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## SAFETY INSTRUCTIONS

1. Please read carefully all of these instructions below and keep the manual for later use.
2. Please install the swivel base below this product before it comes into use.
3. The voltage ratings and the rated frequency are on the overlay centered at rear side of this product. Do not connect with any source of other voltage or frequency and please follow all warnings and instructions marked on the product.
4. Unplug this product from the wall outlet before cleaning and use a damp cloth to clean it. Do not use liquid cleaners or aerosol cleaners.
5. Do not expose this product to rain or moisture.
6. Do not place this product on an unstable cart, stand, or table. The product may fall, causing serious damage to the product.
7. Do not block or cover ventilating openings with cloth or other material. Neither should this product be placed near or over a radiator or a heat register, nor should the product be placed in a built-in installation unless proper ventilation is provided.
8. This product is equipped with a 3-wire grounding type plug. This plug will only fit into a grounding-type power outlet. This is a safety feature. If you are unable to insert the plug into the outlet, contact your electrician to replace your obsolete outlet. Do not defeat the safety purpose of the grounding-type plug. Choose a Tandem Blade attachment plug configuration power cord for 230V AC input.

Due to the safety requirements of different areas, please select a suitable power cord according to the following rules, in addition to the electric rating:

- A. Northern America area: Please select a UL listed and CSA certified power cord.
- B. Germany: Please select a VDE certified power cord.
- C. Nordic countries: Please select a power cord certified by SEMKO, NEMKO, DEMKO or FIMKO.
- D. The other areas: Please select a power cord suitable to the local power system and power outlet.

## SAFETY INSTRUCTIONS

Usually a suitable power cord is provided by the manufacturer, while this product is sold. However, this product is sometimes, resold or transported to another area of different power system and safety requirements, please pay attention to the selection of a suitable power cord.

The plug on the power cord is intended to serve as the disconnect device, the socket-outlet shall be installed near the equipment and shall be easily accessible.

9. Do not allow anything to rest on the power cord. Do not locate this product where persons will walk on the cord.
10. Never push objects of any kind into this product through cabinet slots as they may touch dangerous voltage points or short out parts that could result in a risk of fire or electric shock. Never spill liquid of any kind on the product.
11. Do not attempt to service this product yourself, as opening or removing covers may expose you to dangerous voltage points or other risk. Refer all servicing to service personnel.
12. Unplug this product from the wall outlet and refer servicing to qualified service personnel under the following conditions.
  - A. When the power cord or plug is damaged or frayed.
  - B. If liquid has been spilled into the product.
  - C. If the product has been exposed to rain or water.
  - D. If the product does not operate normally, when the operating instructions are followed, adjust only those controls that are covered by the operating instructions since improper adjustment of other controls may result in damage and will often require extensive work by a qualified technician to restore the product to normal operation.
  - E. If the product has been dropped or the cabinet has been damaged.
  - F. If the product exhibits a distinct change in performance, indicating a need for service.

# INTRODUCTION

## Introduction

The monitor is a multiple frequency high-resolution color monitor for IBM compatible PC's or Macintosh and workstation systems. The monitor is equipped with microprocessor based intelligence and multiple frequency scanning capability, allowing it to provide maximum compatibility for various system platforms.

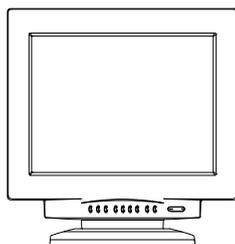
The monitor uses the latest screen technology including a 0.25mm Aperture Grille CRT to display crisp text and vivid color graphics with a max. resolution up to 1600 x 1200 pixels. Furthermore, it supports VESA 85Hz modes to provide a flicker free display. The full-function digital control and On-Screen Display (OSD) system provides easy adjustment of image geometry and color settings for different display modes with the precision of a fixed frequency monitor.

The design of the monitor is also ergonomics concerned. In addition to the friendly controls and user comfort features, the emission level of the electric and magnetic field is kept low to meet the Swedish MPR II and TCO standards.

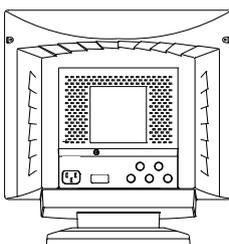
The monitor is also equipped with energy saving functions; it is compatible with the VESA power saving standards. The lowest power consumption is less than 8 W.

