

Table of contents



Chapter 1 Introduction	E-1
Features of the MultiSync 5FG/6FG	E-1
ColorControl	E-2
ErgoDesign	E-4
Chapter 2 Installation	E-6
Recommended use	E-7
Quick start	E-9
Installation to NEC, IBM and compatible computers	E-10
Installation to Apple Macintosh II computers	E-11
Installation to video cards with BNC connectors	E-12
Installation to other Computer systems and video cards	E-13
Monitor adjustment controls	E-14
Chapter 3 Trouble Shooting	E-20
Chapter 4 Specifications	E-22
Appendix A, B, C,	A

IBM PC/XT/AT, PS/2, MCGA, VGA, 8514/A and XGA are registered trademarks of International Business Machines Corporation.

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

NEC is registered trademark of NEC Corporation. ErgoDesign, ColorControl, and Advanced Digital Control System are trademarks of NEC Home Electronics, Ltd.

MultiSync is registered trademark of NEC Technologies, Inc in U.S., and of NEC Home Electronics, Ltd in Canada, U.K., Germany, France, Spain, Italy, Austria, Benelux, Switzerland, Denmark, Finland, Norway and Saudi Arabia.



Introduction to the MultiSync 5FG/6FG color monitor

Congratulations on your purchase of the MultiSync 5FG/6FG color Monitor!

The MultiSync 5FG/6FG monitor allows you to "plug and play"; the MultiSync technology provides you with automatic compatibility with multiple operating platforms and a vast array of graphics standards allowing resolution upgrades without upgrading the monitor.

The larger 17/21", high contrast, flatter screen offers improved clarity and enhanced color and image quality.

ColorControl allows you to adjust the colors on your screen to exactly what you want. Thus eliminating misrepresentations and frustration.

The MultiSync 5FG/6FG monitor strictly follows ErgoDesign guidelines. ErgoDesign describes a philosophy governing the design of the MultiSync monitors. The goal of ErgoDesign is to maximize the comfort and productivity of the end user.

Feature Highlights

Multiple Frequency Technology

The Multiple Frequency Technology automatically adjust the monitor to the video card's scanning frequency thus displaying the resolution you require. The MultiSync 5FG/6FG also supports multiple operating platforms including IBM compatible and Macintosh family systems.

Increased Resolution adds to the image clarity, and the MultiSync 5FG/6FG monitor provides a wider range of higher resolutions for your needs for now and in the future.

A Wide Range of Graphics Standards is displayable by the MultiSync 5FG/6FG monitor including:

- VGA at 640x480 at 60 and 72 Hz
- SuperVGA at 800x600 56, 60, 70 and 72 Hz
- MAC II at 640x480 66.7 Hz
- 8514/A at 1024x768 Interlaced
- XGA at 1024x768 Interlaced
- 1024x768 Non-Interlaced 60, 70, 75 and 80 Hz
- 1280x1024 Non-Interlaced 60, 70 and 74 Hz

Screen Technology

A High Contrast Tube with a 0.28mm dot pitch increases the clarity and displays greater detail. Good clarity allows your eyes to flow over the screen image and more easily absorb the information.

The Flatter Screen of the MultiSync 5FG/6FG monitor reduces distortion of your image.

Increased Brightness provides higher contrast and more vivid colors.

Color Control

ColorControl is the ability to adjust the image color to:

- what you like (your personal preference depending upon the application used).
- what you want (matched to a color standard or to another monitor's color).
- what you expect (your printer or output service).

The Advanced Digital Control System not only adjust the size, position and pincushion of your image, it is also used to adjust the color. Included are:

- digital controls (to separately set the amount of red, green and blue in precise digital steps).
- microprocessor (to store the settings.)

What this is all about?

Currently, you have the ability to adjust color on your screen via the software or graphics board. For the first time, you have the ability to personally adjust the color on the key component of your system: the NEC MultiSync 5FG/6FG monitor. Using the Advanced Digital Control System, the ColorControl feature allows you to easily adjust the color you see on the screen to your preference: to existing standards, to other monitors, or to your output. You control the color and when the color looks right to you, it is.

