Studio Display (15" flat panel)

Basics

Studio Display (15" ßat panel)

Overview

The Studio Display (15" flat panel) is a high-quality, flat panel, XGA desktop monitor for the Macintosh and PC platforms. The display size and weight benefits from an LCD display with a unique Apple ID and system architecture. The design is both ergonomic and flexible.

Click the icon at left for a QuickTime VR movie of the Studio Display (15" flat panel).

movie.studio

The display can be used with either stand:

¥ Desktop Stand allows a wide range of tilt, swivel, and height adjustment

¥ Flip-Out Stand allows a fixed, table-top position optimal for single-user viewing

Both stands are supplied with the display, and they are also available as separate parts.

———————— Desktop Stand

Flip-Out Stand ————

Features

The Studio Display (15" flat panel) includes the following
key features:

- ¥ Small footprint, lightweight, and adjustable mechanical
  mounting
- ¥ 1024 x 768 fixed resolution display format
- ¥ 24-bit color
- ¥ High brightness
- ¥ Standard RGB, analog interface
- ¥ DDC1/2B for cross platform compatibility
- ¥ Full screen, direct NTSC/PAL/SECAM playback
- ¥ Mini-stereo connector for audio

U.S. Repair Strategy

The Studio Display (15" flat panel) is serviced through the service facilitation process. Customers may choose carry-in repair service through an Apple-authorized service provider (AASP) who will then facilitate a mail-in repair or customers can receive mail-in service from Apple directly.

Ordering

Apple-authorized service providers planning to support the Studio Display (15" flat panel) may facilitate service by calling 800-919-2775 and selecting option 6.

For more details on this facilitation process, please refer to the Facilitation Process in the archived service notices section of the Service Source CD. (Open the Notices Archive

folder at the top level of the Main CD. The complete path is
Notices Archive: Service Notices Archive: Service Source
Startup: Service Information: Notices: Service Notices:
Archived List: Facilitation Process.)

Parts

To order replacement parts, use the AppleOrder system and
refer to Studio Display (15" flat panel) in the Service Price
Pages. Large businesses, universities, and K-12 accounts
must provide a purchase order for all transactions,
including orders placed through the AppleOrder system.

Service providers not enrolled in AppleOrder may fax their
orders to Service Provider Support (512-908-8125) or
mail them to the following address:

Apple Computer, Inc.
Service Provider Support
MS 212-SPS
Austin, TX 78714-9125

If you have further questions, please call Service Provider
Support at 800-919-2775 and select option 1.

Warranty and AppleCare

The Studio Display (15" flat panel) is covered under the
Apple One-Year Limited Warranty. The AppleCare Service
Plan is also available for this product. Service Providers
are reimbursed for warranty and AppleCare repairs
facilitated for this display. For pricing information, refer to
the Service Price Pages.

Canada Repair Strategy

The service strategy for the Studio Display (15" flat panel) is whole-unit replacement in Canada. To prevent Òno fault foundÓ returns on the unit, please use the following procedure when you require a service repair:

1 Troubleshoot the unit to ensure the problem isn't with the software or with the computer.

2 After confirming the issue is with the display, call Technical Service Provider Support (TSPS) at 800-217-9517 (have your 10-digit service account number, beginning with 61, ready). Be prepared to explain the issue, your troubleshooting steps, and the display's serial number to the TSPS phone agent.

3 After verifying the troubleshooting you've performed, the TSPS phone agent will authorize the repair by giving

you the whole-unit service replacement part number, and a Vantive case number.

4   Use AppleOrder to place the order for the whole-unit service replacement by manually populating the Part Number field with the part number given to you by the TSPS. Then mark the order for review, and put the Vantive case number in the Comments field. Failure to do so will result in your order being declined.

5   When you receive the whole-unit service replacement, return the old display as you would any other service module.
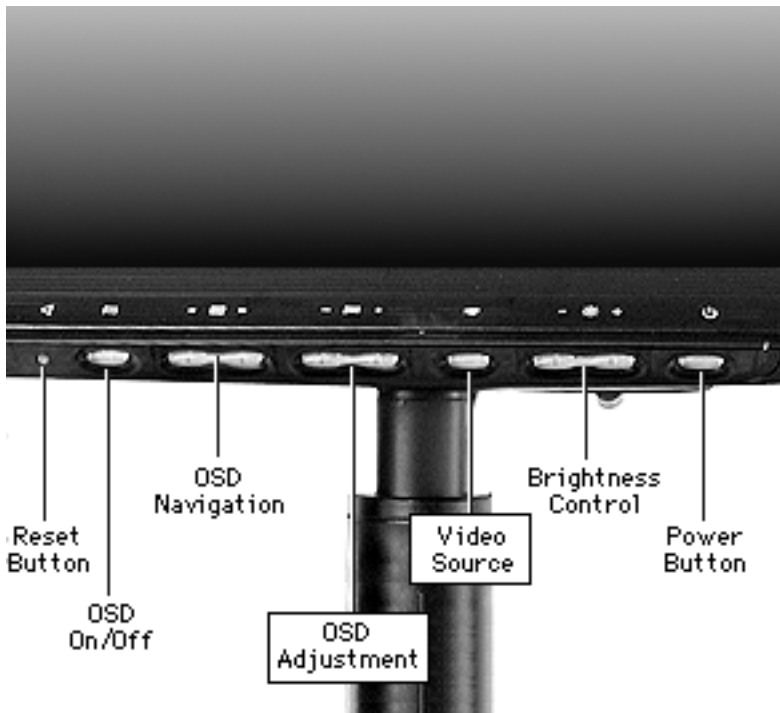
Front View

The front underside of the display includes the following controls:

- ¥ Reset button
- ¥ OSD (On-Screen Display) on/off
- ¥ OSD navigation
- ¥ OSD adjustment
- ¥ Video source
- ¥ Brightness control
- ¥ Power button

For information on adjusting the display, refer to the Adjustments chapter.