## Package Contents

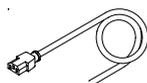
The following lists all of the items included in the monitor package box. Please save the original box and packing materials for future transportation or shipment of the monitor.



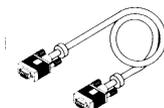
Front View



Rear View



Power Cord



Signal Cable



User's Manual

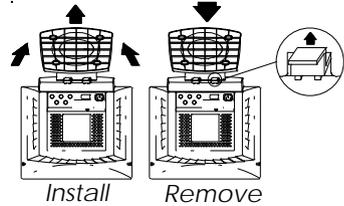
# INTRODUCTION

## **Installing or Removing the Tilt/Swivel Base**

1. Turn off the system and all attached peripherals.
2. Carefully set the monitor upside down.

### **Remove the Tilt/Swivel Base:**

1. Squeeze and hold the latches.
2. Pull the tilt/swivel base to the rear of the monitor and lift to remove the base.



### **Installing the Tilt/Swivel Base:**

1. Align the base with the slots on the bottom of the monitor and insert the tilt/swivel base into the slots.
2. Push the tilt/swivel base firmly toward the front of the monitor until the latches click into the locked position.

## **Feature Highlights**

### **Maximum Compatibility**

- Automatically scans all horizontal frequencies between 30kHz and 95kHz, and all vertical frequencies between 50 Hz and 160 Hz.
- Supports multiple operating platforms such as IBM compatible PC's or Macintosh computers (with optional adapter).
- Multiple graphic standards with high refresh rates: 640 x 480/160Hz, 800 x 600/147Hz, 1024 x 768/117Hz, 1280 x 1024/85Hz, 1600 x 1200/75Hz.
- Supports wide range of graphics standards including VGA, Super VGA, 8514/A, XGA, Mac II 13" (640 x 480), Mac 16" (832 x 624), Mac 21" (1152 x 870), as well as all VESA standards.

### **Latest Screen Technology**

- 0.25 mm Aperture Grille 17" CRT (43.1 cm) for maximum clarity and detailed pictures.
- Special anti-reflection, anti-glare and anti-static coating of the screen face provides better focus, contrast and color performance.
- Cylindrical screen reduces image distortion and glare.
- Full feature digital control and multi-lingual OSD system allows easy adjustment of geometry and color. Furthermore the monitor provides even advanced adjustments like trapezoid, parallelogram, side-pin, pin-balance, convergence and rotation which allow the user to fine-tune the screen image.

# INTRODUCTION

## Ergonomics Concerned

- Electric and magnetic field emissions are kept low to meet the Swedish MPR II and TCO standard.
- Front user controls allow easy access and comfort to adjust the screen image to your personal preferences.
- Horizontal and vertical full-scan capabilities allow you to use the entire screen area in most resolutions.
- A tilt/swivel base for horizontal and vertical adjustments always provides the optimum viewing angle.
- The BNC/D-15 selection allows user to connect two systems to the monitor and easily select between the two from the front panel switch.

## Instant Power Saving Solution

- The monitor is compatible with VESA DPMS (Display Power Management Signalings) standard which provides four power saving modes by detecting horizontal and vertical sync signals.
- The monitor consumes 65 W to 110 W depending on the screen contents in normal operation; when a power saving mode is activated, it consumes less than 15 W in Stand-by mode, less than 15 W in Suspend mode and less than 8 W in Off mode.

