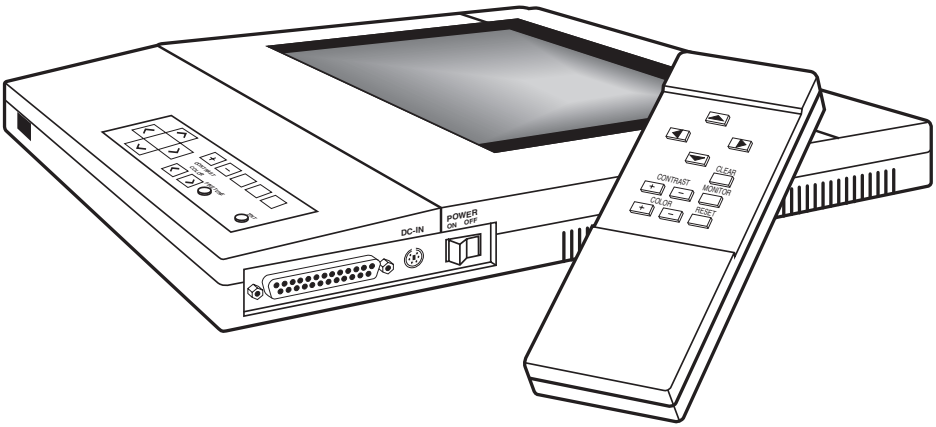
BLACK BOX®
NETWORK SERVICES

JULY 1994
AC403A

# 262K Color LCD Panel




**CUSTOMER SUPPORT INFORMATION**

Order **toll-free** in the U.S. 24 hours, 7 A.M. Monday to midnight Friday: **877-877-BBOX**
FREE technical support, 24 hours a day, 7 days a week: Call **724-746-5500** or fax **724-746-0746**
Mail order: **Black Box Corporation**, 1000 Park Drive, Lawrence, PA 15055-1018
Web site: **www.blackbox.com** • E-mail: **info@blackbox.com**

## FEDERAL COMMUNICATIONS COMMISSION
## AND
## INDUSTRY CANADA
## RADIO FREQUENCY INTERFERENCE STATEMENTS

This equipment generates, uses, and can radiate radio frequency energy and if not installed and used properly, that is, in strict accordance with the manufacturer's instructions, may cause interference to radio communication. It has been tested and found to comply with the limits for a Class A computing device in accordance with the specifications in Subpart J of Part 15 of FCC rules, which are designed to provide reasonable protection against such interference when the equipment is operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference, in which case the user at his own expense will be required to take whatever measures may be necessary to correct the interference.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

*This digital apparatus does not exceed the Class A limits for radio noise emission from digital apparatus set out in the Radio Interference Regulation of Industry Canada.*

*Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de la classe A prescrites dans le Règlement sur le brouillage radioélectrique publié par Industrie Canada.*

**Trademarks**

Apple®, Mac®, and Macintosh® are registered trademarks of Apple Computer, Inc.

Hercules® is a registered trademark of Hercules Computer Technology.

IBM® is a registered trademark of IBM Corporation.

*Any other trademarks mentioned in this manual are acknowledged to be the property of the trademark owners.*

# Contents

**Chapter** **Page**

1. Specifications ..... 4

2. Introduction ..... 5

3. Installation ..... 6
   - 3.1 Setting Up ..... 6
   - 3.2 Connecting the Cables ..... 7
     - 3.2.1 Connecting to a VGA System ..... 7
     - 3.2.2 Connecting to an EGA, CGA, or Hercules System ..... 8
     - 3.2.3 Connecting to a Mac II System ..... 8
     - 3.2.4 Connecting to a Mac LC System ..... 9
   - 3.3 Rear Projection ..... 9

4. Using the LCD Panel ..... 10
   - 4.1 Control Keys ..... 10
   - 4.2 How to Use the LCD Panel ..... 11
   - 4.3 Using the Remote Control ..... 11

5. Care and Maintenance ..... 12
   - 5.1 Cleaning the Bottom Glass ..... 12
   - 5.2 Cleaning the Housing ..... 13
   - 5.3 Static Electricity ..... 13
   - 5.4 Transporting the LCD Panel ..... 13

