



# Apple Studio Displays FAQ

## Basic Product Information

### Q. What monitors did Apple introduce?

**A.** Apple is introducing two new CRT-based displays and reintroducing our exciting LCD-based Apple Studio Display. The new CRT-based displays include a 17-inch (16-inch viewable image size) model and a 21-inch (19.8-inch viewable image size) model. The LCD-based display has a 15.1-inch screen that uses thin-film transistor, active-matrix liquid-crystal display (TFT AMLCD) technology. The new products have the following names:

15.1-inch AMLCD (flat-panel)	Apple Studio Display
17-inch Diamondtron CRT	Apple Studio Display
21-inch Trinitron CRT	Apple Studio Display with ColorSync technology

### Q. What's so special about these products?

**A.** The first thing you'll notice about Apple's new CRT displays is their stunning industrial design, created especially to match the latest Power Macintosh G3 computers. Closer inspection will show you that these displays are not only good looking, they're great to work with.

The 17-inch and 21-inch Studio Displays use advanced CRT technology to provide outstanding display performance and other features that make them ideal for Power Macintosh G3 customers.

The flat-panel display now comes in a new color so, like the other displays, it complements the new Power Macintosh G3 systems. And Apple has lowered its price while keeping the same great features, making it an even more attractive alternative to CRT-based displays.

### Q. When will the Apple Studio Displays be available and where will customers be able to buy one?

**A.** The Apple Studio Displays are available immediately through all Apple distribution channels, including national and regional resellers, direct sales to educational accounts, and the Apple Store on the World Wide Web.

### Q. How much do these displays cost?

**A.** The estimated street prices (not including tax and shipping) at introduction of these products are as follows.

15.1-inch flat-panel Apple Studio Display	\$1099
17-inch (16-inch viewable) CRT-based Apple Studio Display	\$499
21-inch (19.8-inch viewable) CRT-based Apple Studio Display	\$1499



## **CRT-based Apple Studio Displays**

### **Q. What's so special about the industrial design of these new displays?**

**A.** The industrial design of the new Apple Studio Displays is as functional as it is stunning. The plastic bezel design around the screen is achromatic to minimize any influence it has on the perception of colors on the screen. Also, the color was chosen to meet strict worldwide standards for the amount of light reflectivity it generates, so it reduces eyestrain when you sit in front of it for hours on end.

Both CRT models have a tripod base that lets you easily tilt and swivel the monitor. It has space underneath for keyboard storage. The base of the 21-inch display also has four USB ports, making the connection of desktop peripherals extremely easy.

### **Q. What are the features of the new 17-inch Apple Studio Display?**

**A.** The key feature of the new 17-inch Apple Studio Display is its performance. Incorporating an advanced Diamondtron CRT with a superfine 0.25mm aperture grille pitch, this display offers sharp text and vivid colors. It's designed to support multiple resolutions from 640 by 480 pixels up to 1,600 by 1,200 pixels at high refresh rates so you can comfortably view large documents without scrolling. It provides a multilingual on-screen control system for easy setup and adjustment. The Apple Studio Display is both EPA ENERGY STAR and TCO 99 compliant, meeting strict worldwide standards for low power consumption, low emissions, and recyclability.

### **Q. What are the features of the new 21-inch Apple Studio Display?**

**A.** The new 21-inch display is an uncompromising product. It offers a large Sony Trinitron CRT with a variable superfine 0.25–0.27mm aperture grille pitch. It supports multiple resolutions from 640 by 480 pixels up to 1,600 by 1,200 pixels at a flicker-free, 85-Hertz refresh rate. It incorporates a self-powered four-port USB hub for easy convenient connection of USB peripherals. And most important, it has a patented internal calibration system that makes viewing color on screen more reliable. No other display offers this many features at this price. The Apple Studio Display with ColorSync technology is a complete monitor solution. The Apple Studio Display is both EPA ENERGY STAR and TCO 99 compliant, meeting strict worldwide standards for low power consumption, low emissions, and recyclability.

