST HDR CMPRE
 2 030   8          B     STORTR         ENDTYP          1      3280  B C28 K03 1
 2 040   4          B     GPMTST                                3288  B C36
 2 050   1  HDRLGH  R                                           3292  1            RD & STR LABEL
 2 060   7          LCA   0080           3880                   3293  L 080 H80
 2 070   7          C     0146           ZERO80                 3300  C 146 K11
 2 080   5          B     MORE                            T      3307  B C16 T
 2 090   4          B     ENDJOB&  8                             3312  B B80
 2 100   1  MORE    R                                           3316  1
 2 110   7          MCW   0080           3960                   3317  M 080 I60
 2 120   4          B     ENDJOB&  8                             3324  B B80
 2 130   1  STORTR  R                                           3328  1            STR TRAIL LABEL
 2 140   7          LCA   0080           TRALOC                 3329  L 080 040    TST 705 GP MK
 2 150   8  GPMTST  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  N 155 595
 2 190   4          CW    0155                                  3362  ¤ 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 WD 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 I94 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          CW    0048                                  3428  ¤ 048
 2 320   7  ENTHLD  MCW   0070           HOLD                   3432  M 070 I77    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 I69
 2 360   1          MCW                                         3445  M
 2 370   8          B     TWMULT         HOLD  -  1      1      3446  B E81 I76 1
 2 380   8          B     TSTSEQ& 07     HOLD  -  2             3454  B A56 I75    BR ALL FLDS STRD
 2 390   7          A     I9             HOLD  - 12             3462  A I79 I65
 2 400   8          BWZ   INSERT         HOLD            K      3469  V G32 I77 K BR ON FLD INSERT
 2 410   8          B     LNGH M         HOLD  -  7      1      3477  B G21 I70 1 BR REC LGH 1000
 2 420   7  ADNTRY  A     CONST1         HOLD  -  4             3485  A J93 I73    SET FLD TP LOC
 2 430   4          MCW   HOLD  -  4                            3492  M I73
 2 440   7          A     HOLD  - 12     HOLD  -  2             3496  A I65 I75
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PG LIN  CT  LABEL   OP   A OPERAND      B OPERAND      D      LOC   INSTRUCTION COMMENTS    0146

 2 450   7          A    HOLD  - 12     HOLD  -  7            3503  A I65 I70
 2 460   7          C    HOLD           CDSQNO                3510  C I77 I63   TST CD PCH SEQ
 2 470   5          B    CSQERR                        U      3517  B I20 U
 2 480   7  FLDMOV  MCW  HOLD           FLD 1                 3522  M I77 L44   STR FLD PARAM
 2 490   1          MCW                                      3529  M
 2 500   1          MCW                                      3530  M
 2 510   1          MCW                                      3531  M
 2 520   7          A    ONE80 -  2     FLDCNT                3532  A K06 I81
 2 530   8          B    MODTST- 12     0150                  3539  B F50 150   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                        S      3565  B E93 S     OF BLOCK
 2 580   7          A    RECLNG         LTHCTR                3570  A J97 I87
 2 590   4          B    LSTREC                               3577  B E51
 2 600   4  TWMULT  CW   MPLCDS                               3581  ¤ L28
 2 610   4          SW   MLTTST& 23                           3585  , R77
 2 620   4          B    ENTHLD&022                           3589  B D54
 2 630   7  SETLST  A    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          MCW  B              LSTREC-  4            3607  M L26 E47
 2 660   7          C    0150           FLDCNT                3614  C 150 I81   BR WHEN SEL FLD
 2 670   5          B    SEQ1                          S      3621  B G61 S     EQUALS SEQ FLD
 2 680   7          C    0152           FLDCNT                3626  C 152 I81
 2 690   5          B    SEQ2                          S      3633  B H07 S
 2 700   7          C    0154           FLDCNT                3638  C 154 I81
 2 710   5          B    SEQ3                          S      3645  B H67 S
 2 720   7          C    FLDCNT         FULTOT                3650  C I81 N45
 2 730   5          B    TSTSEQ& 07                    S      3657  B A56 S
 2 740   8  MODTST  B    MODIFY         FLDCNT         2      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  SW   FLDMOV&  4                           3677  , E26       UPDATE FLD STOR
 2 770   7          A    TWELVE         FLDMOV&  6            3681  A N48 E28   INSTRUCTION AND
 2 780   4          CW   FLDMOV&  4                           3688  ¤ E26       BRANCH
 2 790   7          MCW  HOLD           CDSQNO                3692  M I77 I63
 2 800   4          B    ENTHLD                               3699  B D32
 2 810   7  MODIFY  MCW  ONE80 -  2     ENTHLD&  2            3703  M K06 D34   MODIFY INST
 2 820   7          MCW  ZZZERO-  2     MODTST&  7            3710  M L04 F69   TO STORE FLD IN
 2 830   4          R    SELWMK                               3717  1 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          MCW  HOLD  -  2                           3739  M I75       INSERTION OF
 2 880   7          MZ   BLANKS-  1     HOLD                  3743  Y J89 I77   CHARCTERS
 2 890   7          A    HOLD  - 12     HOLD  -  2            3750  A I65 I75
 2 900   4          B    FLDMOV- 12                           3757  B E10
 2 910   7  SEQ1    MCW  FLDMOV&  6     SQFLD1                3761  M E28 050   SET INSTRUCTIONS
 2 920   7          MCW  HOLD  -  7     LDREAD&  7            3768  M I70 556   TO LOAD READ
 2 930   7          MCW  HOLD  -  4     LDREAD&  3            3775  M I73 552   AREA WITH LAST
 2 940   7          MCW  HOLD  -  4     CONMOV& 14            378[illegible]  M I73 W60
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PG LIN  CT  LABEL   OP    A OPERAND       B OPERAND        D        LOC   INSTRUCTION COMMENTS    0196

 2 950   7          MCW   HOLD  - 10     LDREAD& 10                3789  M I67 559
 2 960   7          MCW   HOLD  - 10     LDCTR                     3796  M I67 I41
 2 970   4          B     MODTST- 12                               3803  B F50
 2 980   7  SEQ2    MCW   FLDMOV&  6     SQFLD2                    3807  M E28 053
 2 990   7          MCW   HOLD  -  7     LDREAD& 18                3814  M I70 567
 3 000   7          MCW   HOLD  -  4     CONMOV& 18                3821  M I73 W64
 3 010   7          MCW   HOLD  -  4     LDREAD& 14                3828  M I73 563
 3 020   7          A     HOLD  - 10     LDCTR                     3835  A I67 I41
 3 030   7          MCW   LDCTR          HOLD  - 10                3842  M I41 I67
 3 040   7          MCW   LDCTR          LDREAD& 21                3849  M I41 570
 3 050   7          MCW   TWO            CLSQWM& 21                3856  M L29 448
 3 060   4          B     MODTST- 12                               3863  B F50
 3 070   7  SEQ3    MCW   FLDMOV&  6     SQFLD3                    3867  M E28 056
 3 080   7          MCW   THREE          CLSQWM& 21                3874  M 044 448
 3 090   7          MCW   HOLD  -  7     LDREAD& 29                3881  M I70 578
 3 100   7          MCW   HOLD  -  4     LDREAD& 25                3888  M I73 574
 3 110   7          MCW   HOLD  -  4     CONMOV& 22                3895  M I73 W68
 3 120   7          A     HOLD  - 10     LDCTR                     3902  A I67 I41
 3 140   7          MCW   LDCTR          LDREAD& 32                3909  M I41 581
 3 150   4          B     MODTST- 12                               3916  B F50
 3 160   7  CSQERR  MCW   SELCON         0280                      3920  M I61 280    PRINT MESSAGE
 3 170   1          W                                              3927  2            CARD NUM FOR
 3 180   4          CS    0280                                     3928  / 280        FLD SEL PCHG
 3 190   4          SW    0201                                     3932  , 201        OUT OF SEQUENCE
 3 200   4          H     *     -  3                               3936  . I36
 3 210   2  LDCTR   DCW   *                                        3941
 3 220   3  LCSELT  DSA   *              FLDSEL             600    3944
 3 230  17  SELCON  DCW   *                   FLD CD NO SEQ ERR    3961
 3 240   2  CDSQNO  DCW   *                                        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  I9      DCW   *                                  I9    3979
 3 310   2  FLDCNT  DCW   *                                        3981
 3 320   3  ADCNTR  DCW   *                                        3984
 3 330   3  LTHCTR  DCW   *                                        3987
 3 340   4  MPCTST  DCW   *                                0720    3991
 3 350   3  BRFIX   DSA   *              FIXTST             Q45    3994
 3 360              ORG   0333
 3 370   4  FLDSEQ  NOP   ERESTR                                   0333  N 526        RESTORE AFT SQER
 3 380   7  SEQFLD  MCW   SQFLD1         SEQMOV&  3                0337  M 050 347    SET SEQ FIELD
 3 390   7  SEQMOV  MCW   0000           TEST                      0344  M 000 198    FOR COMPARE
 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    TEST FOR FIRST
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PG LIN  CT  LABEL   OP   A OPERAND      B OPERAND       D       LOC   INSTRUCTION COMMENTS    0246

 3 460   5          B    ONCE                            S       0369  B 493 S     RECORD OF BLOCK
 3 470   7          MCW  TEST  -  7     SQINST&  3              0374  M 191 423
 3 480   7  SQADD   A    ADLNGH          TEST  -  4              0381  A L09 194   UPDATE  TAPE
 3 490   7          A    ADLNGH          TEST  -  7              0388  A L09 191   LOCATION BY ONE
 3 500   7          MCW  TEST  -  4     SEQWMK&  3              0395  M 194 419   RECORD LENGTH
 3 510   7          MCW  TEST  -  4     CLSQWM&  3              0402  M 194 430   AND COMPARE
 3 520   7          MCW  TEST  -  7     SQINST&  6              0409  M 191 426   INSTRUCTIONS
 3 530   4  SEQWMK  SW   0000                                   0416  , 000
 3 540   7  SQINST  C    0000            0000                    0420  C 000 000
 3 550   4  CLSQWM  CW   0000                                   0427  ¤ 000
 3 560   5          B    BLARGR                          U       0431  B 468 U     BR SEQ OK
 3 570   5          B    ERROR1                          T       0436  B 504 T     BR SEQ ERR
 3 580   8          B    BLARGR          SEQCNT          1       0441  B 468 057 1 BR ALL FLDS CHKD
 3 590   4          SW   SEQFLD&  1                              0449  , 338       SET INSTRUCTIONS
 3 600   7          A    THREE           SEQFLD&  3              0453  A 044 340   FOR NEXT FIELD
 3 610   4          CW   SEQFLD&  1                              0460  ¤ 338       TO BE SEQUENCED
 3 620   4          B    FLDSEQ&  4                              0464  B 337
 3 630   7  BLARGR  MCW  SQBASE          SEQFLD&  3              0468  M 047 340   RESET COMPARE
 3 640   7          MCW  ZZZERO-  2      SEQCNT                  0475  M L04 057   TO CHECK MAJOR
 3 650   7          NOP  RECLNG          ADLNGH                  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      SQINST&  3              0493  A 188 423
 3 680   4          B    SQADD                                  0500  B 381
 3 690   4  ERROR1  SW   SSD   &  4                              0504  , ‡83       SET INST TO PRIN
 3 700   7          MCW  SEQERR          0290                    0508  M 591 290   COMPLETE RECORD
 3 710   7          MCW  B               FLDSEQ                  0515  M L26 333   AND ERROR MSGE
 3 720   4          B    BLARGR                                 0522  B 468
 3 730   4  ERESTR  CS   0290                                   0526  / 290       RESTORE FROM
 3 740   4          SW   0201                                   0530  , 201       SEQ ERR RTNE
 3 750   4          CW   SSD   &  4                              0534  ¤ ‡83
 3 760   4          B    SEQFLD                                 0538  B 337
 3 770   7          MCW  ZZZERO          SQINST&  3              0542  M L06 423
 3 780   4  LDREAD  SW   0001                                   0549  , 001       LOAD LAST REC
 3 790   7          MCW  0001            0001                    0553  M 001 001   SEQ FIELDS TO
 3 800   4          SW   0001                                   0560  , 001       READ AREA
 3 810   7          MCW  0001            0001                    0564  M 001 001
 3 820   4          SW   0001                                   0571  , 001
 3 830   7          MCW  0001            0001                    0575  M 001 001
 3 840   4          B    CONMOV& 11                             0582  B W57
 3 850   6  SEQERR  DCW  *                              SEQERR  0591
 3 860   3  BRSEQ   DSA  *               FLDSEQ             333  0594
 3 870              ORG  0600
 3 880   7  FLDSEL  MCW  ONE01           CONTRL                  0600  M L23 N50   FIELD SELECTION
 3 890   7          MCW  FLDORG          ORG   &  3              0607  M 186 617
 3 900   7  ORG     MCW  0000            TEST                    0614  M 000 198   MOVE FIELD
 3 910   1          MCW                                         0621  M           PARAMETERS
 3 920   1          MCW                                         0622  M           TO HOLD AREA
 3 930   1          MCW                                         0623  M
 3 940   1          MCW                                         0624  M
 3 950   7          C    SELCTR          SELTOT                  0625  C 096 N43
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PG LIN  CT  LABEL   OP   A OPERAND      B OPERAND      D     LOC   INSTRUCTION COMMENTS    0296

