APPLECOLOR HIGH-RESOLUTION RGB MONITOR OWNER'S GUIDE

The AppleColor High-Resolution RGB Monitor is an ideal companion for your Macintosh computer. Take a few minutes to review the information in this guide about setting up and using your monitor.

About This Monitor and Guide

Your AppleColor High-Resolution RGB Monitor provides excellent image quality and an ergonomic design. Some of its innovative features include:

- a Trinitron color picture tube for true colors and crisp, sharp focus

- a high-contrast, full-sized screen

- stable, flicker-free images

- high brightness for easy viewing

- easy-to-reach brightness and contrast controls

- manual degauss button to eliminate distortion and ensure maximum color purity

- height-adjustment bar to improve viewing angle

Your AppleColor High-Resolution RGB Monitor is easy to set up and adapt to your working habits and environment. You can change the brightness and contrast of the monitor to suit your preferences. You can also adjust the viewing angle of your monitor with the accompanying height-adjustment bar or a monitor stand (available from your authorized Apple dealer).

By the way: The name RGB means that the monitor creates color images by combining red, green, and blue light.

Here's an overview of the topics you will find in this owner's guide:

- installing a video card, if needed

- setting up the optional monitor height-adjustment bar

- connecting the monitor to your Macintosh computer

- turning the monitor on

- setting the number of colors

- adjusting the monitor's display

- troubleshooting

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

Important Safety Guidelines

As you begin to set up your AppleColor High-Resolution RGB Monitor, keep in mind the following:

- Read all the installation instructions carefully before you plug your monitor into an electrical outlet.

- Keep these instructions handy for reference by you and others.

- Follow all instructions and warnings dealing with your system.

!! 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. !!

What You Need to Set Up Your Monitor

Before you set up the monitor, it's a good idea to have the original setup instructions that came with your computer. In addition, you need these items, which are packaged with your monitor:

- the height-adjustment bar

- the video cable

- the power cable

You may also need a video card (sometimes called a display card). A video card is not required if your Macintosh model has a built-in video port (sometimes called on-board video). However, you can add a video card that provides more capabilities than those of the built-in video circuitry.

Your AppleColor High-Resolution RGB Monitor is designed to work with any of these three video cards from Apple:

Macintosh Display Card	Maximum number of colors
4•8	256
8•24	16.7 million
8•24 GC (accelerated)	16.7 million

Compatible video cards are also available from other manufacturers. Consult your authorized Apple dealer for more information.

By the way: A video card is an example of what's called an "expansion" card because it expands the capabilities of your computer.

If you're missing any of the pieces you need, contact your authorized Apple dealer.

Installing a Video Card

If you need to install a video card in one of the expansion slots inside your computer, it's best to use the specific setup instructions that came with your computer. If you don't have these, you can follow the general steps listed here. Don't worry if your computer and video card look slightly different from the ones shown in Figure 1.

1. Make sure your computer's power cord is plugged into the recessed power plug on the back of your computer and into a grounded electrical outlet or power strip.

2. If you hear the computer start up, turn it off using the button or switch on the back panel.

3. Remove the lid from your computer.

4. To discharge any static electricity, touch the shiny metal cover of the power supply.

5. Choose any unused expansion slot.

If there is a protective metal shield for the slot inside the computer's back panel, lift the shield up and out.

6. Push out the plastic cover for the slot so that there is an opening in the back panel of the computer.

Figure 1   Adding a video card to a Macintosh IIfx computer

7. Remove the video card from its static-proof bag.

8. Hold the card by its top edge.

9. Align the video card connector over the expansion slot you want to use.

10. Press down firmly on the card until the connector is seated on the expansion slot.

11. Replace the lid on the computer.

After installing the video card, you'll see its video port accessible inside the opening on the back of your computer. This is where you will connect the video cable.

