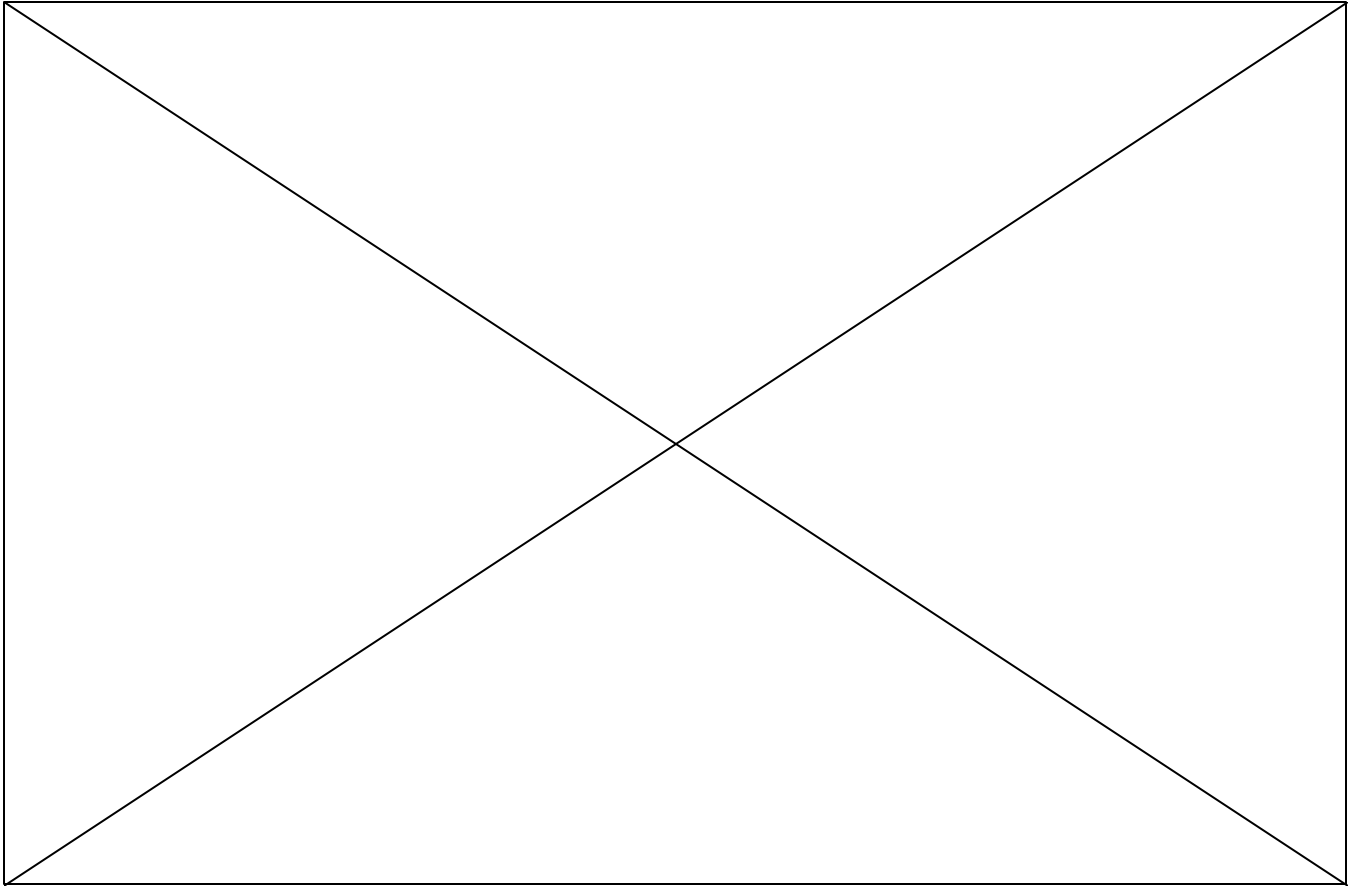


# Macintosh IIci Logic Board Upgrade



## Overview

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The Macintosh® IIci Logic Board Upgrade provides users of Apple® Macintosh IIcx computers with the system performance and capabilities of the Macintosh IIci.

The Macintosh IIci Logic Board Upgrade incorporates a 25-megahertz 68030 microprocessor, which enables the system to perform up to 45 percent faster than the Macintosh IIcx. A 25-megahertz 68882 floating-point coprocessor, which also comes standard with the Macintosh IIci

Logic Board Upgrade, permits faster processing of complex mathematical functions.

Installing an optional cache memory card allows users to improve system performance by an additional 20 percent to 30 percent, for an overall performance improvement of up to 75 percent over that of the Macintosh IIcx.