 3 960   5          B    PCHBR1                        S     0632  B 740 S
 3 970   7          A    ONE80 -  2     SELCTR               0637  A K06 O96
 3 980   7  CTLCMP  C    TEST           CONTRL               0644  C 198 N50
 3 990   5          B    PCHBR2                        /     0651  B 784 /      BR FLDS IN PCH
 4 000   8          BWZ  CHRADD         TEST  -  7     K     0656  V 814 191 K TST CHAR INSERT
 4 010   7          A    ADLNGH         TEST  -  4           0664  A L09 194    UPDATE INST
 4 020   7          A    ADLNGH         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     CWMINS&  3           0685  M 194 720
 4 050   7          MCW  TEST  -  4     WMINST&  3           0692  M 194 702
 4 060   4  WMINST  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  CWMINS  CW   0000                                0717  ¤ 000
 4 100   4  TRNFLD  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          CW   ORG   &  1                          0732  ¤ 615
 4 130   4          B    ORG                                 0736  B 614
 4 140   7  PCHBR1  MCW  BCLP1          SW8   &  3           0740  M N57 ‡92
 4 150   4          B    NUMCDS                              0747  B ‡33        BR TO PUNCH
 4 160   4  CLPCH1  CS   0180                                0751  / 180        CLEAR PUNCH
 4 170   4          SW   0101                                0755  , 101        AREA
 4 180   7          MCW  ZZZERO-  1     CONTRL               0759  M L05 N50    RESET COUNT
 4 190   7          MCW  ZZZERO-  1     SELCTR               0766  M L05 O96
 4 200   7          A    RECLNG         ADLNGH               0773  A J97 L09    UPDATE REC CTR
 4 210   4          B    BLKTST- 14                          0780  B V25
 4 220   7  PCHBR2  MCW  BCLP2          SW8   &  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    CTLCMP                              0810  B 644
 4 280   7  CHRADD  MCW  TEST  -  8     ZWMINS&  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  ZWMINS  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          CW   0100                                0876  ¤ 100
 4 390   7          MCW  CHRADD         ZINST &  7           0880  M 814 872
 4 400   4          B    TRNFLD                              0887  B 721
 4 410   4          CS   0180                                0891  / 180
 4 420   4          SW   0101                                0895  , 101
 4 430   4  SW1     B    SW2                                 0899  B 949        SWITCH 1
 4 440   7  SELFIL  A    ONE80 -  2     FILNUM               0903  A K06 J82    SELECT FILE
 4 450   7  FILCMP  C    FILNUM         SLFIL1               0910  C J82 J84    TO BE PCHED
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PG LIN  CT  LABEL   OP    A OPERAND       B OPERAND       D      LOC   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  MCW   %U1              TPNTRY          R      0927  M %U1 P01 R
 4 490   4          MCW   BLANK                                  0935  M L03
 4 500   1          CW                                           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  MOVTAP  MCW   %U1              TPNTRY          R      0953  M %U1 P01 R READ TAPE
 4 550   4          MCW   BLANK                                  0961  M L03
 4 560   1          CW                                           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  EOF     B     FILEND                          K      0975  B W73 K      BR EOF
 4 600   5          B     XTRPCH                          C      0980  B #20 C
 4 610   7          MCW   CONST1           RECORD                 0985  M J93 183
 4 620   5          B     NO SPF                          F      0992  B #09 F
 4 630   4  TSTXCP  NOP   EXCPTN                                 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  MCW   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          MCW   NOP              XTRPCH                 1022  M L25 #20    C CONTROL
 4 710   4          B     MOVTAP                                 1029  B 953
 4 720   7  NUMCDS  A     ONE80 -  2       CDCNT                  1033  A K06 L16    UPDATE CD CNT
 4 730   7  AUTTOT  MCW   CDCNT            0100                   1040  M L16 100    MOVE CD CNT
 4 740   1          NOP                                          1047  N            TO PUNCH
 4 750   7          A     ONE80 -  2       MPLCDS                 1048  A K06 L28    UPDATE INTRA CNT
 4 760   7          C     FXCDNO           MPLCDS                 1055  C K05 L28    TEST CD NUM FOR
 4 770   5          B     GPFIX                           S      1062  B #93 S      ADDTL INFO
 4 780   7  MOVMCT  MCW   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          SS                                      4      1087  K 4          STACKER SELECT
 4 860   4  SW8     B     CMP                                    1089  B 607        BR TO REC SEG
 4 870   7  GPFIX   MCW   FIXED            0100                   1093  M K92 100    MOVE ADDTL INFO
 4 880   1          NOP                                          1100  N            TO PUNCH
 4 890   4          B     MOVMCT                                 1101  B #67
 4 900   7  PRTPCH  MCW   0180             0280                   1105  M 180 280    MOVE PUNCH INFO
 4 910   1          P                                            1112  4            TO PRINT AREA
 4 920   1          W                                            1113  2            PRINT AND PUNCH
 4 930   5          B     FRMCTL                          @      1114  B /23 @
 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
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PG LIN  CT  LABEL   OP    A OPERAND       B OPERAND       D       LOC   INSTRUCTION COMMENTS    0397

 4 970   7  EXCPTN  LCA   RECORD          TSTCH1&  3              1128  L 183 /73   TEST TAPE REC
 4 980   7          LCA   RECORD          TSTCH2&  3              1135  L 183 /96   LOCATION FOR
 4 981   7  EXCEPT  A     RECLNG          RECORD                  1142  A J97 183
 4 990   7          A     ADDEX1          TSTCH1&  3              1149  A 083 /73   EXCEPTION CODES
 5 000   7          A     ADDEX2          TSTCH2&  3              1156  A 087 /96
 5 010   7          CW    TSTCH1&  1      TSTCH2&  1              1163  ¤ /71 /94
 5 020   7  TSTCH1  MCW   0000            FIRSTX                  1170  M 000 072
 5 030   7          C     FIRSTX          XCHAR1                  1177  C 072 080   COMPARE FIRST
 5 040   5          B     TSTCH2                          /       1184  B /93 /     CHARCTER
 5 050   4          B     XCPFND                                  1189  B S12
 5 060   7  TSTCH2  MCW   0000            SECNDX                  1193  M 000 073
 5 070   7          C     SECNDX          XCHAR2                  1200  C 073 084   COMPARE SECOND
 5 080   5          B     SW4                             /       1207  B ‡01 /     CHARACTER
 5 090   4  XCPFND  SW    NUMCDS&  4                              1212  , ‡37       SET INST TO
 5 100   7          MCW   LCPTPN          NUMCDS&  3              1216  M 076 ‡36   PROCESS EXCEPT
 5 110   4          MCW   B                                       1223  M L26       RECORD
 5 120   4          SW    BLKTST& 11                              1227  , V50
 5 130   7          MCW   BRXEND          BLKTST& 10              1231  M 079 V49
 5 140   7  OPTION  MCW   NOP             PRTPCH&  7              1238  M L25 /12
 5 150   7          MCW   NOP             PRTPCH&  8              1245  M L25 /13
 5 160   4          B     SW5                                     1252  B ‡05
 5 170   7  XCPEND  LCA   NMCDCW&  6      NUMCDS&  6              1256  L 091 ‡39   RESET INST FOR
 5 180   7          LCA   BLKDCW&  4      BLKTST& 11              1263  L 096 V50   NORMAL PROCESS
 5 190   7          LCA   FOUR            PRTPCH&  7              1270  L 094 /12
 5 200   7          LCA   TWO             PRTPCH&  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          MCW   NOP             *     &  1              1301  M L25 T08
 5 260   2          SS                                    4       1308  K 4
 5 270   5  TPECNT  B     1673                            K       1310  B W73 K
 5 271   2          NOP                                   0       1315  N 0
 5 272   7          MCW   B               TAPERR                  1317  M L26 S88
 5 280   7          A     ONE80 -  2      ERRCNT                  1324  A K06 V03
 5 290   8          B     BDBLCK          ERRCNT-  1      1       1331  B T91 V02 1
 5 291   5          CU    %U1                             B       1339  U %U1 B
 5 300   7          MCW   B               SW3                     1344  M L26 971
 5 310   4          B     MOVTAP                                  1351  B 953
 5 320   7  ERRSTK  MCW   KEIGHT-  1      TPECNT-  2              1355  M 070 T08
 5 330   4          B     TPECNT-  2                              1362  B T08
 5 340   7  ERESET  MCW   ZZZERO          ERRCNT                  1366  M L06 V03   RESET FOR NORMAL
 5 350   7          MCW   NOP             TAPERR                  1373  M L25 S88   TAPE TRANS
 5 360   7          MCW   NOP             SW3                     1380  M L25 971
 5 370   4          B     EOF                                     1387  B 975
 5 380   7  BDBLCK  NOP   NOP             PRTPCH&  7              1391  N L25 /12
 5 390   7          NOP   NOP             PRTPCH&  8              1398  N L25 /13   BLOCK OPTION
 5 400   7          NOP   CDCNT           BBLKCT                  1405  N L16 V07
 5 410   7          SW    SSD   &  4      BLKTST& 11              1412  , ‡83 V50
 5 420   7          MCW   LOCBND          BLKTST& 10              1419  M V10 V49
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PG LIN  CT  LABEL    OP    A OPERAND          B OPERAND          D      LOC   INSTRUCTION COMMENTS     0445

