Listed below are some of the new hardware changes in the Apple IIc Plus computer.
Hardware Changes:
800K Internal Drive
Accelleration Circuit
Built-in Power Supply
Other Changes
800K Internal Drive

Support for the 800K internal drive is accomplished by a custom chip and dedicated RAM which interfaces with the IWM (intergrated Woz machine-disk controller chip) and the Apple 3.5" disk drive. The custom gate array is called the MIG (magic interface glue). A RAM buffer and the MIG are necessary to replace the circuit that is contained in the UniDisk 3.5 to provide support for the Apple 3.5" disk drive.

An additional 8K of ROM code was necessary to support the Apple 3.5" disk drive. The ROM does not provide support for copy-protection on the UniDisk 3.5" disk drive. There may be applications that used copy protection that worked on the UniDisk 3.5 but will fail on the Apple IIc Plus due to use of the Apple 3.5" disk drive.

Accelleration Circuit

New hardware has been added to the Apple IIc Plus to allow operation up to 4MHz. This circuit includes two 8K of static RAMs, a 65C02 running at 4MHz, and an 84-pin custom gate array to control access between the static RAM and the rest of the computer. The static RAM acts as a data cache for the 4MHz 65C02, and is controlled by the gate array.

Most programs run the same routines repeatedly. Using a cache is an ideal way of allowing these routines to be run faster, while letting the rest of the Apple IIc Plus continue at the normal 1MHz rate.

The gate array is the chip that enables the fast cache RAM method speed-up of the Apple IIc Plus computer. This chip is specific to the 65C02 and the Apple IIc Plus memory map. On one side of the gate array sits the 65C02 (4MHz) and two SRAMs for data cache. On the other side of the gate array is the rest of the Apple IIc Plus (video, I/O, memory, disk drive, ROM, etc.). The gate array knows which parts of Apple memory may be cached and which may not be (e.g. I/O), and keeps track of which bank of switched memory areas are switched in.

The cache RAM is transparent and not directly addressable. Data that fills the cache RAM can come from most areas of memory; main RAM, aux RAM, ROM, Language card RAM.

Built-in Power Supply

The Apple IIc Plus uses a built-in power supply to operate the computer. A battery power supply would have to provide the SUPPLY VOLTAGES. Due to the new design, an existing battery power supply for the Apple IIc will not work in the Apple IIc Plus. The internal power supply operates using the following paramaters:

Electrical Requirements:
- Line voltage: 90 to 130 volts AC
- Line frequency: 50 to 60 hertz
- Maximum power consumption: 20 watts continuous

- Supply voltages:
+ 5 volts (+- 5%)
+12 volts (+-10%)
-12 volts (+-10%)

- Maximum supply currents:
+ 5 volts = 1.5 amps
- 5 volts = 30 milliamps
+12 volts = 0.9 amps continuous (1.5 amps intermittent)
-12 volts = 100 milliamps

Other Changes

There were a number of small changes to the Apple IIc Plus. These include:

- Volume Control slide located above the keyboard and replaces the 40/80 switch
- Rear handle locks in place
- Uses Apple standard mini-din 8 connectors
- Normal speed operation. (Hold down Esc key before you press Command-Control-Reset, Release the Reset Key, then release the ESC key when you see the word NORMAL on the screen, then release the other keys.)
- Headphone jack has been removed