Placing Your Monitor on Top of the Computer

Your AppleColor High-Resolution RGB Monitor is designed to fit right on top of the computer case, but you can put it wherever you like -- for instance, next to the computer. You also have the option to use the height-adjustment bar to raise the monitor one-fourth or one-half inch higher.

Follow these instructions to use the height-adjustment bar:

1. Gently turn the monitor on its side.

2. Align the slots on the height-adjustment bar with the plastic guides on the bottom of the monitor.

- To raise the monitor one-fourth inch, use the slots on the wide side of the bar.

- To raise the monitor one-half inch, use the slots on the narrow side of the bar.

3. Push the bar onto the plastic guides.

4. Gently return the monitor to its upright position.

Figure 2   Attaching the height-adjustment bar

If the height-adjustment bar doesn't meet your needs, you can purchase a monitor stand. With a monitor stand, you can raise the monitor even higher and adjust the viewing angle. Monitor stands swivel from side to side and tilt forward and back, allowing you to set your monitor to the viewing angle you find most comfortable. (Monitor stands are available from your authorized Apple dealer.)

!! WARNING: Protect your monitor from dampness and wet weather and keep it away from other sources of liquids, such as coffee cups, drinking glasses, and wash basins. !!

Connecting Your Monitor

Before you connect the monitor to your computer, make sure your computer is turned off.

You need to attach the monitor's power and video cables to the back panel of your computer. (Note the exception in step 3 for a Macintosh LC.) Follow these steps:

1. Place the monitor and computer so that you can easily get at the back panel of each.

2. Plug the socket end of the power cable (or, if you have a Macintosh LC, the extra power cord that came with your computer) into the monitor's recessed power plug.

3. Plug the pronged end of the power cable into the computer's power socket (unless you have a Macintosh LC).

- Most Macintosh models have a power socket on the back panel that matches the other end of the monitor's power cable. The monitor's power cable will not fit into a wall outlet or power strip.

- The Macintosh LC does not have a power socket for your monitor cable. You will need to use the monitor power cord that came with your Macintosh LC to connect the monitor directly to a grounded wall outlet or power strip.

By the way: If for some reason you decide not to plug your monitor into your computer, or if you're using more than one monitor, you'll need at least two outlets near your computer, and you'll need to contact your authorized Apple dealer to get a standard power cord with a three-prong grounded plug.

4. Plug one end of the video cable (both ends are the same) into the monitor's video socket.

The socket is on the monitor's back panel, marked with the video icon.

5. Tighten the thumbscrews.

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

6. Connect the other end of the video cable to the appropriate video port on the computer and tighten the thumbscrews.

- If you have not installed a video card, connect the cable to the built-in video port on the computer's back panel.

- If you have installed a video card, connect the cable to the port on the video card.

TURNING YOUR MONITOR ON

To turn your monitor on, press the on/off button on the monitor's back panel. When you turn on the monitor, 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 button again. If this doesn't work, make sure you've connected the monitor according to the instructions in "Connecting Your Monitor." For instance, if the monitor's power cable is connected to your Macintosh, be sure the computer is turned on. If the light still doesn't come on after you've checked the connections, consult "Troubleshooting."

To turn just the monitor off, you can press the monitor's on/off button. If you want to turn off your entire computer system, leave the monitor's on/off button in the on position, and shut down your computer. With the monitor plugged into the back of the computer, shutting down the computer shuts down the whole system. The next time you turn your computer on, the monitor will come on with it.

By the way: If you have a Macintosh LC or if you haven't connected the monitor's power cable to your computer, you will need to turn the monitor on and off each time by using the monitor's on/off button.

Setting the Number of Colors

You set the number of colors (or shades of gray) you want in the Monitors control panel, according to the following steps. The boldface instructions for steps 2 through 5 are for system software version 7.0 or later. Notes after those boldface steps explain any differences with earlier versions of system software.

1. Start up your computer.

Depending on your model of Macintosh, you can press the Power On key on the keyboard or use the on/off switch on the back of the computer. The Power On key does not work this way with a Macintosh LC, so you need to use the on/off switch at the back of the computer.