 5 430   4          B     ERESET                                       1426  B T66       RESET INST
 5 431   4          B     FXBBLK                                       1430  B U68
 5 435   5  BBLKND  B     FLDSEL                             T         1434  B 600 T
 5 440   7          MCW   TWO                PRTPCH&  8               1439  M L29 /13   FOR NORMAL
 5 450   4          MCW   FOUR                                         1446  M 094       PROCESSING
 5 460   7          CW    SSD    &  4        BLKTST& 11               1450  ¤ ‡83 V50
 5 470   7          MCW   BLKDCW&  4        BLKTST& 11               1457  M 096 V50
 5 480   4          B     BLKTST                                       1464  B V39       CORRECT TAPE
 5 490   1  FXBBLK  H                                                  1468  .           READ AREA
 5 491   7          MCW   ZZZERO             RCOUNT                   1469  M L06 L12
 5 500   7          MCW   BBLKCT             CDCNT                    1476  M V07 L16   BY HAND
 5 510   5          CU    %U1                            B           1483  U %U1 B
 5 520   8          MCW   %U1                TPNTRY      R           1488  M %U1 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   *                  BBLKND            U34     1510
 5 580   7  UPCNT   MCW   ONE80              PCHMOV&  6               1511  M K08 693   UPDATE RECORD
 5 590   7          MCW   BRCMP              SW8    &  3               1518  M K95 ‡92   COUNT
 5 600   7          A     ONE80 -  2         RCOUNT                   1525  A K06 L12
 5 610   7          MCW   ZZZERO             MPLCDS                   1532  M L06 L28
 5 620   7  BLKTST  C     RECBLK             RCOUNT                   1539  C K00 L12   TEST FOR END
 5 630   5          B     TSTXCP                         T           1546  B 997 T     OF BLOCK
 5 640   7          A     RECBLK             RECTOT                   1551  A K00 L20   UPDATE REC TOT
 5 650   7          MCW   ZZZERO             RCOUNT                   1558  M L06 L12   COUNT
 5 660   4          MCW   ZZZERO                                       1565  M L06       RESET RECORD
 5 670   4          MCW   ZZZERO                                       1569  M L06       COUNTER AND
 5 680   4          B     LDREAD-  7                                   1573  B 542       ADD COUNTER
 5 690   4          B     MOVTAP-  4                                   1577  B 949
 5 700   8  CVTTST  B     CONVRT             0101                     1581  B W31 101
 5 710   4          SW    CVTTST&  4                                   1589  , V85       FOR CONVERSION
 5 720   7          A     ONE80 -  2         CVTTST&  6               1593  A K06 V87   OF 705 GPMK
 5 730   4          CW    CVTTST&  4                                   1600  ¤ V85       TO 1401 GPMK
 5 740   7          C     CVTTST&  6         ONE80                    1604  C V87 K08
 5 750   5          B     *      &  5                T           1611  B W20 T
 5 760   4          B     CVTTST                                       1616  B V81
 5 770   7          MCW   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          MCW   CVTTST&  6         CONMOV&  6               1635  M V87 W52
 5 810   4          CW    CVTTST&  4                                   1642  ¤ V85
 5 820   7  CONMOV  MCW   0595                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-  4                                   1669  B 949
 5 880   4  FILEND  CS    0299                                         1673  / 299       CLEAR PRINT
 5 890   4          CS    0180                                         1677  / 180       PUNCH AND
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PG LIN  CT  LABEL    OP   A OPERAND       B OPERAND       D      LOC   INSTRUCTION COMMENTS     0495

 5 900   4          CS   0080                                   1681  / 080       READ AREAS
 5 910   1          P                                           1685  4           DUMMY PUNCH
 5 920   7          MCW  CONST3          0225                   1686  M N41 225   MOVE REC TOT
 5 930   4          MCW  RECTOT                                 1693  M L20       AND CD CNT TO
 5 940   4          MCW  CONST2                                 1697  M N32       PRINT AREA
 5 950   4          MCW  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            0001                   1716  , 101 001
 6 010   7          MCW  0225            RECTOT                 1723  M 225 L20   RESET REC TOT
 6 020   1          MCW                                         1730  M           AND CD CNT CNTRS
 6 030   1          MCW                                         1731  M
 6 040   7          MCW  PRTPCH&  7      XTRPCH                 1732  M /12 ‡20
 6 050   8          B    ALTSTK          PUNCH &  3        N    1739  B Y46 ‡87 N ALTERNATE STACKR
 6 060   7          MCW  NOP             PUNCH &  3             1747  M L25 ‡87
 6 070   5          B    SWB ON                             B    1754  B Y75 B     BR HALT ON B
 6 080   8 TSTALL   B    ALLTAP          NUMFIL                 1759  B Y79 K02   BR TRAIL EOR
 6 090   4          B    TYPFIL                                 1767  B Z93
 6 100   4 TSTNUM   B    MLTFIL                                 1771  B X94       BR TO SPEC FILES
 6 110   4          SW   FILCMP&  4                            1775  , 914       UPDATE SELECT
 6 120   7          A    TWO             FILCMP&  6             1779  A L29 916   FILE COUNT
 6 130   4          CW   FILCMP&  4                            1786  ¤ 914
 6 140   4          B    NEWFIX                                 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    NEWFIX                             /    1808  B Z59 /     BR ON MORE FILES
 6 180   4 PROSND   CS   0299                                   1813  / 299
 6 190   7          MCW  ZZZERO-  1      FILTOT                 1817  M L05 L32   RESET FILE COUNT
 6 200   4          SW   0201                                   1824  , 201
 6 210   4          CS   TPNTRY& 98                            1828  / P99
 6 220   5          B    FILE                               E    1832  B Y42 E     NO REWIND
 6 230   5 REEL     CU   %U1                                R    1837  U %U1 R     REWIND TAPE
 6 240   4 FILE     H    NEWFIX                                 1842  . Z59       HALT BR NEW FIX
 6 250   7 ALTSTK   MCW  LETR K           PUNCH &  3             1846  M L30 ‡87
 6 260   4          B    TSTALL-  5                            1853  B X54
 6 270   7 ENDFIL   MCW  ZZZERO-  1      FILNUM                 1857  M L05 J82   RESET SELECT
 6 280   7          MCW  LOCSLF          FILCMP&  6             1864  M 099 916   FILE COUNTER
 6 290   4          B    PROSND                                 1871  B Y13
 6 300   4 SWB ON   H    TSTALL                                 1875  . X59
 6 310   7 ALLTAP   LCA  GPMK78          TPNTRY& 80             1879  L L24 P81
 6 320   8          LCA  %U1             TPNTRY            R    1886  L %U1 P01 R
 6 330   4          MCW  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   %U1                                B    1907  U %U1 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
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PG LIN  CT  LABEL   OP    A OPERAND       B OPERAND       D       LOC   INSTRUCTION COMMENTS    0545

 6 400   5  TRALRT  B     BKSPSE                          /       1931  B Z07 /     STORED FROM CARD
 6 410   4          B     PROSND                                  1936  B Y13
 6 420   7  TRALOK  C     TWO             TWO                     1940  C L29 L29
 6 430   7          MCW   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  RDADTL  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          MCW   %U1             TPNTRY          R       2004  M %U1 P01 R LABELS
 6 590   4          MCW   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                          K       2024  B X71 K
 6 630   8          B     TRALES          TPNTRY& 80              2029  B -71 P81
 6 640   7          MCW   TPNTRY& 79      0280                    2037  M P80 280
 6 650   7  TRANRC  MCW   0280            0180                    2044  M 280 180
 6 660   1          W                                             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  MCW   TPNTRY& 79      0280                    2071  M P80 280
 6 720   1          MCW                                           2078  M
 6 730   4          B     TRANRC                                  2079  B -44
 6 740   4  HDRPRO  B     SW1   -  8                              2083  B 891       PROCESS HEADER
 6 750   8          MCW   %U1             TPNTRY          R       2087  M %U1 P01 R LABELS BETWEEN
 6 760   4          MCW   BLANK                                   2095  M L03       FILES
 6 770   1          CW                                            2099  ¤
 6 780   5          B     SW1   -  8                      K       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   MCW   TPNTRY& 79      0200                    2128  M P80 200   SECOND 80 CHAR
 6 850   7          NOP   0280            0180                    2135  N 280 180
 6 860   1          W                                             2142  2
 6 870   4          CS    0280                                    2143  / 280
 6 880   7          SW    0201            0200                    2147  , 201 200
 6 890   7          MCW   B               PART1 -  4              2154  M L26 J05
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PG LIN  CT  LABEL   OP    A OPERAND       B OPERAND       D      LOC   INSTRUCTION COMMENTS    0595

 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    %U1                              B       2172  U %U1 B
 6 930   4          B     SW1    -  8                              2177  B 891
 6 940   2  FILNUM  DCW   *                                        2182
 6 950   2  SLFIL1  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  CONST1  DCW   *                              P00       2193
 7 010   4  RECLNG  DCW   *                                        2197
 7 020   3  RECBLK  DCW   *                                        2200
 7 030   2  NUMFIL  DCW   *                                        2202
 7 040   1  ENDTYP  DCW   *                                        2203
 7 050   2  FXCDNO  DCW   *                                        2205
 7 060   3  ONE80   DCW   *                              180       2208
 7 070   3  ZERO80  DCW   *                              080       2211
 7 080   1  SIX     DCW   *                                6       2212
 7 090  80  FIXED   DS    *                                        2292
 7 100   3  BRCMP   DSA   *               CMP            607       2295
 7 110   3  BRUPCT  DSA   *               UPCNT          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  ADLNGH  DCW   *                                        2309
 7 170   3  RCOUNT  DCW   *                                        2312
 7 180   4  CDCNT   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   *                                B       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
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PG LIN  CT  LABEL   OP    A OPERAND      B OPERAND       D        LOC   INSTRUCTION COMMENTS    0645

 7 400  12          DCW   *                                       2488
 7 410  12          DCW   *                                       2500
 7 420  12          DCW   *                                       2512
 7 430  12          DCW   *                                       2524
 7 440   8  CONST2  DCW   *                             CDCNT     2532
 7 450   9  CONST3  DCW   *                            NUM REC    2541
 7 460   2  SELTOT  DCW   *                                       2543
 7 470   2  FULTOT  DCW   *                                       2545
 7 480   1  SEQTOT  DCW   *                                       2546
 7 490   2  TWELVE  DCW   *                                 12    2548
 7 500   2  CONTRL  DCW   *                                       2550
 7 510   4  ZZ80    DCW   *                               0080    2554
 7 520   3  BCLP1   DSA   *              CLPCH1             751    2557
 7 530   3  BCLP2   DSA   *              CLPCH2             802    2560
 7 540  80  TRALOC  DS    *                                       2640
 7 550   3  BRFILE  DSA   *              FILE               Y42    2643
 7 560   1  THREE   DCW   *                                  3    2644
 7 570   3  SQBASE  DSA   *              SQFLD1             050    2647
 7 580   3  SQFLD1  DCW   *                                       2650
 7 590   3  SQFLD2  DCW   *                                       2653
 7 600   3  SQFLD3  DCW   *                                       2656
 7 610   1  SEQCNT  DCW   *                                       2657
 7 620   1  LETR F  DCW   *                                  F    2658
 7 630   3  ONE00   DCW   *                                100    2661
 7 640   3  BRUP    DSA   *              UPCNT & 14         V25    2664
 7 650   3  BRVAR   DSA   *              VNDTST-  7         649    2667
 7 660   2  STKHLD  DCW   *                                       2669
 7 670   2  KEIGHT  DCW   *                                 K8    2671
 7 680   1  FIRSTX  DCW   *                                       2672
 7 690   1  SECNDX  DCW   *                                       2673
 7 700   3  LCPTPN  DSA   *              PRTPCH             /05    2676
 7 710   3  BRXEND  DSA   *              XCPEND             S56    2679
 7 720   1  XCHAR1  DCW   *                                       2680
 7 730   3  ADDEX1  DCW   *                                       2683
 7 740   1  XCHAR2  DCW   *                                       2684
 7 750   3  ADDEX2  DCW   *                                       2687
 7 760   1  MVDIGT  DCW   *                                  D    2688
 7 770   1  LETR S  DCW   *                                  S    2689
 7 780   3  LOCSW4  DSA   *              SW4                ‡01    2692
 7 790   1  LETR Y  DCW   *                                  Y    2693
 7 800   1  FOUR    DCW   *                                  4    2694
 7 810   2  SELCTR  DCW   *                                       2696
 7 820              EX    START                                          B P01
 7 830              ORG   2701
 7 840   8          B     TPUNIT         0117                     2701  B A50 117   BR NO EXCEPTIONS
 7 850   7          MCW   B              TSTXCP                   2709  M L26 997   SET INSTRUCTIONS
 7 860   8          B     FIXCPT         0160                     2716  B P77 160   FOR EXCEPTION
 7 870   8  OPTST   B     PRINTX         0117           2         2724  B P59 117 2 OPTION DESIRED
 7 880   8          B     PTPCHX         0117           3         2732  B P92 117 3
 7 890   8          B     STKSLX         0117           4         2740  B Q03 117 4
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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   RETSTK&  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    PICK UP PARAMTRS
 8 050   5          B     ERROR                           T       2838  B P88 T      FOR EXCEPT OPTS
 8 060   7          MCW   0118            XCHAR1                  2843  M 118 080    ANALYZE AND
 8 070   8          B     XLOC1M          0121            1       2850  B A07 121 1  MODIFY INST
 8 080   7          A     0124            ADDEX1                  2858  A 124 083    TO PROCESS
 8 090   8          B     NOCHR2          0126                    2865  B &63 126    EXCEPTION RECORD
 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      0120            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   8  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   LOCSW4          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
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PG LIN  CT  LABEL   OP   A OPERAND      B OPERAND       D      LOC   INSTRUCTION COMMENTS    0745

