IDENTIFICATION

Product Code: DEC-08-PMP0-D

Product Name: Readin-Mode (RIM) Punch

Date Created: November 22, 1966

Maintainer: Software Services Group



ABSTRACT

The RIM Punch program provides a means of punching out information contained in selected blocks of core memory as RIM-coded tape via the ASR 33 Perforated Tape Punch or 75E High Speed Punch. The punch program may occupy either low or high memory depending on the version used.

2. PRELIMINARY REQUIREMENTS

2.1 Equipment

PDP-8 with its associated ASR 33 or 75E punch.

2.2 Storage

This program requires 61 (decimal) memory locations.

LOADING OR CALLING PROCEDURE

3.1 Loading

This routine is loaded using the Binary Loader. See DEC-08-LBAA for a complete description of the Binary Loader.

3.2 Calling Sequence

None. This routine cannot be called as a subroutine.

4. USING THE PROGRAM OR ROUTINES

4.1 Switch Settings

The SWITCH REGISTER is used to enter the initial and final address of each block of core memory to be punched.

4.2 Start Up/Entry

- a. Make sure ASR 33 or 75E punch is on.
- b. Set the starting address 0041 (or 7441 if using the high-memory version) into the SWITCH REGISTER and press the LOAD ADDRESS key. Next press the START key.

 $^{^{} extstyle e$

- c. The computer halts. Set the initial address of the block to be punched into the SWITCH REGISTER and press the CONTINUE key.
- d. The computer halts. Set the final address of the block to be punched into SWITCH REGISTER and press the CONTINUE key.

Note that the final address must be larger than the initial address.

- e. A block of leader (code 200) is punched followed by the selected block of data in RIM format.
- f. The computer halts. Steps c and d may now be repeated to punch as many blocks of data as desired. To terminate the tape, proceed as follows.
- g. Set the terminating address 0074 (7474) into the SWITCH REGISTER and press the LOAD ADDRESS key. Next press the START key and a block of trailer is punched.

DETAILS OF OPERATION AND STORAGE

Reference to section 7.1, Flow Chart, will illustrate the following discussion.

After entry, a short subroutine is entered to punch a block of leader. Next the initial address is picked up and the six most significant bits are rotated right, masked out, added to 0100 (in order to punch channel 7), and punched. The least-significant six bits of the address are next masked out and punched.

A similar process is followed to punch the data associated with the corresponding address except 0100 is not added before the first character is punched.

This process is repeated until the final address is reached; then the computer halts at the starting address. If more blocks of data are to be punched, this is done as explained in step f above.

The routine is entered at a different address to punch the final trailer.

5.1 Execution Time

This routine is output limited with respect to speed.

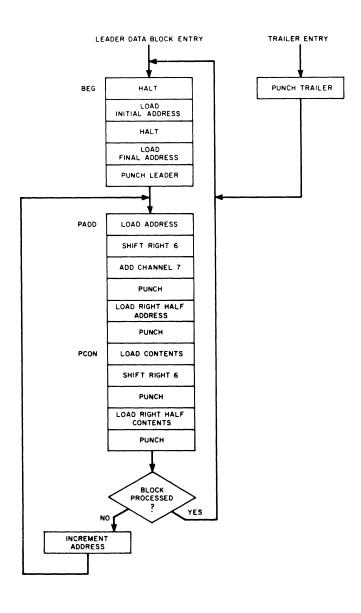
SPECIAL FORMATS

6.1 External Data

See Digital-8-2-U for a description of RIM paper tape format.