6. Troubleshooting ..... 14
   - 6.1 Troubleshooting Guide ..... 14
   - 6.2 Calling Black Box ..... 15
   - 6.3 Shipping and Packaging ..... 15

Index ..... 16

# 1. Specifications

**Display —** True-color active matrix TFT (Thin Film Transistor) LCD; 640 x 480 resolution; 100:1 contrast ratio; 4:3 aspect ratio; 30 ms typical response time

**Colors —** Five modes: 8, 16, 2197, 32,768, or 262,144 colors

**Controls —** Directions, contrast, color selection, reset, front/rear, clear, fine-tune, tint

**Power —** Autoswitching; input: 100 to 250-VAC, 50 to 60 Hz, 0.9 A

**Size —** 12.6"H x 14"W x 1.6"D (32 x 35.5 x 4 cm); Display: approx. 6.7" x 5.1" (17 x 13 cm)

**Weight —** 5 lb. (2.3 kg)

**Video Systems Supported:**

| Video Mode | Resolution | H. Sync (KHz) | V. Sync (KHz) | Dot Clock (MHz) |
|---|---|---|---|---|
| IBM VGA | 720 x 480 | 31.47- | 70.00+ | 28.322 |
| | 640 x 480 | 31.47- | 59.94- | 25.175 |
| | 640 x 400 | 31.47- | 70.00+ | 25.175 |
| | 640 x 400 | 31.47+ | 70.00- | 25.175 |
| IBM EGA | 640 x 350 | 21.85+ | 59.70- | 16.257 |
| IBM CGA | 640 x 200 | 15.69+ | 59.92+ | 14.318 |
| Hercules (text) | 720 x 350 | 18.14+ | 49.03- | 16.000 |
| Hercules (graphics) | 720 x 348 | 18.51+ | 50.05 | 16.000 |
| IBM MDA | 720 x 350 | 18.43+ | 49.82- | 16.257 |
| Macintosh II | 640 x 480 | 35.00- | 66.68 | 30.240 |
| Macintosh LC | 640 x 480 | 34.97- | 66.61- | 31.334 |

# 2. Introduction

With the 262K Color LCD Panel, you can project computer video on a screen big enough for a whole room to watch. It's perfect for business meetings, conferences, and classroom instruction.

Your LCD Panel has a range of 262,144 colors, for rich true-color images. It's compatible with both Apple® Macintosh® and IBM® compatible computers; on the IBM compatibles, it will work with VGA—or with CGA, EGA, or Hercules® compatible video, with the optional DB9 Y cable.

The Y cable that comes with the LCD Panel lets you attach both the Panel and your computer monitor at once, so you can display your presentation on both simultaneously.

## What's in the Package

Besides this manual, the package should contain these items:

- 262K Color LCD Panel
- DB15HD Y cable for VGA
- DB15 Y cable for Mac®
- Power adapter with cord
- Remote control
- Two AA batteries (for the remote control)

If anything on this list is missing, call Black Box right away.

# 3. Installation

When you connect the LCD Panel to a PC, it works the same way a monitor does, taking signals from the same video port on your PC.

If you have a portable or notebook computer with an internal screen, you may have to activate the external video port before it will work. See the manual for your computer.

## 3.1 Setting Up

1. Position your overhead projector at the right level and distance for projection. For best results, you'll want:

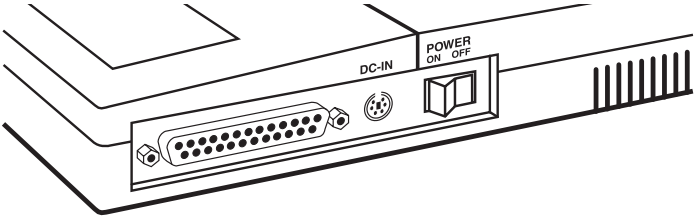
   - A high-intensity overhead projector—for instance, a 400-watt halogen or metal-vapor type—that projects a bright, uniformly illuminated image. (A rating of 4000 lumens or better is recommended.)
   - A dimmed room with no direct sunlight shining in.