 8 400   4          B    STORE2                                 3081  B Q73
 8 410   7  ZNCHR1  MCW  LETR Y         TSTCH1                  3085  M 093 /70
 8 420   4          B    DGCHR1                                 3092  B R26
 8 430   7  ZNCHR2  MCW  LETR Y         TSTCH2                  3096  M 093 /93
 8 440   4          B    DGCHR2                                 3103  B &25
 8 450   7  XLOC1M  MZ   LETR Y         0122                    3107  Y 093 122
 8 460   4          B    STORE2- 15                             3114  B Q58
 8 470   7  XLOC2M  MZ   LETR Y         0128                    3118  Y 093 128
 8 480   4          B    STORE2& 15                             3125  B Q88
 8 490   7  STKX    MCW  SW8   -  1     STKHLD                  3129  M ‡88 069
 8 500   7  XCPSTK  MCW  KEIGHT         SW8   -  1              3136  M 071 ‡88
 8 510   7  RETSTK  MCW  STKHLD         SW8   -  1              3143  M 069 ‡88
 8 520   8  TPUNIT  B    PGMSEL         0142                    3150  B B46 142    BR NO SPEC TUNIT
 8 530   4          SW   0142                                   3158  , 142
 8 540   7          MCW  0142           UNITNO                  3162  M 142 K99    MOVE SPECIFIED
 8 550   7          MCW  UNITNO         ALLTAP& 10              3169  M K99 Y89    TAPE UNIT NUM
 8 551   7          MCW  UNITNO         TPECNT& 32              3176  M K99 T42
 8 560   7          MCW  UNITNO         TYPFIL& 14              3183  M K99 -07    INTO ALL TAPE
 8 570   7          MCW  UNITNO         REEL  &  3              3190  M K99 Y40    INSTRUCTIONS
 8 580   7          MCW  UNITNO         BKSPSE&  3              3197  M K99 Z10
 8 590   7          MCW  UNITNO         MOVTAP&  3              3204  M K99 956
 8 600   7          MCW  UNITNO         TAPMOV&  3              3211  M K99 930
 8 610   7          MCW  UNITNO         FXBBLK& 18              3218  M K99 U86
 8 620   7          MCW  UNITNO         FXBBLK& 23              3225  M K99 U91
 8 630   7          MCW  UNITNO         HDRPRO&  7              3232  M K99 -90
 8 640   7          MCW  UNITNO         INITL & 10              3239  M K99 J75
 8 650   4  PGMSEL  CS   0080                                   3246  / 080        SELECT PROPER
 8 660   7          SW   0024           0056                    3250  , 024 056    ROUTINE FOR
 8 670   7          SW   0063           0067                    3257  , 063 067    MAIN PROGRAM
 8 680   1          R                                           3264  1
 8 690   8          B    SELPGM         0160                    3265  B B77 160
 8 700   4          B    RUNOUT                                 3273  B B97
 8 710   8  SELPGM  B    0056           RECLNG-  3       V      3277  B 056 J94 V READ VARIABLE
 8 720   8          B    0056           0076             2      3285  B 056 076 2 READ FIXED
 8 730   4          R    SELPGM&  8                             3293  1 B85
 8 740   8  RUNOUT  B    0056           0076                    3297  B 056 076    RD ANAL
 8 750   4          R    RUNOUT                                 3305  1 B97
 8 760   1          NOP                                         3309  N
 8 770              EX   OPTST - 23                                   B P01
 8 780              ORG  0600
 8 790   7  VARECD  MCW  CONST1         VARINS& 10              0600  M J93 690    SET INSTRUCTIONS
 8 800   7          MCW  VCONST         VNDTST&  6              0607  M 737 662    TO PROCESS
 8 810   7          MCW  ONE00          VARINS& 13              0614  M 061 693    VARIABLE LENGTH
 8 820   7          SW   VARINS&  8     VNDTST&  4              0621  , 688 660
 8 830   7          A    ONE80 -  2     VARINS& 13              0628  A K06 693
 8 840   7          A    ONE80 -  2     VARINS& 10              0635  A K06 690
 8 850   7          A    ONE80 -  2     VNDTST&  6              0642  A K06 662
 8 860   7          CW   VARINS&  8     VNDTST&  4              0649  ¤ 688 660
 8 870   8  VNDTST  BWZ  VAREND         0000             1      0656  V 698 000 1
 8 880   7          C    VARINS& 13     ONE80                   0664  C 693 K08
 8 890   5          B    VARINS                          S      0671  B 680 S
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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            SW8    & 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             SW8    & 3             0698  M 064 ‡92
 8 950   4          CS    0180                                    0705  / 180
 8 960   7          SW    VNDTST&  4       0101                   0709  , 660 101
 8 970   7          MCW   VNDTST&  6       VARCWM&  3             0716  M 662 730
 8 980   4          CW    VNDTST&  4                              0723  ¤ 660
 8 990   4  VARCWM  CW    0000                                    0727  ¤ 000
 9 000   4          B     VARINS&  7                              0731  B 687
 9 010   3  VCONST  DCW   *                                  P01 0737
 9 020              EX    RUNOUT                                        B B97
 9 030              ORG   0600
 9 040   7  CREG    MCW   RECLNG           CHAREG                 0600  M J97 084    SET CHAR CNT
 9 050   7  CMP     C     ZZ80             CHAREG                 0607  C N54 084    FOR FIX LNG REC
 9 060   5          B     ADD80                             U    0614  B 659 U      BR OVER 80 CHAR
 9 070   4          CS    0180                                    0619  / 180
 9 080   7          SW    0101             PCHMOV&  5             0623  , 101 692
 9 090   7          MCW   BRUPCT           SW8    & 3             0630  M K98 ‡92    SET SW8 TO REC E
 9 100   7  SETPCH  MCW   CHAREG           PCHMOV&  6             0637  M 084 693    SET MOVE INST
 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    UPDATE RECORD CT
 9 150   7          S     ZZ80             CHAREG                 0666  S N54 084    UPDATE CHAR CTR
 9 160   7          MZ    BLANKS-  1       CHAREG                 0673  Y J89 084
 9 170   7  RECMOV  MCW   RECORD           PCHMOV&  3             0680  M 183 690
 9 180   7  PCHMOV  MCW   0000             0180                   0687  M 000 180    MOVE REC PART
 9 190   1          NOP                                           0694  N            TO PUNCH AREA
 9 200   4          B     NUMCDS                                  0695  B ‡33
 9 210   8  COLBIN  MCW   %B1               TPNTRY           R    0699  M %B1 P01 R  PROCESS MIXED
 9 220   5          B     TAPERB                             L    0707  B 793 L      BINARY AND BCD
 9 230   7          MCW   ZZZERO           BERCNT                 0712  M L06 854    RECORDS
 9 240   5          B     FILWMK                             K    0719  B 773 K
 9 250   8          MCW   TPNTRY&159       0580             B    0724  M Q60 580 B
 9 260   7          A     ONE80 -  2       CDCNT                  0732  A K06 L16    UPDATE CD CNT
 9 270   7          A     ONE80 -  2       RECTOT                 0739  A K06 L20    AND REC TOT
 9 280   7          MCW   SW8    -  2       *      & 3             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  ¤ Q69
 9 320   8          B     COLBIN           TPNTRY&161       5    0761  B 699 Q62 5  TEST LOOK
 9 330   4          B     MOVTAP                                  0769  B 953        AHEAD
 9 340   4  FILWMK  CW    TPNTRY&  1                              0773  ¤ P02
 9 350   4          B     FILEND                                  0777  B W73
 9 360   8  TSTBIN  B     MOVTAP           TPNTRY&  80            0781  B 953 P81
 9 370   4          B     COLBIN                                  0789  B 699        AHEAD
 9 38    8  TAPERB  B     BINBBK           BERCNT-  1       1     0793  B 829 853 1
 9 39    5          CU    %U1                                B    0801  U %U1 B
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PG LIN  CT  LABEL   OP    A OPERAND       B OPERAND       D       LOC   INSTRUCTION COMMENTS   20846

 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      BERCNT                  0818  A K06 854    SET FOR
 9 430   4          B     COLBIN                                  0825  B 699
 9 440   4  BINBBK  B     COLBIN& 13                              0829  B 712        SET INST
 9 450   1          H                                             0833  .            FOR BIN
 9 460   5          CU    %U1                             B       0834  U %U1 B
 9 470   8          MCW   %B1             TPNTRY          R       0839  M %B1 P01 R PROCEDURE
 9 480   5          B     COLBIN& 13                      G       0847  B 712 G
 9 490   1          H                                             0852  .
 9 500   2  BERCNT  DCW   *                                       0854
 9 510              EX    RUNOUT                                        B B97
 9 520              ORG   2701
 9 530   8  VARTST  B     VRANAL          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          SW    0401                                    2722  , 401
 9 580   8          B     MIXED           0143            2       2726  B D43 143 2 BR MIXED BINARY
 9 590   7          MCW   B               MOVTAP&  2              2734  M L26 955
 9 591   7          MCW   *      &  1     BDBLCK&  7              2741  M P48 T98
 9 600   7          MCW   B               TAPMOV&  2              2748  M L26 929    SET BCD FIXED
 9 610   7          MN    NOP             AUTTOT&  4              2755  D L25 ‡44    LENGTH ROUTINE
 9 620   7          MN    NOP             GPFIX &  4              2762  D L25 ‡97    TO OPERATE IN
 9 630   7          CW    GPFIX &  7      AUTTOT&  7              2769  ¤ /00 ‡47    BINARY MODE
 9 640   7          MCW   B               AUTTOT&  7              2776  M L26 ‡47
 9 650   7          MCW   B               GPFIX &  7              2783  M L26 /00
 9 660   7          LCA   BINPCH          PUNCH &  1              2790  L G04 ‡85
 9 670   7          LCA   BINPCH          XTRPCH&  1              2797  L G04 ‡21
 9 671   7          LCA   BINPCH          PRTPCH&  8              2804  L G04 /13
 9 672   7          MCW   NOP             BBLKND&  5              2811  M L25 U39
 9 673   7          MCW   NOP             BBLKND& 12              2818  M L25 U46
 9 674   7          MCW   NOP             BDBLCK                  2825  M L25 T91
 9 675   7          MCW   NOP             BDBLCK&  7              2832  M L25 T98
 9 680   7          MCW   NOP             CMP                     2839  M L25 607
 9 690   7          MCW   NOP             CMP    &  7             2846  M L25 614
 9 700   7          C     RECLNG          ONE68                   2853  C J97 F91
 9 710   5          B     FULLCD                          S       2860  B E73 S
 9 720   7          MCW   RECLNG          CVTPCH                  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          CVTPCH                  2880  A J97 G02
 9 760   7          MCW   CVTPCH-  1      BPCHMV-  1              2887  M G01 F98
 9 770   7  PCHSET  MCW   NOP             SETPCH                  2894  M L25 637
 9 780   7          LCA   BPCHMV          PCHMOV&  7              2901  L F99 694
 9 790   7          MCW   NOP             UPCNT                   2908  M L25 V11
 9 800   7          MCW   NOP             UPCNT &  7              2915  M L25 V18
 9 810   7  FINISH  MCW   UNITNO          CLRTPE& 19              2922  M K99 &33
 9 820   7          MCW   UNITNO          BACKUP&  3              2929  M K99 E67
 9 830   8          B     NOSEL           SLFIL1                  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             TSTALL                  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 &06
 9 870   8  NOSEL   B     REELND          NUMFIL                  2962  B R77 K02   SET INST FOR
 9 880   4          B     HEADR                                   2970  B &06       SPECIFIC FILE NU
 9 890   3  LCNWFX  DSA   *               NEWFIX            Z59   2976
 9 900   7  REELND  MCW   LCNWFX          TYPFIL&  3              2977  M R76 Z96   SET INST FOR
 9 910   7          MCW   LCNWFX          TRANRC- 17              2984  M R76 -27   TRAIL OR 2 TP
 9 920   8          B     HEADR           ENDTYP          1       2991  B &06 K03 1 MKS EOR
 9 930   7          MCW   NOP             BKSPSE-  9              2999  M L25 Y98
 9 940   8  HEADR   B     NOHDER          0147                    3006  B E84 147
 9 950   7  CLRTPE  LCA   GPMK78          TPNTRY&199              3014  L L24 R00
 9 960   4          CS    TPNTRY&198                              3021  / Q99
 9 970   1          CS                                            3025  /
 9 980   4          SW    TPNTRY                                  3026  , P01
 9 990   8          MCW   %U1             TPNTRY          R       3030  M %U1 P01 R
10 000   4          MCW   BLANK                                   3038  M L03
10 010   1          CW                                            3042  ¤
10 020   5          B     LDCLER                          K       3043  B F50 K
10 030   4          NOP   BACKUP                                  3048  N E64
10 040   4          SW    0144                                    3052  , 144
10 050   7          LCA   0157            0097                    3056  L 157 097
10 060   8          B     PRTHDR          0087            1       3063  B A44 087 1
10 070   8          B     PCHHDR          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 &48   SET INSTRUCTIONS
10 110   8          B     CLRTPE& 16      0097                    3098  B &30 097   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 &30 097 1 BETWEEN FILES
10 150   7  HDPTR   MCW   NOP             TYPFIL                  3129  M L25 Z93
10 160   4          B     CLRTPE& 16                              3136  B &30
10 170   4          B     CLRTPE& 16                              3140  B &30
10 180   7  PRTHDR  C     0086            ZERO80                  3144  C 086 K11   PRINT HEADER
10 190   5          B     DBLINE                          T       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          CW    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  N 280 180
10 270   1          W                                             3205  2
10 280   2          CC                                    1       3206  F 1
10 290   4          CS    0280                                    3208  / 280
10 300   4          SW    0201                                    3212  , 201
10 310   4          B     AFT1ST                                  3216  B &91
10 320   7  DBLINE  MCW   PRTINS& 21      PART1 & 14              3220  M B05 J23
10 330   7          MCW   DBLINE          PART1                   3227  M B20 J09
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PG LIN  CT  LABEL   OP    A OPERAND        B OPERAND        D    LOC   INSTRUCTION COMMENTS     0946