Why do you need it?

WYSIWYG means "**What You See Is What You Get**". Some software does allow you to manipulate the color, but how the monitor refers to color and how the printer refers to color is inconsistent. On current systems, displayed red and printed red rarely match. Using ColorControl you can match the display to your output, thus achieving WYSIWYG. This means no errors or misrepresentations; you know that the subject on your screen is as close as possible to the final product or output. ColorControl saves time and frustration.

Applications have become more powerful. You are now able to create professional-looking output such as pamphlets, business presentations, brochures, graphics art, pre-press output and computer-aided and 3D designs. These new and exiting applications offer you, the user, increased control and the ability to use new color standards for easier communications. ColorControl allows you to visually match the color on your screen to any standard or any output. Color is now not only the key to success, but can become the easy element of projects.

How it works

Your monitor produces colors by using electron guns at different intensities that excite the phosphor coating on the inside of your screen which then produces light of different colors. The three colors that make up the monitor's primary colors are red, green and blue (RGB). All the colors displayed are made up of mixtures of these three primary colors. ColorControl allows you to vary the amount of red, green or blue separately on your screen.

Limitations

Each device can physically display a limited number of colors. Monitors cannot physically display all humanly-visible colors, but the monitor can display more colors than printers.

Note: Other components of your system may address color differently. You may want to use another color setting for different applications or different equipment you are using.

ErgoDesign

Cabinet design & aesthetics

The most noticeable feature of ErgoDesign is the new ergonomic case design that provides a more pleasing look from all angles. The back or "visitor view" contains no labels, cables or adapters. A rounded back allows adjustment even within tight places if the monitor back is near the wall.

User Controls allow adjustment of the image to individual preference. The controls are located on the front of the monitor for ease of access, user convenience, and comfort.

A tilt/swivel base for horizontal and vertical adjustments provides the optimum viewing angle for individual needs.

Emission Test

The ErgoDesign also incorporates reduced electrostatic and electromagnetic emission. NEC has designed the MultiSync monitors to address recent concerns regarding potential risks from extended use of computer monitors due to the emission of electric and magnetic fields.

NEC's ErgoDesign monitors have been tested by SEMKO, who ensure compliance to the standards of safety prescribed by the Swedish National Board for Measurement and Testing, also known as MPR and SWEDAC (Swedish Board For Technical Accreditation). This requires that levels of electric and magnetic fields are below SWEDAC's recommended levels. NEC choose to conform to the Swedish standards, which are the most restrictive standards in the world.

Static electricity protection

Reduction of static electricity virtually eliminates static electric shock, but also significantly reduces the dust build-up on your screen.

Horizontal and vertical fullscan

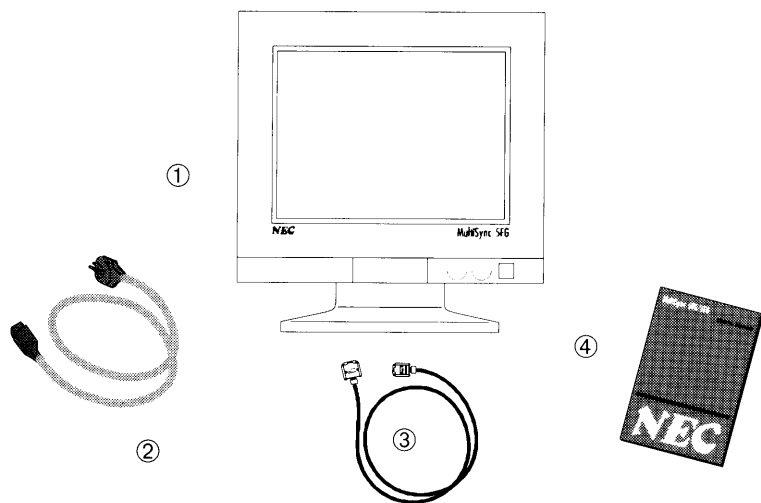
This feature allows certain video modes to be displayed on the screen with no black areas between the monitor bezel and screen image. Therefore, the maximum screen area can be used to view the image. Video modes which are not supported automatically, can be changed and stored manually. Using of Graphics Standards which do not display an aspect ratio of 3:4, Full Scan in the horizontal direction is possibly restricted.

