

WHAT YOU NEED FOR SETUP-YOUR DISPLAY SYSTEM AT A GLANCE

These pages show the Macintosh 16" Color Display set up using all its optional features. To set up your own display system, follow the instructions beginning on page 4.

SETTING UP

Choosing a Good Location

When considering where to place your monitor:

- Choose a spot where the monitor can be near, but not on top of, the computer. Never place this monitor on top of your computer.
- Be sure that the desk or table can support the monitor's weight -- about 50 lbs.
- Make sure that the power, video, sound, and Apple Desktop Bus (ADB) cables reach from the back of the monitor to your computer.
- Allow at least 4 inches of clearance behind the monitor for unobstructed tilt and swivel.
- Avoid placing the monitor so that it reflects a source of bright light, such as a window.
- Keep in mind that you can place the monitor, keyboard, and mouse on your desk, and move your computer to a shelf or the floor.
- For greatest comfort, your eyes should be between 16 and 22 inches away from the monitor and about level with the top edge of the screen.

Lifting and Positioning the Monitor

When you lift the monitor, bend from your knees, not your back. The monitor is heaviest near the screen, so position your hands and body close to the front. If possible, ask someone to help you.

To position the monitor on a table or desk, follow these steps:

1. Place the monitor so that the rounded side of the monitor stand faces the front.
2. To slide the monitor, lift the front up slightly and push or pull in the direction you want.

There are non-skid pads under the front and easy-to-slide plastic spheres under the rear of the monitor stand.

3. Adjust the viewing angle of the monitor by tilting it up or down and turning it left or right on its stand.

Do You Need a Video Card?

The Macintosh 16" Color Display is compatible with the built-in video circuitry in some Macintosh models, such as the Macintosh Quadra 700 and the Macintosh Quadra 900. If your computer provides this video circuitry,

continue with the next section, "Connecting Your Display System."

To use the monitor with other Macintosh models, such as the Macintosh IIxi and IIci, you need to install a compatible video card and attach your monitor to that card. The Macintosh 16" Color Display is compatible with the latest versions of these Apple video cards:

- Macintosh Display Card 8•24
- Macintosh Display Card 8•24 GC

Compatible video cards that can provide up to 16 million colors are also available from other manufacturers. Your authorized Apple dealer can give you details.

If an appropriate video card is already installed in your computer, continue with the next section, "Connecting Your Display System."

If you need to install a video card, see the detailed instructions in the setup booklet provided with your Macintosh. (If you don't have the original setup instructions that came with your computer, you can follow the general steps listed in the section "Installing a Video Card," on page 16 of this guide.)

Connecting Your Display System

If you plan to use the Macintosh 16" Color Display with one or more additional monitors connected to your computer, review the guidelines in the section "Using More Than One Monitor," on page 17, before you start these steps.

Follow these steps to connect the monitor to your computer:

1. Plug the power cord into the recessed power plug on the back of the monitor.
2. Plug the other end of the power cord into the recessed power socket on the back of the computer.

If you have another monitor attached to the power socket on your computer, you can plug your Macintosh 16" Color Display directly into a grounded wall outlet using a standard, detachable, UL-listed power cord. You can get this cord from your authorized Apple dealer.

!! WARNING: If you use a power cord other than the one supplied with your computer, use only a power cord that is equipped with a three-wire grounding plug -- a plug that has a third (grounding) pin. A grounded plug will fit only a grounded AC outlet. If you are unable to insert the plug into the outlet, contact a licensed electrician to replace the outlet with a properly grounded outlet. Do not defeat the purpose of the grounding plug! !!

3. Attach the monitor's built-in video cable to the video port on the back of the computer (or to the port on the back of the installed video card) and tighten the thumbscrews.

If you are connecting the monitor to a video card, attach the video cable to the port on the end of the card, rather than to the computer's video port.

Options for Greater Convenience

The Macintosh 16" Color Display provides features for greater convenience as you work with your computer. You can attach your keyboard, mouse, and sound input and output devices (such as a microphone and headphones) directly to the monitor's stand, reducing cable clutter on your desk, and allowing you to place the computer on a shelf above or below your monitor, or on the floor.

Connecting the keyboard and mouse to your display system

If you wish, you can plug your keyboard and mouse directly into the base of the monitor stand, rather than into the back of the computer. The stand has an ADB port on the back that you can connect to your computer, and one ADB port on each side of the base for your keyboard or mouse (or any other ADB device).

!! IMPORTANT: To prevent damage to your system, always be sure that your computer is shut down before you plug in or disconnect ADB cables. !!

If you decide to plug your keyboard and mouse cables into your monitor stand, follow these instructions:

1. If your keyboard or mouse cable is connected to an ADB port on the back of your computer, unplug the cable.
2. Attach either end of the extended ADB cable to the ADB port at the center of the back of the monitor's base.