## Specifications

<i>Color Picture Tube</i>	43.1 cm / 17" (16" viewable screen size) diagonal measurement, 90 degree deflection, Aperture Grille CRT, anti-glare, anti-reflection, anti-static, medium short persistence phosphor, dark bulb		
<i>Dot Pitch</i>	0.25 mm, Aperture Grille		
<i>Input Signal</i>	Video: 0.7 Vp-p/75 ohm, analog positive Sync: Separate Sync.: TTL Level Horizontal Sync.: positive/negative Vertical Sync.: positive/negative Composite Sync.: TTL Level, positive/negative Composite Sync.: on green video 0.3Vp-p Negative		
<i>Scan Frequency</i>	Horizontal: 30 to 95 kHz automatically Vertical: 50 to 160 Hz automatically		
<i>Display Area</i>	Horizontal 300 mm (adjustable) Vertical 225 mm (adjustable)		
<i>Max. Resolution</i>	1600 x 1200 pixel, non-interlaced		
<i>Display Colors</i>	Analog input, unlimited colors		
<i>Pixel Rate</i>	202.5 MHz		
<i>Misconvergence</i>	Center 0.3 mm, Corner 0.4 mm maximum		
<i>Plug &amp; Play</i>	DDC 1 / DDC 2B		
<i>Power Supply</i>	100-120 VAC/200-240 VAC, 50/60 Hz (automatically)		
<i>Power Consumption</i>	110W max.		
<i>Dimensions</i>	418(W) x 430(H) x 446.5(D) mm		
<i>Weight</i>	21.3 kgs(G.W.), 18.5kgs(N.W.)		
<i>Environment Consideration</i>	Operating Temperature:	0°C	to 35°C
	Humidity	20%	to 80%
	Storage Temperature:	-20°C	to 60°C
	Humidity	10%	to 90%

*Note: Specifications are subject to change without notice.*

# INTRODUCTION

## ***Recommended Use of the Monitor***

When setting up and using the monitor, pay special attention to the following for optimum performance:

- Do not use your monitor against a bright background or where sunlight or other light sources will shine directly on the screen.
- The monitor should be placed just below eye level (10° ~ 15°) for optimum viewing.
- Set the monitor's brightness to match the ambient room light.
- For optimum focus, the contrast control should not be set to the maximum level unless the input signal level is extremely low. Also, the brightness control should be set to a point where the overall background area just begins to disappear.
- Allow adequate ventilation around the monitor so that the heat from the monitor can properly dissipate.
- Neither the monitor itself, nor any other heavy objects, should rest on the power cord. Damage to the power cord can cause fire or electrical shock.
- Keep the monitor away from high-capacity transformers, electrical motors, or other strong magnetic fields.
- Your monitor should not be used in damp, dusty, or dirty areas.
- Handle your monitor with care when transporting it.

## **CAUTION**



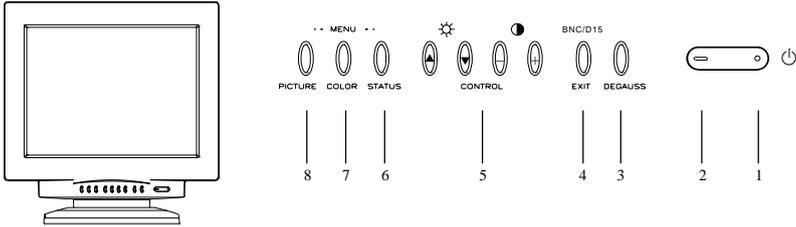
- **Do not scrap or knock the surface of CRT with a pen, a screwdriver and so on.**
- **Clean the CRT surface with a lint-free, nonabrasive, soft cloth, and should not use the solution or glass cleaner containing corpuscles like an abrasive, alcohol and an alkaline solution.**

# CONTROLS AND ADJUSTMENTS

## Controls and Adjustments

Once you have installed the monitor for your system, please read the instructions of this section which give you some guidelines on how to use the monitor more efficiently. It leads you through the various function of the user controls and explains how to adjust the monitor to your personal preference.

### Front User Controls



#### 1. Power Switch

To turn the monitor on or off.

#### 2. Power LED Indicator

As long as the monitor is powered, this indicator is lit. In normal operation, it lights green. While in power saving mode, the indicator will turn to amber.

#### 3. Degauss Switch

To manually degauss the monitor.

#### 4. BNC/D15 / Exit Switch

To select input signals from BNC or D-SUB 15 pin connector or to turn off OSD window.

#### 5. Control Keys

- To adjust the parameter of the selected function.
- To adjust the contrast level or brightness of the screen.

#### 6. Status Key

To display and select the "Mode", "Off time", "Power save", "Recall", "Language" and "Location" functions.

- "Mode" shows horizontal/vertical frequency and polarity
- "Off time" sets OSD window display time.
- "Power save" enables or disable the power saving function.
- "Recall" recalls the factory settings of the "Picture", "Color" and "Converge" parameters.
- "Language" selects the OSD menu language.
- "Location" moves the position of the OSD window.

#### 7. Color Key

To display and select the color mode.(four different color modes can be chosen)

#### 8. Picture Key

To display and select the "Position", "Size", "Pincushion", "Geometry", "Rotation" and "Others" functions.

