

# Technical Information

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*Specifications for Macintosh PowerBook 190 series computers*

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## General specifications

### Processor

- 68LC040 at 66 or 33 megahertz (MHz) clock frequency

### Memory

- 4 or 8 megabytes (MB) low-power dynamic random-access memory (DRAM), expandable to 36 or 40 MB
- 2 MB read-only memory (ROM)

### Disk drives

- 500 MB 2.5" hard drive  
(Hard drive sizes may vary and depend on the model.)
- Removable 1.44 MB floppy disk drive (in the expansion bay) reads and writes Macintosh 800K and 1.4 MB floppy disks, as well as Windows, DOS, and OS/2 720K and 1.44 MB floppy disks.

### Video display

- *Macintosh PowerBook 190*  
9.5" diagonal, 640 x 480 backlit supertwist (FSTN), 16 grays
- *Macintosh PowerBook 190cs*  
10.4" diagonal, 640 x 480 dual-scan passive matrix (FSTN), 256 colors

### Battery

- Rechargeable nickel-metal-hydride (NiMH) battery provides 2.5–5 hours of operation, depending on battery-saving features used and computer configuration.

### Backup battery

- 50 milliamperes (mA) rechargeable lithium battery for calendar/clock maintenance also backs up the contents of RAM for a few minutes while you change batteries with your PowerBook in sleep mode.

## **Sound**

- 16-bit stereo sound out supports 44.1 kilohertz (kHz) (“CD quality” sound), 22 kHz, and 11 kHz sample rates.
- Speaker housed in the PowerBook’s display
- Built-in microphone

## **Interfaces**

- Two PC Card (PCMCIA card) slots support either two Type I or Type II cards, or one Type III card.
- Expansion bay slot accepts a removable expansion bay module, including the 1.44 MB floppy disk drive and other optional modules.
- Apple Desktop Bus (ADB) port for keyboard, mouse or other input devices using a low speed, synchronous serial bus
- SCSI port (HDI-30 connector) for hard disk drives, CD-ROM drives, scanners, printers, and other devices; also supports PowerBook SCSI disk mode
- Serial port for printers, modems, a LocalTalk network connection, or other serial devices (RS-422)
- Sound output port for external audio amplifier/powered speakers, stereo mini-jack, 3-connector, standard 3.5 mm stereo miniplug
- Optional infrared file transfer capability
- Optional video capabilities for 8-bit/256-color video output to most Apple monitors, VGA monitors (640 x 480 pixels), and SVGA monitors (800 x 600 pixels)

## **Power adapter**

- Input: AC 100–240 volts (V), 50/60 hertz (Hz)
- Output: DC 24 V, 1.875 A nominal

## **Keyboard**

- 3.0 mm travel keyboard  
19 mm vertical pitch, 19 mm horizontal pitch

### **Trackpad**

- Integrated, solid-state trackpad provides precise cursor movement and lets you click, double-click, and drag.

### **Weight**

- *Macintosh PowerBook 190*  
with the floppy disk drive expansion bay module inserted: 2.7 kg (6.0 lb)
- *Macintosh PowerBook 190cs*  
with the floppy disk drive expansion bay module inserted: 2.9 kg (6.3 lb)

### **Dimensions**

- *Macintosh PowerBook 190*  
279 mm x 216 mm x 50.8 mm (11.0 in. x 8.5 in. x 2.0 in.)
- *Macintosh PowerBook 190cs*  
279 mm x 216 mm x 56 mm (11.0 in. x 8.5 in. x 2.2 in.)

### **Apple Desktop Bus power requirements**

- Maximum current draw for all ADB devices is 200 mA

*Note:* The maximum number of ADB devices recommended in a daisy chain connected to the ADB port is three.

### **RAM configurations**

All models ship with either 4 MB or 8 MB of RAM on the main logic board. Additional RAM may be installed by means of RAM expansion cards, available from any Apple-authorized dealer.

RAM expansion cards must use RAM chips rated at 70 ns access time or faster, and must have TSOP low-profile RAM chips only. Installing a card with high-profile chips may damage your computer.

### **Microphone**

The internal microphone is an omnidirectional electret type.

### **Environment**

- Operating temperature: 5° C to 35° C (41° F to 95° F)

### **Storage temperature**

- -25° C to 60° C (-13° F to 140° F)

### Relative humidity

- 20% to 80% noncondensing

### Altitude

- Operating: 3048 m (10,000 ft.) maximum
- Shipping (non-operating): 4572 m (15,000 ft.) maximum

## Options and accessories

The following are available as options and accessories for your PowerBook computer:

Item	Part number
Macintosh PowerBook Power Adapter for Macintosh PowerBook 5300 series and 190 series	M3747**/A
Macintosh PowerBook 8MB RAM Expansion Card for Macintosh PowerBook 5300 series and 190 series	M3750**/A
Macintosh PowerBook Logic Board Upgrade Kit with PowerPC for Macintosh PowerBook 190 series	M3881**/A
Macintosh PowerBook Infrared Upgrade Kit for Macintosh PowerBook 190 series	M4071**/A
Macintosh PowerBook 8-bit Color Video-out Upgrade Kit for Macintosh PowerBook 190 series	M3743**/A
Macintosh PowerBook 10.4" Active Matrix Color Display Upgrade Kit for Macintosh PowerBook 5300 series (requires PowerPC upgrade)	M3746**/A
PowerBook Video Adapter Cable	M3927LL/A
Apple HDI-30 SCSI Disk Adapter for SCSI disk mode	M2539LL/A
Apple SCSI Peripheral Interface Cable for SCSI to SCSI connection	M0207
Apple HDI-30 SCSI System Cable for CPU to SCSI connection	M2538LL/A





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