7. FLOW CHARTS AND LISTINGS

7.1 Flow Chart



7.2 Listings /DIGITAL-8-4-U-RIM /RIM PUNCH 33 LOW MEMORY 0041 7402 BEG, HLT /ENTRY FOR LEADER DATA BLOCK 0042 7604 LAS /SET INITIAL ADDRESS 0043 3122 DCA IA 0044 7402 HLT 0045 7604 LAS /SET FINAL ADDRESS 0046 3123 DCA FA 0047 4076 JMS LTS /GO TO L/T SUBROUTINE 0050 PADD. TAD IA 1122 /PUNCH ADDRESS 0051 4106 JMS SHFT 0052 1126 TAD CH7 0053 4114 JMS PUN TAD IA 0054 1122 AND SL6 0055 Ø125 0056 4114 JMS PUN 0057 1522 PCON, TAD I IA /PUNCH CONTENTS JMS SHFT 0060 4106 0061 4114 JMS PUN 0062 1522 TAD I IA 0063 0125 AND SL6 0064 4114 JMS PUN TAD IA 0065 1122 0066 7041 CIA 0067 1123 TAD FA 0070 7650 SNA CLA /TEST FOR END JMP .+4 0071 5075 ISZ IA 0072 2122 5050 JMP PADD 0073 0074 4076 JMS LTS /ENTRY FOR L/T 0075 5041 JMP BEG /L/T SUBROUTINE 0000 0076 LTS, 0 0077 TAD M101 1127 DCA CTR 0100 3124 0101 1130 MORE, TAD C200 JMS PUN 0102 4114 0103 2124 ISZ CTR 0104 5101 JMP MORE /MORE L-T CODES JMP I LTS 0105 5476 /SHIFT RIGHT 0106 0000 SHFT. 0 RTR 0107 7012 0110 7012 RTR 7012 RTR 0111 AND SL6 0112 0125 JMP I SHFT 0113 5506 /PUNCH SUBROUTINE 0114 PUN, 0 0000 0115 6046 TLS 0116 TSF 6041 JMP .-1 0117 5116 CLA 0120 7200 JMP I PUN 0121 5514 IA, 0122 0000 0123 0000 FA, Ø 0124 0000 CTR, 0 77 0125 0077 SL6. 0126 0100 CH7, 100 0127 7677 M101, -101 200 C200, 0130 0200

BEG

BEG

CH7

CTR

FΑ

C200

7441

7526

7524

753ø

7523

0041

```
CH7
         0126
CTR
         0124
C200
         0130
FA
         0123
IΑ
         0122
LTS
         0076
MORE
         0101
M101
         0127
PADD
         0050
PCON
         0057
PUN
         0114
SHFT
         0106
SL6
         0125
      5514
a121
              0053<sub>01</sub>
                                      JYP I PUN
0122
                           IA,
      0000
              00540
0123
                           FA.
      0000
              00550
                                      0
                           CTR,
0124
      0000
              00560
                                      Ø
0125
      ØØ77
              00570
                           SL6,
                                      77
0126
      0100
              00580
                           CH7,
                                      100
              00590
Ø127
      7677
                           M171,
                                      -101
0132 0200
              00600
                           C220,
                                      200
              00610
/DIGITAL-8-4-U-RIM
                                      12/01/66 08:08.42
                                                               PAGE Ø2
SYMBOL TABLE
BEG
          2041
CH7
          7126
CTR
          8124
C200
          2130
FA
          2123
ĪΑ
          7122
LTS
          0076
MORE
          0101
M101
          0127
PADD
PCON
          2050
          2057
PUN
          0114
SHFT
          2126
SL6
          2125
```