Dynamic and Dual Beam Focus

Precise, continuous focus adjustment of the electron beam in both the horizontal and vertical directions greatly improves the focus and clarity of your image. Dynamic and dual beam focus are required for optimum image quality on larger screen monitors.

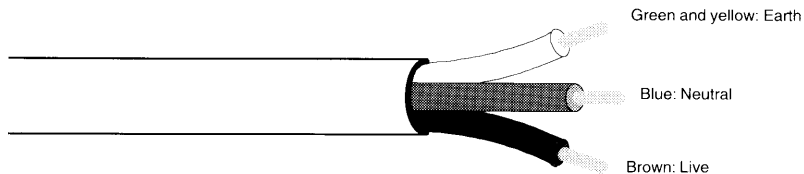
Contents of the package

The diagram below illustrates all of the items included in your MultiSync 5FG/6FG monitor package. Please save the original box and packing materials for transportation or shipment of this monitor.



- ① MultiSync 5FG/6FG color monitor (JC-1741UMB/R)/ (JC-2141UMB/R) with tilt/swivel stand.
- ② Power cord

The end of U.K. Powercord is as follows



- ③ MultiCable
- ④ User's Manual

Recommended use

For optimum performance when setting up and using the MultiSync 5FG/6FG color monitor, please note the following:

- The optimum monitor position is away from direct sunlight.
- Place the monitor just below eye level for the ideal viewing angle.
- Allow adequate ventilation around the monitor so that heat can properly dissipate.
- Do not place any heavy objects on the power cord. Damage of the cable may cause shock or fire.
- Keep the monitor away from high capacity transformers, electric motors and other devices which may create strong magnetic fields.
- Use the monitor in a clean, dry area.
- Handle with care when transporting.
- Do not connect the signal cables to D-SUB 15 pin and Mini D-SUB 15 pin inputs on your MultiSync 5FG/6FG monitor at the same time.
- **We recommend to adjust the brightness in a way that the background raster disappears.**
- **For ergonomical reasons we recommend not to use the position of the maximum contrast control.**
- **For ergonomical reasons the preset size and position is recommended with the standard signals.**
- **For ergonomical reasons preset color setting and preset side-pincushion setting is recommended.**

- For ergonomical reasons we recommend to use the following vertical frequencies except interlaced signals: 65-90Hz with a light background.
- For ergonomical reasons we recommend not to use the primary color blue on dark background (it is difficult to recognize and produces eye fatigue due to insufficient contrast).
- To separate the equipment from the power source you have to remove the plug from the inlet socket.
- The power outlet socket should be installed as near to the equipment as possible, and should be easily accessible.
- We recommend using the power cord supplied with the monitor. However, if another type of power cord is required, power cord H05VV-F should be used except in U.K.