10 340   7          MCW   DBLINE- 12       PART1 & 15            3234  M B08 J24
10 350   4          CS    0280                                   3241  / 280
10 360   7          MCW   TPNTRY& 79       0280                  3245  M P80 280
10 370   7          NOP   0280             0180                  3252  N 280 180
10 380   1          W                                            3259  2
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          MCW   DBLINE& 28       PRTINS&  3            3282  M B48 A87
10 440   7          MCW   DBLINE           PART1 &  7            3289  M B20 J16
10 450   4          B     PRTHDR& 12                             3296  B A56
10 460   7  PCHHDR  MCW   PCHHDR            DBLINE& 32            3300  M C00 B52   PUNCH HEADER
10 470   7          MCW   SIX              DBLINE& 39            3307  M K12 B59   AND TRAILER
10 480   7          MCW   PCHHDR           PRTINS& 14            3314  M C00 A98
10 490   7          MCW   SIX              PRTINS& 21            3321  M K12 B05
10 500   7          MCW   PCHHDR           PART2 &  7            3328  M C00 J35
10 510   7          MCW   SIX              PART2 & 14            3335  M K12 J42
10 520   7          MCW   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   COMPARE HEADER
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          CW    HDCMP &  1       HDCMP &  4            3382  ¤ C90 C93
10 600   7  HDCMP   C     3801             TPNTRY                3389  C H01 P01
10 610   5          B     SETEND                           S    3396  B D05 S
10 620   4          B     HDRMSG                                 3401  B D23
10 630   7  SETEND  MCW   NOP              PART2 & 14            3405  M L25 J42
10 640   7          MCW   NOP              TRANRC&  7            3412  M L25 -51
10 650   4          B     AFTIST                                 3419  B £91
10 660   7  HDRMSG  MCW   HDERR            0220                  3423  M F85 220
10 670   1          W                                            3430  2
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   MCW   B                SW2                   3443  M L26 949   SET MAIN ROUTINE
10 720   7          MCW   NOP              UPCNT &  7            3450  M L25 V18
10 730   7          MCW   UNITNO           BINBBK& 13            3457  M K99 842
10 740   8          B     *      &  8      0158                  3464  B D79 158
10 750   7          MCW   NOP              BINBBK                3472  M L25 829
10 760   7          MCW   UNITNO           BINBBK&  8            3479  M K99 837
10 770   7          MCW   UNITNO           TAPERB& 11            3486  M K99 804
10 780   7          MCW   UNITNO           COLBIN&  3            3493  M K99 702
10 790   7          MCW   NOP              PUNCH &  2            3500  M L25 ‡86
10 800   7          MCW   BINBR            SW8    &  3           3507  M F88 ‡92
10 810   7          MCW   BINBR            NUMCDS-  1            3514  M F88 ‡32
10 820   7          MCW   BINBR            CVTTST-  1            3521  M F88 V80
10 830   7          MCW   NOP              XTRPCH                3528  M L25 ‡20
```

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PG LIN  CT  LABEL   OP    A OPERAND       B OPERAND       D        LOC   INSTRUCTION COMMENTS    0996

10 840   7          MCW   ZZ80            RECLNG                   3535  M N54 J97
10 841   8          B     FINISH          0158                     3542  B R22 158
10 842   7          MCW   NOP             BINBBK                   3550  M L25 829
10 850   4          B     FINISH                                   3557  B R22
10 860   3  BRPCH   DSA   *               PUNCH              ‡84   3563
10 870   5  BACKUP  CU    %U1                             B        3564  U %U1 B
10 880   4          B     LDCLER                                   3569  B F50
10 890   7  FULLCD  MCW   BNCNST          CONST1                   3573  M G07 J93
10 900   4          B     PCHSET                                   3580  B Q94
10 910   7  NOHDER  MCW   LCLDCL          AFT1ST& 10               3584  M F04 A01
10 920   7          LCA   0157            0097                     3591  L 157 097
10 930   4          B     AFT1ST                                   3598  B &91
10 940   3  LCLDCL  DSA   *               LDCLER             F50   3604
10 950   7  VRANAL  MCW   ALLTAP&  7      MOVTAP                   3605  M Y86 953    SET MAIN PROGRAM
10 960   7          MCW   LCVRCD          SW5    &  3              3612  M F46 ‡08    FOR VARIABLE
10 970   7          MCW   NOP             PUNCH &  2               3619  M L25 ‡86    LENGTH RECORDS
10 980   7          MCW   NOHDER&  7      MOVTAP&  8               3626  M E91 961
10 990   7          MCW   LBLNKS          MOVTAP& 11               3633  M F49 964
11 000   4          B     FINISH                                   3640  B R22
11 010   3  LCVRCD  DSA   *               VARECD             600   3646
11 020   3  LBLNKS  DSA   *               BLANKS             J90   3649
11 030   4  LDCLER  CS    0080                                     3650  / 080
11 040   7          SW    0024            0056                     3654  , 024 056
11 050   7          SW    0063            0067                     3661  , 063 067
11 060   4          R     0056                                     3668  1 056
11 070  14  HDERR   DCW   *                       HEAD COMP UNEQ   3685
11 080   3  BINBR   DSA   *               TSTBIN             781   3688
11 090   3  ONE68   DCW   *                                  168   3691
11 100   8  BPCHMV  DCW   *                            M000580B   3699
11 110   3  CVTPCH  DCW   *                                        3702
11 120   2  BINPCH  DCW   *                                   4C   3704
11 130   3  BNCNST  DCW   *                                  092   3707
11 140   3  BRHDPR  DSA   *               HDRPRO             -83   3710
11 150              EX    VARTST                                         B P01
11 160              ORG   0181
11 170   3  RECORD  DCW   *                                        0183
11 180   3  FLDORG  DSA   *               FLD 1              L44   0186
11 190   2  CHTEST  DCW   *                                        0188
11 200   3  HITEST  DCW   *                                        0191
11 210   3  LOTEST  DCW   *                                        0194
11 220   2  PNTEST  DCW   *                                        0196
11 230   2  TEST    DCW   *                                        0198
11 240              ORG   0081
11 250   4  CHAREG  DCW   *                                        0084
11 260   7  NMCDCW  A     ONE80 -  2      CDCNT                    0085  A K06 L16
11 270   5  BLKDCW  B     TSTXCP                          T        0092  B 997 T
11 280   3  LOCSLF  DSA   *               SLFIL1             J84   0099
11 290              ORG   2901
11 300   4  CLEAR   CS    3997                                     2901  / I97        CLEAR TAPE
11 310   1          CS                                             2905  /            READ-IN AREA
```

```
PG LIN  CT  LABEL   OP    A OPERAND       B OPERAND       D     LOC   INSTRUCTION COMMENTS     1046

11 320   1          CS                                          2906  /           OF ANALYZE
11 330   1          CS                                          2907  /           INSTRUCTIONS
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&198                            2914  / 099
11 410   1          CS                                          2918  /
11 420   4          NOP   TPNTRY                                2919  N P01
11 430   4          CS    0080                                  2923  / 080
11 440   4          SW    0001                                  2927  , 001
11 450   7          CS    SW1   -  8       TPNTRY&298          2931  / 891 R99
11 460             END   CLEAR                                       / R01 080

        1065 CARDS
```

IBM

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	C067
068	C068
119	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:

Item No.	Contents
1	Three patch cards
2	System listing of Version 1, Modification Level 1, 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

```
M18028042B/23@B‡86F‡861L183/73          ,/14,/19,/23,/281L030/34,/12,/138039  C067

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

ML25S45BQ31ML25/42BP24.P88ML25S38BP66 ,P84,P88,P92,P991L037Q02,P73,P77B039  C119
```

IBM
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

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

Table of Contents

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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.

Control Card No.	Columns	Meaning
1	1-4	*Record Length - number of characters (including record mark if present). Enter VVVV in columns 1-4 for variable length records.
1	5-7	*Records per block - 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	*Files within one tape reel to be punched - 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	*End of Reel designation - leave blankfor 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	Enter First selected file number for punching.
1	13-14	Enter Second selected file number for punching.
1	15-16	Enter Third selected file number for punching.
1	17	Exception Record Procedure - 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 stacker (8), (punch 4). If no exception record processing is required, leave blank.
1	18	First exception character - character, digit, or zone.
1	19	Exception code type - 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	Exception disposition 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	First exception character 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	Second exception character
1	26	Second exception disposition.

Control Card No.	Columns	Meaning
1	27-30	Second exception character location on tape.
1	31-32	Intra record card numbering - 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	Inter-record card numbering - 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	Number of Columns - 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	Insertion of Additional Information - 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	High order location - that fixed information is to be punched into, on card(s).
1	40-41	Number of Columns - to be reserved for fixed information (Maximum 80 columns).
1	42	*Tape Unit Selection - any tape unit may be specified, if left blank, unit (1) will be assumed.
1	43	Column Binary records - 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	*Header label length - Punch actual number of up to 160 characters contained in a header label. If no header, leave blank.
1	47	*Header label processing - 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	Field Sequence Checking - 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.

Control Card No.	Columns	Meaning
1	49-50	Sequence field 1 - 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	Sequence field 2 - same as above.
1	53-54	Sequence field 3 - same as above.
1	55	Group Mark Conversion - if it is desired to change 705 group mark to a 1401 group mark punch a (1), if not desired, leave blank.
1	56	Change fixed information - 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	*Header or Trailer - 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	If hand correcting redundant tape transmission is desired, punch a (1), if not wanted, leave blank.
1	59-60	Field selection - 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	First field number of characters - punch total number representing field.
1	63-66	High order 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	High order output field location - punch high order location on card into which selected field is to be punched.
1	69-70	First Field card number - punch number of the card into which the field is to be inserted.
1	71-72	Second field number of characters
1	73-76	Second field high order location on tape record.
1	77-78	Second field high order punch location.
1	79-80	Second field card number.