!! IMPORTANT: When connecting ADB cables, be sure to align the symbol on the connector with the same symbol on the port. If you force the connector the wrong way, you could damage it. !!

3. Attach the other end of the extended ADB cable to an ADB port on the back panel of the computer.
4. Decide how you want to connect the keyboard and mouse.

For example, you can plug your keyboard cable into the ADB port on the left side of the base and plug your mouse cable into the port on the right side. Or, if you prefer, you can plug your mouse cable into the keyboard and then connect the keyboard to one of the ADB ports on the base.

5. Connect your keyboard and mouse cables to the monitor's ADB ports according to your preference.

Connecting a microphone to your display system

If you wish, you can plug sound input devices (such as a microphone) into the Macintosh 16" Color Display's stand. If you decide to plug your microphone into the monitor stand, follow these steps:

1. If your microphone is connected to the sound input port on the back of your computer, unplug it.
2. Attach one end of the sound input cable to the sound input port on your computer.
3. Attach the other end of the of the cable to the sound input port on the

back of the monitor stand.

!! WARNING: Be sure to match the icon on the sound input cable to the same icon on the monitor stand. You could damage an audio device by plugging it into the wrong port. !!

4. Plug your sound input device (such as a microphone) into the microphone port on the front of the monitor stand.

Connecting headphones or speakers to your display system

If you wish, you can plug sound output devices (headphones and speakers) into the Macintosh 16" Color Display's stand. If you decide to plug your sound output devices into the monitor stand, follow these steps:

1. If your headphones or speakers are attached to the sound output port on the back of your computer, unplug them.

2. Attach the one end of the sound output cable to the sound output port on the back of the computer.

3. Attach the other end of the cable to the sound output port on the back of the monitor stand.

!! IMPORTANT: Connecting the sound output cable to your computer turns off the computer's internal speaker. If you don't plan to use headphones (or external speakers), don't attach this cable to your computer. !!

4. Plug your sound output device (such as a pair of headphones) into the headphone port on the front of the monitor stand.

!! WARNING: Be careful not to plug any sound output device (such as a pair of headphones) into the microphone port. Doing so may damage your audio equipment. !!

Turning On the Monitor

Follow these steps to turn on the monitor:

1. Press the power-on switch on the front of the monitor.

If you plugged your monitor's power cord into the back of your computer, the monitor won't come on until you start up the computer.

2. Press the power-on key at the top of the keyboard, or press the on/off switch on the back of the computer to start up the computer.

Whether you use the power-on key or the on/off switch depends on your Macintosh model.

By the way: If you plug the monitor into a wall outlet, you need to use the monitor's power-on switch every time you want to turn it on or off.

After turning on your monitor, you may notice two thin horizontal gray lines on the screen. These are a normal part of the Trinitron monitor design and appear only on the screen; they do not appear in any documents you print from your computer.

Setting the Number of Colors

You set the number of colors (or shades of gray) you want in the Monitors control panel. Follow these steps:

1. Choose Control Panels from the Apple menu.
2. Locate the Monitors icon and double-click it.
3. To display colors, click the Colors button.
4. Click the number of colors you wish to use.

Adjusting Brightness and Contrast

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

1. Turn the contrast control clockwise, as far as it will go.
2. Turn the brightness control until you feel it reach the centered, or detent, position.

It takes about 20 minutes for the monitor to warm up. During this time you may see slight changes in brightness.

Here are a few guidelines to ensure your viewing comfort:

- If, after the monitor has warmed up, the screen image appears dim, turn up the brightness to your preference.
- If the room is dim, faint lines may appear along the outer perimeter of the screen. To remove these, turn down the brightness slightly.
- To prevent eyestrain, be sure to take occasional breaks to focus your eyes on a distant object.
- If over time, you feel eyestrain, adjust the contrast to your preference. In a bright room, contrast is usually best set at maximum; in a dim room, lower contrast is usually more comfortable.

Changing the Shade of White

When using compatible built-in video or a compatible Macintosh video card, your monitor is set at what's called the Page-White Gamma option. This setting makes the shade of white on screen similar to the whiteness of a piece of paper.

If you prefer to use a brighter white, follow these instructions:

1. Open the Monitors control panel icon.

To open the Monitors control panel, choose Control Panels from the Apple menu and double-click the Monitors icon.

If you have more than one monitor, click the icon that represents the Macintosh 16" Macintosh Color Display.

2. Hold down the Option key on the keyboard as you click the Options button in the control panel.
3. Click the Use Special Gamma box so that the X appears.
4. Click the Mac Std Gamma option.
5. Click OK.

The new setting takes effect in a few seconds and remains in effect until you change it again.