AV Door

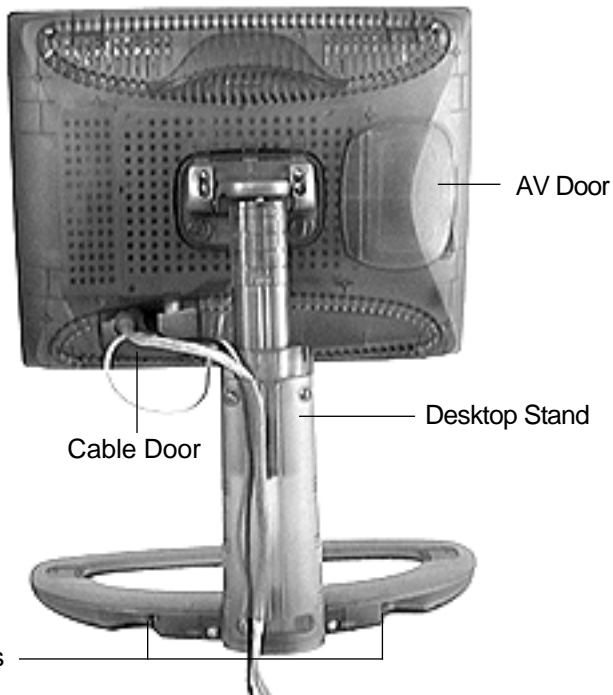Desktop Stand

Cable Door

ADB Ports

Back View

From the back of the display, you can see
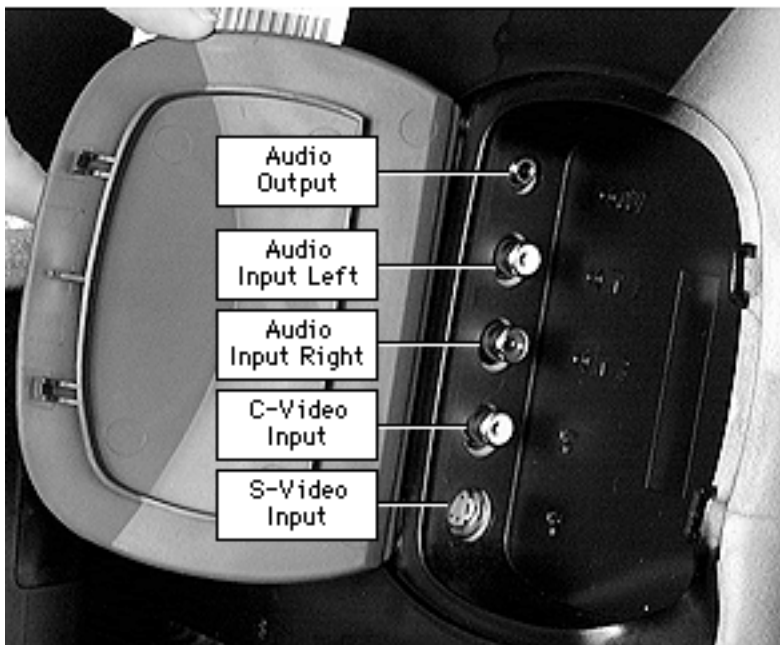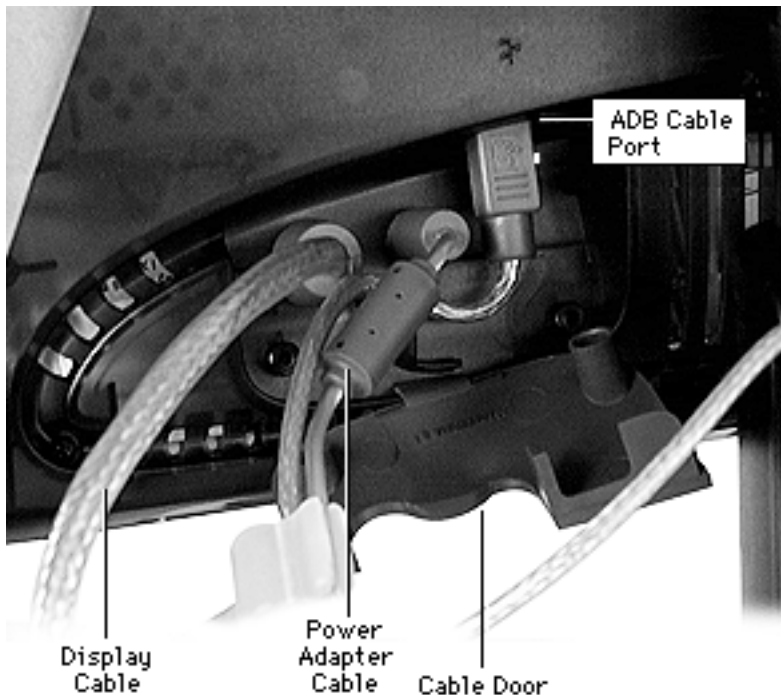
¥ AV door
¥ Cable door
¥ Desktop stand
¥ ADB ports

AV Door

Behind the AV door are the following ports:

¥ Audio output
¥ Audio input left
¥ Audio input right
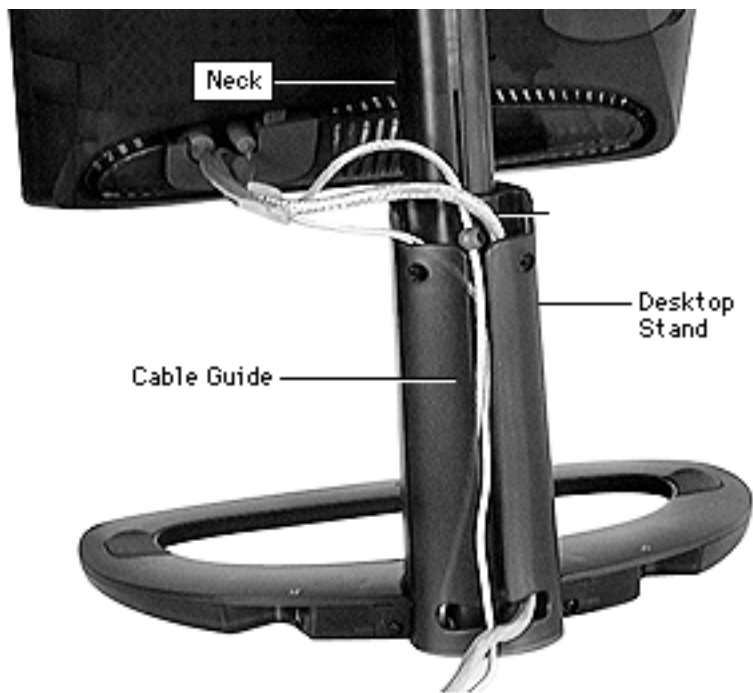¥ C-video (composite) input
¥ S-video input

