



# Tech Info Library

## Apple II+ Mini-Assembler (1 of 4)

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Security: Everyone

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The attached listing is a relocated version of the mini-assembler for the Apple II+ with instructions for the Apple II version. This version can be BRUN from the disk or BLOAded and start with CALL 2048 from Applesoft. To restart use CALL 2051. From machine language the start is 800G and the restart is 803G. Users who have Integer Basic available need only enter that language and use the instructions in part one of this note.

Please note that the mini-assembler performs a NEW command, so it will wipe out any resident Applesoft program. Also note that the mini-assembler loads from \$800 to \$947. Don't try to assemble anything into those locations.

This note covers the operation of the mini-assembler only. It is not a course in assembly language programming. For a reference on programming the 6502 microprocessor, refer to the Synertek Programming manual or any of the tutorials available. This note assumes the user has a working knowledge of 6502 programming and mnemonics.

The mini-assembler is a programming aid aimed at reducing the amount of time required to convert a handwritten program to object code. The mini-assembler is basically a look-up table for opcodes. With it, you can type mnemonics with their absolute addresses, and the assembler will convert it to the correct object code and store it in memory.

Typing "F666G" puts the user in mini-assembler mode. While in this mode, any line typed in will be interpreted as an assembly language instruction, assembled, and stored in binary form unless the first character on the command line is a "\$".

If the first character of a command line is a "\$", the remainder of the line will be interpreted as a normal monitor command, executed, and control returned to the mini-assembler. To get out of the mini-assembler, press RESET.

If the first character on the line is blank, the assembled instruction will be stored starting at the address immediately following the previously assembled instruction. If the first character is not a blank nor a "\$", the line is assumed to contain an assembly language instruction preceded by the instruction address (a hex number followed by a ":"). In either case, the instruction will be retyped over the line just entered in dis-assembler format to provide a visual check of what has been assembled.

The counter that keeps track of where the next instruction will be stored is the pseudo PC (Program Counter) and it can be changed by many monitor commands (eg. 'L', 'T', . . .). Therefore, it is advisable to use the explicit instruction address mode after every monitor command and, of course, when the mini-assembler is first entered.

Errors (unrecognized mnemonic, illegal format, etc.) are signalled by a "beep" and a caret ("^") will be printed beneath the last character read from the input line by the mini-assembler.

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