2. Choose Control Panels from the Apple menu.

If you are using a version of system software earlier than 7.0, you will need to choose Control Panel from the Apple menu.

3. Open the Monitors control panel icon.

If you are using a version of system software earlier than 7.0, scroll in the small window on the left side of the Control Panel to find the Monitors icon and then click the icon.

4. Click Colors to turn on the color capability.)

5. Click the number of colors you wish to use.

See the Macintosh reference materials that came with your computer for more details on using the Monitors control panel.

Figure 7   The Monitors control panel in system software version 7.0

Adjusting the Display

You can adjust the screen display on the monitor to suit your preferences, using these controls:

- The brightness and contrast controls work just like those controls on a television.

- The degauss button corrects any distortions that might appear in the colors displayed on your monitor.

These controls are described in the next sections.

The Brightness and Contrast Controls

Under normal lighting conditions, you'll get the best results by setting the brightness and contrast controls as follows:

1. Turn the contrast control clockwise as far as it will go.

This gives maximum contrast.

2. Turn the brightness control clockwise until it's in about the center, or detent, position.

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

It takes about 20 minutes for the monitor to warm up completely. During this time you may

see slight changes in brightness.

For best performance over the life of the monitor, keep brightness set below maximum, preferably at the detent position. You will find tips for adjusting brightness and contrast to avoid eyestrain in various room lighting situations in "Troubleshooting."

The Degauss Button

Changes in the magnetic field around a monitor can cause distortions to the image displayed on the screen. The magnetic field may change when you move the monitor, or when you bring a magnetized object, such as an audio speaker, close to the monitor.

The monitor automatically adjusts, or degausses (de gous' ez), every time you turn it on. However, if you leave the monitor turned on over long periods (more than three days), it's a good idea to press the manual degauss button on the back of the monitor. This ensures that you are getting the best quality image possible.

The degauss button is located just below the on/off button on the back panel.Pressing the degauss button makes the screen flicker for a few seconds as the degauss circuitry corrects the colors in your monitor. When the screen becomes steady again, the colors should be correct. If you still detect color distortion, contact your authorized Apple dealer.

Using and Caring for Your Monitor

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

For Your Safety

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 monitor is exposed to rain or any other excess moisture.

- Your monitor has been dropped and damaged, or the case has been otherwise damaged.

- You suspect that your monitor needs service or repair.

- You want to clean the case (use only the recommended cleaning procedure described later in this guide).

Working Tips

Here are some tips you should keep in mind when using the AppleColor High-Resolution RGB Monitor:

- To reduce glare, place the monitor so that the screen won't reflect bright light. Also, avoid placing the monitor near 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 these guidelines to avoid damaging your monitor:

- Avoid placing objects -- books, papers, magazines, clothing, and so on -- where they will block the cooling vents.

- Avoid jostling or bumping the monitor. It has sensitive internal parts that can be damaged by rough treatment.

- Avoid exposing the monitor to direct sunlight. Heat can damage the case and even the electronic circuitry.

- Avoid setting cups, glasses, or anything containing liquids on or beside the monitor. Spilling liquid into any electronic device can damage the circuitry.

By the way: Your monitor feels warm to the touch when it's on. This is normal. Like a television set, the electronic circuitry and picture tube give off some heat.

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 monitor 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 not being used for long periods of time. A screen saver protects your monitor from phosphor degradation by darkening the screen. (Turning the brightness control down to dim the screen can protect the monitor'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 monitoring a moving image -- for example, fireworks or roving geometric shapes.

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

Protecting Your Monitor from Theft

The small rectangular opening next to the video socket on the back of the monitor is for connecting a security lock. It lets you attach a narrow, flexible cable that you can use to secure your monitor (and the rest of your Apple computer system) to prevent theft. (See Figure 10.) Security locks are available from your authorized Apple dealer.