7522

ĪΑ

```
LTS
         7476
MORE
         7501
         7527
M101
PADD
         7450
PCON
         7457
PUN
         7514
SHFT
         7526
SL6
         7525
             /DIGITAL-8-4-U-RIM
             /RIM PUNCH 33 HIGH MEMORY
             *7441
7441
      7402
             BEG,
                        HLT
                                     /ENTRY FOR LEADER DATA BLOCK
7442
      7604
                        LAS
                                     /SET INITIAL ADDRESS
7443
      3322
                        DCA IA
7444
      7402
                        HLT
7445
      7604
                                     /SET FINAL ADDRESS
                        LAS
7446
      3323
                        DCA FA
      4276
7447
                        JMS LTS
                                     /GO TO L/T SUBROUTINE
745Ø
      1322
             PADD.
                        TAD IA
                                     /PUNCH ADDRESS
                         JMS SHFT
7451
      4306
7452
      1326
                         TAD CH7
7453
      4314
                         JMS PUN
7454
      1322
                         TAD IA
7455
      Ø325
                         AND SL6
7456
      4314
                         JMS PUN
             CON,
                                     /PUNCH CONTENTS
7457
      1722
                        TAD I IA
7460
      4306
                         JMS SHFT
7461
      4314
                         JMS PUN
7462
      1722
                        TAD I IA
7463
      0325
                        AND SL6
7464
      4314
                        JMS PUN
7465
      1322
                         TAD IA
      7041
7466
                        CIA
7467
      1323
                        TAD FA
7470
      7650
                        SNA CLA
                                     /TEST FOR END!
7471
      5275
                         JMP .+4
7472
      2322
                        ISZ IA
7473
      5250
                         JMP PADD
7474
      4276
                        JMS LTS
                                     /ENTRY FOR L/T
7475
      5241
                        JMP BEG
7476
      0000
             LTS,
                                     /L/T SUBROUTINE
7477
      1327
                        TAD M101
      3324
7500
                        DCA CTR
             MORE,
7501
      1330
                        TAD C200
7502
      4314
                        JMS PUN
7503
      2324
                        ISZ CTR
7504
      5301
                        JMP MORE
                                     /MORE L-T CODES
7505
      5676
                        JMP I LTS
7506
             SHFT,
      0000
                        0
                                     /SHIFT RIGHT
7507
      7012
                        RTR
7510
      7012
                         RTR
7511
      7012
                         RTR
7512
      0325
                         AND SL6
7513
      5726
                         JMP I SHFT
7514
             JUN.
                                     /PUNCH SUBROJTINE
      0000
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7515
      6046
                        TLS
7516
      6041
                        TSF
       5316
7517
                        JMP .-1
7520
      720Ø
                        CLA
7521
       5714
                        JMP I PUN
7522
      0030
             IA,
7523
      0000
             FA,
                        Ø
      0000
7524
             CTR,
                        Ø
7525
      0077
             SL6,
                        77
             CH7,
7526
      0100
                        100
7527
      7677
             4101,
                        -101
753Ø
      Ø20Ø C200,
                        200
BEG
         7441
         7526
CH7
CTR
         7524
C200
         7530
FΑ
         7523
IΑ
         7522
LTS
         7476
MORE
         7501
M101
         7527
PADD
         7450
PCON
         7457
PUN
         7514
SHFT
         7526
         7525
SL6
(0)
BEG
         7441
CH7
         7526
CTR
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C200
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FA
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ΙA
        7522
        7476
LTS
MORE
        7501
M101
        7527
PADD
        7450
PCON
        7457
PUN
        7514
SHFT
        7526
SL6
        7525
             /DIGITAL-8-4-U-RIM
             /RIM PUNCH 75 HIGH MEMORY
             *7441
7441
                        HLT
      7402
             BEG,
                                    /ENTRY FOR LEADER DATA BLOCK
7442
      7604
                        LAS
                                    /SET INITIAL ADDRESS
7443
      3322
                        DCA IA
      7402
7444
                        HLT
7445
      7604
                                    /SET FINAL ADDRESS
                        LAS
7446
      3323
                        DCA FA
                        JMS LTS
7447
      4276
                                   /GO TO L/T SJBROUTINE
            PADD,
     1322
                                   PUNCH ADDRESS
7450
                        TAD IA
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```
JMS SHFT
 7451
       43 46
 7452
        1326
                         TAD CH7
 7453
        4314
                          JMS PUN
 7454
        1322
                         TAD IA
 7455
       0325
                         AND SL6
 7456
                          JMS PUN
       4314
              CON,
 7457
       1722
                         TAD I IA
                                      /PUNCH CONTENTS
       4346
 7460
                         JMS SHET
 7461
        4314
                         JMS PUN
 7462
       1722
                         TAD I IA
 7463
       0325
                         AND SL6
       4314
 7464
                          JMS PUN
 7465
       1322
                         TAD IA
 7466
        7041
                         CIA
 7467
        1323
                         TAD FA
       765D
 747Ø
                          SNA CLA
                                      /TEST FOR END
 7471
        5275
                         JMP .+4
 7472
        2322
                         ISZ IA
 7473
        525W
                         JMP PADD
 7474
       4276
                         JMS LTS
                                      /ENTRY FOR L/T
 7475
       5241
                          JMP BEG
 7476
       00000
              -TS,
                                      /L/T SUBROUTINE
       1327
 7477
                         TAD MIDT
 7500
       3324
                         DCA CTR
       133d
 7501
              MORE,
                         TAD C200
 7502
       4314
                          JMS PUN
 7503
       2324
                         IS7 CTR
 7504
       5331
                          JMP MORE
                                      /MORE L-T CODES
 7505
        5676
                          JMP I LTS
 7506
              SHFT,
       00 'U
                                      /SHIFT RIGHT
 7507
        7012
                         RTR
 7510
        7012
                         RTR
 7511
        7012
                         RTR
 7512
        2325
                         AND SL6
 7513
       57 16
                          JMP I SHFT
 7514
       0030
              JUN,
                                      /PUNCH SUBROJTINE
 7515
       6026
                         PLS
 7516
       6021
                         PSF
 7517
       5316
                         JMP
                             . - 1
· 7520
       7270
                         CLA
       5714
 7521
                         JMP I PUN
              IA,
 7522
       0020
                         2
              FA,
 7523
       0000
                         2
       0000
              CTR,
 7524
                         9
 7525
       9077
              SL6,
                         77
 7526
       Ø170
              CH7,
                         100
 7527
       7677
              4101.
                         -191
 7530
       0230
              CZØØ,
                         200
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BEG
        7441
        7526
CH7
CTR
        7524
C200
        7530
FΑ
        7523
ĪΑ
        7522
LTS
        7476
MORE
        7521
M101
        7527
PADD
        745Ø
PCON
        7457
PUN
        7514
SHFT
        7526
SL6
        7525
        2041
BEG
        7126
CH7
CTR
        2124
C200
        7130
FΑ
        0123
        7122
ΙΑ
        W076
LTS
MORE
        0101
        3127
M101
PADD
        005Ø
PCON
        0057
PUN
         3114
SHFT
         2126
SL6
         7125
             /DIGITAL-8-4-U-RIM
             IRIM PUNCH 75 LOW MEMORY
             #41
0041
      7422
             BEG,
                        HLT
                                    /ENTRY FOR LEADER DATA BLOCK
0042
      7604
                        LAS
                                    /SET INITIAL ADDRESS
      3122
                        DCA IA
0043
0044
      7472
                        HLT
                                    /SET FINAL ADDRESS
0045
      7674
                        LAS
0046
      3123
                        DCA FA
                                    /GO TO L/T SUBROUTINE
0047
      4076
                        JMS LTS
            SADD,
                                    /PUNCH ADDRESS
0050
      1122
                        TAD IA
0051
      4106
                        JMS SHFT
      1126
0052
                        TAD CH7
0053
       4114
                        JMS PUN
0054
       1122
                        TAD IA
       0125
                        AND SL6
0055
0056
                        JMS PUN
      4114
0057
      1522
            PCON,
                        TAD I IA
                                    /PUNCH CONTENTS
0060
      4176
                        JMS SHFT
                        JMS PUN
0061
      4114
                        TAD I IA
0062
      1522
0063
      0125
                        AND SL6
0064
       4114
                        JMS PUN
0065
       1122
                        TAD IA
       7041
                        CIA
```

