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AOPB SYSTEMS MANUAL
Program Description

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IBM 1401 SELECTIVE TAPE TO CARD

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GODDARD SPACE FLIGHT CENTER

GREENBELT, MARYLAND

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IBM 1401 SELECTIVE TAPE TO CARD

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August, 1964

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I. Program Objective

18957

The object of this program is to punch one 80-character card image per record of those records of any BCD tape specified by the user. This program is written in SPS for the IBM 1401. Input cards are punched in the described format to select those records of the BCD tape to be punched on card. The BCD tape remains unaltered. The output is punched cards. The records of the tape are taken to be consecutively numbered starting with the number one and going up to (potentially) 99999.

Author

The program will halt with messages printed out (1) if an end of file is reached before the last record number requested; (2) if record numbers requested are not in an increasing sequence; (3) when all records requested have been punched (normal halt).

II. Program Usage

Input: (1) The BCD tape containing records to be punched should be mounted on tape unit 3.

(2) The card input specifies which records are to be punched, and should be in the following format:

a_N = column $(10 \cdot N + 1)$ to column $(10 \cdot N + 5)$: record with which punching begins

b_N = column $(10 \cdot N + 6)$ to column $10 \cdot (N + 1)$: record with which punching ends

where N = 0, 1, 2, 3, . . .

These ten digits continue across the card, and onto additional cards if necessary, with each pair of 5 digits selecting a sequence of records to be punched with the following restriction:

$$0 < a_1 \leq b_1 \leq \ldots a_N \leq b_N \leq a_{(N+1)} \leq \ldots .$$

III. Sample Solution

Input card:

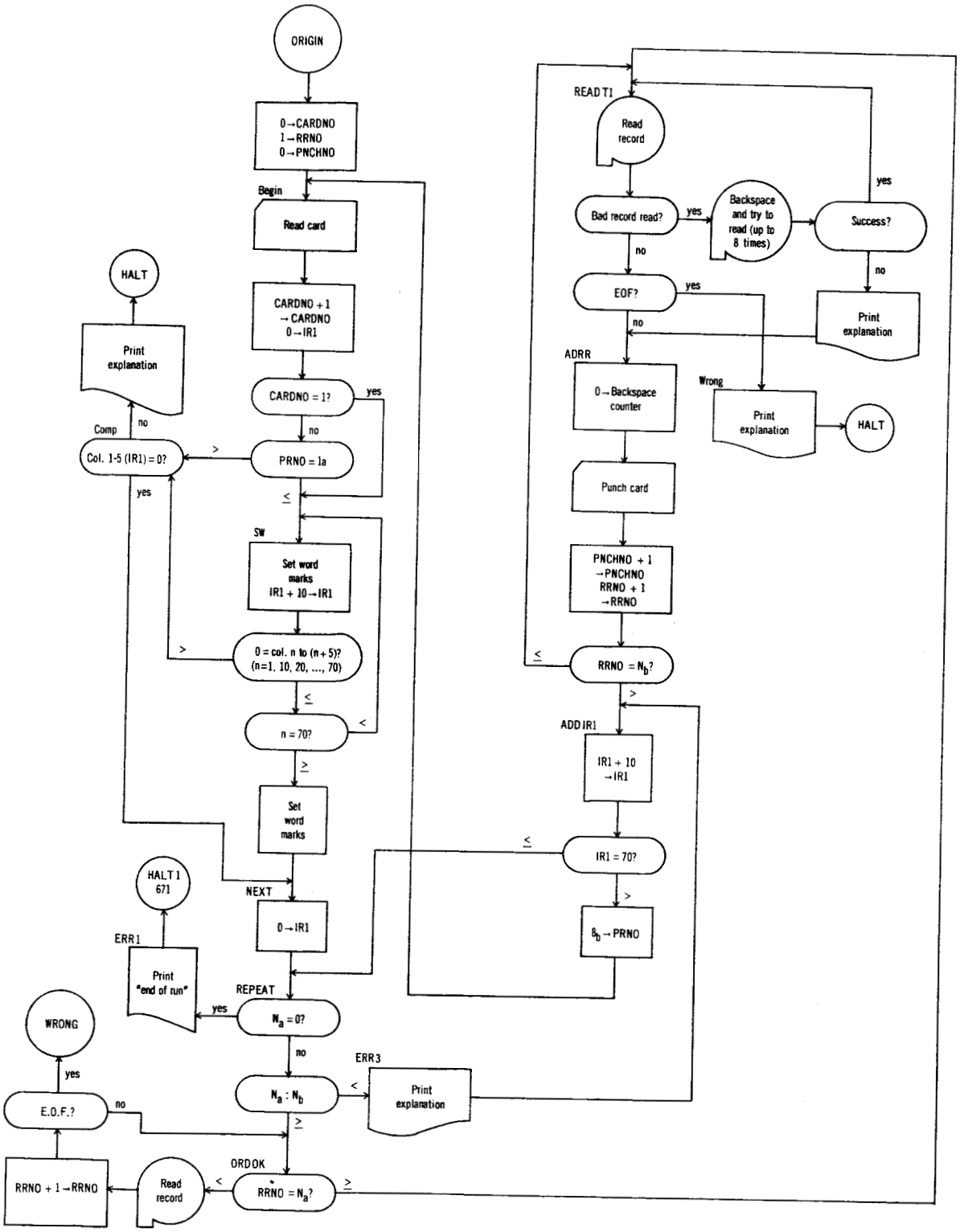
columns 1 to 5 00003
columns 6 to 10 00005
columns 11 to 15 00008
columns 16 to 20 00009
columns 21 to 25 00009
columns 26 to 30 00011
columns 31 to 80 . . . . . blanks

