

## CHAPTER 1-SETTING UP AND USING YOUR DISPLAY

The Macintosh 12" Monochrome Display is an ideal companion for your Macintosh computer in both design and usability. Its features include:

- a high-contrast, antiglare screen
- bright, crisp image quality
- "page-white" background for easy viewing
- graphics capability
- simultaneous presentation of graphics and text
- easily accessible brightness and contrast controls
- an easy-to-clean screen and cabinet

The Macintosh 12" Monochrome Display is designed to work with any modular Macintosh, whether it has a built-in video port or requires a video card. It's easy to set up the display and adapt it to your working habits and environment. To get the best results from your display, take a few minutes to read this manual, and follow all instructions carefully.

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

You'll also find tips on using and caring for the display as well as notes on service and support. Chapter 2 gives instructions for installing a video card. The appendix provides technical specifications.

!! 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.

Be sure that you always:

- Follow all instructions and warnings relating to your system.
  - Read all the installation instructions carefully.
  - 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 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)

### Getting Started

Before you set up the display, make sure that your Macintosh computer is turned off. Unwrap the power cord that comes with the display.

Note: A power jumper cord that can be plugged into your computer's auxiliary power outlet has been included with this display. The auxiliary power outlet is located on the back of your computer, next to its power receptacle.

However, some Macintosh computers do not have an auxiliary power outlet. If you have one of these computers you should have received a second power cord to plug your monitor into a wall outlet. If you did not receive one, contact your authorized Apple dealer.

If your Macintosh doesn't have a built-in video port, you'll need a video card, too. The built-in video port is a horizontal socket on the computer's back panel that's marked with a video icon. If your computer doesn't have this port, you can get a video card from your authorized Apple dealer. (Chapter 2 explains how to install a video card.)

### Positioning the 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.

The Macintosh 12" Monochrome Display has been designed to fit on top of your 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.

If you decide to place the display on top of the computer, you can wrap the extra length of video cable around the spool on the display's underside.

Using two displays: If you're 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 chapter, for help.

### Connecting the Display

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.)

Your display connects to a built-in video port or a video card connector on the back panel of the computer and to a power source. 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.

- If you have installed a video card, plug the cable into the connector on the video card.

3. Tighten the two thumbscrews.

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

4. Plug the socket end of the display's power cord into the display's power receptacle, and plug the other end into a power source.

If your Macintosh has an auxiliary power outlet (located next to its power receptacle), plug the other end of your power cable into this outlet.

If your Macintosh does not have an auxiliary power outlet, you should have received an extra power cord with your computer which plugs into a three-pronged grounded AC outlet. Use this power cord in place of the one that came with your display. Connect it to the display and to a grounded AC outlet. If you did not receive a second power cord, contact your Apple dealer.

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. When you turn on the display and the computer, 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 the display is plugged into a power outlet on the computer, make sure the computer is on. If this doesn't work, make sure you've connected the display according to the instructions in the previous section, "Connecting the Display." If the light still doesn't come on after you've checked the connections, consult the section "Troubleshooting," later in this chapter.

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

By the way: The display's brightness decreases gradually over years of use. If you use your display at a high brightness setting for extended periods of time, its brightness will decrease faster. 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 to help you get the most out of the display.

### Working tips

Here are some tips you should keep in mind when using the Macintosh 12" Monochrome 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 Macintosh 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. As with a television set, the display's 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. 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 power source.
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 obscure the image or reduce its 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. Chapter 2 gives instructions for installing a video card. (Your computer must have a NuBus expansion slot to accommodate each additional video card.)

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.

To change the relative positions of your displays: You can change the

relative positions of your displays and move the menu bar from one display to another using the Control Panel. The documentation that comes with your Macintosh explains how to use the Control Panel to change your display settings.

## Troubleshooting

This section gives solutions to some common problems you might encounter while using your Macintosh 12" Monochrome 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 power source 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.)

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

**Solution:** Check to see that the power cord is plugged in properly. If the display's power cord is plugged into a Macintosh, make sure the computer's power cord is plugged into a wall outlet and the computer is turned on. If the display's power cord is plugged into an AC wall outlet, 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.

## Service and Support

To help you get the best performance from your system, Apple Computer has established a worldwide network of full-support authorized Apple dealers. If you need answers to technical questions or information about product updates, your authorized Apple dealer can help you. Apple Technical Support 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 options 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.

## CHAPTER 2-INSTALLING A VIDEO CARD

If your Macintosh has a built-in video port and you're connecting only one display to your computer, you can skip this chapter. (The built-in video port is a horizontal socket on the computer's back panel that's marked with a video icon.) 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. You can obtain a video card from your authorized Apple dealer.

The exact procedure for installing a video card depends on the kind of Macintosh you have. The sections that follow explain how to install a video card in a Macintosh with three NuBus expansion slots (for example, a Macintosh IICx or Macintosh IICi) and a Macintosh with six expansion slots (for example, a Macintosh II, Macintosh IIX, or Macintosh IIFx).

### Installing a Video Card in a Macintosh with Three Slots

If you have a Macintosh with three expansion slots, follow the instructions in this section to install a video card in your computer.