Cable Door

Behind the cable door are the
¥ Display cable
¥ Power adapter cable
¥ ADB cable port

ADB Cable Port

Display Cable

Power Adapter Cable

Cable Door

Desktop Stand

The neck of the desktop stand can be raised or lowered for optimum viewing height. The back of the desktop stand includes a cable guide for easily routing cables.

ADB Ports

Two ADB ports are provided on the base of the desktop stand. The ADB ports support input devices such as a keyboard, mouse, or trackball.

ADB Ports

Repair Issues: New Rev. B Version

In January 1999, the Rev. B version of the Studio Display (15" flat panel) was introduced. The display performance and internal circuitry remains the same. The Rev. B version is identical to the original (Rev. A) version except the video cable has changed to a VGA style, and the housing colors are different.

New Housing Color

Unlike the original colors of gray and blue, the Rev. B version of the display sports a translucent aqua and translucent white color combination.

Important: The Rev. B housing parts (desktop stand, flip-out stand, and AV door) should be exchanged like for like.

New VGA-to-Macintosh Adapter

The connector on the display cable is a VGA video connector.

To ensure the proper connection to your computer or video card, click the icon called ÒUpdate.pdfÓ for instructions on using the VGA-to-Macintosh adapter that comes with the Rev. B version of the Studio Display (15" flat panel).

Update.pdf

Specifications

Studio Display (15" ßat panel)

Introduction

Specifications information for the Studio Display   (15" flat panel)
can be found in the Spec Database, which you can access in one of
three ways:

¥ Double-click the Apple Spec Database runtime alias at the top
   level of the Main Service Source CD.

¥ Select ÒApple Spec DatabaseÓ from the Service Source drop-
   down main menu.

¥ Click the Acrobat toolbar icon for the database, which is near
   the right end of the toolbar with the letters ÒSP.Ó

Apple Studio Display

The Apple Studio Display combines state-of-the-art digital imaging technology with advanced software-based features unique to Apple. The result is a high-performance flat-panel display that's ideal for anyone who spends a lot of time manipulating text, graphics, and other media on-screen. Whether you're a multimedia content creator, a designer, a writer, an educator, or an accountant, the Apple Studio Display can make your job look a lot better to you—and vice versa.

The thin film transistor (TFT) active-matrix LCD technology used by the Apple Studio Display enables it to offer outstanding brightness, contrast ratio, and sharpness—for optimal viewing. It also provides an impressively wide viewing angle, as well as completely eliminating screen flicker. And the Apple Studio Display offers all of this performance in a product that's a fraction the size of a traditional computer monitor.

Probably the most distinguishing feature of this display, though, is the advantage it takes of Apple's outstanding hardware/software integration. In the case of the Apple Studio Display, this enables an unmatched combination of "smart features" and superior software controls—adding up to an extraordinarily flexible, responsive device with which to view your work.

In fact, the Apple Studio Display can make that eight-plus hours per day you spend in front of your computer significantly more productive—and surprisingly more pleasant. If you deal primarily with graphics, you'll be glad to know that the Apple Studio Display requires no special graphics adapter to work seamlessly with your computer. If you deal more with multimedia, you'll appreciate its built-in connectors for composite and S-video as well as audio input. And if what you deal with most frequently is a combination, you'll find the display's ability to shift instantly between graphics and video modes invaluable.

The Apple Studio Display—when you look at all of its high-performance capabilities, you'll really like what you see.

Features

Spectacular display performance
- Offers outstandingly crisp, clear images using thin film transistor (TFT) active-matrix liquid crystal display (LCD) technology
- Produces a distortion-free image without any time-consuming geometric correction
- Enables flexible viewing through its wide (120° horizontal) viewing angle
- Includes composite and S-video connectors, so you can easily display full-screen video
- Eliminates screen flicker

Stunning style
- Takes up a fraction of the space required by a traditional display
- Includes tilt-and-swivel and height adjustments for optimal viewing comfort
- Offers an alternate picture-frame stand that can further minimize its desktop footprint
- Provides easy access to audio/video connectors and screen-control buttons
- Reduces cable clutter through an integrated cable guide
- Complies with the strict global TCO 95 standards for low power consumption, low emissions, and recyclability

Outstanding hardware/software integration
- Offers an unmatched combination of "smart" features and superior software user controls
- Features smart scaling, which provides full-screen, high-quality viewing of graphics and video at varying resolutions
- Ensures the best possible performance regardless of display/graphics card or analog input from the computer, through accurate, easy phase adjustment
- Makes it easy to "optimize" your viewing experience using a unique software-based tool that gives you precise, integrated control over white level, black level, and brightness

Apple Studio Display

Technical Specifications

Screen size
- 15.1 inches (diagonal viewable image size)

Screen type
- Thin film transistor (TFT) active-matrix liquid crystal display

Display colors
- 16 million (maximum)

Viewing angle (typical)
- 120° horizontal; 90° vertical

Brightness (typical)
- 200 cd/m^2

Contrast ratio (typical)
- 200:1

Resolution and screen refresh rates
- 640 by 480 pixels at 60 Hz, 67 Hz, 72 Hz, or 75 Hz
- 720 by 400 pixels at 70 Hz
- 800 by 600 pixels at 56 Hz, 72 Hz, or 75 Hz
- 832 by 624 pixels at 75 Hz
- 1,024 by 768 pixels at 60 Hz, 70 Hz, 74.9 Hz, or 75 Hz