/TEST FOR END

TAD FA

SNA CLA

0066

0067

0070

1123

765Ø

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0071
      5075
                        JMP .+4
0072
      2122
                        ISZ IA
                        JMP PADD
0073
      5050
                                    /ENTRY FOR L/T
0074
      4076
                        JMS LTS
                        JMP BEG
0075
      5041
             LTS,
      0000
                                    /L/T SUBROUTINE
0076
                        0
0077
      1127
                        TAD M101
                        DCA CTR
0100
      3124
             MORE,
      1130
                        TAD C200
0101
                        JMS PUN
      4114
2102
01,03
      2124
                        ISZ CTR
      5101
                        JMP MORE
                                    /MORE L-T CODES
0104
0105
      5476
                        JMP I LTS
                                    /SHIFT RIGHT
             SHFT,
0106
      0000
                        Ø
                        RTR
0107
      7012
                        RTR
      7012
0110
                        RTR
      7ø12
0111
                        AND SL6
      Ø125
Ø112
                        JMP I SHFT
Ø113
      5506
                                     /PUNCH SUBROUTINE
             PUN,
                        Ø
      0000
0114
                        PLS
      6026
Ø115
                        PSF
      6021
0116
      5116
                         JMP .-1
Ø117
                        CLA
0120
      7200
                         JMP I PUN
0121
      5514
             IA,
                         Ø
Ø122
      0000
             FA,
                         Ø
      0000
Ø123
       0000
             CTR,
                         Ø
0124
                         77
0125
       0077
             SL6,
                         100
             CH7,
Ø126
       0100
       7677
              4101,
                         -101
Ø127
                         200
       0200
             C200,
0130
         0041
BEG
         Ø126
CH7
         0124
CTR
         0130
 C200
         0123
 FA
          0122
ĪΑ
 LTS
          ØØ76
 MORE
          0101
          Ø127
 M1ø1
          0050
 PADD
          0057
 PCON
 PUN
          0114
          0106
 SHFT
          0125
 SL6
```