6. Click the close box to close the control panel.

Important Safety Guidelines

Immediately disconnect the monitor's power cord from the computer (or from the wall outlet) by pulling the plug whenever:

- 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 damaged by dropping, or the case has been otherwise damaged.
- You suspect that your monitor needs service or repair.
- You want to clean the case. (See page 14 for the recommended cleaning procedures.)

USING YOUR MONITOR

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, including the vents underneath the monitor.
- Avoid sharp jolts to the case. The monitor has sensitive internal parts that can be damaged by rough treatment.
- Avoid exposing the monitor to direct sunlight. Excessive heat over time 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's electronic circuitry and picture tube give off a small amount of heat, so the unit will be warm to the touch.

Protect Your Monitor from Theft

The vertical, rectangular opening 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. Security locks are available from your authorized Apple dealer.

Use a Screen Saver Program

If your monitor is left on but unused over long periods of time, the image displayed can become permanently "burned in" on the screen. Using a screen saver can prevent this. A screen saver is a special kind of utility software that darkens the screen when your computer is on but not in use. You can get more details from your authorized Apple dealer.

Cleaning and Maintenance

It's a good idea to keep your monitor free of dust and smudges. An accumulation of dust on the screen can result in reduced image quality. To clean your monitor, follow these procedures:

1. Turn off the monitor by pressing the on/off switch on the front.
2. Disconnect the monitor's power plug from the computer's auxiliary power socket, or from the wall outlet. (Pull the plug, not the cord.)
3. To clean the screen, apply a household glass cleaner to a clean cloth or paper towel and wipe the screen gently.

Don't spray glass cleaner directly onto the screen. It could run down inside the case and damage electrical circuits.

4. To clean the case, use a damp (not wet) lint-free cloth.

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

Troubleshooting

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

Make sure that

- The monitor's power cord is plugged in properly.

If it is plugged into a wall outlet, 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 monitor doesn't, contact your authorized Apple dealer.

No image appears on the screen.

Make sure that

- The monitor is plugged into the computer or into a grounded AC power outlet and the green power-on light on the front of the case is glowing.

!! WARNING: If you detect a loose connection, be sure to turn off your computer before reconnecting any cable. !!

- The brightness and contrast are set correctly. See "Adjusting Brightness and Contrast," earlier in this book.

-The monitor's video cable is connected to the video port on the computer or to the video connector on a video expansion card, and the computer is turned on.

If the monitor's video cable is connected to the built-in video port on a computer that does not have the circuitry to support your monitor, no image will appear on the screen. You need to attach the video cable to a compatible video expansion card.

If you are using an older version of the Macintosh 8•24 or 8•24 gc Display Card, no image will appear on the screen. See your Apple dealer about upgrading your video expansion card.

There are two very thin gray lines across the screen, one near the top and the other near the bottom.

This is a normal characteristic of the Trinitron color picture tube design. The lines do not appear on any documents you print.

One or more patches of color distortion appear on the screen.

- Press the power-on switch to turn the monitor off, then press it again.

This automatically corrects problems caused by interference from nearby magnetic objects. Technically, this process is called "degaussing" the monitor. If the distortion reappears, try moving any magnetized object, such as a stereo speaker, farther away from the monitor.

If color distortion persists, try rotating and repositioning your monitor to adjust for magnetic fields in your location.

There's flickering on the screen.

Be sure that the video cable is securely attached. Flickering could also 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 computer and monitor.

If you have more than one monitor connected to your computer, the monitors might be interfering with one another. See the guidelines for avoiding interference listed on page 19.

You don't hear any sounds from your Macintosh.

If you have connected the sound output cable to the back panel of your computer, the internal speaker is turned off. In that case, to hear sounds, you need to have headphones or external speakers connected to the monitor stand. If you don't wish to use headphones or speakers, it's best to disconnect the sound output cable from the back of your computer.

No colors appear on the screen.

Check to make sure that the number of colors is set correctly in the Monitors control panel. See page 10 for instructions.

INSTALLING A VIDEO CARD

This section provides general instructions for adding a video expansion card to one of the NuBus expansion slots found in many Macintosh computers. If you have a Macintosh IIxi, be sure you have a NuBus adapter card to connect the video card to the computer's expansion slot.

1. Make sure your computer's power cord is plugged into the power socket on the back of your computer or into an electrical outlet or power strip.
2. If the computer starts up, push the power switch on the back panel to turn off the power.
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.
7. Remove the video card from its static-proof bag.
8. Hold the card by the top edges.
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 in the expansion slot.
11. Replace the lid on the computer.

USING MORE THAN ONE MONITOR

If your Macintosh is equipped with expansion slots, you can use more than one monitor with your computer. Your Macintosh User's Guide or Macintosh Reference has more complete information about working with additional monitors. Here are the general steps for setting up and using additional monitors.

