

IDENTIFICATION

Product Code: DEC-08-PMP0-D  
Product Name: Readin-Mode (RIM) Punch  
Date Created: November 22, 1966  
Maintainer: Software Services Group



## 1. 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<sup>®</sup> with its associated ASR 33 or 75E punch.

### 2.2 Storage

This program requires 61 (decimal) memory locations.

## 3. 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.

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<sup>®</sup>PDP is a registered trademark of the Digital Equipment Corporation.

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.

## 5. 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.

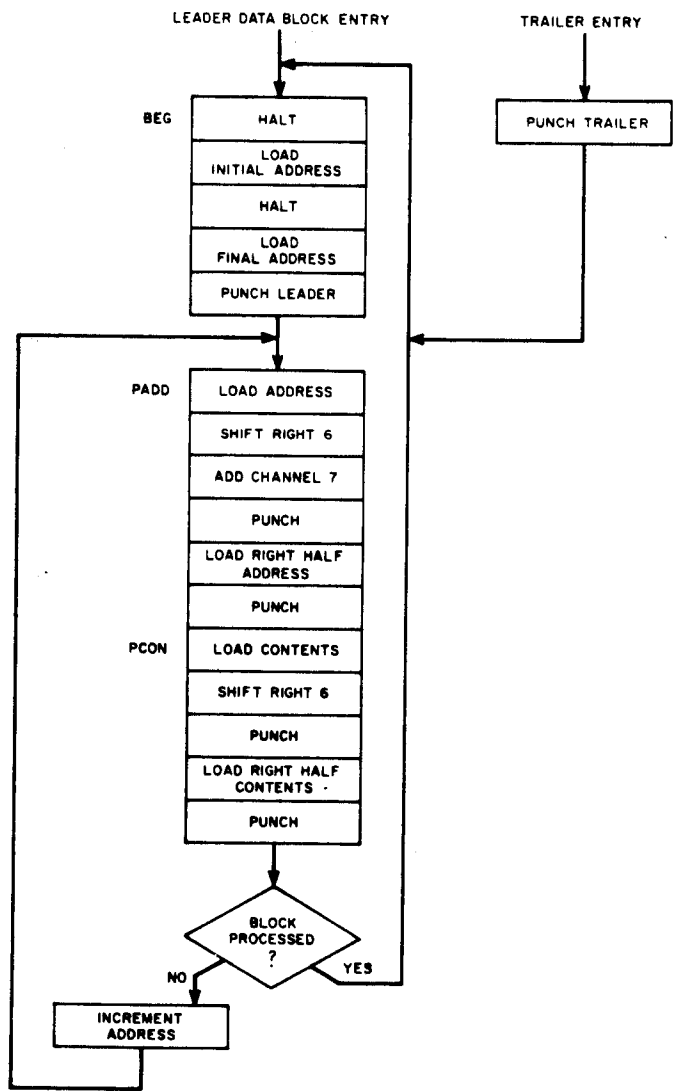
## 6. SPECIAL FORMATS

### 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
*41
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 1122  PADD,    TAD IA        /PUNCH ADDRESS
0051 4106          JMS SHFT
0052 1126          TAD CH7
0053 4114          JMS PUN
0054 1122          TAD IA
0055 0125          AND SL6
0056 4114          JMS PUN
0057 1522  PCON,    TAD I IA      /PUNCH CONTENTS
0060 4106          JMS SHFT
0061 4114          JMS PUN
0062 1522          TAD I IA
0063 0125          AND SL6
0064 4114          JMS PUN
0065 1122          TAD IA
0066 7041          CIA
0067 1123          TAD FA
0070 7650          SNA CLA      /TEST FOR END
0071 5075          JMP .+4
0072 2122          ISZ IA
0073 5050          JMP PADD
0074 4076          JMS LTS      /ENTRY FOR L/T
0075 5041          JMP BEG
0076 0000  LTS,      0          /L/T SUBROUTINE
0077 1127          TAD M101
0100 3124          DCA CTR
0101 1130  MORE,    TAD C200
0102 4114          JMS PUN
0103 2124          ISZ CTR
0104 5101          JMP MORE     /MORE L-T CODES
0105 5476          JMP I LTS
0106 0000  SHFT,    0          /SHIFT RIGHT
0107 7012          RTR
0110 7012          RTR
0111 7012          RTR
0112 0125          AND SL6
0113 5506          JMP I SHFT
0114 0000  PUN,      0          /PUNCH SUBROUTINE
0115 6046          TFS
0116 6041          TSF
0117 5116          JMP .-1
0120 7200          CLA
0121 5514          JMP I PUN
0122 0000  IA,       0
0123 0000  FA,       0
0124 0000  CTR,      0
0125 0077  SL6,      77
0126 0100  CH7,      100
0127 7677  M101,    -101
0130 0200  C200,    200

