

MACINTOSH 12" RGB DISPLAY

The Macintosh 12" RGB Display is an ideal companion for your Macintosh computer in both design and usability. It produces color images by combining red, green, and blue light.

The Macintosh 12" RGB Display has the following features:

- full analog RGB color capacity
- a high-contrast, full-sized screen
- crisp image quality
- bright, vibrant colors
- graphics capability
- simultaneous presentation of color graphics and text
- easily accessible brightness and contrast controls
- an easy-to-clean screen and cabinet

The Macintosh 12" RGB Display is designed for use with any Macintosh computer that has a built-in video port, or any Macintosh with the appropriate video card installed. ("Installing a Video Card," later in this manual, gives information about video cards.)

Your Macintosh 12" RGB Display is easy to set up and adapt to your working habits and environment. To get the best results from your display, take a few minutes to read this manual. Here's an overview of the topics you'll find:

- connecting the display to your Macintosh computer and to a power outlet
- turning the display on
- adjusting the display's brightness and contrast

You'll also find some tips on using and caring for the display, notes on service and support, and a section that provides technical specifications. Follow all instructions carefully.

!! WARNING: Electrical equipment may be hazardous if misused. Operation of this product, or similar products, must always be supervised by an adult. Do not allow children access to the interior of any electrical product, and do not permit them to handle any cables. !!

Important Safety Instructions

Before you plug in your display, read these important safety instructions.

!! WARNING: Your display is equipped with a three-pronged grounding plug, which will fit only a grounded AC outlet. This is a safety feature. If you are unable to insert the plug into an outlet, contact a licensed electrician to replace the outlet with a properly grounded outlet. Do not defeat the purpose of the grounding plug! !!

Be sure that you always:

- Follow all instructions and warnings dealing with your system.
- Read all the installation instructions carefully before you plug your display into an electrical outlet.
- Keep your display away from sources of liquids, such as coffee cups, drinking glasses, and wash basins.
- Protect your display from dampness or wet weather -- rain, snow, and so on.
- Keep these instructions handy for reference by you and others.

For your own safety and that of your equipment, immediately disconnect the power plug from the electrical outlet (by pulling the plug, not the cord) when any of the following conditions exists:

- the power cord or plug becomes frayed or otherwise damaged
- you spill something onto the case
- your display is exposed to rain or any other excess moisture
- your display has been damaged by dropping, or the case has been otherwise damaged
- you suspect that your display needs service or repair
- you want to clean the case (use only the recommended cleaning procedure described later in this manual)

Positioning Your Display

When considering where to put your computer system, keep in mind that you'll need an electrical outlet nearby. Many people find it convenient to plug their computer equipment into a single power strip equipped with a surge protector, which protects against damage caused by sudden increases in voltage. Although your Macintosh and display are designed to withstand power surges, such a power strip provides an extra measure of protection against this risk. See your authorized Apple dealer for more information about power strips.

!! IMPORTANT: Never plug your computer into a wall socket that you can turn off with a wall switch. If someone switches off the lights and shuts down your computer, you could lose any data not saved on disk. **!!**

Choose a sturdy desk or table to work on. Don't set up your Macintosh computer system on a card table or other surface that could be tipped or knocked over easily.

Your Macintosh 12" RGB Display has been designed to fit on top of the computer's case, although you can position it anywhere you like. Try it on top of the computer and see if you like it there. If not, you can place the display to the side.

Using two displays: If you are using two displays with your Macintosh, placing them close together may cause interference with the images on the

displays' screens. If this happens, see "Working With More Than One Display," later in this manual, for help.

Your display can be used comfortably without a monitor stand. However, with a monitor stand, you can raise the display and adjust the viewing angle. Monitor stands swivel from side to side and tilt forward and back, allowing you to set your display to the viewing angle you find most comfortable. (Monitor stands are available from your authorized Apple dealer.)

Installing a Video Card

If your Macintosh doesn't have a built-in video port, you'll need to install a video card in one of the NuBus expansion slots in your computer. Your Macintosh 12" RGB Display is designed to work with either the Macintosh Display Card 4•8 or the Macintosh Display Card 8•24. Your authorized Apple dealer can provide you with the appropriate video card for your computer.

The manuals that come with your Macintosh include complete instructions for installing a video card (along with instructions for setting up your computer). If you can't find these instructions, or if you prefer not to install the video card yourself, ask your authorized Apple dealer for assistance.

Connecting the display

Your display connects to a built-in video port or a video card connector on the back panel of the computer and to a grounded AC outlet. Here's how to connect the display:

1. Position the display and computer so that you can easily get at the back panel of each.
2. Connect the end of the display's video cable to the appropriate video socket on the computer.
 - If your computer has a built-in video port, plug the cable into the video port -- it's the horizontal socket on the computer's back panel that's marked with the video icon.
 - If you have installed a video card, plug the cable into the vertical connector on the video card.