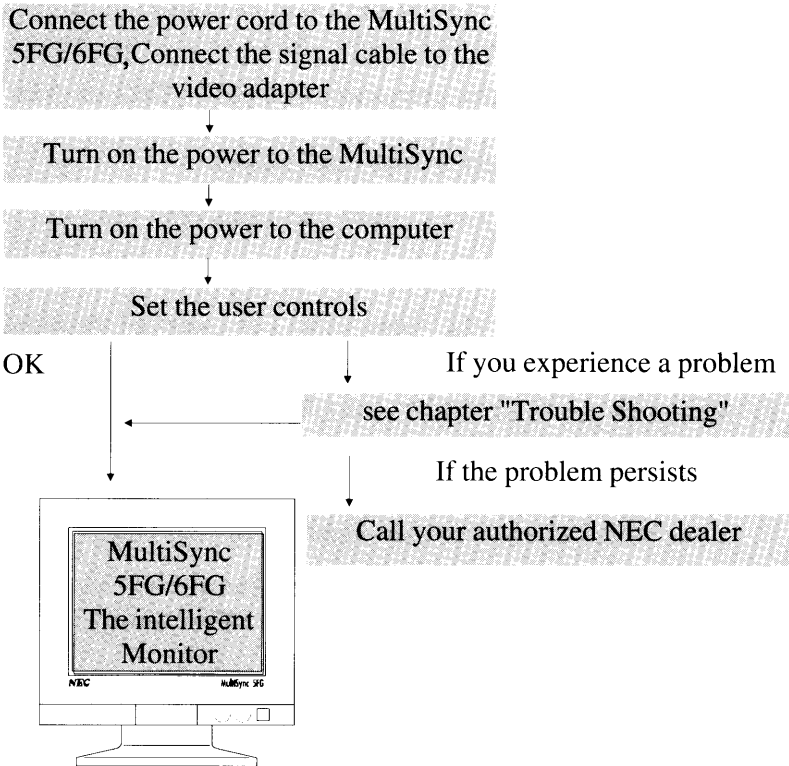
Warning: Do not press the degaussing switch for more than 10 seconds.

To clean the CRT surface use a lint-free, non-abrasive cloth and an neutral cleaner based, non-abrasive cleaning solution or glass cleaner for best results.

Quick start

The following chart summarizes the connection process for the MultiSync 5FG/6FG monitor.

For more details please turn to the following pages if you are connecting to a IBM compatible, Macintosh or compatible or other system.



Connection to your personal computer (NEC, IBM and compatibles)

The MultiSync 5FG/6FG color monitor compliments NEC or IBM PC/XT, AT, 386, 486, PS/2 computer and compatibles.

Your System should have one of two configurations:

1. The video controller is built into the computer.
2. The video controller is in the form of a video card (sometimes referred to as a graphic card, video adapter, or graphics board.)

Both configurations have a video connector (or a CRT PORT on NEC laptop computers). If you are not sure as to which connector is the video connector, consult your computer or video card manual.

To attach the monitor to your system, follow the instructions below.

1. Turn off the power to the monitor and computer.
2. If necessary, install the video card. For more information, refer to the manual accompanying the card.
3. Make sure the D-SUB/BNC SWITCH on the front panel of the MultiSync 5FG/6FG monitor is set to the D-SUB position.
4. Connect the 15 pin mini D-SUB (the smaller connector) end of the MultiCable to the video connector of your system.
5. Connect the 15 pin D-SUB (the larger connector) end of the MultiCable to the monitor and shift the SYNC. switch to the ON position.
6. Connect one end of the power cable to the MultiSync 5FG/6FG monitor and the other end to the power outlet.
7. Turn on the monitor and computer.

If you have any problems, please refer to the chapter "Trouble Shooting".

Connecting to your personal computer (Macintosh II family compatibles)

The MultiSync 5FG/6FG color monitor compliments the Macintosh II family of computers. Your System should have one of two configurations:

1. The video controller is built into the computer.
2. The video controller is in the form of a video card (sometimes referred to as graphic card, video adapter, or graphics board).

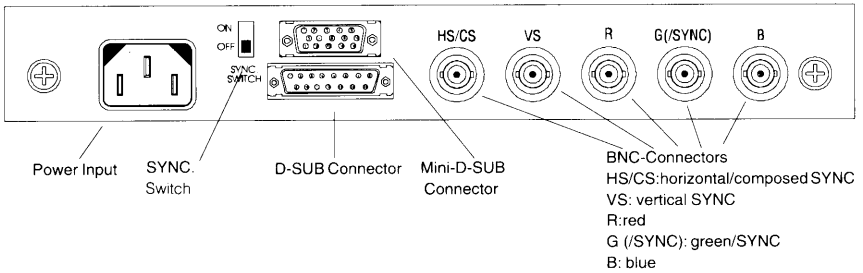
Both configurations have a video connector. If you are not sure as to which connector is the video connector, consult your computer or video card manual.