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BEG	0041
CH7	0126
CTR	0124
C200	0130
FA	0123
IA	0122
LTS	0076
MORE	0101
M101	0127
PADD	0050
PCON	0057
PUN	0114
SHFT	0106
SL6	0125

0121	5514	00530
0122	0000	00540
0123	0000	00550
0124	0000	00560
0125	0077	00570
0126	0100	00580
0127	7677	00590

	JMP I PUN
IA,	0
FA,	0
CTR,	0
SL6,	77
CH7,	100
M101,	-101

0130	0200	00600
		00610

C200,	200
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/DIGITAL-8-4-II-RIM

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SYMBOL TABLE

BEG	0041
CH7	0126
CTR	0124
C200	0130
FA	0123
IA	0122
LTS	0076
MORE	0101
M101	0127
PADD	0050
PCON	0057
PUN	0114
SHFT	0106
SL6	0125

BEG	7441
CH7	7526
CTR	7524
C200	7530
FA	7523

IA 7522  
 LTS 7476  
 MORE 7501  
 M101 7527  
 PADD 7450  
 PCON 7457  
 PUN 7514  
 SHFT 7506  
 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		LAS	/SET FINAL ADDRESS
7446	3323		DCA FA	
7447	4276		JMS LTS	/GO TO L/T SUBROUTINE
7450	1322	PADD,	TAD IA	/PUNCH ADDRESS
7451	4306		JMS SHFT	
7452	1326		TAD CH7	
7453	4314		JMS PUN	
7454	1322		TAD IA	
7455	0325		AND SL6	
7456	4314		JMS PUN	
7457	1722	PCON,	TAD I IA	/PUNCH CONTENTS
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	
7466	7041		CIA	
7467	1323		TAD FA	
7470	7600		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 REG	
7476	0000	LTS,	Ø	/L/T SUBROUTINE
7477	1327		TAD M101	
7500	3324		DCA CTR	
7501	1330	MORE,	TAD C200	
7502	4314		JMS PUN	
7503	2324		ISZ CTR	
7504	5301		JMP MORE	/MORE L-T CODES
7505	5676		JMP I LTS	
7506	0000	SHFT,	Ø	/SHIFT RIGHT
7507	7012		RTR	
7510	7012		RTR	
7511	7012		RTR	
7512	0325		AND SL6	
7513	5706		JMP I SHFT	
7514	0000	PUN,	Ø	/PUNCH SUBROUTINE

7515	6046		TLS
7516	6041		TSF
7517	5316		JMP .-1
7520	7200		CLA
7521	5714		JMP I PUN
7522	0000	IA,	0
7523	0000	FA,	0
7524	0000	CTR,	0
7525	0077	SL6,	77
7526	0100	CH7,	100
7527	7677	M101,	-101
7530	0200	C200,	200

BEG	7441
CH7	7526
CTR	7524
C200	7530
FA	7523
IA	7522
LTS	7476
MORE	7501
M101	7527
PADD	7450
PCON	7457
PUN	7514
SHFT	7506
SL6	7525

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BEG	7441
CH7	7526
CTR	7524
C200	7530

FA	7523
IA	7522
LTS	7476
MORE	7501
M101	7527
PADD	7450
PCON	7457
PUN	7514
SHFT	7506
SL6	7525

/DIGITAL-8-4-U-RIM  
/RIM PUNCH 75 HIGH MEMORY

\*7441

7441	7442	BEG,	HLT	/ENTRY FOR LEADER DATA BLOCK
7442	7604		LAS	/SET INITIAL ADDRESS
7443	3322		DCA IA	
7444	7402		HLT	
7445	7604		LAS	/SET FINAL ADDRESS
7446	3323		DCA FA	
7447	4276		JMS LTS	/GO TO L/T SUBROUTINE
7450	1322	PADD,	TAD IA	/PUNCH ADDRESS