The Macintosh IIci Logic Board Upgrade also provides built-in video capability that enables the

system to display up to 256 colors or shades of gray simultaneously on a variety of Apple color and gray-scale monitors. And it includes three internal NuBus<sup>®</sup> expansion slots, as well as the capability for expanding RAM to up to 8 megabytes.

The Macintosh IIci Logic Board Upgrade is compatible with the Macintosh IIci Cache Card, the Macintosh IIci memory expansion kits, the full range of NuBus expansion cards, and virtually all current versions of Macintosh applications.

# Features

# Benefits

- Full 32-bit 68030 microprocessor, running at 25 megahertz
- Built-in Paged Memory Management Unit (PMMU)
- Burst mode RAM access

- 68882 floating-point math coprocessor

- Cache connector

- Built-in video support for the following Apple monitors:
  - 12-inch Apple High-Resolution Monochrome Monitor
  - 13-inch Apple Color<sup>®</sup> High-Resolution RGB Monitor
  - 15-inch Apple Macintosh Portrait Display

- Three NuBus expansion slots

- Eight built-in ports:
  - Two serial ports
  - Two Apple Desktop Bus<sup>®</sup> ports
  - One SCSI port
  - One DB-19 serial port (for an external floppy disk drive)
  - One DB-15 video port (for built-in video support)
  - One sound port

- 1 megabyte of on-board RAM, expandable to 8 megabytes

- 512K of ROM, including:
  - 32-bit addressing
  - Hierarchical File System
  - 32-bit Color QuickDraw<sup>®</sup>

- Offers superior processing speed.
- Supports multitasking operating systems (such as Apple's A/UX<sup>®</sup>) that require memory management capabilities in order to run.

- Provides fast processing of complex mathematical functions.

- With installation of a high-speed cache memory card, provides a 20 percent to 30 percent improvement in overall system performance.

- Provides the flexibility to choose among three of Apple's most popular monitors.
- Makes it easier to set up the system.
- Enhances system expandability by freeing up the NuBus slot usually occupied by the video card.

- Makes it easy to add a variety of cards to meet specific needs. (Cards are self-configuring—they require no DIP switches, and can be placed in any slot.)

- Allows you to tailor your system to your needs with popular peripherals without using expansion slots.
- Provides access to LocalTalk<sup>®</sup> networks, allowing you to connect your Macintosh to other computers and to LaserWriter<sup>®</sup> printers through the AppleTalk<sup>®</sup> network system.
- Provides connection for Apple Desktop Bus devices such as a keyboard, mouse, trackball, or graphic tablet.
- Supports up to seven SCSI peripherals.
- Provides connection to built-in video.
- Supplies high-quality stereo sound to the stereo jack.

- Provides the flexibility to grow as you need additional memory.

- Enables future 32-bit versions of the Macintosh operating system to address up to 4 gigabytes of memory.
- Organizes document storage and allows easy access to files.
- Provides a consistent user interface throughout the Macintosh family and enables color systems to display up to 16 million colors simultaneously.

# Product Details

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## Product Details

### 68030 processor

- Separate instruction and data caches provides significantly faster processing.
- Built-in PMMU supports virtual, shared, and protected memory in operating systems that have been designed for it.
- Burst mode RAM access enables groups of instructions and data to be read in fewer clock cycles than in the normal access mode, improving overall system performance.

### ROM

- The Macintosh IIci Logic Board Upgrade comes standard with 512K of ROM. In addition, a ROM SIMM socket will facilitate the installation of future versions of ROM as they become available.

### RAM

- The RAM in the Macintosh IIci Logic Board Upgrade can be increased incrementally to 8 megabytes.
- When denser chips become available, RAM can be upgraded to up to 32 megabytes.
- The Macintosh IIci Logic Board Upgrade uses higher-speed memory (80-nanosecond RAM) than the memory used in other Macintosh II computers. As a result, only Apple Macintosh IIci Memory Expansion Kits can be used in the Macintosh IIci Logic Board Upgrade.

### Operating system software

- Macintosh system software includes:
  - System Tools Version 6.0.4 or greater (the Macintosh operating system)
  - Printer disk (printer drivers for all Apple printers)
  - Utilities disks (include utilities such as the Apple File Exchange, HDSC Setup, Close View, Disk First Aid<sup>®</sup>, and Font/DAMover)
  - HyperCard<sup>®</sup> Version 1.2.5 (or greater) is included.
  - A/UX Version 1.1.1 (or greater) is compatible with the Macintosh IIci Logic Board Upgrade.