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

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

	I-Address Displayed	Course of Action
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

	I-Address Displayed	Course of Action
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.

Examples

Example #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

	Card col.	Punch	Description
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

	Card Col.	Punch	Description
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

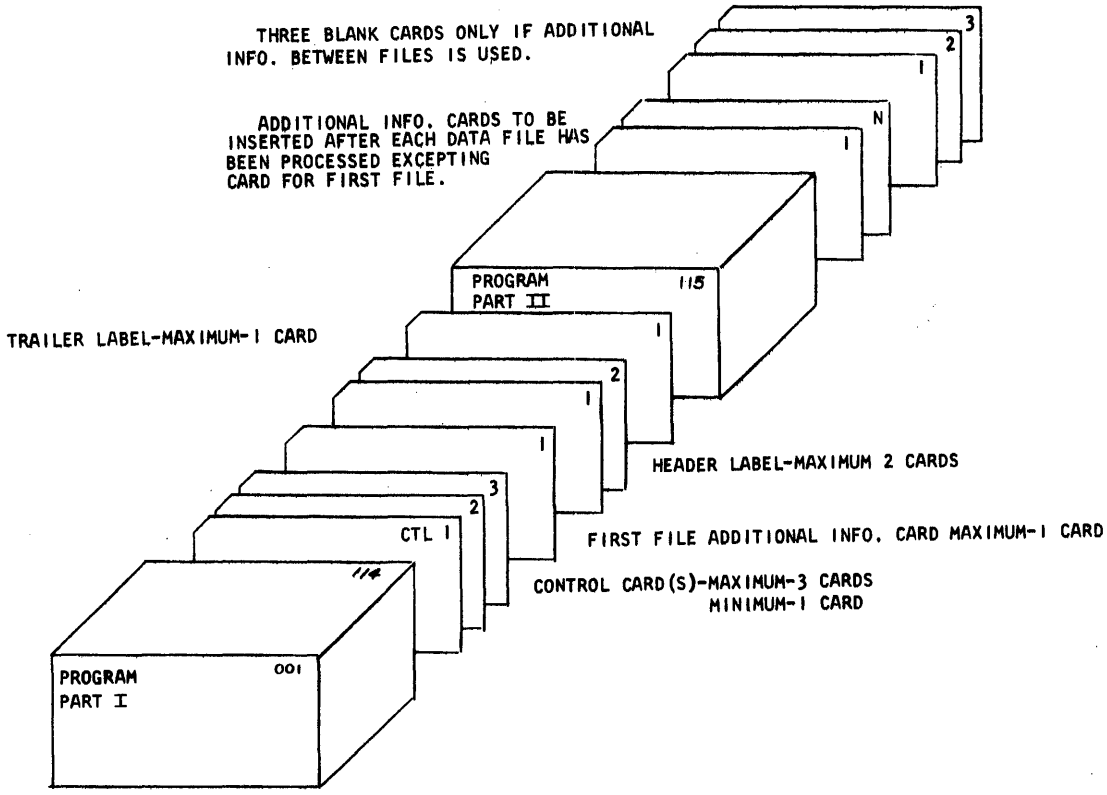
	Card Col.	Punch	Description
1.	1-4	0250	Record Length
2.	5-7	005	Records per block
3.	10	1	Trailer label
4.	17-24	1X2A0001	First exception coding
5.	25-30	Z20012	Second exception coding
6.	33-35	774	File sequencing numbering
7.	36-41	010120	Added card information
8.	42	3	Tape unit used
9.	44-46	120	Header 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

