ASM65 Usage Information

Expressions

Expressions are simple terms separated by one of these operators:

+	Addition
-	Subtraction
*****	Integer multiplication
/	Integer division

A term can be another expression in parentheses or one of the following:

123	A constant with no prefix is assumed to be in decimal.
$xxxx	A 1 to 4-digit hexadecimal constant.
%xxxxx	A 1 to 5-digit octal constant.
'A	The ASCII code for the character following the apostrophe.
NAME	A symbolic name (up to 6 characters in length) that's been defined and assigned a value. The default value is zero. Symbol names must be all capital letters.
<…	The low order 8 bits of the expression value which immediately follows.
>…	The high order 8 bits of the expression value which immediate follows.
.	The memory address of where the byte will be stored. (See example usage below.)

Directives

Directives always start with a "." (period) followed by one of the following names. They direct the assembler to do something.

.DEF SYMNAME = expression (Defines a symbolic name and assigns it a value)

.LOC expression (Sets the memory address where subsequent bytes will be stored.)

.BYTE expression (Stores the low order 8-bits of the expression in the current memory address.)

.WORD expression (Stores the low order 16-bits of the expression in the next two memory addresses.)

.ASCII 'Some text' (Stores ASCII codes representing the enclosed characters in sequential addresses.)

.PAGE (Advances to a new page when producing the .lst listing file.)

.NOLIST (Turn off listing to the .lst file.)

.LIST (Turn on listing to the .lst file. Listing is on by default.)

.VERBOSE (Turn on assembler troubleshooting info.)

.NOVERBOSE (Turn off assembler troubleshooting info.)

.NOBIN (Stop generating binary output to .bin file.)

.BIN (Generate binary output to .bin file. This is on by default.)

.LINK filename (Link to another source file. Assembly continues in the that file.)

.END (Indicates the end of all assembly language source statements.)

OPCODES and ADDRESSING MODES

ASM65 uses the same three-character instruction opcode names used in the MOS Technology Programming Manual. Here are a few examples:

LDA Load accumulator
STA Store accumulator
LDX Load X register
STX Store X register
LDY Load Y register
STY Store Y register
CLC Clear carry bit
SEC Set carry bit
ADC Add, including the carry bit
TXS Transfer X register to the stack pointer

One important difference between ASM65 and the MOS Technology Programming Manual is how addressing modes are specified. In ASM65, the addressing mode is specified by placing one or more suffix characters immediately following the three-character opcode name. For example, here are all the addressing modes for the **LDA** (load accumulator) instruction:

LDA# Immediate: The data immediately follows the opcode.
LDA Absolute: The two-byte (low order byte, followed by high order byte) address of the data follows.
LDA Page Zero: If the data is on page zero, then the one-byte low order page zero address follows.
LDAX Absolute, offset by X register contents. Two-byte absolute address follows.
LDAX Page Zero, offset by X register contents. One-byte low order page zero address follows.
LDAY Absolute, offset by Y register contents. (There is no Page Zero, offset by Y.)
LDAX@ Absolute, offset by X register, then indirect via resultant address.
LDA@Y Absolute, first indirect, then offset by Y register.

Here are the ASM65 address modes listed on the left, with corresponding programming manual "Assembly Language Form" listed on the right (See Appendix B-17 in manual):

LDA# Operand	**LDA #Operand**
LDA Operand	**LDA Operand**
LDA Operand	**LDA Operand**
LDAX Operand	**LDA Operand, X**
LDAX Operand	**LDA Operand, X**
LDAY Operand	**LDA Operand, Y**
LDAX@ Operand	**LDA (Operand, X)**
LDA@Y Operand	**LDA (Operand), Y**