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## Technical Specifications

### Processor

- 68030; 32-bit internal Harvard architecture
- 25-megahertz clock speed
- Burst mode RAM access
- 256-byte instruction and data caches

### Coprocessor

- 68882 floating-point coprocessor (IEEE standard—80 bits precision)

### Cache connector

- 120-pin memory cache connector (for connection of optional high-speed cache memory card)

### Built-in video support

- Supports 640-by-480-pixel screens at up to 256 colors or shades of gray (up to 8 bits per pixel)
- Supports 640-by-870-pixel screens at up to 16 shades of gray

### Interfaces

- Three internal NuBus slots support full 32-bit address and data buses
- Two mini-8 serial (RS-232/RS-422) ports
- Two Apple Desktop Bus ports allow daisy-chaining of multiple peripheral devices

- SCSI interface: one 50-pin internal connector and one DB-25 external connector

- One DB-19 serial port for connecting external floppy disk drives

- One DB-15 video port for built-in video

- Stereo sound jack

### Sound generator

- Apple Sound Chip (ASC): includes four-voice, wave-table synthesis and stereo sampling generator capable of driving stereo mini-phone-jack headphones or other stereo equipment



# Macintosh IIci Logic Board Upgrade

## System Requirements

The following chart shows the possible configurations and the upgrade required for each one.

Starting configuration	Required upgrade*	Upgraded configuration
<ul style="list-style-type: none"> <li>Macintosh IIcx personal computer with 1 megabyte of RAM</li> </ul>	<ul style="list-style-type: none"> <li>Macintosh IIci Logic Board Upgrade (M0245LL/A)</li> </ul>	<ul style="list-style-type: none"> <li>Macintosh IIci personal computer with 1 megabyte of RAM</li> </ul>
<ul style="list-style-type: none"> <li>Macintosh IIcx personal computer with 2 megabytes of RAM</li> </ul>	<ul style="list-style-type: none"> <li>Macintosh IIci Logic Board Upgrade (M0245LL/A)</li> <li>Macintosh IIci 1MB Memory Expansion Kit (M0291LL/A)</li> </ul>	<ul style="list-style-type: none"> <li>Macintosh IIci personal computer with 2 megabytes of RAM</li> </ul>
<ul style="list-style-type: none"> <li>Macintosh IIcx personal computer with 5 megabytes of RAM</li> </ul>	<ul style="list-style-type: none"> <li>Macintosh IIci Logic Board Upgrade (M0245LL/A)</li> <li>Macintosh IIci 4MB Memory Expansion Kit (M0292LL/A)</li> </ul>	<ul style="list-style-type: none"> <li>Macintosh IIci personal computer with 5 megabytes of RAM</li> </ul>
<ul style="list-style-type: none"> <li>Macintosh IIcx personal computer with 8 megabytes of RAM</li> </ul>	<ul style="list-style-type: none"> <li>Macintosh IIci Logic Board Upgrade (M0245LL/A)</li> <li>Two Macintosh IIci 4MB Memory Expansion Kits (M029LL/A)</li> </ul>	<ul style="list-style-type: none"> <li>Macintosh IIci personal computer with 8 megabytes of RAM</li> </ul>

## Recommended Options

<ul style="list-style-type: none"> <li>Macintosh IIci Cache Card</li> <li>The Macintosh IIci Cache Card (M0326LL/A) can increase system performance by 20 percent to 30 percent.</li> </ul>	<ul style="list-style-type: none"> <li>RAM</li> <li>The Macintosh IIci 1MB Memory Expansion Kit (M0291LL/A) can expand Macintosh IIci memory to 2 megabytes or 5 megabytes.</li> </ul>	<ul style="list-style-type: none"> <li>The Macintosh IIci 4MB Memory Expansion Kit (M0292LL/A) can expand Macintosh IIci memory to 5 megabytes or 8 megabytes.</li> </ul>
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## Ordering Information

Macintosh IIci Logic Board Upgrade**	Order No. M0295LL/A	With your order, you'll receive: <ul style="list-style-type: none"> <li>Macintosh IIci logic board</li> <li>Macintosh IIci bottom case</li> <li>Macintosh System Software Version 6.0.4 (or greater)</li> <li>HyperCard Version 1.2.5 (or greater)</li> <li>Macintosh IIci Owner's Guide</li> <li>Limited warranty statement</li> </ul>
Macintosh IIci 1MB Memory Expansion Kit**	Order No. M0291LL/A	
Macintosh IIci 4MB Memory Expansion Kit**	Order No. M0292LL/A	

\*RAM that is removed from the Macintosh IIcx may be used in other Macintosh systems, including Macintosh IIx, II, SE/30, SE, and Plus computers. Installing RAM in these computers without dealer assistance will invalidate any existing warranty.

\*\*Dealer installation is required