User controls (hardware and software)
- Power on/off
- Graphics/video toggle
- Brightness
- Reset
- On-screen display navigation
— Menu position (vertical, horizontal)
— Information (display status)
— Language
— Function adjustment
— Menu off
- On-screen display functions
— Tracking (coarse, fine)
— Position (vertical, horizontal)
— Black level
— Sharpness
— White point

Screen treatment
- Antistatic, antireflective coating

Connectors and cables
- Input
— 15-pin D-sub for RGB video
— 4-pin DIN for S-video
— Three 4-pin DIN connectors for Apple Desktop Bus
— RCA-type connector for composite video
— Two RCA-type connectors for audio (left, right)
— 65mm DC connector for DC input
- Output
— Mini-stereo connector for audio

Power supply electrical requirements
- Line voltage: 100 to 240 V AC
- Frequency: 50 to 60 Hz, single phase
- Power: less than 35W (operating)

Agency approvals
- FCC Part 15 Class B
- CISPR 22 Class A (EN500821f)—complies with European EMC directive
- DOC Class B
- MPR-II
- VCCI Class 2
- CE Mark
- EPA Energy Star compliant
- IEC 950
- EN60950
- NUTEK
- TCO 95

Environmental requirements
- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: -4° to 140° F (−20° to 60° C)
- Operating humidity: 10% to 80%, noncondensing
- Storage humidity: 5% to 95%, noncondensing
- Operating altitude: 0 to 10,000 feet (0 to 3,048 m)
- Shipping: 0 to 35,000 feet (0 to 10,606 m)

System requirements
- Works with Power Macintosh or other Mac OS–based systems with PowerPC processors running Mac OS 7.5 or later*
- Works with Windows 95– and Windows NT–based systems

Size and weight
- With desktop stand: 15.0 inches (minimum) to 19.3 inches (maximum) by 15.7 inches by 9.8 inches (38.1 cm to 49.0 cm by 39.9 cm by 24.9 cm)
- With picture-frame stand: 11.6 inches by 15.7 inches by 6.9 inches (24.9 cm by 39.9 cm by 17.5 cm)
- With desktop stand: 12 lb. (5.5 kg)
- With picture-frame stand: 7.7 lb. (3.5 kg)

Does not work with Macintosh PowerBook 1400 or 5300 systems or with PowerBook Duo 2300 systems.

Ordering Information

Apple Studio Display
Order No. M6356LL/A
- Apple Displays software (with ColorSync profile)
- VGA adapter
- Power cord and adapter
- Picture-frame stand
- User's manual
- Limited warranty

For more information
For more information about this product, or to find out where to buy Apple products—through a reseller or from the Apple Store—visit www.apple.com or call 1-800-538-9696.

Apple Studio Display

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- Reduces cable clutter through an integrated cable guide
- Complies with the strict global TCO 95 standards for low power consumption, low emissions, and recyclability

Outstanding hardware/software integration

- Offers an unmatched combination of "smart" features and superior software user controls
- Features smart scaling, which provides full-screen, high-quality viewing of graphics and video at varying resolutions
- Ensures the best possible performance regardless of display/graphics card or analog input from the computer, through accurate, easy phase adjustment
- Makes it easy to optimize your viewing experience using a unique software-based tool that gives you precise, integrated control over white level, black level, and brightness

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- Graphics/video toggle
- Brightness
- Reset
- On-screen display navigation
— Menu position (vertical, horizontal)
— Information (display status)
— Language
— Function adjustment
— Menu off
- On-screen display functions
— Tracking (coarse, fine)
— Position (vertical, horizontal)
— Black level
— Sharpness
— White point

Screen treatment
- Antistatic, antireflective coating

Connectors and cables
- Input
— 15-pin mini D-Sub VGA connector
— Two 4-pin DIN connectors for Apple Desktop Bus
— 4-pin DIN connector for S-video
— RCA-type connector for composite video
— Two RCA-type connectors for audio (left, right)
— DC connector for DC input
- Output
— Mini-stereo connector for audio

Power supply electrical requirements
- Line voltage: 100V to 240V AC
- Frequency: 50 to 60 Hz, single phase
- Power: less than 35W (operating)

Agency approvals
- FCC Part 15 Class B
- CISPR 22 Class A (EN500821f)—complies with European EMC directive
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- VCCI Class 2
- CE Mark
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- EN60950
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- With picture-frame stand: 11.6 by 15.7 by 6.9 inches (24.9 by 39.9 by 17.5 cm)
- With desktop stand: 12 pounds (5.5 kg)
- With picture-frame stand: 7.7 pounds (3.5 kg)

*The display does not work with Macintosh PowerBook 1400, 3400, or 5300 systems or with PowerBook Duo 2300 systems.

Nothing works and looks better with a new Power Macintosh G3 computer than an Apple Studio Display (sold separately).

Ordering Information

Apple Studio Display
Order No. M6356LL/B

- Apple Displays software (with ColorSync profile)
- VGA-to-Macintosh adapter
- Power cord and adapter
- Picture-frame stand
- User's manual
- Limited warranty

For More Information

For more information about this product, or to find out where to buy Apple products, visit www.apple.com on the World Wide Web or call 1-800-538-9696. To purchase this products from the Apple Store, go to www.apple.com/store.

Apple stands behind its products with world-class service and support. Offering quality parts, extended hardware service options, phone support, and support via the Internet, we provide you with support choices that meet your needs. For more information, visit www.apple.com/support.

Apple Computer, Inc.

1 Infinite Loop
Cupertino, CA 95014
(408) 996-1010
www.apple.com

Troubleshooting

Studio Display (15" flat panel)

General

The Symptom Charts included in this chapter will help you
diagnose specific symptoms related to your product. Because cures
are listed on the charts in the order of most likely solution, try
the first cure first. Verify whether or not the product continues to
exhibit the symptom. If the symptom persists, try the next cure.