   The LCD Panel works with all *transmissive* overhead projectors—projectors with a light source that shines *through* the image (the kind of projector you ordinarily use with transparencies, not opaque sheets of paper).

2. Make sure everything is turned off—the computer, the overhead projector, the monitor, and the LCD panel.

3. Set up your computer and monitor near the projector—close enough for the 15-foot (4.6-m) Y cable to reach without stretching.

4. Place the LCD Panel on the projector's glass plate with the controls on the Panel toward the screen.




**Connectors and Switch on the LCD Panel.**

## 3.2 Connecting the Cables

The LCD Panel comes with two Y cables, one for VGA video and one for Macintosh video. You can also order optional cables for connecting to CGA, EGA, and Hercules video; call your supplier.

### 3.2.1 Connecting to a VGA System

1. Make sure the PC is switched off. *Never* connect the LCD panel when the PC's power is on.

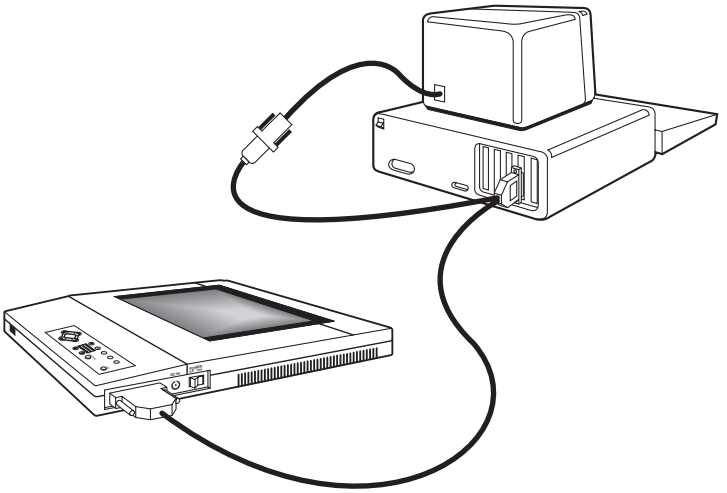
2. Disconnect the monitor cable from the PC. If you want to use both the PC monitor and the LCD Panel at the same time, plug the monitor cable into the short cable stub on the Y cable. Tighten the thumbscrews to make sure you have a good connection.

**NOTE: For some software programs that detect the presence of an external monitor in order to determine the type of display, you'll need to have the external monitor connected.**

3. Plug the single-connector end of the Y cable—the end with two cables coming out of it—into the PC's video port. Again, tighten the thumbscrews to make a tight connection.

4. Plug the DB25 connector (the large one) into the LCD Panel.

5. Plug the 6-pin mini-DIN connector from the power adapter into the DC-IN jack on the LCD Panel. Connect the socket end of the AC cord to the power adapter.



**Connecting the Y Cable.**

6. Make sure the power on the LCD Panel is off, then plug the power cord into a convenient AC outlet.

7. Turn on the PC, then the LCD Panel.

**NOTE: Follow this power-up sequence, or the video signals might not be synchronized corectly. The image on the Color LCD Panel is made up of red, green, and blue parts, and the parts are synchronized to the incoming video signal from the computer. If there isn't a video signal from the computer—if you turn on the LCD Panel while the computer is still off, for example—then the LCD Panel might lose synchronization, and you'll see a split image of red, green, and blue.**

**To bring the LCD panel back to normal, you can press the RESET button on the panel or on the remote control.**

**Avoid turning on the LCD Panel for any length of time when no video signal is present—that can reduce the lifetime of the LCD.**

8. Run a program on the computer that creates a colorful image on the screen. It's easier to adjust the LCD panel when it's showing a colorful image. Focus the projector.

## CAUTION

**Make sure the LCD Panel's power adapter is completely connected before you turn on the projector. The cooling fans in the LCD Panel won't work unless the power connected, and the h from the projector cou damage the Panel.**

### 3.2.2 Connecting to an EGA, CGA, or Hercules System

The connections are exactly the same as for a VGA system (see **Section 3.2.1**), but you need the optional DB9 Y cable.