### **Q. What does “with ColorSync technology” mean in terms of the 21-inch Apple Studio Display?**

**A.** ColorSync technology is software built into the Mac OS. It's considered the gold standard of color-management systems and consists of a color-management module (CMM) and device profiles. Device profiles contain information about the color characteristics of a device. Using the information captured in the device profile, the CMM manages color from one device to another to provide a consistent color workflow. The more accurate the profiles, the more predictable the results of ColorSync are. Predictable color saves time and money by reducing the trial and error of matching color.

The benefit of the Apple Studio Display with ColorSync is the accuracy of the profiles it creates. Using an internal calibration system that measures and adjusts beam current, this display maintains color accuracy. The profile it generates is extremely accurate—more accurate than displays that don't have a calibration system. The bottom line is that with a 21-inch Studio Display, users get greater color consistency and accuracy from device-to-device over time.



**Q. Why is it important for a monitor to be calibrated?**

**A.** Due to many factors, such as changes in electronic components, phosphor aging, and ambient light conditions, a display performs differently at different times. Without compensating for these variations, you cannot confidently use the screen as a reference for how color images will look when they're printed or viewed on other displays. A calibrated display is more accurate, which allows ColorSync software to work more effectively in achieving screen-to-print matching. The 21-inch Apple Studio Display is one of the only monitors available that can provide accurate, consistent color day after day, week after week, year after year, so you can use it more reliably as an accurate color reference.

**Q. How does the Apple Studio Display with ColorSync technology differ from other calibrated monitors?**

**A.** Compensating for monitor variability requires the use of a measurement and control system. Traditional display-measurement systems use an external photometric "puck" or light sensor that is placed on the front of the screen. Apple designed a system that doesn't require this cumbersome and expensive external device. Rather than measuring the light output of the monitor, the internal system in the Studio Display measures the electron beam current. Because beam current is ultimately responsible for generating the colors on the screen, measuring them means you can measure what you are seeing. The difference is that the Apple Studio Display with ColorSync technology can achieve a high level of color consistency and is much easier to use.

**Q. Are there any cost benefits to the self-calibration system used in Apple's monitor?**

**A.** Compared with monitors that use an external photometer, Apple's patented internal measurement system reduces the complexity of the monitor. This simpler design enabled Apple to offer the Apple Studio Display with ColorSync technology at a fraction of the price of other calibrated displays. So the Studio Display makes high-end color accuracy and consistency available to many more people by making it both simple and inexpensive.

**Q. Can I use the 17-inch Apple Studio Display in a color-managed work environment?**

**A.** Yes. ColorSync software, part of the Mac OS, includes the Monitor Calibration Assistant, which helps users to quickly and easily create ColorSync profiles for their displays that provide a good level of color accuracy. However, if accurate color is critical to your work, the internal beam-sensing calibration system of the 21-inch Apple Studio Display provides a superior level of color fidelity.

**Q. Why does the 21-inch Studio Display have USB connectors?**

**A.** The four-port Universal Serial Bus (USB) hub built into the 21-inch Studio Display makes it easy to connect a variety of desktop peripherals such as keyboards and mice. A growing number of devices support this emerging industry standard, which allows for hot-plugging and data transfer rates up to 12 megabits per second. The display itself uses a fifth USB connection to communicate with the Power Macintosh G3 computer, so you can control all monitor functions, including all geometry and color calibration systems, through the familiar Monitors & Sound control panel. The 21-inch Studio Display is currently compatible only with the new Power Macintosh G3 with built-in USB.



**Q. Are these Apple Studio Displays compatible with Windows-based PCs?**

**A.** Both the 15.1-inch and 17-inch Apple Studio Displays feature an on-screen control system that allows them to work with Windows-based PCs. The 21-inch Studio Display with ColorSync technology, however, is designed specifically for use with the Macintosh operating system. All of its controls are adjusted via the computer's Monitors & Sound control panel. These control features are not available when this display is used with a Windows-based computer.