For additional assistance, contact Apple Technical Support.

For general troubleshooting tips, go to the Adjustments chapter
and click the icon for the linked userÕs manual. In the linked
userÕs manual, refer to Chapter 6, ÒTips and Troubleshooting.Ó

Symptom Charts

No Raster

No raster (screen is
black); green power
indicator light on

1 Verify computer signal by connecting a known-good monitor.
   Then disconnect the known-good monitor and reconnect the
   Studio Display (15" flat panel).   Ensure the monitorÕs video
   cable and ADB cable are connected to the computer.

2 Adjust front panel brightness (it may be set too low).

3 If screen brightness has decreased over time, the most likely
   condition is the backlights failing. The backlights have an
   average life of 10,000 hours (about 40 hours per week for
   five years. If the display is over a year old and you suspect
   backlight failure, contact an Authorized Apple Dealer for
   replacing the backlights.

4 US only: Call Apple Technical Support at 1-800-919-2775.

White screen at
power on; random/
predominant screen
color; controls on
bottom of display do
not respond

1   With system power off, disconnect ADB cable from computer.
    Disconnect power to the display. Reconnect power to the
    display, and reconnect ADB cable to the computer.

2   Verify keyboard's ADB cable is connected to ADB port on the
    Studio Display's stand.

3   Restart system to check if the symptom remains.

4   US only: Call Apple Technical Support at 1-800-919-2775.

Screen Resolutions

Blurry or wavy
screen image at
different resolutions

1 Set resolution to 1024x768, and adjust Sharpness setting to
   the full right position.
2 Adjust tracking in the Monitors & Sound control panel.

Dark screen or
random images or
message ÒSignal Out-
of-RangeÓ when
changing screen
resolution

1 Select another resolution.
2 Some graphics cards may show a resolution that is not used
   by this display. If ÒSignal Out-of-RangeÓ message doesn't go
   away after about 10 seconds, restart computer by holding
   down Shift key to turn extensions off. Open Preferences
   folder in System Folder and drag Display Preferences file to
   the Trash. Restart computer again.

Only one resolution
available; display
name or settings
missing from
Monitors & Sound

1 Ensure ADB cable is connected to computer for software to
   recognize which display model you have.
2 Ensure Apple Displays Software 1.6 (or later) is installed.

Missing resolutions;
display name or
settings missing from
Monitors & Sound;
error message reads
ÒAppleVision failed to
load completely.
Error 0x00088F8Ó

Install Apple Displays Software 1.6 (or later) that came on the CD
with the Studio Display (15" flat panel).

Miscellaneous

Studio Display not
listed in Color section
of Monitors & Sound

The Studio Display (15" flat panel) profile does not appear in the
2.5 release of ColorSync. Select Generic LCD Display profile
instead. (The Studio Display profile will appear in the next
release of ColorSync.)

Vertical gray bar on
edge of raster at
1024x768 resolution

Adjust the screen position, via the Monitors & Sounds control
panel, so that raster is centered on display.

Take Apart

Studio Display (15" flat panel)

Safety Guidelines

Caution: Before handling the Studio Display (15" flat panel), ensure that you have a clean, flat work surface. Protect the display face from scratches or nicks by placing a protective film over it. Remove all jewelry that could scratch or damage the display or plastic housing.

Desktop Stand

Desktop Stand

Caution: Before you begin, ensure that you have a clean, flat surface to work on. Protect the display face from scratches or nicks by placing a protective film over it.
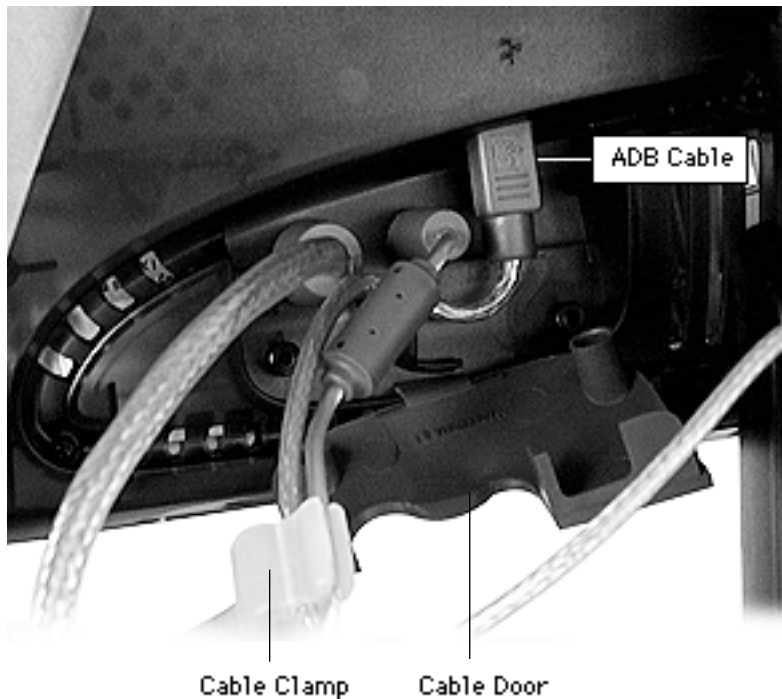
1 Adjust the neck of the desktop stand to its highest extended position.