1. Make sure your computer is turned off.
2. Connect the power cord for each additional monitor to a power source.

Your computer has just one recessed power plug for your main monitor's power cord, so you need to use a wall socket or a power strip for the second monitor's power source.

3. Connect the cable for each monitor to an installed video card port or a built-in video port.

To use more than one monitor with your Macintosh computer, you need an installed, compatible video card or a compatible built-in video port for each monitor.

For instance, you can connect a 13" AppleColor High-Resolution RGB Monitor to the built-in video port on the Macintosh IIci. Then you can connect your Macintosh 16" Color Display to a compatible video card installed in one of the NuBus expansion slots.

4. Start up your computer.

5. Open the Monitors control panel and adjust the monitors' positions to your preference.

The pointer passes from one monitor to the other when it crosses the border where the monitor icons touch.

To change the relative positions of the monitors, drag the small, numbered monitor icons where you want them.

To change which monitor is the main monitor, drag the tiny white menu bar to the monitor icon you want.

Your changes take effect after you restart your computer.

6. Drag windows from your main monitor to the additional monitor.

7. Try to position your monitors so that the backs of your monitors are at least 16 inches apart.

Monitors placed too closely together can interfere with each other. If the backs of two monitors are less than about 16 inches apart, you may notice that the image on one or both of the monitors is unstable or "jitters."

If you notice jitter, turn off one of the monitors. If the monitor that's still turned on no longer jitters, there's interference. Try moving the monitors farther apart, then turn the other monitor back on.

If you have a limited work space and want to keep your monitors closer together, try setting the monitors at an angle so that their screens are close and their back panels are farther apart. This placement should help clear up the jitter.

If after moving the monitors more than 16 inches apart, you still see jitter, contact your Apple dealer for assistance.

SERVICE AND SUPPORT

To help you get the best performance from your system, Apple Computer has established authorized Apple dealers who offer full support. If you need answers to technical questions or information about product updates, your authorized Apple dealer can help you. Apple's technical support organization backs each dealer and international technical support group via an AppleLink network, a state-of-the-art on-line electronic information service, to ensure prompt, reliable assistance.

Your dealer has the latest information on new hardware and software products as well as product updates. If you wish to upgrade your system, your dealer can help you select compatible components.

If your product requires service, your local authorized Apple dealer is trained and ready to support you. Apple provides factory-quality parts and the latest available diagnostic equipment to the more than three thousand authorized Apple service centers throughout the world. Apple guarantees parts and warranty labor. (Regulations in each country determine the length of warranty. Some restrictions may apply, depending on the country of original purchase.)

Apple also offers service plans designed to meet your needs. One of these is the AppleCare Service Agreement (available in the United States, Canada, and Australia only), which extends full warranty coverage up to three years. Your AppleCare contract will be honored at any participating authorized Apple dealer within the country of purchase -- an added benefit if you relocate. Local service means time saved in getting your Apple system back to work.

You can purchase AppleCare at any time, but it's a good idea to purchase it with your system, or at least before your warranty has expired, to avoid an inspection at your own expense.

SPECIFICATIONS

Picture tube

- 17-inch diagonal, 16-inch viewable, Trinitron CRT
- High-contrast glass with antiglare, antistatic coating
- 0.26 mm pitch aperture grill

Input signals

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

User controls

- Power-on switch (front, lower right)
- Automatic degauss at power-up; manual degauss by turning power off, then on
- Contrast control (front, left)
- Brightness control, (with detent reference (front, right of contrast control)

Scanning and refresh rates

- Horizontal scan rate 50 kHz
- Vertical refresh rate 75 Hz

Active video image area

- Adjusted at the factory to produce an active video area described by an ideal rectangle of 300 mm by 225 mm.

Resolution

-832 horizontal pixels by 624 vertical lines; 70 dots per inch

Weight

-50 lb. (22.6 kg)

Height

-40 cm

Input electrical requirements (exclusive of power cord)

-Voltage. 90-270 Vrms

-Frequency. 47-63 Hz

-Power. 130 watts maximum

Operating ambient temperature

-50°-95° F (10°-40° C)

Operating humidity

-95% maximum, noncondensing

Operating altitude

-10,000 feet maximum

Fuse protection

-The monitor contains internal power line fuse protection. Its fuse should be replaced with a fuse of the same rating 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)

Video cable connector pin assignments

Pin.	Description
1.	Red Video ground
2.	Red Video
3.	CSYNC
4.	ID Bit 1 (tied to pin 10)
5.	Green Video

6. Green Video Ground
7. (ID Bit 2 open)
8. (not used)
9. Blue Video
10. ID Bit 3 (tied to pin 4)
11. VSYNC.ground
12. VSYNC
13. Blue Video ground
14. HSYNC.ground
15. HSYNC
- (Shell). Shield ground