Cleaning Your Monitor

Follow these procedures whenever you need to clean your monitor:

1. Turn off the monitor by pressing the on/off button.

2. Disconnect the monitor power cable or cord from your computer's power socket (or from the electrical outlet if you have a Macintosh LC).

Pull the plug, not the cable or cord.

3. Clean the cabinet with a damp (not wet), lint-free cloth.

Don't use aerosol sprays, alcohol, 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.

Keep your monitor clean: An accumulation of dust on the screen can result in reduced image quality.

Storing Your Mointor

When you're not going to use your monitor 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 monitor against jarring bumps and spilled liquids.

Working with More Than One monitor

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

To control how your monitors will interact, use the Monitors control panel to adjust the monitor settings to suit your needs. (If you're using a version of system software version earlier than 7.0, use the Monitors section of the Control Panel.) See your Macintosh reference materials for more details.

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

The solution to a jitter problem is to place your monitors farther apart. (Moving them 16 inches apart should eliminate the jitter.) If you have a limited work space and you want to keep your monitors together, try setting the monitors at an angle so that their screens are together and their back panels are apart.

Troubleshooting

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

There's a very thin gray line across the screen, about one-third of the way up from the bottom

Solution: This thin line is a normal part of the Trinitron color picture tube design. It appears only on the screen.

There's no image on the screen

Solution: Make sure that your monitor'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 monitor is plugged into the computer's power socket (or other electrical outlet) and that 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: First, press the degauss button on the back of the monitor. If that doesn't correct the problem, check to make sure the monitor'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 moving the electrical devices that might be causing interference, or move your Macintosh and monitor. ("Working With More Than One Monitor" explains how to deal

with interference that is caused by another monitor.)

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

Solution: Press the degauss button on the back of the monitor.

The monitor's power-on light doesn't come on

Solution: Check to see that all cords and cables are plugged in properly.

In a dim room, faint lines are visible along the outer perimeter of the screen

Solution: Turn down the brightness slightly.

After the initial 20-minute warm-up time, or after many hours of use, the screen image appears dim

Solution: Turn up the brightness to suit your preference.

Over time, you feel eyestrain

Solution: Adjust the contrast to suit your preference. In a bright room, contrast is usually best set at maximum; in a dim room, lower contrast is usually more comfortable. Also, be sure to take occasional breaks to focus your eyes on a distant object.

Specifications

Picture tube

- 13-inch viewable diagonal

- .26 millimeter aperture grille pitch Trinitron CRT

Input signals

- Red, green, and blue video signals; composite sync, negative going TTL

User controls

- On/off button (back panel)

- Degauss button (back panel)

- Brightness control with detent reference (right side)

- Contrast control (right side)

Scanning and refresh rates

- Horizontal scan rate   35.000 kHz

- Vertical refresh rate   66.7 Hz

Rise and fall time

- 18 ns maximum

Active video display area

- Adjusted at the factory to produce an active video area of 235 mm horizontal by 176 mm vertical. The remainder of the screen is used for the dark border around the monitor.

Resolution

- 640 horizontal pixels by 480 vertical lines; 69 dpi

Weight

- 44 lb. (20 kg), including video and power cables

Input electrical requirements

- Voltage   90-270 Vrms

- Frequency   47-63 Hz

- Power   160 watts maximum, all line conditions

Operating ambient temperature

- 10oC to 40°C (50°F to 104°F)

Operating humidity

- 90% maximum, noncondensing

Operating altitude

- 10,000 feet maximum

Fuse protection

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

Warm-up time

- 20 minutes to meet all specifications (however, the monitor 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	Monitor ID bit #1
5	Green video
6	Green video ground
7	Monitor ID bit #2
8	(not used)
9	Blue video
10	Monitor ID bit #3

11	(not used)
12	(not used)
13	Blue video ground
14	(not used)
15	(not used)
(Shell)	Shield ground