2 Remove the cables from the cable guide on the desktop stand.

Rear Housing

Cable Door

Desktop Stand

3 Tilt the display so the bottom of the rear housing touches the desktop stand.

4 Open the cable door.

Cable Clamp   Cable Door

5 Remove the ADB cable from its port in the rear housing.
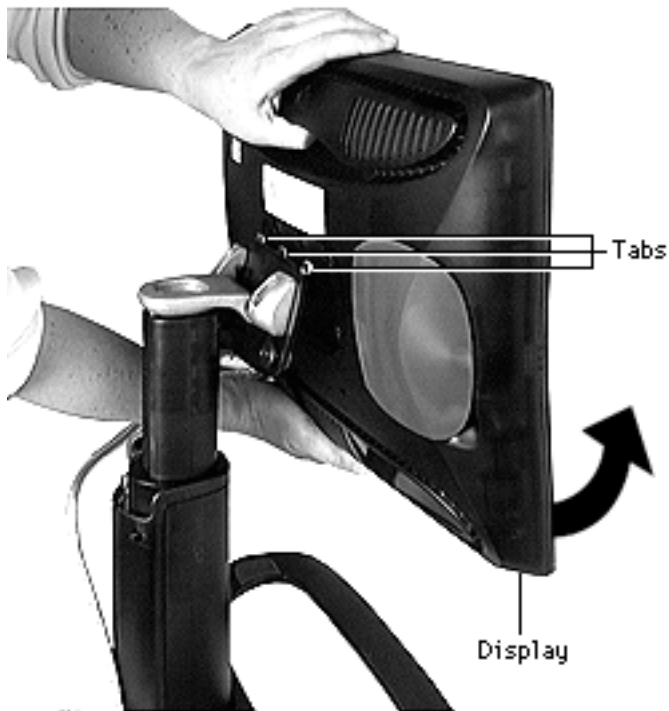
6 Remove the ADB cable from the cable clamp.

7 Using a flat-blade screwdriver, loosen but do not remove the two thumbscrews and thin plastic washers at the rear of the display.

   Note: Keep the thumbscrews and washers attached to the desktop stand.

Tabs

Display

8   While supporting the
    display, tilt up the
    bottom of the display,
    and raise it off the three
    metal tabs on the stand.

9   Place the display on a
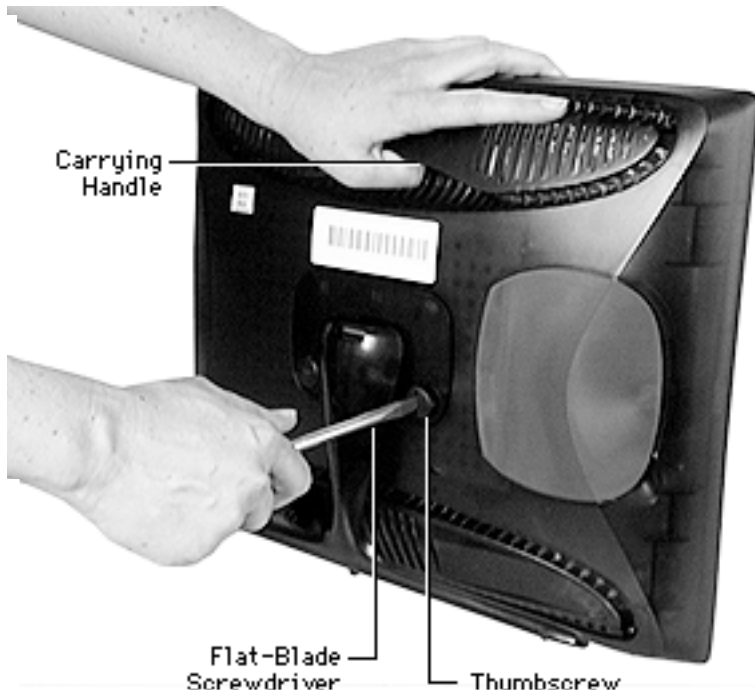   clean, flat surface.

Flip-Out Stand

Caution: Before you begin,
ensure that you have a clean,
flat surface to work on.
Protect the display face
from scratches or nicks by
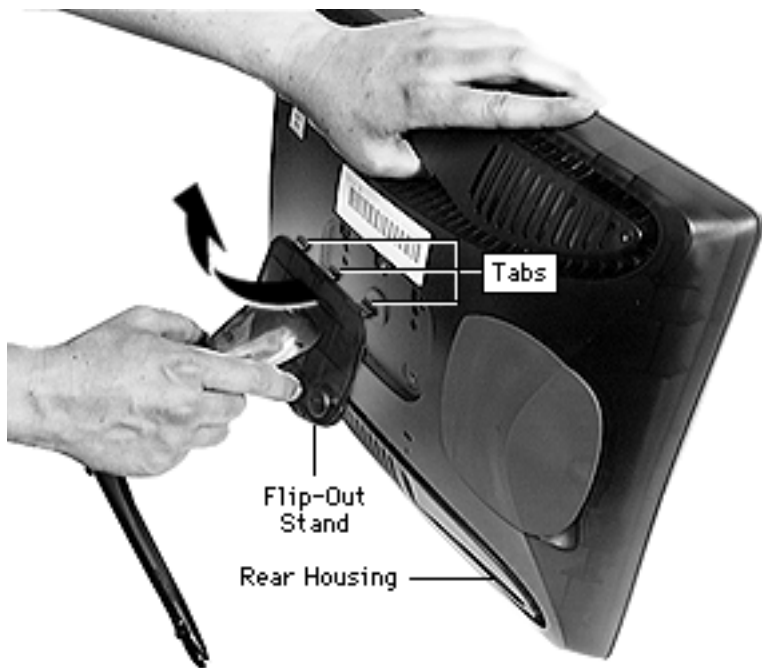placing a protective film
over it.

Carrying Handle

Flat-Blade Screwdriver

Thumbscrew

1 Support the display at the carrying handle.

2 Using a flat-blade screwdriver, loosen but do not remove the two thumbscrews and thin plastic washers at the rear of the display.