Listing of input tape:

record number 1: 12345A
record number 2: 12345B
record number 3: 12345C
record number 4: 12345D
record number 5: 12345E
record number 6: 12345F
record number 7: 12345G
record number 8: 12345H
record number 9: 12345I
record number 10: 12345J
record number 11: 12345K
record number 12: 12345L
etc.

Output (punched cards):

card number 1: 12345C
card number 2: 12345D
card number 3: 12345E
card number 4: 12345H
card number 5: 12345I
card number 6: 12345J
card number 7: 12345K (last card punched)


ORIGIN
0→CARDNO
1→RRNO
0→PNCHNO
Begin
Read card
CARDNO + 1
→CARDNO
0→IR1
CARDNO = 1?
yes
no
PRNO = 1a
≤
SW
Set word marks
IR1 + 10→IR1
0 = col. n to (n+5)?
(n=1, 10, 20, ..., 70)
>
≤
n = 70?
<
≥
Set word marks
HALT
Print explanation
Comp
no
Col. 1-5 (IR1) = 0?
>
yes
NEXT
0→IR1
HALT 1
671
ERR1
Print "end of run"
yes
REPEAT
N_a = 0?
no
ERR3
N_a : N_b
<
Print explanation
≥
WRONG
yes
E.O.F.?
no
RRNO + 1→RRNO
Read record
ORDOK
<
RRNO = N_a?
≥
READT1
Read record
Bad record read?
yes
Backspace and try to read (up to 8 times)
Success?
yes
no
no
EOF?
yes
no
Print explanation
ADRR
0→Backspace counter
Wrong
Print explanation
HALT
Punch card
PNCHNO + 1
→PNCHNO
RRNO + 1
→RRNO
≤
RRNO = N_b?
>
ADD IR1
IR1 + 10
→IR1
≤
IR1 = 70?
>
8_b→PRNO

```
PG LIN  CT  LABEL   OP    A OPERAND      B OPERAND          D          LOC   INSTRUCTION COMMENTS
 6 070  29         DCW   •        CHECK SEQUENCE OF NUMBERS OF        0976
 6 080  32         DC    •      RECORDS REQUESTED ON INPUT CARD       1008
 6 090   3  NOTE5  DC    *                                  NO.       1011
 6 100  32         DCW   •      END OF REEL REACHED BEFORE REC.       1043
 6 110  13  NOTE6  DC    •                          NO. REQUESTED     1056
 6 120  32         DCW   •      RECORD NO        IS BLANK BECAUSE     1088
 6 130  16  NOTE7  DC    •                          OF A TAPE CHECK   1104
 7 010   3  TEN3   DCW   3003                            010         3003
 7 020   3  ZERO3  DCW   3077                                        3077
 7 030   5  ONE5   DCW   3011                          00001         3011
 7 050   1  BSPK1  DCW   3030                                        3030
 7 060   1  ONE    DCW   3031                              1         3031
 7 070   4  BLK4   DCW   *                                           1108
 7 090   5  ZERO5  DCW   •                          00000             1113
 7 110   1  BKSPCT DCW   *                                           1114
 7 120   1  GMWM   DCW   0181                                        0181
 7 140   5  PNCHNC DCW   •                          00000             1119
 7 150   5  RRNO   DCW   •                          00001             1124
 7 160   3  SVNTY  DCW   *                              070           1127
 7 170   5  CARDNC DCW   •                          00000             1132
 7 180   5  PRNO   DCW   *                          00000             1137
 7 190   3         DCW   C089                                        0089
 7 200   5         DCW   3878                                        3878
99 999             END   0333                                              / 333 080
```