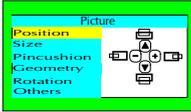
#### Power Saving Note:

This monitor is equipped with a automatic power-saving circuitry design that will work with any computer which meets the VESA DPMS standard. It meets the ENERGY STAR low power state definition.

# CONTROLS AND ADJUSTMENTS

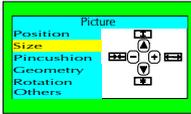
## "Picture" Menu

### A. Position:



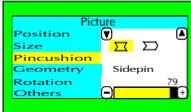
- Press the "+" or "-" key to reposition the display to the right or left.
- Press the "▲" key to move the entire picture upwards and "▼" to move it downwards.

### B. Size:



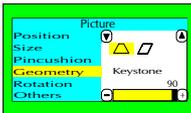
- Press the "+" or "-" key to enlarge or reduce the horizontal width.
- Press the "▲" key to enlarge the vertical size or "▼" to reduce it.

### C. Pincushion:



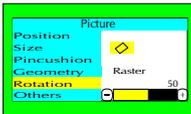
- Press the "▼" or "▲" key to select "Sidepin" or "Balance".
- Press the "+" or "-" key to adjust the picture according to your preferences.

### D. Geometry:



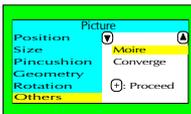
- Press the "▼" or "▲" key to select "Keystone" and "Parallel".
- Press the "+" or "-" key to adjust the picture according to your preferences.

### E. Rotation:

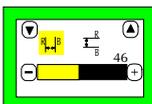
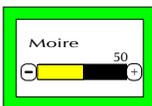


Press the "+" or "-" key to rotate the picture.

### F. Others:



- Press the "▼" or "▲" key to select the Moire or Convergence.
- Press the "+" key to proceed.
- Press the "+" or "-" key for preferred adjustment.
- Press the "▼" or "▲" key to select the H.V. Convergence.
- Press the "+" or "-" key for preferred adjustment.



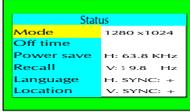
### Caution:

- If moire reduction is overdone, picture quality, i.e. focus and vertical line stability will both be effected.
- Proper adjustment is recommended for not effecting picture performance.

# CONTROLS AND ADJUSTMENTS

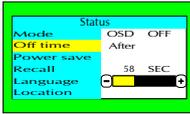
## "Status" Menu

### A. Mode:



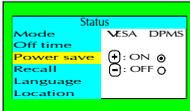
To display timing information for the resolution, frequency and polarity of the current mode.

### B. Off time:



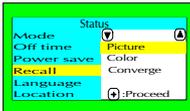
Press the "+" or "-" key to specify an Off time between 5 and 255 seconds.

### C. Power save:

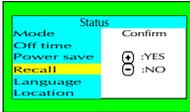


Press the "+" key to enable or the "-" key to disable the power saving function.

### D. Recall:



- Press the "▼" or "▲" key to select "Picture", "Color" or "Converge".
- Confirm the Recall action and proceed by pressing the "+" key or cancel the action by pressing the "-" key.

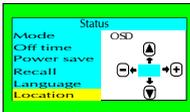


### E. Language:



Press the "▼" or "▲" key to select between English, German, French, Spanish or Italian language for the OSD menu.

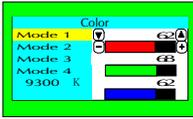
### F. Location:



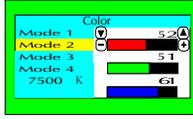
- Press the "+" key to shift the OSD window to the right or the "-" key to shift it to the left.
- Press the "▲" key to move the OSD window upwards or "▼" to move it downwards.

# CONTROLS AND ADJUSTMENTS

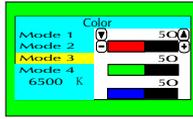
## "Color" Menu



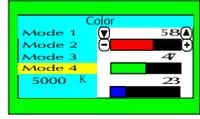
Mode 1



Mode 2



Mode 3



Mode 4

- By pressing the "Color" key you can select between mode 1, 2, 3 or 4 to store your user defined color settings.
- Press the "▼" or "▲" key to select the R/G/B gain, then press the "+" key to increase or press the "-" key to decrease the respective color intensity.