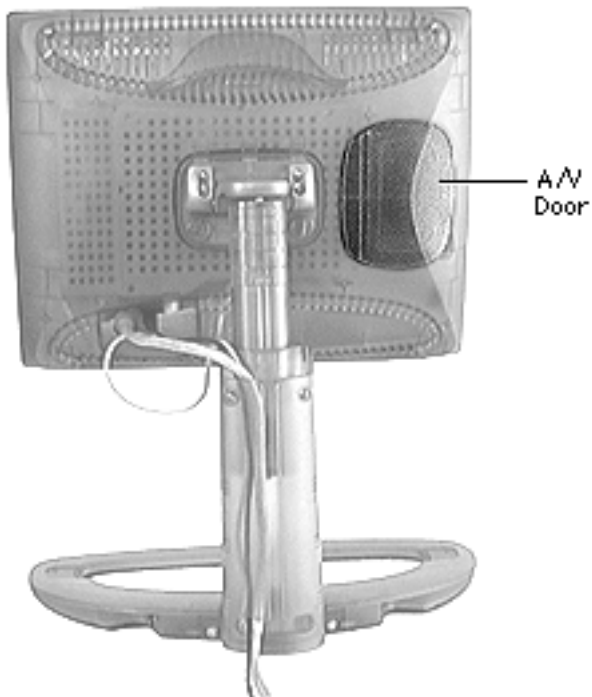Note: Keep the thumbscrews and washers attached to the flip-out stand.

3 While supporting the display, tilt the flip-out stand down and away from the display to release the three tabs from the rear housing.
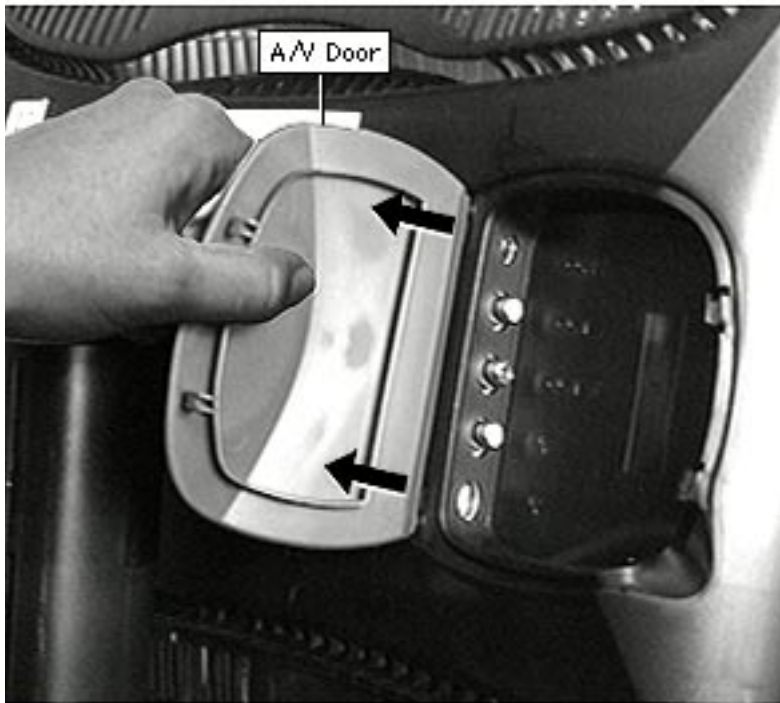
4 Place the display on a clean, flat surface.

Audio/Video Door

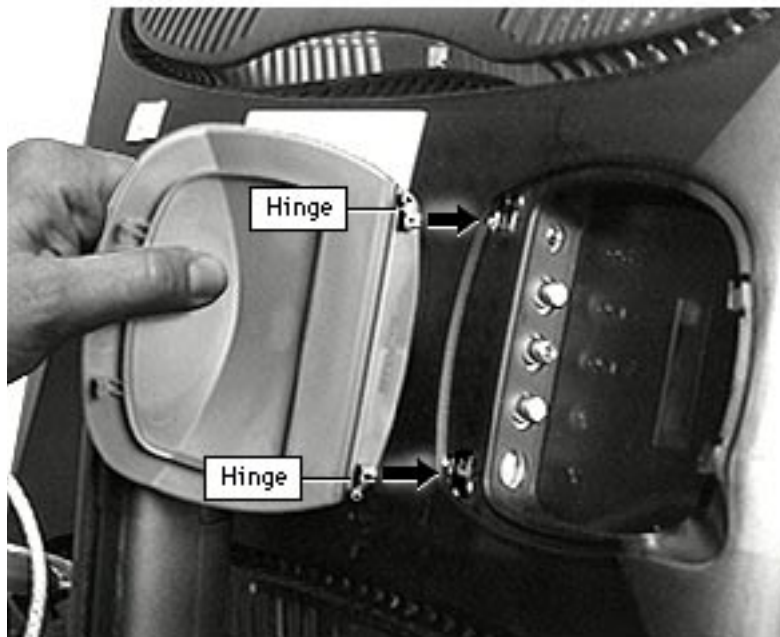Before you begin, position the display with the A/V door facing you.

1 Open the A/V door.

A/V Door

2 Pull the A/V door away
from the rear housing.

Replacement Note: Align the two hinges on the A/V door to the two small openings on the rear housing. Press the A/V door into place.

Adjustments

Studio Display (15" flat panel)

Linked User's Manual

You can adjust the screen image using the controls on the front underside of the Studio Display (15" flat panel) or you can use the On-Screen Display (OSD). Refer to Chapter 3 ÒUsing Manual Controls and the On-Screen DisplayÓ in the linked Studio Display (15" flat panel) userÕs manual.

Click the icon at left to open the userÕs manual.

See the next section for a quick reference for setting up and adjusting the display.

studio.pdf

Quick Reference for Setting Up and Adjusting the Studio Display

These instructions are for quickly setting up the Studio Display (15" flat panel) and adjusting settings for the best screen image.

Important: For detailed instructions, refer to the Apple Studio Display UserÕs Manual.

1   Plug in the display.

2   Connect the display cable to your computer.

Important: The ADB connector on the display cable is not optional. If the ADB connector is not connected, the maximum number of resolutions and software controls will not be available.

3   For a Mac OS-based computer, connect the keyboard and mouse to the desktop stand.

4   Start up the computer. (You might see an image on the screen; this is a normal characteristic of a flat panel display.)

5   Insert the Apple Displays Software CD into the CD-ROM drive on the computer, and install the Apple Displays Software. Restart the computer.