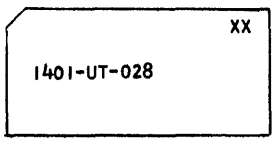
card #2

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

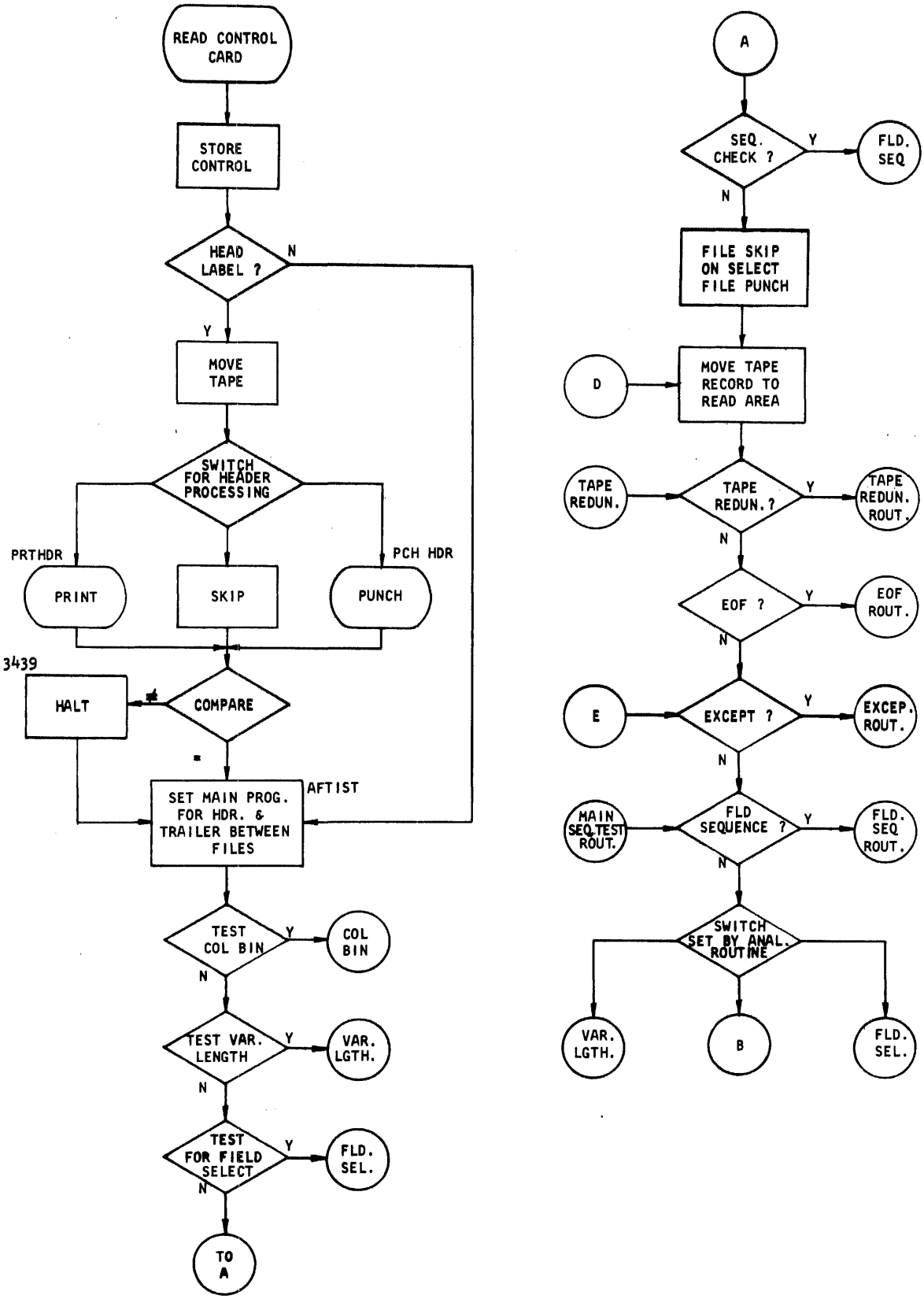


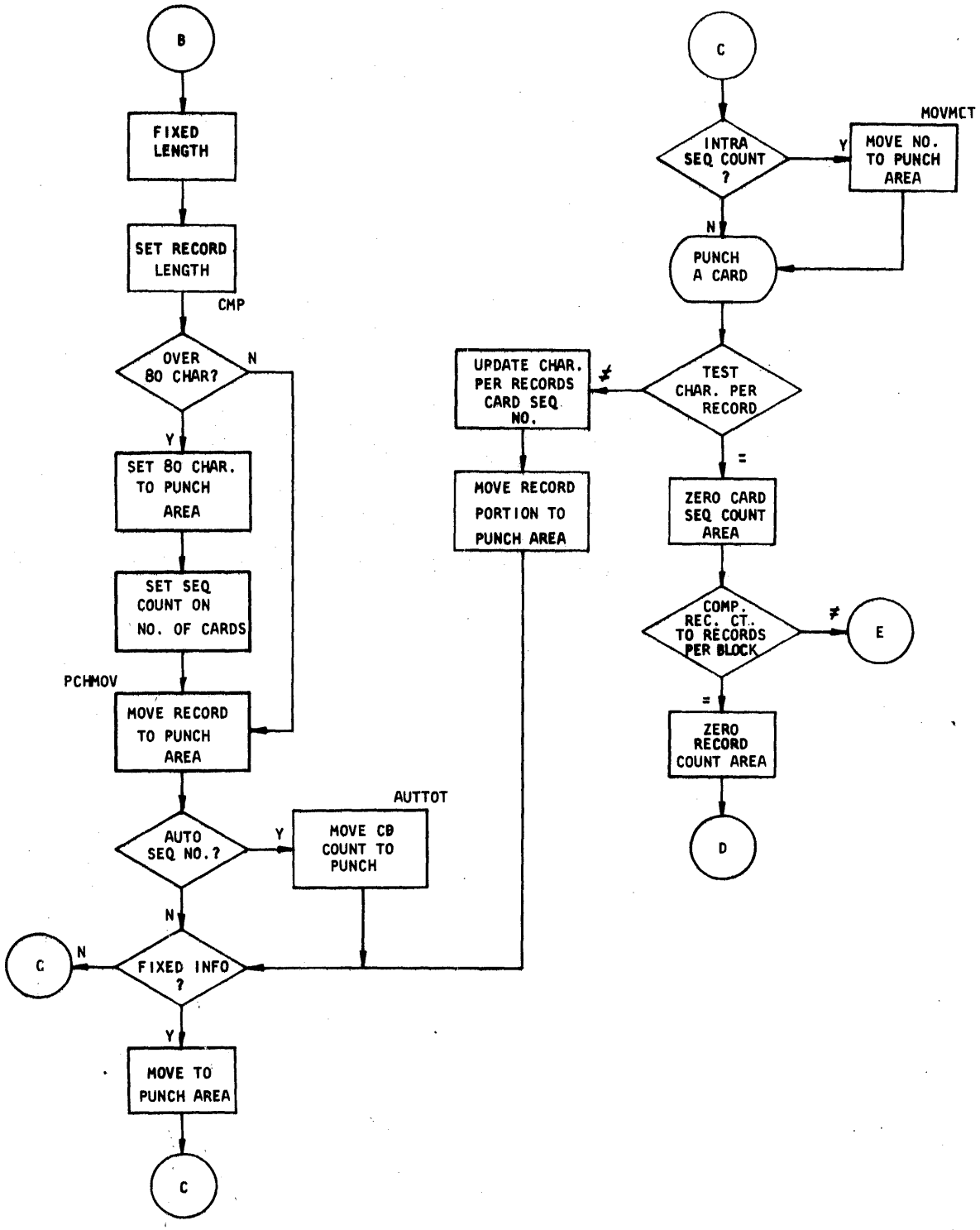


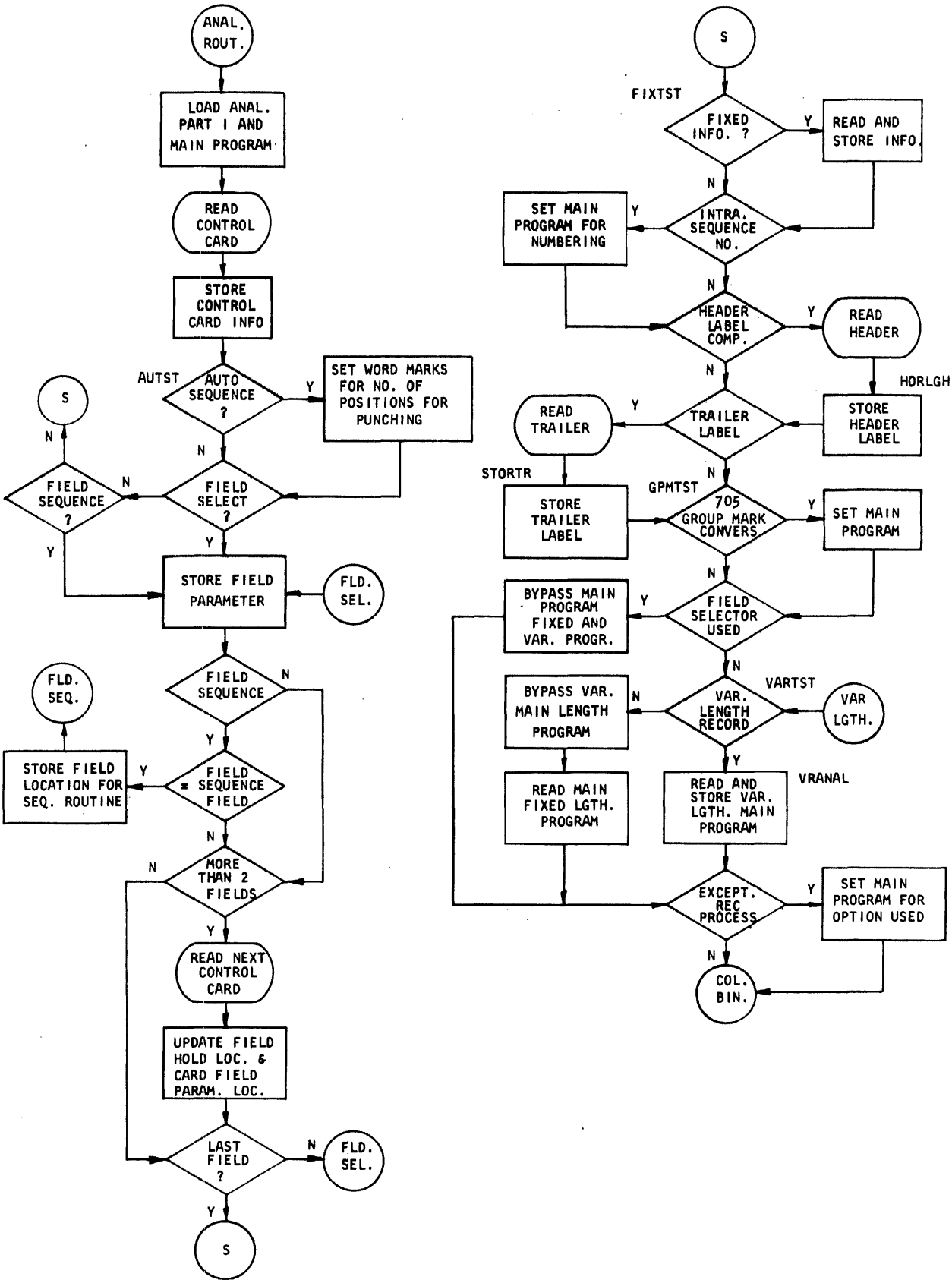
CARD FORMAT

IDENTIFICATION FIELD

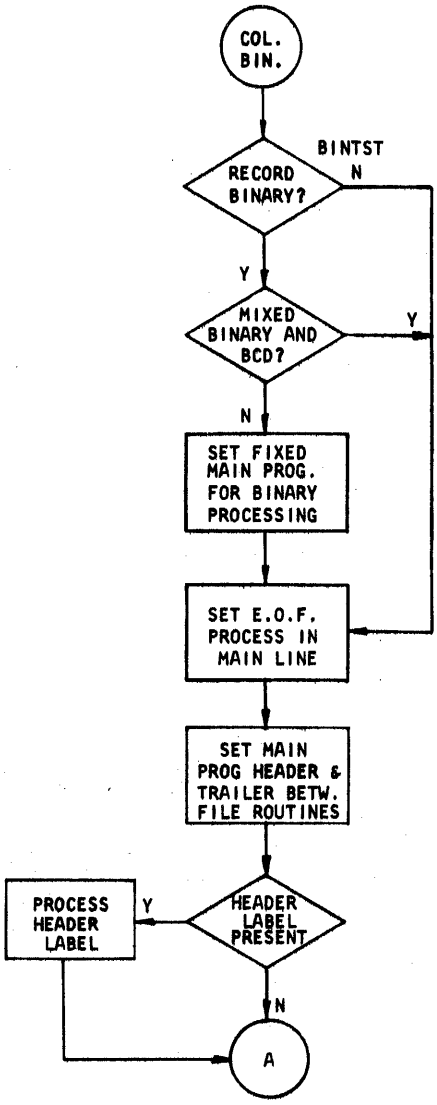
COLUMN	MEANING
78-80	SEQUENCE NUMBER


READ CONTROL CARD
STORE CONTROL
HEAD LABEL ?
N
Y
MOVE TAPE
SWITCH FOR HEADER PROCESSING
PRTHDR
PRINT
SKIP
PUNCH
PCH HDR
3439
HALT
COMPARE
≠
=
AFTIST
SET MAIN PROG. FOR HDR. & TRAILER BETWEEN FILES
TEST COL BIN
Y
COL BIN
N
TEST VAR. LENGTH
Y
VAR. LGTH.
N
TEST FOR FIELD SELECT
Y
FLD. SEL.
N
TO A
A
SEQ. CHECK ?
Y
FLD. SEQ
N
FILE SKIP ON SELECT FILE PUNCH
D
MOVE TAPE RECORD TO READ AREA
TAPE REDUN.
TAPE REDUN. ?
Y
TAPE REDUN. ROUT.
N
EOF ?
Y
EOF ROUT.
N
E
EXCEPT ?
Y
EXCEP. ROUT.
N
MAIN SEQ. TEST ROUT.
FLD SEQUENCE ?
Y
FLD. SEQ ROUT.
N
SWITCH SET BY ANAL. ROUTINE
VAR. LGTH.
B
FLD. SEL.

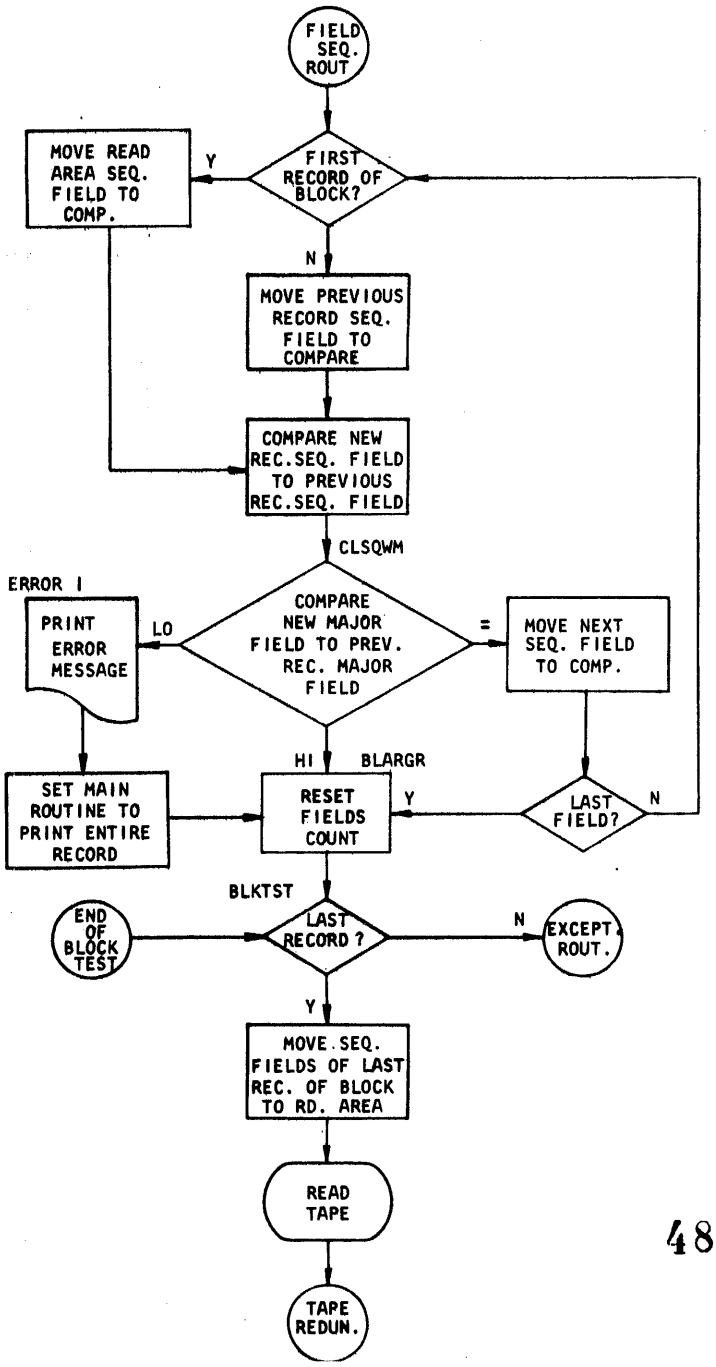

B
FIXED LENGTH
SET RECORD LENGTH
CMP
OVER 80 CHAR?
N
Y
SET 80 CHAR. TO PUNCH AREA
SET SEQ COUNT ON NO. OF CARDS
PCHMOV
MOVE RECORD TO PUNCH AREA
AUTTOT
AUTO SEQ NO.?
Y
MOVE CD COUNT TO PUNCH
N
C
N
FIXED INFO ?
Y
MOVE TO PUNCH AREA
C
C
MOVMCT
INTRA SEQ COUNT ?
Y
MOVE NO. TO PUNCH AREA
N
PUNCH A CARD
TEST CHAR. PER RECORD
≠
UPDATE CHAR. PER RECORDS CARD SEQ NO.
MOVE RECORD PORTION TO PUNCH AREA
=
ZERO CARD SEQ COUNT AREA
COMP. REC. CT. TO RECORDS PER BLOCK
≠
E
=
ZERO RECORD COUNT AREA
D


ANAL. ROUT.
LOAD ANAL. PART I AND MAIN PROGRAM
READ CONTROL CARD
STORE CONTROL CARD INFO
AUTST
AUTO SEQUENCE ?
Y
SET WORD MARKS FOR NO. OF POSITIONS FOR PUNCHING
N
FIELD SELECT ?
N
FIELD SEQUENCE ?
N
S
Y
STORE FIELD PARAMETER
FLD. SEL.
FIELD SEQUENCE
N
Y
FIELD = SEQUENCE FIELD
Y
FLD. SEQ.
STORE FIELD LOCATION FOR SEQ. ROUTINE
N
MORE THAN 2 FIELDS
N
Y
READ NEXT CONTROL CARD
UPDATE FIELD HOLD LOC. & CARD FIELD PARAM. LOC.
LAST FIELD ?
N
FLD. SEL.
Y
S
S
FIXTST
FIXED INFO. ?
Y
READ AND STORE INFO.
N
INTRA. SEQUENCE NO.
Y
SET MAIN PROGRAM FOR NUMBERING
N
HEADER LABEL COMP.
Y
READ HEADER
HDRLGH
STORE HEADER LABEL
N
TRAILER LABEL
Y
READ TRAILER
STORTR
STORE TRAILER LABEL
GPMTST
N
705 GROUP MARK CONVERS
Y
SET MAIN PROGRAM
N
FIELD SELECTOR USED
Y
BYPASS MAIN PROGRAM FIXED AND VAR. PROGR.
N
VARTST
VAR. LENGTH RECORD
N
VAR LGTH.
BYPASS VAR. MAIN LENGTH PROGRAM
Y
VRANAL
READ AND STORE VAR. LGTH. MAIN PROGRAM
READ MAIN FIXED LGTH. PROGRAM
EXCEPT. REC PROCESS
Y
SET MAIN PROGRAM FOR OPTION USED
N
COL. BIN.

