



# DECUS

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TITLE	PAL1Ø
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SOURCE LANGUAGE	MACRO-10

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## ABSTRACT

PAL10 offers several advantages over to antiquated PALX assembler. Some of these improvements are:

- A. PAL10 runs in 4K as compared to 7K for PALX.
- B. Has a binary search on symbol table which significantly reduces processor time for any given assembly.
- C. Stacks symbol table listing in four vertical columns per page, reducing listing time and size.
- D. Has conditional assembly and literals.
- E. Two flavors of text handling.
- F. Assembler generated literals or links have been modified to flag the generated statement with a hash mark next to the object code and be counted as a link and not as an error.

## PAL10 VERSION .134

PSEUDO	OP	CODES
*EXPUNGE		DELETE ALL SYMBOLS EXCEPT PSEUDO OPS
*FIXMRI		ARG- <del>X000</del> DEFINE MEMORY REFERENCE INSTRUCTION HAVING VALUE "X000"
*FIXTAB		ESTABLISH ALL SYMBOLS CURRENTLY DEFINED AS ASSEMBLER SYMBOLS
*NOTE, PAL10		INITIALIZES ITS SYMBOL TABLE BEFORE EACH ASSEMBLY. I.E. FIXTAB, FIXMRI, AND EXPUNGE FUNCTIONS ARE VALID ONLY FOR THE ASSEMBLY IN WHICH THEY OCCUR
ZBLOCK	ARG	GENERATE BLOCK OF ZEROES
DECIMAL		CHANGE TO RADIX 10
OCTAL		CHANGE TO RADIX 8
DEFINE		DEFINE MACRO
*DTORG		GENERATE DECTAPE ORIGIN
DUBL	ARG	ACCEPT DOUBLE PRECISION
ENPUNCH		ENABLE BINARY OUTPUT
NOPUNCH		DISABLE BINARY OUTPUT
FIELD	ARG	GENERATE FIELD ORIGIN

CONDITIONAL	ASSEMBLY	PSEUDO OPS
IFDEF TAG < ARG>	ASSEMBLE	"ARG" IF "TAG" <u>IS</u> DEFINED.
IFNDEF TAG < ARG>	ASSEMBLE	"ARG" IF "TAG" IN <u>NOT</u> DEFINED.
IFZERO TAG < ARG>	ASSEMBLE	"ARG" IF "TAG" IS DEFINED AS <u>ZERO</u> .
IFNZRO TAG < ARG>	ASSEMBLE	"ARG" IF "TAG" IS DEFINED AS <u>NON-ZERO</u> .

PAGE Automatic origin at beginning of next core page

PAUSE NO-OPERATION

TEXT /ARG? Generate text table. "/" is the next delimiter. If number of characters is odd, table will be terminated with a 6 bit zero, if even table will be terminated by a 12 bit zero.

XLIST Toggle listing flip flop.

### Literal Facility

[ARG] Define a location (determined by assembler) on page  $\emptyset$  which contains "ARG."

( ARG ) Defines a location (determined by assembler) on current page which contains "ARG."

### Operators

! Logical Shift 6-bits left

& Logical And

↑ Integer Multiply

< > Special, Alpha only, text mode when not used in Macro definitions or conditional assembly delimiters.

" Generate a word which contains the eight bit ASCII equivalent of the next character.

### Error Indicators

C Illegal Character Error (this includes comment field)

D Illegal Redefinition

G Link Generated

- I Illegal Indirect
- L Literal error (overlap)
- M Macro Error
- N Number Error
- O OP code error
- P Phase or Multiply defined error
- Q Questionable format?
- T Illegal Text Character
- U Undefined Character
- Z Page Zero Literal or Exceeded Error

#### COMMAND STRING SWITCHES

- A Advanced Magtape One File
- B Back Space Magtape One File
- C Enable "CREF" Format (Switch must be set before listing device)
- D Enable DECTape Origins i. e. "DTORG"
- M Suppress Symbol Table Output
- N Suppress Errors on TTY
- T Skip to Logical End Of Tape
- W Rewind Magtape
- Z Zero DECTape Directory

In addition to the command string switches mentioned above, there are a group of special switches which are designed to tailor the assembler's symbol table to match up with other PAL assemblers. These switches modify only the symbol table including Pseudo-op codes. Operators including & and ! remain as their current function.

/P3	PAL III
/P8	MACRO 8
/PD	PALD
/PS	Super PAL or PAL 8

### PAL1Ø General Notes

PAL1Ø does not currently possess a /X for core map.

Bug associated with Illegal use of equates has been fixed.

The passing of top of forms during XList CREF listings has been suppressed.

Bug associated with multi-device command strings has been fixed.