6   Open the Apple (ð) menu, choose Control Panels, then choose Monitors & Sound.

    Note: If youÕre using a Windows-based computer, use the On Screen Display to make adjustments. For more information, refer to Chapter 3 in the Apple Studio Display UserÕs Manual.

7   Make adjustments so the screen image is crisp and clear.

   a   Set the resolution to 1024x768, which provides the
       sharpest image for optimal performance. Click the
       Monitor button at the top of the Monitors & Sound
       control panel. Then select a 1024x768 resolution
       setting in the Resolution area.

   b   Make sure the sharpness is set to the maximum
       level. Click the Flat Panel button at the top of the
       Monitors & Sound control panel. Then move the
       Sharpness slider all the way to the right.

   c   Adjust tracking to synchronize the video signal, so
       the screen image is not blurry or fuzzy. Click the
       Tracking button. In the window that appears, click +
       and - to change the Coarse and Fine adjustments.
       Adjust the controls to eliminate or minimize any
       horizontal and vertical lines or ÒnoiseÓ you see on
       the screen. The screen image may get slightly worse

before it sharpens. When finished, click OK.

d   Click the buttons in the Position area to center the
    screen image.

e   Make sure the black level and white level are set
    correctly. Click the Optimize button in the White
    Level & Black Level area to automatically adjust
    these levels to the optimal setting. (You can adjust
    the black level and white level separately; however,
    click Optimize to make sure these are always at the
    optimal settings.)

f   Adjust the brightness. Click the Monitor button at
    the top of the Monitors & Sound control panel. Then
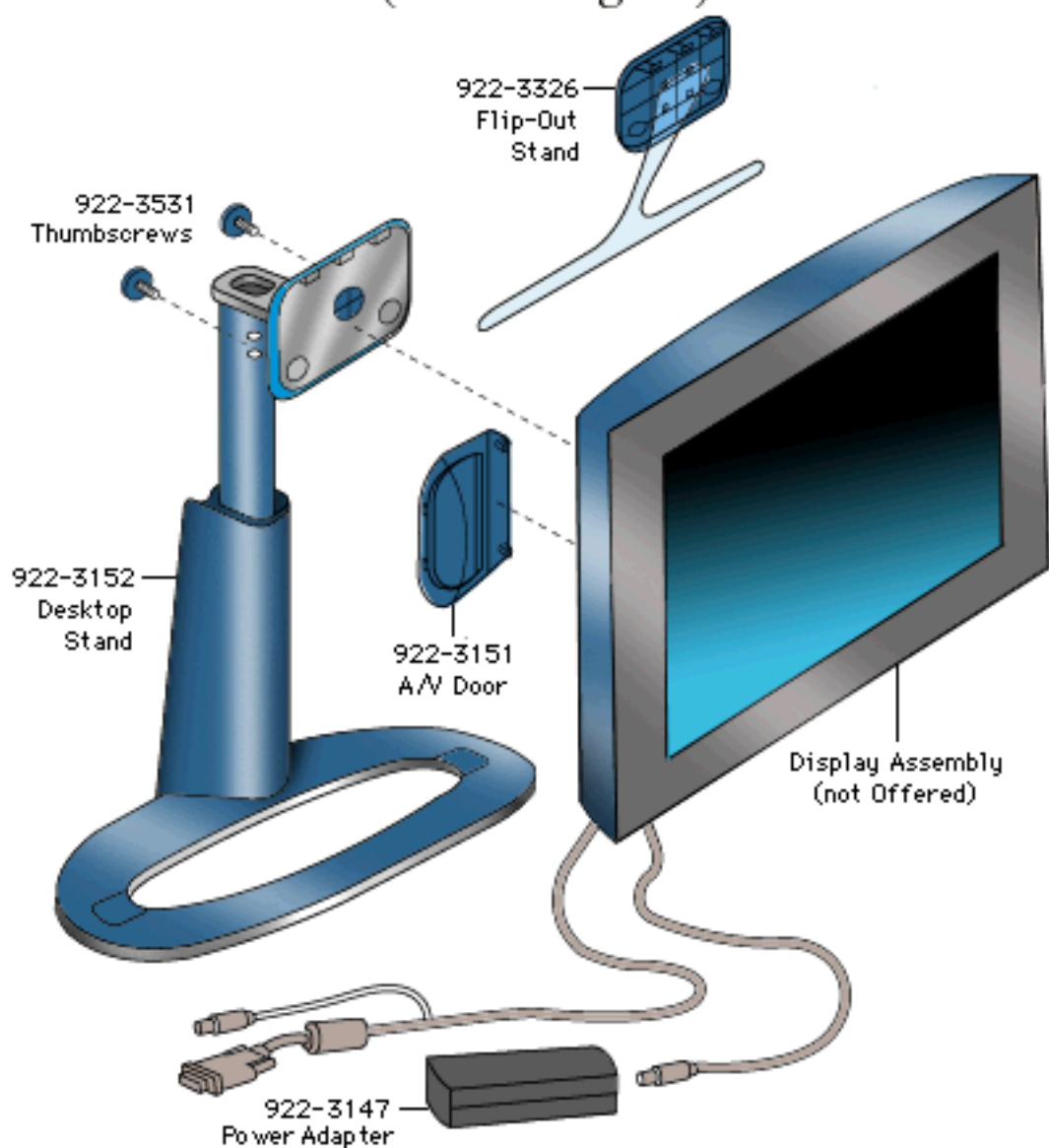   move the Brightness slider to the desired setting.

Exploded View

Studio Display (15" ßat panel)

Exploded View of Studio Display (15" flat panel)
(Rev. A Original)

922-3326 — Flip-Out Stand

922-3531 Thumbscrews

922-3152 Desktop Stand

922-3151 A/V Door

Display Assembly (not Offered)

922-3147 — Power Adapter

Exploded View of Studio Display (15" flat panel) (Rev. B)

922-3744
Flip-Out
Stand

922-3531
Thumbscrews

922-3743
Desktop
Stand

922-3742
A/V Door

Display Assembly
(not Offered)

922-3147
Power Adapter