If you have a Macintosh IICi: The Macintosh IICi has a built-in video port. You don't need to install a video card unless you're connecting an additional display to the computer.

To install a video card in your computer, follow the steps below.

!! **WARNING:** Before you install a video card, make sure that your computer is turned off (and turn off any peripheral devices that are connected to it). But leave the power cord plugged into a grounded electrical outlet. The plug grounds the computer system and protects it from electrical damage while you're installing the card. !!

1. Remove the lid from the computer
  - Remove the security screw on the computer's back panel.
  - Pull up on the two latches at the rear corners of the case and lift up the back of the lid. Then move the lid back and away from the case.
2. Touch the metal part of the power supply case inside the computer to discharge any static electricity that might be on your clothes or body.

3. Push out the plastic cover plate for the slot you plan to use. (It doesn't matter which slot you choose.)

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

Hold the card by its top edge to avoid touching the connector on the bottom of the card.

5. Position the card's connector directly over the expansion slot.

align the metal bracket on the end of the card with the hole you exposed by removing the plastic cover plate (in step 3).

6. Press down firmly on the card until the connector is seated.

Don't force the card. If you meet a lot of resistance, pull it out and try again, being sure to keep the card straight as you lower it.

To see if the card is properly connected, lift it gently. If it resists and stays in place, it's connected.

If you have other cards to install, repeat steps 2 through 6 for each additional card. Otherwise, go on to step 7.

7. Replace the lid on the computer.

- align the front of the lid with the guides inside the case.

- Lower the back of the lid onto the case and press firmly on the back corners until the rear latches into place. Then replace and tighten the security screw.

#### Installing a Video Card in a Macintosh with Six Slots

This section explains how to install a video card in a Macintosh with six slots.

To install a video card in your computer, follow the steps listed below.

!! WARNING: Before you install a video card, make sure that your computer is turned off (and turn off any peripheral devices that are connected to it). But leave the power cord plugged into a grounded electrical outlet. The plug grounds the computer system and protects it from electrical damage while you're installing the card. !!

1. Remove the lid from the computer.

- Remove the security screw on the computer's back panel.

- Press the latches at the rear corners of the case and lift up on the back of the lid. (Don't be concerned if you hear a snapping sound. This is the sound of the lid clearing the three small hooks inside the front of the case, which it needs to do.)

- Lift the lid back and away from the case--don't rotate it to a perpendicular position.

2. Touch the metal part of the power supply case inside the computer to

discharge any static electricity that might be on your clothes or body.

3. Choose an expansion slot (it doesn't matter which one) and remove its shield by lifting up until the shield is free of the guide and pin.

4. Push out the plastic cover of the plate of the slot from which you removed the shield in step 3.

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

Hold the card by its top edge to avoid touching the connector on the bottom of the card.

6. Position the card's connector directly over the expansion slot.

The metal bracket on the end of the card attaches to the inside of the computer in the same way as the shield you removed in step 3. Align the bracket on the card so that it slips down over the pin and guide of the slot's opening.

7. Press down firmly on the card until the connector is seated.

Don't force the card. If you meet a lot of resistance, pull it out and try again, being sure to keep the card straight as you lower it.

To see if the card is properly connected, lift it gently. If it resists and stays in place, it's connected.

If you have other cards to install, repeat steps 2 through 7 for each additional card. Otherwise, go on to step 8.

8. Replace the lid on the computer.

- Make sure the front of the lid catches the three hooks inside the case.

- Lower the back of the lid onto the case and press firmly on the back corners until the rear latches snap into place. Then replace and tighten the security screw.

## APPENDIX-A-SPECIFICATIONS

Picture Tube

12-inch viewable diagonal

90 deflection angle

Phosphor type (aluminized), PC104 and PC193

Faceplate of spherical, gray filter glass

Input Signals

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 35 kHz

Vertical refresh rate 66.67 Hz

Rise and Fall Time

- 16 ns maximum

Active Video Display Area

- Adjusted at the factory to produce an active video area described by an ideal rectangle of 212 mm by 159 mm. The remainder of the screen is used for the dark border around the display.

Resolution

- 640 horizontal pixels by 480 vertical lines; 76 dpi

Weight

- 16 lb. (7 kg)

Input Electrical Requirements

- Voltage 90-132 and 190-270 volts AC
- Frequency 47-63 Hz
- Power 30 watts maximum, all line conditions

Operating Ambient Temperature

- 50-104F (10-40C)

Operating Humidity

- 95% maximum, noncondensing

Operating Altitude

- 10,000 feet maximum

Fuse Protection

- The display contains internal power-line fuse protection. Its fuse must 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	(not used)
2	(not used)
3	Composite H and V sync
4	ID bit 1 -- grounded at monitor
5	Monochrome video
6	Monochrome video ground
7	ID bit 2 -- open at monitor
8	(not used)
9	(not used)
10	ID bit 3 -- open at monitor
11	CSYNC ground
12	(not used)
13	(not used)
14	(not used)
15	(not used)
(Shell)	Shield ground

- Connector type: D subminiature 15-pin