132 CARDS

```
PG LIN  CT  LABEL  OP    A OPERAND        B OPERAND        D  LOC   INSTRUCTION COMMENTS
 3 165   5         B     WRONG                             K  0619  B 786 K
 3 170   7         A     ONE5             RRND             0624  A +11 /24
 3 180   4         B     ORDOK                             0631  B 483
 3 190   4  ERR1   CS    0332                              0635  / 332       REC NO IS ZERO
 3 200   1         CS                                      0639  /
 3 205   7         LCA   NOTE2            0228             0640  L 890 228
 3 206   7         LCA   PNCHNO           0234             0647  L /19 234
 3 207   1         W                                       0654  2
 3 208   4         CS    0299                              0655  / 299
 3 209   7         LCA   NOTE1            0215             0659  L 862 215
 3 210   1         W                                       0666  2
 3 211   4  HALT1  H     HALT1                             0667  . 667
 4 010   7  ERR4   A     ONE              BKSPCT           0671  A +31 /14   BAD RECORD READ
 4 020   8         B     RELESE           BKSPCT           0678  B 695 /14·9
 4 030   5         CU    (U3                           B  0686  U (U3 B      BKSP
 4 040   4         B     READT1                            0691  B 495
 4 060   4  RELESE CS    0332                              0695  / 332
 4 070   1         CS                                      0699  /
 4 080   7         LCA   NOTE7            0248             0700  L /04 248
 4 090   7         LCA   RRNO             0215             0707  L /24 215
 4 100   1         W                                       0714  2
 4 110   4         B     ADDRR                             0715  B 520
 4 112   7  COMP   C     0005         1   ZERO5            0719  C 0#5 /13
 4 114   5         B     NEXT                          S  0726  B 452 S      EQUAL
 4 190   4         CS    0332                              0731  / 332       OUT OF ORDER
 4 192   1         CS                                      0735  /
 4 194   7         LCA   NOTE5            0264             0736  L #11 264
 4 196   7         LCA   CARDNO           0269             0743  L /32 269
 4 198   1         W                                       0750  2
 4 200   4         CS    0269                              0751  / 269
 4 201   7         LCA   NOTE2            0228             0755  L 890 228
 4 202   7         LCA   PNCHNO           0234             0762  L /19 234
 4 203   1         W                                       0769  2
 4 205   4         CS    0234                              0770  / 234
 4 206   7         LCA   NOTE1            0215             0774  L 862 215
 4 207   1         W                                       0781  2
 4 208   4  HALT2  H     HALT2                             0782  . 782
 5 010   4  WRONG  CS    0332                              0786  / 332       EOF
 5 020   1         CS                                      0790  /
 5 030   7         LCA   NOTE6            0245             0791  L #56 245
 5 040   1         W                                       0798  2
 5 050   4         CS    0299                              0799  / 299
 5 060   7         LCA   NOTE4            0257             0803  L 947 257
 5 070   7         LCA   CARDNO           0227             0810  L /32 227
 5 080   1         W                                       0817  2
 5 082   4         CS    0257                              0818  / 257
 5 084   7         LCA   NOTE2            0228             0822  L 890 228
 5 086   7         LCA   PNCHNO           0234             0829  L /19 234
 5 088   1         W                                       0836  2
 5 090   4         CS    0234                              0837  / 234
 5 100   7         LCA   NOTE1            0215             0841  L 862 215
 5 110   1         W                                       0848  2
 5 120   4  HALT3  H     HALT3                             0849  . 849
 6 010  10  NOTE1  DCW   *                          END OF RUN  0862
 6 020  28  NOTE2  DCW   *          NO OF CARDS PUNCHED EQUAL TO  0890
 6 030  32         DCW   *     CHECK INPUT CARD NO.          FOR  0922
 6 040  25  NOTE4  DC    *               RECORD NUMBERS REQUESTED.  0947
```

VI. Operating Instructions

Input: (1) The input cards specifying records to be punched should be placed behind the program deck.

(2) The input tape should be mounted on tape unit #3. Records are punched from this tape.

Output: (1) Cards are punched out. The user may request that the IBM 1401 operator list these cards.

A copy of the compressed program deck is kept on the 1401; thus the user need send only the input cards with the request card to the sample request card.