Pseudo Operations:

Mnemonic Meaning

ORI [ORIgin] This must be the first non-comment record in the source program. The operand, if present, must be a non-negative decimal integer <= 255. The operand indicates the absolute address at which the program is to be loaded. If the operand is absent, the program is assumed relocatable. The ORI statement also must have a label, which is the name of the segment.

END [END] Signifies the end of the input program. An optional operand (non-negative decimal integer <= 255 or a symbol) indicates the address at which execution is to begin. If no operand is present, execution begins with the line containing the first non-pseudo-op. If the program is relocatable, the operand, if present, must be a symbol relative to this input program's load address.

EQU [EQUate] Equates the symbol in the label field with the \value" of the operand field, essentially creating a constant within the assembler. The operand field can be a previously defined symbol or a non-negative decimal integer, having value <= 255.

NMD [NuMeric Data] Defines a one word quantity whose contents is the value of the decimal integer in the operand field. This value is placed by the assembler in the word of memory that the NMD op occupies. The decimal integer can be positive or negative, in the range [-2^19, 2^19-1]. The assembler location counter is moved forward one word.

CCD [CharaCter Data] Defines a one word quantity whose contents is defined by the two character ASCII string at the beginning of the operand field. These two characters are placed by the assembler in the upper sixteen bits of the word of memory that the CCD op occupies. The least significant four bits are all set to zero. The assembler location counter is moved forward one word.

The character immediately following the second character of the string should either be a newline character or the space character. If it is not, the assembler should report an error. That the assembler enforces this restriction should make it more clear to the source code reader that the succeeding characters on the line belong to a comment.
Mnemonic Meaning

RES [REServe storage] Sets up a block of storage. The number of words in the block must be at least one and at most 255, as indicated by the positive decimal integer or previously defined absolute symbol in the operand field. This command moves the assembler location counter forward this number of words. No values are placed in this block by this pseudo op.

Note: The ORI and EQU pseudo op instructions require labels. Labels are optional on the RES, CCD, and NMD pseudo ops. There are no labels on END pseudo ops. RES, CCD, and NMD require memory allocation while ORI, EQU, and END do not.

RET [RETurn from subroutine] Is a convenient abbreviation for a branch (BR) instruction with R=3 and S=0. The operand field can be an absolute symbol or a decimal integer, having value 1, 2, or 3. Let's call the operand X. Then, “RET X" abbreviates “BR 3,0(X)", and means “return from this subroutine, using register X as the return address".

GTC [GeT Character] Is a convenient abbreviation for an IO instruction with R=1 (and S=0). The operand field can be an absolute symbol or a decimal integer, having value 0, 1, 2, or 3. Let's call the operand X. Then, “GTC X" abbreviates “IO 1,0(X)", and means “get a character from input, placing it in (part of) register X".

PTC [PuT Character] Is a convenient abbreviation for an IO instruction with R=3 (and S=0). The operand field can be an absolute symbol or a decimal integer, having value 0, 1, 2, or 3. Let's call the operand X. Then, “PTC X" abbreviates “IO 3,0(X)", and means “put a character to output from (part of) register X".