Figure 2 The built-in video port and the video card connector

3. Tighten the thumbscrews.

Tightening the two thumbscrews keeps the connection from coming loose and helps prevent radio and television interference.

Figure 3 Tightening the thumbscrews on the video cable

4. Plug the display's power cord into a grounded AC outlet.

If you have other peripheral devices you want to connect to your computer, do it now while you have easy access to the computer's back panel. If not, you're ready to start the computer and the display.

Turning the Display On

To turn your display on, press the on/off switch on the display's back panel (see Figure 5). When you turn on the display, you should see the green power-on light come on.

If it doesn't work: If the power-on light doesn't come on, press the on/off switch again. If this doesn't work, make sure you've connected the display according to the instructions in the section "Connecting the Display," earlier in this guide. If the light still doesn't come on after you've checked the connections, consult the section "Troubleshooting," later in this guide.

To turn the display off, press the on/off switch again.

Adjusting Brightness and Contrast

The brightness and contrast controls allow you to adjust your display to suit your preferences and environment. These controls work just like the brightness and contrast controls on a television.

To adjust the brightness or contrast, you need to have an image on the screen. First make sure the display and computer are on (it doesn't matter which you turn on first). Then start up an application program. (See the manuals that come with your computer if you don't know how to start a program.)

Once you have a program running, you can adjust your display. The brightness and contrast controls are on the side of the display. An icon identifies each control.

Follow these steps to adjust your display:

1. Turn the contrast control toward the back of the display until it stops.

Turning the control toward the back of the display increases contrast; turning it toward the front decreases contrast.

2. Adjust the brightness control until the screen brightness is comfortable.

As you turn the brightness control, you'll feel a catch near the center of the brightness range. This position -- called detent -- usually marks the best balance between light and dark on your display.

3. Turn the contrast control slowly toward the front of the display to decrease the contrast (and soften the image) until it reaches a comfortable level.

By the way: If you use your display at a high brightness setting for extended periods of time, you may decrease its life expectancy. You'll get the longest life from your display by setting the brightness control at the detent position and the contrast at maximum.

Using and Caring for Your Display

This section includes important guidelines on caring for your display and suggestions on how to use it efficiently.

Working tips

Here are some tips you should keep in mind when using the Macintosh 12" RGB Display:

- The computer and display are not made of antique porcelain, but they aren't made of cast iron either. Use common sense when handling parts of the system.
- To reduce glare, position the display so that the screen won't reflect bright light. Also, avoid placing the display where you will be facing a source of bright light, such as a window.
- Staring at anything for a long time can cause eyestrain. Make it a rule to focus on a distant object occasionally to relax your eye muscles.

Things to avoid

Follow the guidelines listed below to avoid damaging your display:

- Don't subject your display to any sharp jolts. The display has sensitive internal parts that can be damaged by rough treatment.
- Don't leave your Apple computer system exposed to direct sunlight. The heat can damage the case and even the electronics.
- Don't set cups, glasses, or anything containing liquids on or beside the computer, display, or peripheral devices. Spilling liquid into an electronic instrument damages its circuitry.
- Don't place objects -- books, papers, magazines, clothing, and so on -- on top of the computer or display. Such objects can block the cooling vents. The extra weight of objects may also cause the display to tip over.

By the way: Your display probably feels warm to the touch when it's on. Like a television set, the electronics and picture tube give off a certain amount of heat. This is normal and not a cause for concern.

About screen savers

Images left on the screen for long periods of time can become permanently imprinted on the screen. This effect reduces the phosphor brightness of the display in the areas where the images appear. A screen saver is a special kind of utility software that preserves the screen when your Macintosh is on but unused for long periods of time. A screen saver protects your display from phosphor degradation by darkening the screen. (Turning the brightness control down to dim the screen can protect the display's phosphor, too.)

It's not a good idea to turn the contrast all the way down for long periods of time, or to use a screen saver that leaves your screen completely black. A black screen gives the impression that the computer is off, and someone might move the computer or unplug it -- either of which can cause data loss or damage to the hard disk.

The best screen savers keep the screen dark while displaying a moving image - for example, fireworks or roving geometric shapes. Never use a screen saver that leaves stationary images on the screen.

You can get information about screen savers from your authorized Apple dealer.

Protecting your display from theft

The small rectangular opening on the display's back panel is for connecting a security lock. It lets you attach a narrow, flexible cable that you can use to secure your display (and the rest of your Apple computer system) to prevent theft. (See Figure 7.) Security locks are available from your authorized Apple dealer.

Cleaning the display

Follow these procedures whenever you need to clean your display:

1. Turn off the display by pressing the on/off switch.
2. Disconnect the power plug from the electrical outlet. (Pull the plug, not the cord.)
3. Clean the cabinet with a damp (not wet) lint-free cloth.

Don't use aerosol sprays, solvents, or abrasives that might damage the finish on the case.