To attach the monitor to your system, follow the instructions below.

1. Turn off the power to the monitor and computer.
2. If necessary, install the video card. For more information, refer to the manual accompanying the card.
3. Make sure the D-SUB/BNC SWITCH on the front panel of the MultiSync 5FG/6FG monitor is set to the D-SUB position.
4. Connect the 15 pin D-SUB (the larger connector) end of the MultiCable to the connector of the video card.
5. Connect the 15 pin mini D-SUB (the smaller connector) end of the MultiCable to the monitor. Shift the SYNC. switch to the OFF position.
6. Connect one end of the power cable to the MultiSync 5FG/6FG monitor and the other end to a power outlet.
7. This completes the installation.
8. Turn on the monitor and computer.

If you have any problems, please refer to the Chapter "Trouble Shooting".

Connection to Computers or Video cards using BNC cables



The MultiSync 5FG/6FG monitor compliments high resolution graphics card or systems. To attach the monitor to your system, follow the instructions below.

1. Turn off the power to the monitor and computer.
2. If necessary, install the video card. For more information, refer to the manual accompanying the card.
3. Make sure the D-SUB/BNC SWITCH on the front panel of the MultiSync 5FG/6FG monitor is set to the BNC position.
4. Connect the D-SUB end of the video cable supplied with the graphics card to the connector of the video card.
5. Connect the BNC connectors of your video cable to the monitor referring to the manual accompanying the video card.
6. Connect one end of the power cable to the MultiSync 5FG/6FG monitor and the other end to a power outlet.
7. Turn on the monitor and computer.

If you have any problems, please refer to the chapter "Trouble Shooting".

Connection to other computers or video cards

If your computer or video card is not compatible with the PRESET signal (see Appendix B) or has a different pin assignment (see Appendix A) refer to the steps below to determine if your system is compatible with the MultiSync 5FG/6FG or consult your authorized NEC Dealer.

1. Check the output terminal pin assignment of your video card.
2. Check the output signal-timing and level of your video card.
3. Check the pin assignment and signal timing chart and make sure the monitor accepts the pin assignment and signal timing from your video card.
4. Check the SYNC. signal of your video card and shift the SYNC. switch to the requested position.
5. Connect the signal cable supplied with your video card to the monitor and connect the power cable to the monitor.
6. Turn on the monitor and the computer.
7. Adjust the size and position to your preferences.

Monitor adjustment controls

The new Advanced Digital Control System consists of two User Modes, both User Modes use the same controls.

- In User Mode1 (default mode) you define size and position of the display.
- In User Mode2 you find the ColorControl section and the Side-Pincushion Correction.

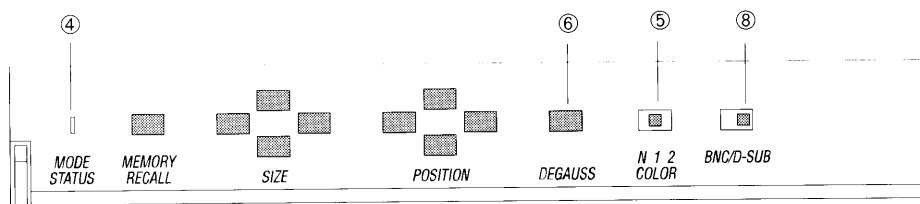
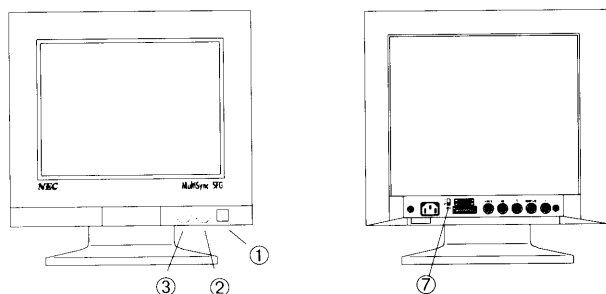
The User Mode1 is the default mode in the Advanced Digital Control System. To move to User Mode2 which includes ColorControl and Side-Pincushion controls, first press the Degauss button, then press Horizontal Position Right button while Degauss button is pressed. The Mode Status LED on the left side of the user controls will turn ON to indicate that the User Mode2 is activated.

