IDENTIFICATION

Product Code:	DEC-9B-LRIA-D
Product Name:	PDP-9 Readin Mode Loader
Date Created:	November 4, 1967
Maintainer:	Software Services Group

1.1 INTRODUCTION

The RIM Loader is a minimum-sized routine for reading and storing information contained on readin mode tapes via the perforated tape reader.

The RIM Loader requires 13 decimal (15 octal) memory locations.

1.2 LOADING OR CALLING PROCEDURE

The RIM Loader, if not already in core, may be placed in memory by either of two methods.

Since it is a very short program, it may readily be loaded manually by the console switches and control keys. To do this proceed as follows:

a. Set into the MEMORY ADDRESS switches the address of the first memory location into which information is to be loaded (17763).

b. Set the intended contents (700101) of this location into the ACCUMULATOR switches and press the DEPOSIT key.

c. Set the intended contents (617763) of the next memory location into the ACCUMULATOR switches and press the DEPOSIT NEXT key.

d. Repeat the last step until the whole program has been placed in memory.

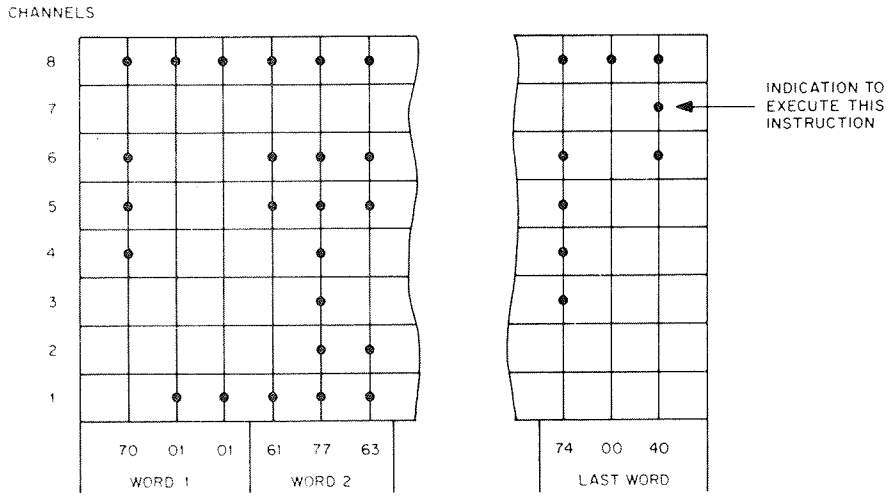
Alternately, the RIM Loader may be placed in memory via the optical paper tape reader if a punched paper tape (in hardware readin mode format) containing the program is available. This tape must be in a format similar to normal binary format (see below) except that channel 7 is never punched until the last group of three characters occurs. In this last group the last character only appears with channel 7 punched; the preceding two characters do not have channel 7 punched.

Place the tape in the optical paper tape reader and set the address at which loading is to commence, 17763, in the MEMORY ADDRESS switches. Depressing the READ-IN key now loads the program.

1.2.1 Hardware Readin Format

When the READ-IN button on the console is pressed, paper tape is read in binary mode. It is read into the location specified in the ADDRESS switches and into consecutive memory locations until a punch is encountered in channel 7 of the last of 3 frames that constitute an 18-bit machine word. The

hardware then executes the instruction which contained the punch in channel 7, which is usually a JMP or possibly a HLT. (The RIM Loader is an example of a program in hardware readin format.)



1.3 START-UP/PROCEDURE

Place the RIM format tape to be loaded in the reader. Set the ADDRESS switches to 17770. Press START.

1.4 DETAILS OF OPERATION AND STORAGE

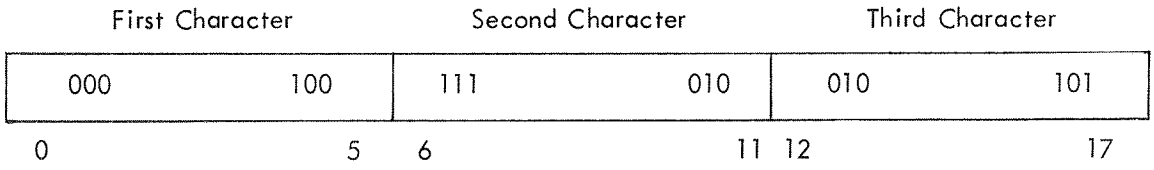
This routine is the basic paper tape loader for the PDP-9. It is placed at the very top of memory and normally is left intact by all programs. All other loaders are themselves loaded with the RIM Loader. (See DEC-9B-LFFA-D, Funny Format Loader.)

1.4.1 Input Data Format

A tape in RIM format consists of pairs of binary words. Each binary word is represented by three characters punched along the tape as follows in binary mode.

Channel	8	7	6	5	4	FEED	3	2	1
First Character	1	1/0	0	0	0		1	0	0
Second Character	1	1/0	1	1	1		0	1	0
Third Character	1	1/0	0	1	0		1	0	1

Channel 8 is always punched. Channel 7 may be punched or not. Channel 6 through 1 in three successive characters are used to represent binary information that will enter the computer to form a single 18-bit word as,



Note that this example represents the instruction DAC 7225.

The first word of each pair on the tape is a DAC instruction with the address field consisting of the address in which the following word is to be stored. These pairs repeat as follows:

First Pair	DAC A
	C(A)
Second Pair	DAC B
	C(B)
	.
	.
	.
Last Pair	JMP Y
	Dummy Word

The last pair of words on the tape will be, respectively, a JMP instruction to a memory location Y and a dummy word, zero for example. A HLT could replace the JMP instruction. The RIM Loader executes this final instruction so that if a JMP is used, control may be transferred to the routine just loaded.

1.5 LISTING

As previously stated, this program may be placed into the PDP-9 memory by using either the DEPOSIT key or the READ-IN key.

Location	Octal Contents			
17762	0	R,	0	/SUBROUTINE TO READ
17763	700101		RSF	/AN 18-BIT BINARY WORD
17764	617763		JMP .-1	/WAIT FOR FLAG
17765	700112		RRB	/READ BUFFER
17766	700144		RSB	/FETCH BINARY WORD
17767	637762		JMP I R	/EXIT SUBROUTINE
17770	700144	GO,	RSB	/ENTRANCE: SELECT BINARY
17771	117762	G,	JMS R	/FETCH A WORD
17772	057775		DAC OUT	/STORE IT (DAC OR JMP)
17773	417775		XCT OUT	/EXECUTE IT
17774	117762		JMS R	/READ NEXT WORD
17775	0	OUT,	0	/EXECUTE FIRST OF PAIR
17776	617771		JMP G	/CONTINUE
17777	740040		HLT	/TO STOP HARDWARE READIN