4. If the screen gets dirty, apply a household glass cleaner to a clean cloth or paper towel and wipe the screen. Don't spray glass cleaner directly onto the screen. It could run down inside the case and damage electrical circuits.

It's a good idea to keep your display clean: An accumulation of dust on the screen can result in reduced image quality.

Storing the display

When you're not going to use your display for an extended period, it's a good idea to put it back in its original packaging and store it in a place where the temperature stays between -40F and 116F (-40C and 47C). The packing material will protect the display against jarring bumps and spilled liquids.

Working with more than one display

To use more than one display with your Macintosh computer, you need to install a video card for each additional display. (Your computer must have a NuBus expansion slot to accommodate each additional video card.)

To control how your displays will interact, choose the Control Panel desk accessory from the Apple menu and adjust the display settings to suit your needs. (See the documentation that comes with your computer for details on using the Control Panel.)

If you're using more than one display and you notice that the image on one or both of the displays is unstable, your displays may be interfering with each other. To find out if this is the problem, turn off one of the displays. If the image on the other display becomes stable, you know that the problem is interference, or "jitter."

The solution to a jitter problem is to place your displays farther apart. (Moving them 16 inches apart should eliminate the jitter.) If you have a limited workspace and you want to keep your displays together, try setting the displays at an angle so that their screens are together and their back panels are apart. This placement should provide enough distance between displays to clear up the jitter.

Troubleshooting

This section gives solutions to some common problems you might encounter while using your Macintosh 12" RGB Display. If you have a problem with your display that you can't solve, contact an authorized Apple dealer, or call one of the phone numbers listed in the next section, "Service and Support."

There's no image on the screen.

Solution: Make sure that your display's video cable is connected to the video port (or video card connector) on the Macintosh, and that the Macintosh is running. Make sure the display is plugged into a grounded AC power outlet and the power-on light is on. Finally, check the brightness and contrast settings to make sure they aren't turned all the way down.

There's flickering and distortion on the screen.

Solution: Check to make sure the display's video cable is connected firmly to the computer. If it is, the flickering could be caused by interference from a nearby power line or electrical device--for example, a radio, a microwave oven, or another computer. Try relocating nearby electrical devices, or move your Macintosh and display. (The previous section, "Working With More Than One Display," explains how to deal with interference that's caused by another display.)

Something magnetic (for example, a stereo speaker) near the display has disturbed the colors on the screen.

Solution: Turn the display's power off, then turn it back on. This should neutralize the effects of the magnet. If the distortion persists, turn the display off and wait about 45 minutes before turning it on again.

The display's power-on light doesn't come on.

Solution: Check to see that the power cord is plugged in properly. If it is, check to see whether power to the outlet has been interrupted. You can test the outlet by plugging in something that you know works--like a desk lamp or a radio. If the test appliance works but the display doesn't, contact your authorized Apple dealer.

Specifications

Picture tube

- 12-inch viewable diagonal, with in-line gun
- 90° deflection angle
- Black matrix-type dot screen
- Phosphor type (aluminized), P22

- Faceplate of spherical, gray filter glass

- Shadow mask

Input signals

- Red, green, and blue video signals using RS-343 standard; TTL composite sync

User controls

- On/off switch (back panel)

- Brightness, with detent reference (right side)

- Contrast (right side)

Scanning and refresh rates

- Horizontal scan rate 24.48 kHz

- Vertical refresh rate 60.15 Hz

Rise and fall time

- 27 ns maximum

Active video display area

- Adjusted at the factory to produce an active video area described by an ideal rectangle of 205 mm by 153 mm. The remainder of the screen is used for the dark border around the display.

Resolution

- 512 horizontal pixels by 384 vertical lines; 64 dpi

- Dot pitch 0.28 mm

Weight

- 24 lb. (10.88 kg)

Input electrical requirements

- Voltage 100-120 volts (AC) +/-10%

- Frequency 50-60 Hz +/-3 Hz

- Power 90 watts maximum, all line conditions

Operating ambient temperature

- 50-104F (10-40C)

Operating humidity

- 95% maximum, noncondensing

Operating altitude

- 10,000 feet maximum (exception: 40C operation from 0 to 7000 feet and derated linearly to 25C at 10,000 feet)

Fuse protection

- The display contains internal power line fuse protection. Its fuse should be replaced with a fuse of the same type by a qualified service technician.

Warm-up time

- 20 minutes to meet all specifications (however, the display can be used immediately after it's turned on)

Input signal jack pin assignments

Pin	Function
1	Red video ground
2	Red video
3	Composite H and V sync
4	ID bit 1
5	Green video
6	Green video ground
7	ID bit 2
8	(not used)
9	Blue video
10	ID bit 3
11	CSYNC ground
12	(not used)
13	Blue video ground
14	(not used)
15	(not used)
(Shell)	Shield ground

-Connector type: D sub-miniature 15-pin