To move back to User Mode1, either wait 60 seconds and the mode will automatically change to User Mode1, or press the Degauss button then press the Vertical Position Up button while Degauss button is pressed. The Mode Status LED will turn OFF to indicate that you are back in User Mode1.

If the Mode Status LED is flashing you are in an undefined mode. Please switch to User Mode1 or User Mode2.

All adjustments are saved automatically after a few seconds.

General Controls and LED



- ① **Power Switch**
Turns the power ON or OFF. When the Power is ON, the LED power indicator above the power switch is lit.
- ② **Brightness Control**
Adjusts the overall image and screen brightness.
- ③ **Contrast Control**
Adjusts the image brightness in relation to the background.
- ④ **Mode Status LED**
LED which indicates the current level of the Advanced Digital Controls:

LED is OFF	User Mode1	(Size/Position functions)
LED is ON	User Mode2	(ColorControl and Side-Pincushion functions)
LED is flashing	Undefined mode	Please switch to User Mode1 or User Mode2.

- ⑤ Color Setting Switch
Select the preferred color setting.

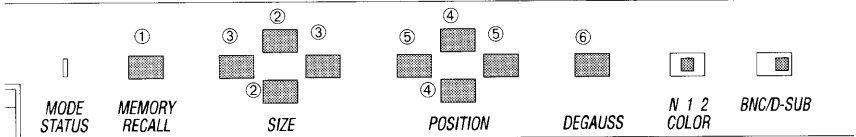
N	Factory Setting (ColorControl is not useable)
1 & 2	User specified settings (ColorControl is useable)

- ⑥ Degauss
Used to purify colors and to move between UserModes.
- ⑦ SYNC. Switch
Used for different SYNC signals.

Position ON	IBM and compatible Computers
Position OFF	Macintosh computers, SYNC. on Green

- ⑧ D-SUB/BNC Switch
Select the connector for video input.

User Mode1

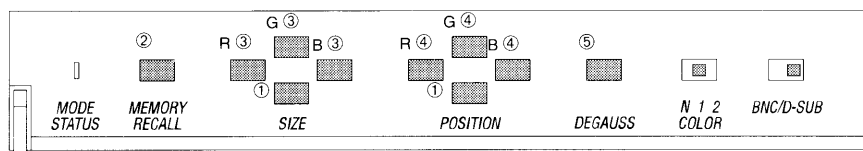


In User Mode1 you can adjust the size and position of the display.

- ① **Memory Recall**
For standard signals, resets the data in the user controlled memory area and recalls the factory preset data of size, position and side pincushion correction.
- ② **Vertical Size Control (increase and decrease)**
Adjusts the vertical size of the image.
- ③ **Horizontal Size Control (increase and decrease)**
Adjusts the horizontal size of the image.
- ④ **Vertical Position Control (up and down)**
Adjusts the vertical position of the image up and down.
- ⑤ **Horizontal Position Control (left to right)**
Adjust the horizontal position of the image from left to right.
- ⑥ **Degauss**
Used to eliminates stray magnetic fields that alter the correct scan of the electron beams and to move between User Modes.

User Mode2

In User Mode2 you can adjust the ColorControl and the Side-Pincushion.



The ColorControl is only useable if the Color Setting switch is in Position 1 or 2. Your color adjustments in position 1 and 2 are saved a few seconds after your last adjustment. This means that user-defined position 1 and 2 are available for you to set your preferences. Position N, where the color controls have no effect, is the factory or default setting.