## Contrast and Brightness Control



When the OSD menu is switched off, proceed as follows to adjust the contrast or brightness:

- Press the "+" or "-" key to increase or decrease the contrast level of the screen.
- Press the "▲" or "▼" key to increase or decrease the brightness level.

## BNC/D15 / Exit Switch

- BNC/D15 selection
  - While the OSD window is not displayed.
  - Select the BNC/D15 by pressing the key.
- Exit Switch
  - You can turn off the OSD window by pressing this key.

## Energy Declaration

This monitor is equipped with a function for saving energy which supports the VESA Display Power Management Signaling (DPMS) standard. This means that the monitor must be connected to a computer which also supports the VESA DPMS standard to fulfill the requirements of the NUTEK specification 803299/94/96. The time settings for switching to a power saving mode are adjusted from the system unit by software. From the first indication of inactivity to power saving position A2 the total time must not be set to more than 70 minutes.

### 1. VESA Power-Management Proposal

VESA DPMS Standard			
H. sync	V. sync	Video	State
Off	On	Blank	Stand-by
On	Off	Blank	Suspend
Off	Off	Blank	Off

### 2. Power Consumption (120/230 Vac)

NUTEK	VESA state	LED indicator	Power Consumption
Normal operation	On	Green	<110W
Power Saving Position A1	Suspend	Amber	<15W
Power Saving Position A2	Off	Amber	<8W

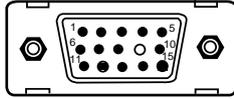
According to TCO guidelines, the optimum TCO readings are measured when brightness and contrast are adjusted to their center position.

## TECHNICAL INFORMATION

### Compatibility

This color monitor supports multiple operating platforms such as IBM compatible and Macintosh family computers. This section provides you with detailed information on pin assignment of the D-Sub connector and the preset timing chart of the prevailing video standards.

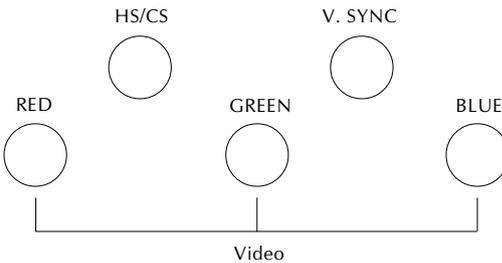
### Pin Assignment



Male Mini D-15 Connector

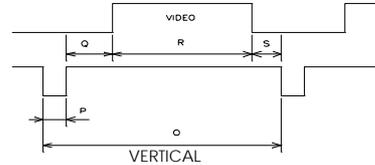
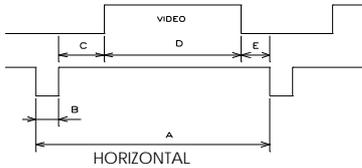
Signal	15 Pin Mini D-Sub
Red Video	1
Green Video	2
Blue Video	3
Horizontal Sync	13
Vertical Sync	14
Ground	4,5,6,7,8,10,11
No Connection	9
SDA (DDC)	12
SCL (DDC)	15

### Pin Assignments of the BNC Connectors



## Preset Timing Chart

Note: This monitor is equipped with a micro-processor which allows the user to set his own preferred mode(s) beyond those standard mode listed below.



