



# DECUS

## PROGRAM LIBRARY

DECUS NO.	8-466F
TITLE	PAL III MODIFIED FOR RL MONITOR
AUTHOR	Mario DeNobili Submitted by: Stanley Rabinowitz
COMPANY	Polytechnic Question Society Brooklyn, New York
DATE	March 1, 1971
SOURCE LANGUAGE	PAL III

DECUS

PHOTOGRAPH LIBRARY



Faint, illegible text or markings, possibly bleed-through from the reverse side of the page, located in the center.



# PAL III MODIFIED FOR RL-SYSTEM

DECUS Program Library Write-up

DECUS NO. 8-466F

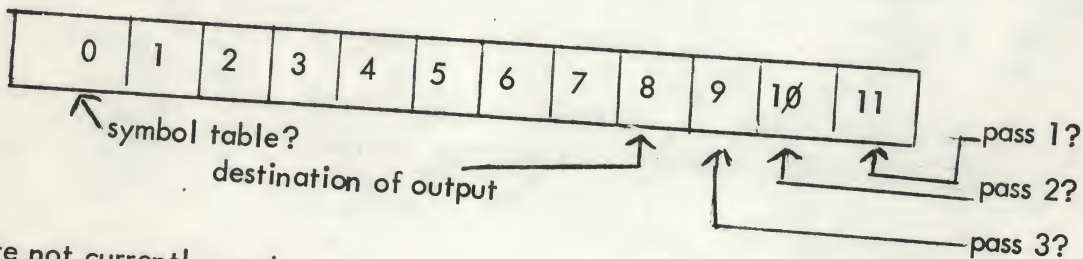
DEC's PAL III assembler (DEC-08-ASAB) has been slightly modified so that it is compatible with the RL-system. Source and binary files may be saved on a tape and easily run or passed to PAL.

The general form of the command to run PAL III is:

```
RUN PAL=parm, file1, file2, ..., filen
```

where parm is an octal number between 0 and 7777; and file<sub>1</sub>, file<sub>2</sub>, ... file<sub>n</sub> are the names of the source files to be passed to PAL. These are passed in order to the assembler. There may not be more than 15 such source files to be concatenated together ( $n \leq 15$ ). If PAL does not encounter a dollar sign (\$) after the last file has been read in from the tape, PAL will take further source input from the teletype until a \$ is found.

The parameter which may be passed to PAL (parm) specifies various options. It is a 12-bit binary number where the uses of the bits are summarized below.



Bits 1-7 are not currently used.

PAL III is a three pass assembler (i.e., it normally reads in all input 3 times. If bit 11 is on (a binary one), PAL will execute pass 1. [ This pass creates the internal symbol table and detects most errors. ] If bit 10 is on, PAL will execute pass 2. [ This pass creates the actual code, (binary output) and outputs it. ] If bit 9 is on, PAL will execute pass 3. [ This pass produces an assembly listing and final symbol table. ] If bit 8 is on, and pass 2 is run, the binary output will be sent to the tape. It will reside on the tape in an area known as THE BIN using a special format to be referred to as the RL-binary format. The tape must be write enabled for this purpose; if it is not, the computer will halt. You may recover by enabling the write and then depressing the continue switch. If bit 8 is off, and pass 2 is run, the binary output will be sent to the teletype (low speed paper tape punch) using the standard DEC-binary format. If bit 0 is off, a symbol table will be printed on the teletype after pass 1; if bit 0 is on, this symbol table will be suppressed (for quicker assemblies).

Any pass may be by-passed by manually branching to location 2000. At the conclusion, control is returned to the monitor (with the working area clear). PAL may not be run using a high speed paper tape reader or punch; if your system has one, it must be off. If source is being read in from the teletype, it must be read in once for each pass (this includes the \$).

The symbol table which is printed at the end of pass 1 (and pass 3) is printed across the page instead of down, with five entries per line.

The built-in symbol table for PAL contains most of the commonly used symbols. It also contains most of the EAE mnemonics, the symbols for the TU55 DECtape transport (with TCØ1), and the symbols for the analog to digital converter (type AFØ1A). It does not contain any symbols for the high speed paper tape reader or punch, nor for memory extension control.

The section of the symbol table built into PAL which contains the memory reference instructions, does not contain the mnemonics for the floating point package instructions, but does contain the following special symbols (as MRI's): [ their definition is given after the equal signs ]

ADD	=	TAD I
PUT	=	DCA I
STORE	=	DCA I
GOTO	=	JMP I
CALL	=	JMS I

The user who wishes to temporarily change this set of memory reference instructions (say if he wants to use the floating point instructions, FADD, etc.) must use the assembler pseudo-instruction, EXPUNGE, and then retype all that assembly. Since this is a tedious job, the P?S supplies a file called SYMTAB which will help the user do this. This file already contains almost all the commonly used symbols defined in such a way that this file need only be attached to the beginning of the users source files so that all these symbols will be available to him. The user can thus easily add other symbols he wants to this file.

Permanent modifications to PAL's symbol table can be made by consulting DEC's document (DEC-08-ASAB-D) and then zapping the appropriate changes directly into PAL on his tape.