**Q. Why do the new Apple Studio Displays and the new Power Macintosh G3 use a VGA-style connector?**

**A.** The VGA-style connector has been a Windows-based PC standard for many years, but it lacked an intelligent way for the display to communicate with the graphics system in the computer. Apple pioneered a system for easy setup and has offered it in every Macintosh since the Macintosh II. However, new standards defined by the Video Electronics Standards Association (VESA) for simple monitor-to-graphics setup are now available with this connector. The introduction of a complete Power Macintosh and display system allows Apple to adopt this standard while ensuring the ease of use Apple customers have come to expect.

## Flat-panel Apple Studio Display

**Q. Why is Apple offering a flat-panel display?**

**A.** Apple has a long history of offering its customers the best in display performance, including the use of 24-bit color (millions of colors) and support for multiple monitors. It continues that tradition by offering the flat-panel Studio Display. Flat-panel technology offers outstanding visual performance. The 15.1-inch Apple Studio Display is twice as bright, has twice the sharpness and contrast ratio, is distortion and flicker-free, produces near-zero electromagnetic emissions, and is less than half the size of an equivalent display based on CRT technology.

**Q. What technology is used in this display?**

**A.** The 15.1-inch Apple Studio Display uses thin-film transistor, active-matrix liquid-crystal display (TFT AMLCD) technology. This technology supports individual pixel addressing to create sharp text and graphics. Apple-designed electronics allow the Studio Display to be optimized with a click of the mouse using powerful software.

**Q. What specific benefits does this display have for content creators?**

**A.** Many content creators are currently using a 17-inch CRT-based display at a primary resolution of 1,024 by 768 pixels. For the same viewable image size and resolution, the AMLCD-based Apple Studio Display offers twice the brightness and contrast ratio. That means it displays highly saturated, near-photographic-quality images and detailed illustrations that appear razor sharp on screen.

Another aspect of this monitor that will appeal to content creators is the direct-video input feature. The Studio Display can be used as a video display and a graphics display simultaneously with the push of a button. It was designed to display NTSC, PAL, and SECAM video signals in both S-video and composite formats. Users who digitize video with their Macintosh computers and use video-editing software to alter and then output the video can use the Apple Studio Display to preview this work. So it's actually two displays in one package.



**Q. Do I have to be positioned directly in front of the screen to avoid the image inverting when I look at it off axis, as with some flat-panel products?**

**A.** No. The 15.1-inch Apple Studio Display has been designed with a special screen treatment that extends the horizontal viewing angle to 120 degrees. This means you'll experience the same sharp graphics and text at widely different viewing angles.

**Q. How accurate is the color on flat-panel Apple Studio Displays?**

**A.** Managing color with an LCD-based display is no easy feat, but Apple has taken a number of steps toward accomplishing this goal. Specifically, we have addressed two issues that affect how well LCD-based displays can reproduce color: their inherent viewing-angle limitations and the problems associated with attaching this digital device to an analog graphics card. First, because of the display's special screen coating, the 120-degree horizontal viewing angle minimizes color shifts when viewing off axis. Second, we provide a one-button "optimize" control that automatically sets the white and black levels to optimize the monitor's displayable colors. Both of these features improve the color capabilities of the display.

**Q. How did Apple make a digital display compatible with analog graphics cards?**

**A.** Most graphics cards today generate an analog signal so they'll be compatible with most CRT-based displays. The Studio Display was designed to be compatible with these graphics cards so that customers don't have to purchase a special card to use it. Because a flat-panel display is inherently a digital device, special care must be taken to ensure the compatibility with analog graphics cards. A poor design seriously hampers the visual performance of the display and limits the number of colors it supports. Apple designed intelligence into the Studio Display to overcome this difficulty. Using special software, included with the displays, the display can be optimized by the user for sharpness and displayable colors.

**Q. Why does the Apple Studio Display come with an alternate picture frame stand?**

**A.** The Studio Display comes standard with both a desktop stand and a picture frame stand. The desktop stand provides height, tilt, and swivel adjustments and makes this display almost infinitely adjustable to suit individual needs. The picture frame stand provides users with greater flexibility in how they position the display and further minimizes the display footprint. Customers can easily switch stands themselves. Two thumbscrews attach the display to the base. An integrated handle on the back of the panel makes this operation very straightforward.