Display Format	VGA		VESA 640x480 at 85 Hz	640x480 at 120 Hz	MAC 832x624 at 75 Hz	VESA 800x600 at 85 Hz	800x600 at 120 Hz	MAC 1152x864 at 75 Hz	VESA 1024x768 at 85 Hz	1024x768 at 100Hz	VESA 1280x1024 at 75 Hz	VESA 1280x1024 at 85 Hz
	Horizontal Dots	640	720	640	640	832	800	800	1152	1024	1024	1280
Vertical Lines	480	400	480	480	624	600	600	864	768	768	1024	1024
H. Frequency(kHz)	31.469		43.269	63.530	49.726	53.674	75.985	67.500	68.677	80.468	79.976	91.146
H. Sync. Polarity	-	-	-	-	-	+	-	+	+	-	+	+
A (Period)	31.778		23.111	15.741	20.110	18.631	13.160	14.815	14.561	12.427	12.504	10.971
* B (Pulse Width)	3.813		1.556	1.749	1.117	1.138	1.074	1.185	1.016	1.073	1.067	1.016
C (Back Porch)	1.907		2.222	1.731	3.910	2.702	1.951	2.370	2.201	1.945	1.837	1.422
D (Active Area)	25.422		17.778	11.660	14.524	14.222	9.827	10.667	10.836	9.309	9.481	8.127
E (Front Porch)	0.636		1.555	0.601	0.559	0.569	0.308	0.593	0.508	0.100	0.119	0.406
V. Frequency(Hz)	59.940	70.087	85.008	119.868	74.552	85.062	120.039	75.000	84.997	99.836	75.024	85.024
V. Sync. Polarity	-	+	-	-	+	+	-	+	+	-	+	+
Oms (Period)	16.683	14.268	11.763	8.343	13.413	11.756	8.330	13.333	11.765	10.016	13.329	11.761
Pms (Pulse Width)	0.064		0.069	0.094	0.060	0.056	0.039	0.044	0.044	0.037	0.038	0.033
Qms (Back Porch)	1.049	1.112	0.578	0.567	0.784	0.503	0.382	0.474	0.524	0.423	0.475	0.483
Rms (Active Area)	15.253	12.711	11.093	7.555	12.549	11.179	7.896	12.800	11.183	9.544	12.804	11.234
Sms (Front Porch)	0.318	0.381	0.023	0.127	0.020	0.018	0.013	0.015	0.014	0.012	0.012	0.011

\* Bμs (Pulse Width) should be more than 0.5 μs.



To reduce visual tiredness and eye strain, it is recommended to choose the highest refresh modes available.

# TROUBLESHOOTING

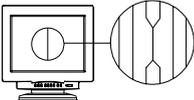
## Troubleshooting

Before calling an authorized service center, please check that the items below are properly connected or set.

In case of using a non-standard signal, please check the pin assignments and the signal timing of your adapter with the specifications outlined in sections "Pin Assignment Table" and "Preset Timing Chart" in chapter 4.

Problem	Items to check
No picture	Power Switch should be in the ON position and the power cord should be properly connected. Check the color of the power LED indicator; if it is orange, then the monitor is in a power saving mode. Check if the horizontal/vertical frequency are out of range. Maximize the Brightness and Contrast controls.
"No Signal Input" is displayed on the screen	The video card should be completely seated in its slot. The computer power switch should be in the ON position. The signal cable should be completely connected to the video card/computer.
Display image is not centered, too small, or too large	Change the Position and Size controls to adjust the image.
Image is scrolling or unstable	The signal cable should be completely attached to the computer. Check the pin assignments and signal timings of the monitor and your video card.
Picture is fuzzy	Adjust the Contrast and Brightness Controls. Push the degauss button once. CAUTION: A minimum interval of 20 minutes should exist before the degauss button is pressed a second time when not switching between modes. Do not hold the button down continuously.
Picture bounces or a wave pattern is present in the picture	Relocate electrical devices that may be causing electrical interference. See the inside front cover of this manual for FCC information.
Edges of the display image are curved either inward or outward	Adjust the Pincushion control.
Color looks blotchy	Press the Degauss button once.
No Plug & Play functionality	Check if the host system is Plug & Play compatible. Check if the VGA card is DDC 1/DDC 2B compatible. Check if Window 95 is installed and the software key for DDC function is enable only. Check if original maker's detachable signal cable is being used(D-15 only). BNC cable does not support Plug & Play function as it does not convey the SCL (Signal Clock) and SDA (Signal Data) signal.

This Monitor is build-in Trinitron™ CRT. This CRT is very sensitive to shocks and vibrations that may occur during transportation. Following are some adjustment tips when below mentioned symptoms occur.

Symptom	Tip
One(15") or two(17") horizontal lines are visible on the screen 	This is normal characteristic of Trinitron CRT. These are damper wires which are attached to the aperture grille and are designed to dampen and prevent which shock and vibration of the aperture grill.
Black fine vertical lines are visible on the screen. Shock and vibration may cause the aperture grill misaligned, which results few fine black vertical lines across the screen 	Degaussing the screen. Tap lightly (do not hit) the side of the monitor. If above mentioned remedies do not work, please do the following: 1. Display full white window or wallpaper background over the area where the black lines appears. 2. Set Contrast and Brightness to the maximum, wait for a moment until the problem is corrected. You may try to tap lightly the side of the monitor to help the expedite of the alignment.