For Hercules systems, the Panel defaults to Hercules Text Mode. To select Graphics Mode, press the RESET button and the COLOR ▶ button on the front panel *at the same time*. To go back to Text Mode, press those two buttons again.

### 3.2.3 Connecting to a Mac II System

1. Make sure the Mac is switched off. *Never* connect the LCD panel when the Macintosh is turned on.

2. Disconnect the monitor cable from the Mac, and plug it into the short cable stub on the Y cable. Tighten the thumbscrews to make sure you have a good connection.

**NOTE: The external monitor must be connected for the computer to work.**

3. Plug the single-connector end of the Y cable—the end with two cables coming out of it—into the Macintosh video port. Again, tighten the thumbscrews to make a tight connection.

4. Plug the DB25 connector (the large one) into the LCD Panel.

5. Plug the 6-pin mini-DIN connector from the power adapter into the DC-IN jack on the LCD Panel. Connect the socket end of the AC cord to the power adapter.

6. Make sure the power on the LCD Panel is off, then plug the power cord into a convenient AC outlet.

7. Turn on the Macintosh, then the LCD Panel.

**NOTE: Follow this power-up sequence, or the video signals might not be synchronized correctly. The image on the Color LCD Panel is made up of red, green, and blue parts, and the parts are synchronized to the incoming video signal from the computer. If there isn't a video signal from the computer—if you turn on the LCD Panel while the computer is still off, for example—then the LCD Panel might lose synchronization, and you'll see a split image of red, green, and blue.**

**To bring the LCD panel back to normal, you can press the RESET button on the panel or on the remote control.**

**Avoid turning on the LCD Panel for any length of time when no video signal is present—that can reduce the lifetime of the LCD.**

8. Run a program on the Macintosh that creates a colorful image on the screen. It's easier to adjust the LCD panel when it's showing a colorful image. Focus the projector.

## CAUTION

**Make sure the LCD Panel's power adapter is completely connected before you turn on the projector. The cooling fans in the LCD Panel won't work unless the power connected, and the h from the projector cou damage the Panel.**

### 3.2.4 Connecting to a Mac LC System

The connections are exactly the same as for a Mac II system.

The LCD Panel defaults to Mac II mode. To switch to Mac LC mode, press the RESET button and the COLOR ▶ button on the front panel *at the same time*. To go back t o Mac II mode, press those two buttons again.

## 3.3 Rear Projection

To use the LCD panel for rear projection, just press the FRONT/REAR button on the control panel. To go back to front projection, press the same button again.

# 4. Using the LCD Panel

Once you've made all the connections in **Chapter 3**, the LCD Panel is ready to go. This chapter describes the controls on the front panel and the remote control.

## 4.1 Control Keys

The keys on the front panel and the remote control work the same way.

**ARROW KEYS—◀▲▼▶**

Use the arrow keys to move the screen image up, down, left, or right. If you press an arrow key once, the image will move by one pixel; if you hold down the arrow key, the image will move faster.

**CONTRAST + AND –**

Press + to lighten the image and – to darken it.

**CLEAR**

Clears the image, whether a signal is present or not. Push the CLEAR button again to restore the image.

**RESET**

Restores the screen position, contrast, and color to the default settings. Press RESET and COLOR ▶ together to select either Mac LC or Hercules Graphics mode.

**COLOR ◀ AND ▶**

These buttons select the color mode. There are five different color modes:

- 8-color
- 64-color
- 512-color
- 32,768-color
- 262,144-color

The default is 512-color mode. Pressing the ◀ button changes the selection one step toward the 8-color mode; pressing the ▶ button changes it one step toward the 262,144-color mode. For some images, a mode with fewer colors will give you a more brilliant and saturated color. Pick the mode that looks best with your image.

**FRONT/REAR**

Toggles front and rear projection to match the type of overhead projector being used.

**FINE TUNE**

Turn this knob to eliminate uneven text or streaking in the image. The adjustment compensates for slight variances in the PC's video timing. Turn the knob slowly until the image looks best.

**TINT**

Turn this knob to adjust the weighting of the red and blue color tones to suit your own preference.