7451	4386		JMS SHFT	
7452	1326		TAD CH7	
7453	4314		JMS PUN	
7454	1322		TAD IA	
7455	0325		AND SL6	
7456	4314		JMS PUN	
7457	1722	P CON,	TAD I IA	/PUNCH CONTENTS
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	
7466	7041		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 REG	
7476	0000	-TS,	0	/L/T SUBROUTINE
7477	1327		TAD M101	
7500	3324		DCA CTR	
7501	1330	MORE,	TAD C200	
7502	4314		JMS PUN	
7503	2324		ISZ CTR	
7504	5301		JMP MORE	/MORE L-T CODES
7505	5676		JMP I LTS	
7506	0000	SHFT,	0	/SHIFT RIGHT
7507	7012		RTR	
7510	7012		RTR	
7511	7012		RTR	
7512	0325		AND SL6	
7513	5716		JMP I SHFT	
7514	0000	PUN,	0	/PUNCH SUBROUTINE
7515	6026		PLS	
7516	6021		PSF	
7517	5315		JMP .-1	
7520	7200		CLA	
7521	5714		JMP I PUN	
7522	0000	IA,	0	
7523	0000	FA,	0	
7524	0000	CTR,	0	
7525	0077	SL6,	77	
7526	0100	CH7,	100	
7527	7677	M101,	-101	
7530	0200	C200,	200	

BEG 7441  
 CH7 7526  
 CTR 7524  
 C200 7530  
 FA 7523  
 IA 7522  
 LTS 7476  
 MORE 7501  
 M101 7527  
 PADD 7450  
 PCON 7457  
 PUN 7514  
 SHFT 7506  
 SL6 7525

REG 4041  
 CH7 7126  
 CTR 2124  
 C200 2130  
 FA 2123  
 IA 2122  
 LTS 2076  
 MORE 2101  
 M101 2127  
 PADD 2050  
 PCON 2057  
 PUN 2114  
 SHFT 2106  
 SL6 2125

/DIGITAL-8-4-U-RIM  
 /RIM PUNCH 75 LOW MEMORY  
 \*41

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	1122	PADD,	TAD IA	/PUNCH ADDRESS
0051	4106		JMS SHFT	
0052	1126		TAD CH7	
0053	4114		JMS PUN	
0054	1122		TAD IA	
0055	0125		AND SL6	
0056	4114		JMS PUN	
0057	1522	PCON,	TAD I IA	/PUNCH CONTENTS
0060	4106		JMS SHFT	
0061	4114		JMS PUN	
0062	1522		TAD I IA	
0063	0125		AND SL6	
0064	4114		JMS PUN	
0065	1122		TAD IA	
0066	7041		CIA	
0067	1123		TAD FA	
0070	7650		SNA CLA	/TEST FOR END

0071	5075		JMP	.,+4	
0072	2122		ISZ	IA	
0073	5050		JMP	PADD	
0074	4076		JMS	LTS	/ENTRY FOR L/T
0075	5041		JMP	REG	
0076	0000	LTS,	0		/L/T SUBROUTINE
0077	1127		TAD	M101	
0100	3124		DCA	CTR	
0101	1130	MORE,	TAD	C200	
0102	4114		JMS	PUN	
0103	2124		ISZ	CTR	
0104	5101		JMP	MORE	/MORE L-T CODES
0105	5476		JMP	I LTS	
0106	0000	SHFT,	0		/SHIFT RIGHT
0107	7012		RTR		
0110	7012		RTR		
0111	7012		RTR		
0112	0125		AND	SL6	
0113	5516		JMP	I SHFT	
0114	0000	PUN,	0		/PUNCH SUBROUTINE
0115	6026		PLS		
0116	6021		PSF		
0117	5116		JMP	.-1	
0120	7200		CLA		
0121	5514		JMP	I PUN	
0122	0000	IA,	0		
0123	0000	FA,	0		
0124	0000	CTR,	0		
0125	0077	SL6,	77		
0126	0100	CH7,	100		
0127	7677	M101,	-101		
0130	0200	C200,	200		

BEG	0041
CH7	0126
CTR	0124
C200	0130
FA	0123
IA	0122
LTS	0076
MORE	0101
M101	0127
PADD	0050
PCON	0057
PUN	0114
SHFT	0106
SL6	0125