

See Appendix A for more information about 65C02 (and 6502) instructions.

Table 5-1
Mini-Assembler address formats

| Addressing mode | Format |
|-------------------|--|
| Accumulator | * |
| Implied | * |
| Immediate | # <i>{value}</i> |
| Absolute | <i>{address}</i> |
| Zero page | <i>{address}</i> |
| Indexed zero page | <i>{address},X</i> <i>{address},Y</i> |
| Indexed absolute | <i>{address},X</i> <i>{address},Y</i> |
| Relative | <i>{address}</i> |
| Indexed indirect | (<i>{address},X</i>) |
| Indirect indexed | (<i>{address}</i>), <i>Y</i> |
| Absolute indirect | (<i>{address}</i>) |

* These instructions have no operands.

Mini-Assembler instruction formats

The Apple Mini-Assembler recognizes 56 mnemonics and 13 addressing formats. These constitute the 6502 subset of the 65C02 instruction set. The mnemonics are standard, as used in the *Synertek Programming Manual* (Apple part number A2L0003), but the addressing formats are somewhat different. Table 5-1 shows the Apple standard address-mode formats for 6502 assembly language.

An address consists of one or more hexadecimal digits. The Mini-Assembler interprets addresses the same way the Monitor does: if an address has fewer than four digits, the Mini-Assembler adds leading zeros; if the address has more than four digits, then it uses only the last four.

❖ *Dollar signs:* In this manual, dollar signs (\$) in addresses signify that the addresses are in hexadecimal notation. They are ignored by the Mini-Assembler and may be omitted when typing programs.

There is no syntactical distinction between the absolute and zero-page addressing modes. If you give an instruction to the Mini-Assembler that can be used in both absolute and zero-page mode, the Mini-Assembler assembles that instruction in absolute mode if the operand for that instruction is greater than \$FF, and it assembles it in zero-page mode if the operand is less than \$0100.

Instructions in accumulator mode and implied addressing mode need no operands.

Branch instructions, which use the relative addressing mode, require the target address of the branch. The Mini-Assembler calculates the relative distance to use in the instruction automatically. If the target address is more than 127 locations distant from the instruction, the Mini-Assembler sounds a bell (beep), displays a caret (^) under the target address, and does not assemble the line.

If you give the Mini-Assembler the mnemonic for an instruction and an operand, and the addressing mode of the operand cannot be used with the instruction you entered, the Mini-Assembler will not accept the line.