**POWER** *(on the right-hand side of the LCD Panel)*

Turns the power on or off.

## 4.2 How to Use the LCD Panel

Make sure you have everything set up as described in **Chapter 3**. Then:

1. Power up your computer.
2. Turn on the power switch on the LCD Panel.
3. Turn on the overhead projector.
4. Use the CONTRAST + and – buttons to get the best-looking image.
5. Use the FINE TUNE knob to eliminate uneven text or streaking.
6. If you like, use the TINT knob to set the image to a more reddish or bluish tone.
7. Use the COLOR ◀ and ▶ buttons to choose the best-looking color mode.

## 4.3 Using the Remote Control

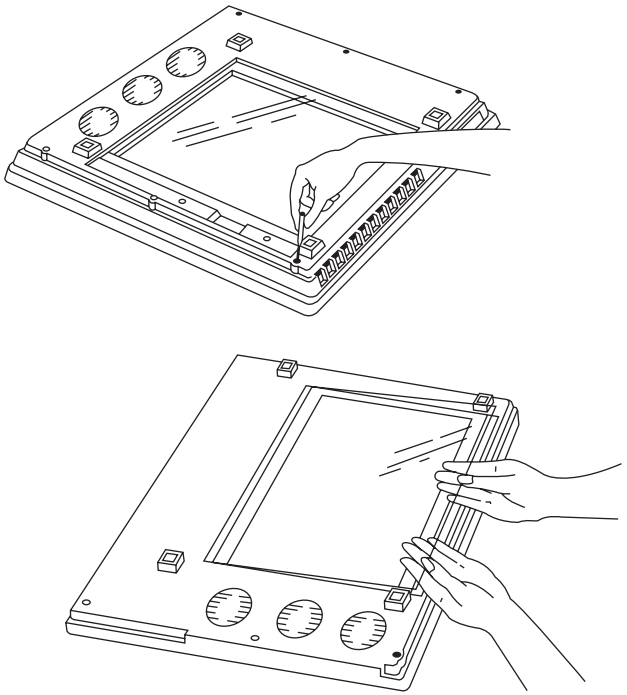
The signal from the hand-held remote control is received on the side of the LCD panel that faces the projection screen. All the buttons on the remote control work the same way as the buttons on the LCD Panel.

# 5. Care and Maintenance

You can reduce the chance of damaging your LCD Panel by treating it the same way you would treat any valuable computer equipment. Keep it clean, don't drop it, and keep it away from static electricity and temperature extremes.

## 5.1 Cleaning the Bottom Glass

You can periodically clean the airway by removing the bottom glass of the LCD Panel. Remove the three mounting screws on the glass mounting bar (see the illustration below). Gently remove the mounting bar and the bottom glass. Use a non-alcohol-based glass cleaner and a soft, nonabrasive cloth. Wipe the glass gently to remove any dust or dirt. Reinstall the bottom glass the same way you took it out.



**Removing the Bottom Glass for Cleaning.**

## CAUTION

**Removing the bottom glass will expose the interior LCD glass, which is fragile and scratches easily. Avoid touching it. Replace the bottom glass immediately after cleaning.**

## 5.2 Cleaning the Housing

*Do not* open the housing. If your LCD panel requires service or repair, call your dealer. *If you attempt to open the housing or repair the LCD Panel, you will void the warranty.*

Don't clean the housing with organic solvents, such as those that contain acetone. Just wipe the exterior of the housing with a soft, damp cloth. Protect the LCD Panel from rain or snow.

## 5.3 Static Electricity

The LCD Projection Panel is vulnerable to static electricity—the kind that's generated when you walk across synthetic carpeting. To avoid transferring an electric charge to the LCD Panel, be sure you discharge this static electricity before handling the Panel. Touch any grounded metal object.

## 5.4 Transporting the LCD Panel

The LCD Panel is a sophisticated piece of equipment, so it's sensitive to impact and extremes of heat, cold, and humidity.