- ① Side-Pincushion Correction
Adjust side-pincushion and barrel distortions in the way you adjust Picture Size and Picture Position in User Mode1.
- ② Memory Recall
Resets the ColorControl to the factory (default) setting when the Color Setting switch is in position 1 or 2.
- ③ Red, Green and Blue Decrease
Decreases the amount of red, green and blue, respectively in your image. Only one adjustment occurs at a time.
- ④ Red, Green and Blue Increase
Increases the amount of red, green and blue, respectively in your image. Only one adjustment occurs at a time.
- ⑤ Degauss
Used to eliminates stray magnetic fields that alter the correct scan of the electron beams and to move between User Modes.

Note: If you have problems adjusting the color, please try again. Use the Memory Recall button to return the color in Color Setting switch position 1 or 2 to the original factory (default) setting.

Remember: If you change one color you change them all because each color is formed by a combination of the same red, green or blue electron guns. As you are making adjustments, you are working towards the closest match for all colors at once.

The controls will automatically change back to User Model after one minute if the controls are not used.

Please check to be certain that the following items are properly connected or set, before calling your NEC dealer.

If a non IBM computer or video card, non Apple Macintosh II computer or video card is being used, make sure the signal timing and pin assignments meet the specifications outlined in Appendix A, B and C.

Problem	Check these items
No picture.	Power Switch and computer power switch should be in the ON position. MultiSync signal cable should be completely connected to the video card/computer. The video card must be completely seated in the slot. Check D-SUB/BNC and SYNC. switch. After removing MultiCable connector from your monitor when BNC/D-SUB switch is in D-SUB position, the monitor will display a white pattern.
LED on the monitor is not lit.	Power switch should be in the ON position and the power cord should be connected.
Display image is not centered, is too small, or too large.	Adjust VERTICAL SIZE and POSITION, HORIZONTAL SIZE and POSITION controls.

Problem	Check these items
Image is scrolling either in the horizontal direction, vertical direction, or both.	Signal cable may not be completely connected to the computer. If optional adapter is used, check for proper connection, or make sure the video adapter or card is IBM or Apple compatible and that the card is properly seated in the computer.
Picture is fuzzy.	Adjust CONTRAST and BRIGHTNESS controls.
Color looks blotchy.	Press DEGAUSS button.
Picture bounces or a wave pattern is present in the picture.	Move electrical devices that may be causing electrical interference away from the monitor.
Edges of the display image are curved either inward or outward.	adjust PIN CUSHION control.

Pictur Tube	17/21 inch flat square CRT, 1370/1733 mm radius 90 degree deflection, 0.28 mm Trio dot pitch Dot type black matrix Medium-short persistence phosphor, dark bulb, glass with anti-static coating	
Input Signal	Video	Analog 0.7 Vp-p 75Ω Positive
	Sync	Separate sync. TTL Level
		Horizontal sync. Positive/Negative
		Vertical sync. Positive/Negative
		Composite sync. TTL Level
Composite Sync. on green	Video 0.3 Vp-p Negative	
Display Colors	Analog Input: Unlimited colors (Depends on the graphics Board)	
Synchronzstion Range	Horizontal	27 kHz to 79 kHz (Automatically)
	Vertical	55 Hz to 90 Hz (Automatically)
Resolution	Horizontal	1280 dots (non interlaced)
	Vertical	1024 dots (non interlaced)
Video Band Width	on D-SUB	75 MHz
	on BNC	135 MHz
Active Display Area (Factory Setting)	Horizontal	5FG 290 mm
		6FG 370 mm (Active display area is dependent upon the signal timing)
	Vertical	5FG 217 mm
		6FG 278 mm (Active display area is dependent upon the signal timing)
Misconvergence	Less than 0.5 mm	
Rated Voltage	AC 220-240 V, 50/60 Hz	

Rated Current	5FG 1.6 A 6FG 1.8 A
Dimensions	5FG 417 (W) x 452.5 (H) x 502 (D) mm 6FG 512 (W) x 525 (H) x 570 (D) mm
Weight	5FG 25.5 kg 6FG 35.8 kg
Environmental Considerations	Operating Temperature 0°C to + 35°C Humidity 30% to 80% Storage Temperature -20°C to + 60°C Humidity 10% to 90%

Technical specifications are subject to change without notice.