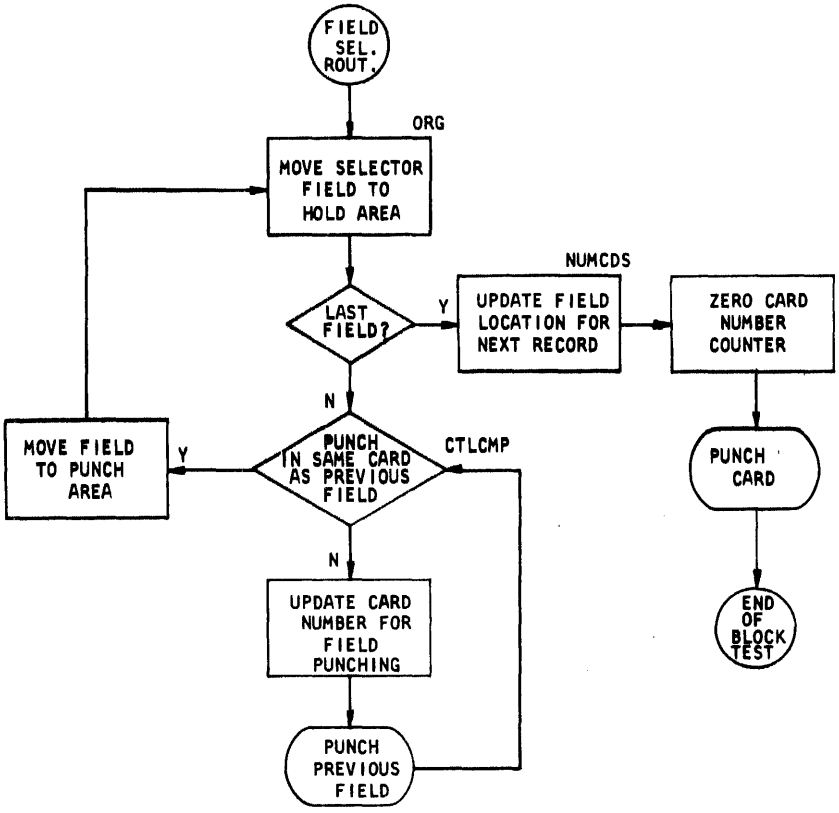
PAGE 2 ANALYZE ROUTINE



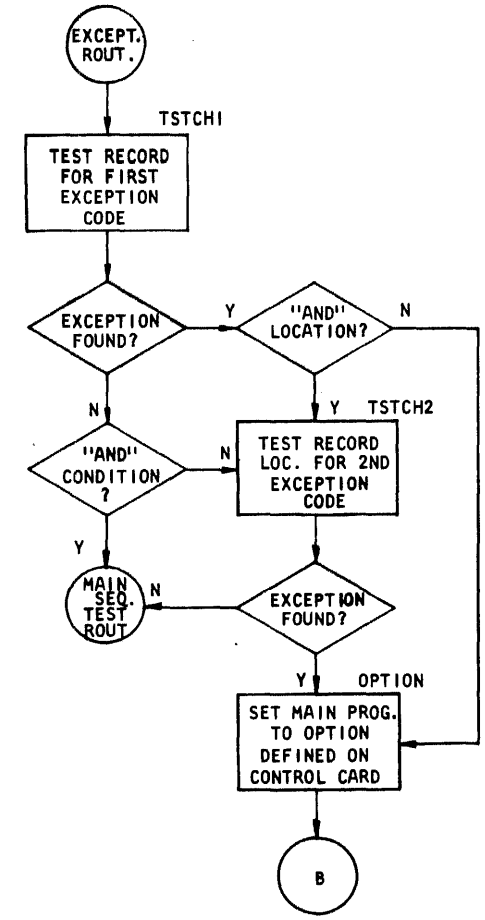
FIELD SEQUENCE ROUTINE

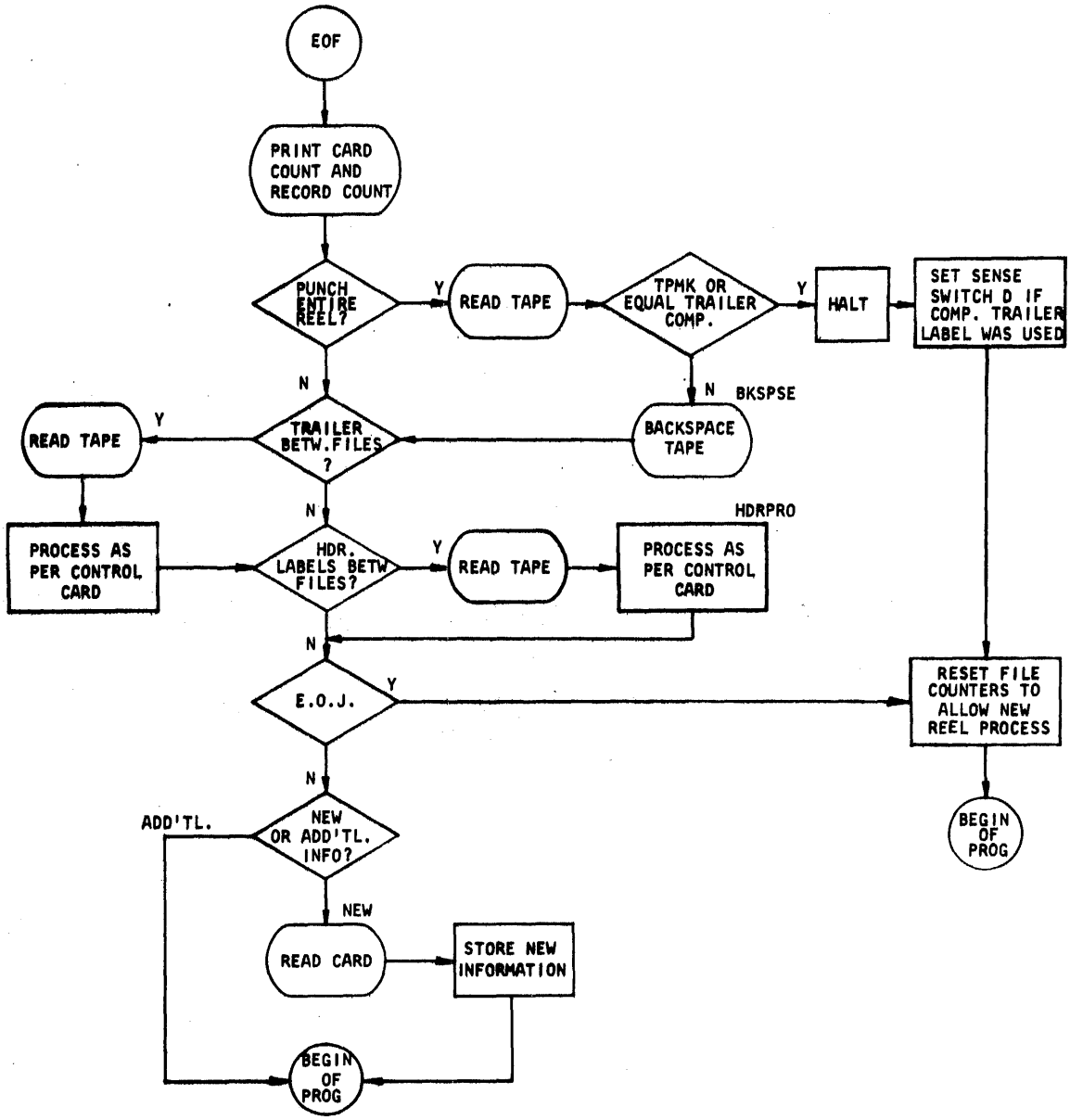


FIELD SELECT ROUTINE



EXCEPTION ROUTINE




EOF
PRINT CARD COUNT AND RECORD COUNT
PUNCH ENTIRE REEL?
Y
READ TAPE
TPMK OR EQUAL TRAILER COMP.
Y
HALT
SET SENSE SWITCH D IF COMP. TRAILER LABEL WAS USED
N
N
BKSPSE
READ TAPE
Y
TRAILER BETW. FILES ?
BACKSPACE TAPE
N
HDRPRO
PROCESS AS PER CONTROL CARD
HDR. LABELS BETW FILES?
Y
READ TAPE
PROCESS AS PER CONTROL CARD
N
E.O.J.
Y
RESET FILE COUNTERS TO ALLOW NEW REEL PROCESS
N
ADD'TL.
NEW OR ADD'TL. INFO?
NEW
READ CARD
STORE NEW INFORMATION
BEGIN OF PROG
BEGIN OF PROG

```
,C03015,022026,03C034,041,045,053,0570731026                                    001
L072116,110106,105117B101/199,027A075029¤027BC010270B026/0991,001/001117100     002
,C08015,022029,036039,043047/039036    ,051,055,056,063N,067071,075,C011056     003
/080,CQ1201,101LL24198IM08018CA110KC3 ,P16,P23,P24,P311L037P37,P05,P12B039      004
MAABP65112 A116J88AA                   ,P41,P49,P56,P571L020P57,P39,P40B039      005
ML25899BA23135 ,135133AI78135A135134   ,P80,P871056      L036P93,P65,P73B039     006
M134‡46,Q31S‡84135YJ89135A135Q33¤Q31   ,Q12,Q19,Q261056   L036Q29,Q01,Q05B039     007
,L12¤133135BA30BA86141 ,136138,140     ,Q45,Q53,Q6C1056  L034Q63,Q34,Q41BC39     008
B&041431M141R04AI79141A141139M139‡991  ,Q86,Q93,R0C1056  L037R00,Q72,Q79BC39     009
LQ00K92N/080,001BR39156 MR07Z79ML25Z67,R13,R17,R25,R321L038R38,R08,RC9B039      010
BB04137AM137K05BB15132 ,131CJ97I91     ,R62,R661056      L034R72,R47,R54B039     011
BR93T,L28M132‡73BB22AK06132BR82M139&14,R89,R93,&0C,&041L038&10,R78,R82B039      012
,400MA22‡97¤/00ML26/C0ML25R00MA22R02   ,&26,&33,&401056   L036&46,&15,&22B039     013
/580/,4011CL&57Z72¤R08MR93R08          ,&56,&58,&65,&691L029&75,&51,&52B039      014
,R29R26AK06R31AK06R28MR01R25MAC4R01    ,&97,A041056      L035A10,&83,&90BC39      015
¤R29R26BQ725ML25‡40BA49160 MI44‡08BC95,A23,A3C,A38,A451L038A48,A18,A22BC39      016
M381482BA68148 BC95ML25‡01ML25V73BQ45  ,A68,A75,A821056   L037A85,A56,A64B039     017
ML25‡62ML25‡55BR54MJ89‡66BA93ML25‡67   ,B04,B11,B151056   L036B21,A93,B00B039     018
3B72158 M953T91M953U05ML25U26MI44U29   ,B44,B511056       L036B57,B30,B37B039     019
ML25U64ML25829BB921474BC28K031BC361    ,B80,B88,B921056  L035B92,B65,B72B039      020
L080H80C146K11BC16TBB801M080160BB8C    ,C12,C16,C17,C241L035C27,C00,C07B039      021
1L080040BC70155 ML25‡86,155N155595¤155,C44,C51,C55,C621L038C65,C29,C36BC39      022
BC77ML25‡75,024056,0630671056,048      ,C84,C91,C951056  L033C98,C70,C77B039     023
MI94A67M048N46M060M060AN46N45¤048      ,D17,D21,D281056  L033D31,D06,D13B039     024
M070I77MMMI69MBE81I761BA56I75          ,D41,D45,D46,D541L030D61,D39,D40B039      025
AI79I65VG32I77KBG2II701AJ93I73MI73     ,D85,D921056      L034D95,D69,D77BC39     026
AI65I75AIo5I70CI77163BI20UMI77L44MM    ,E17,E22,E29,E301L035E30,E03,E10B039      027
MAK06I81BF50150 NE93AK06I84CI84K00     ,E47,E51,E581056  L034E64,E32,E39B039     028
BE93SAJ97I87BE51¤L28,R77BD21AI87I73    ,E81,E85,E89,E931L035E99,E70,E77B039      029
AI87I70ML26E47C150I81BG61SC152I81BH07S,F21,F26,F331056   L038F37,F07,F14B039     030
C154I81BH67SCI81N45BA56SBG03I812       ,F57,F621056      L032F69,F45,F50B039     031
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