Store and transport the LCD Panel at temperatures between 0° and 140° Fahrenheit (-18° to 60° Celsius). Don't leave the Panel in a car during seasonal temperature extremes: Automobile interiors can get hotter than 160° F (71°C) in the summer, and colder than -20°F (-29°C) in winter.

If the LCD Panel has been exposed to extremely hot, cold, or humid conditions, let it stand at room temperature for 30 minutes before you use it.

# 6. Troubleshooting

Before you call for service, try the suggestions in **Section 6.1**. If you still can't solve the problem, read **Sections 6.2** and **6.3** before you call.

## 6.1 Troubleshooting Guide

| Problem | Probable Cause | What to Do |
|---|---|---|
| No image on PC monitor. | No power. The Panel must be powered before you can use the PC monitor. | Connect the power adapter to the Panel. |
| No image on the screen. | 1. Cable not firmly connected. | Check the connection—make sure it's secure. |
| | 2. No power. | Check the power-cord connections. Make sure the AC outlet is working. |
| Faint screen. | Contrast adjustment is wrong. | Adjust the CONTRAST buttons. |
| Remote Control not working. | Batteries are weak or installed wrong. | Check the battery compartment. Try replacing the batteries. |
| Jittering, fuzzy letters or image. | Out of sync. | Adjust the FINE TUNE knob. |
| Contrast is not uniform. | Air intake and exhaust vents are blocked. | Check to see whether air is blowing out from the exhaust vent, and whether the motor is rotating normally. |

| Problem | Probable Cause | What to Do |
|---|---|---|
| Split red, green, and blue image. | Out of sync. | Press RESET button. |
| Reddish or bluish picture. | Tint setting is wrong. | Slowly turn the TINT knob until the picture looks right. |
| Shaky image with a Mac LC system. | Mac LC mode not selected. | Press RESET and COLOR ▶ at the same time. |

## 6.2 Calling Black Box

If you determine that your LCD Panel is malfunctioning, *do not attempt to alter or repair the unit.* It contains no user-serviceable parts. Contact Black Box.

Before you do, make a record of the history of the problem. Black Box will be able to provide more efficient and accurate assistance if you have a complete description, including:

- the nature and duration of the problem.
- when the problem occurs.
- the components involved in the problem.
- any particular application that, when used, appears to create the problem or make it worse.

## 6.3 Shipping and Packaging

If you need to transport or ship your LCD Panel:

- Package it carefully. We recommend that you use the original container.
- If you are shipping the LCD Panel for repair, make sure you include its power supply. If you are returning the LCD Panel, make sure you include this manual as well. Before you ship, contact Black Box to get a Return Materials Authorization (RMA) number.

# Index

Arrow Keys .....10
Background color for text .....10, 11
Bottom glass, cleaning .....12
Cables.....7
CGA.....8
CLEAR button .....10
COLOR buttons .....10
Color modes .....4, 10
CONTRAST buttons .....10, 11, 14
Contrast, problems with.....14
Control Keys .....10
Cooling fans.....8
EGA.....8
External video port (on a portable computer) .....7
Faint screen .....14
FINE TUNE knob .....11
FRONT/REAR button .....9, 11
Hercules graphics mode .....8
Hercules video.....8
Housing, cleaning .....13
Installation.....6
Internal screen .....6
Laptop computers.....6
Lighting conditions, ideal .....6
Mac II.....8
Mac LC.....9
Mac LC, problems with .....15
Maintenance.....12
Notebook computers .....6
Overhead projector, what kind to use.....6
Package contents.....5
Portable computers.....6
Power-up sequence .....11
Problems.....14
Rear projection .....9
Remote control .....11
Remote control, problems with.....14
RESET button.....8, 9, 10
Restoring a cleared image .....10
Static electricity .....13
Storing the LCD Panel.....13
Synchronization .....8, 9, 15
Temperatures .....13
TINT .....11, 15
Transporting the LCD Panel.....13
Troubleshooting .....14
VGA.....7
Video systems supported .....4
Y cables.....7
Video port, external, on a portable computer.....7

© Copyright 1994. Black Box Corporation. All rights reserved.

*1000 Park Drive • Lawrence, PA 15055-1018 • 724-746-5500 • Fax 724-746-0746*