



Solutions for Demanding Applications

**VarTech Systems Inc.**

Industrial CRT and Flat Panel Displays



## **Color Video Monitor** 14" and 15" Slow Scan

MODEL NUMBERS:

VT14A-D · VT14A-DX · VT15A-M  
VT15A-C · VT15A-P · VT15A-R

## **User's Guide**

Read these instructions completely before attempting to operate your new Color Display.

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## SAFETY INSTRUCTIONS

The following general safety precautions are for both operating and service personnel. These precautions must be observed during all phases of operation, service and repair of this monitor. Failure to comply with these precautions, or with specific warnings noted elsewhere in this manual, violates safety standards of design and manufacture. The seller assumes no liability for the customer's failure to comply with these requirements.

### SAFETY SYMBOLS



#### DANGER

High Voltage. Alerts the user to the presence of dangerous voltages within the product enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.



#### ATTENTION

Refer to manual. Alerts the user to the presence of important operating and maintenance (service) instructions in the literature accompanying the monitor.



#### EARTH GROUND

Denotes protective earth ground terminal.

### Important Safety Instructions

1. Please read carefully all of these instructions below.
2. Keep this manual for later 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.
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 any objects into this product through cabinet openings 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 unit from the wall outlet and refer 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.

## **Federal Communications Commission (F.C.C.) Statement**

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- (1) this device may not cause harmful interference, and
- (2) this device must accept any interference received, including interference that may cause undesired operation.

**Accessories:** This device has been tested and found to comply with the limits of a Class A digital device, the accessories associated with this equipment are following:

- Shielded video cable.
- Power Cord.

These accessories are required to be used in order to ensure compliance with FCC Rules. It is the responsibility of the user to provide and use these accessories.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient/Relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio or TV technician for help.

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

### **DOC Compliance Notice**

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

### **Technical Service Warning for X-ray Radiation Protection:**

This product contains electrical and mechanical parts essential for X-ray protection. For replacement purposes, use only part types shown in the parts list. Do not substitute.

## **SECTION 1: GENERAL INFORMATION**

### **1.1 INTRODUCTION**

Thank you for purchasing this color monitor. This monitor was designed to meet the screen performance requirements of today's demanding applications. It delivers a larger screen area, higher resolutions, and greater color accuracy.

This monitor is designed to operate under a multitude of hardware platforms and video standards ranging from RS170 to all RS343 video formats. Its multi-scan function automatically adjusts the monitor to the scanning frequency of your video card. The multi-format capability enables the monitor to operate from a variety of video signal formats, including; CGA, EGA, VGA, and analog sync-on-green video.

Its' non-interlaced and higher refresh rate offers flicker-free images, reducing eye-strain and fatigue. This monitor also has a universal power supply, allowing you to use the monitor in countries where the local commercial AC power falls between 85 and 132 volts or 170 and 264 volts, with an alternating frequency of 47 or 440 Hertz.

The monitor is also offered with the VESA power savings protocol, allowing the user to conserve system power consumption when the monitor is not in use.

### **1.2 CONTENTS OF PACKAGE**

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

- Color Multi-sync Monitor.
- Operating Manual
- Power Cord

### **1.3 FEATURES**

- Automatically scans all horizontal frequencies between 15 and 48 KHz, and all vertical frequencies between 50 and 120 Hz.
- Maximum resolution up to 1024 X 768, non-interlaced.
- Supports a wide range of graphics standards.

### **1.4 AGENCIES**

The basic monitor complies with the following FCC and DHHS regulations.

- United States Food and Drug Administration, Department of Health and Human Services DHHS Rule 21, CFR Subchapter J.
- FCC rules and regulations part 15 subpart J, sections 15.830 (Class A radiation limit), and 15.832 (Class A conduction limit) for Class A computing devices. The monitor is compatible with VESA DPMS (Display Power Management Signaling) convention on providing four power saving modes by detecting horizontal and vertical sync signals.

## SECTION 2: INSTALLATION INSTRUCTIONS

### 2.1 SAFETY AND RELIABILITY CONSIDERATIONS

- Use only the AC power cord supplied or, when the power cord is not supplied, a recommended power cord.
- Unplug monitor from wall outlet if it is not to be used for several days.
- To disconnect the AC cord, pull it out by the plug. Never pull the cord itself.
- Should any liquid or solid object fall into the cabinet, unplug the monitor and have it checked by qualified personnel before further operation.

### 2.2 INSTALLATION CONSIDERATIONS

- Allow adequate air circulation to prevent internal heat build-up. Do not place monitor on surfaces (rugs, blankets, etc.) or near materials (curtains, draperies, etc.) that may block ventilation openings.
- Avoid installing the monitor near heat sources such as radiators or air ducts, or in places subject to direct sunlight, excessive dust, mechanical shock or vibration.
- Keep the monitor away from loudspeakers, motors, or power mains, as the image may be affected.

### 2.3 CONNECTION TO VIDEO SOURCE

Follow the instructions below to attach the monitor to your system.

- Make sure the power to the monitor and the computer is turned off.
- If necessary, install the video card. For more information, refer to the video card manual.
- Connect the one end of the video cable(s) to the monitor and the other end to the video connector on the system. If you are unsure which connector is the video connector, consult your computer or video card manual for instructions. Secure both ends with retaining screws
- Connect the one end of the power cord to the monitor and the other end to the power outlet.
- Apply power to the computer, then the monitor.

### 2.4 USE THE CORRECT POWER CORD

#### **120 VAC Power Cord**

For units used at 120V: Use a UL-listed cord set consisting of a minimum No. 18 AWG, Type SVT or SJT, rated 6A 125V, three-conductor cord a maximum of 15 feet in length, and a parallel-blade, grounding-type attachment plug.

#### **240VAC Power Cord**

For units used at 240V (domestic use): Use a UL-listed cord set consisting of a minimum No. 18 AWG, Type SVT or SJT, rated 6A 250V, three-conductor cord a maximum of 15 feet in length, and a tandem-blade, grounding-type attachment plug.

For units used at 240V (outside of the U.S.)- Use a cord set consisting of a minimum No. 18 AWG cord and grounding-type attachment plug rated 6A 250V. The cord set should have the appropriate safety approvals for the country in which the equipment will be installed and marked HAR.

## 2.5 RECOMMENDED USE OF 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 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 object, should rest on the power cord. Damage to a power cord can cause fire or electrical shock.
- Keep the monitor away from high capacity transformers, electrical motors, and other strong magnetic fields.
- Your monitor should not be used in damp, dusty, or dirty areas.
- Handle your monitor with care when transporting it.
- Clean the CRT surface with a lint-free, non-abrasive cloth and a non-alcohol, neutral, non-abrasive cleaning solution or glass cleaner.

## 2.6 REPACKING

- Retain the original carton and packing materials for safe transport of this unit in the future.

## Section 3: Pin Assignments

Sync. Type	15-Pin Connector (Figure 1)
Pin No.	Separate
1	Red
2	Green
3	Blue
4	GND
5	DDC Return
6	GND-R
7	GND-G
8	GND-B
9	Reserved
10	GND
11	GND
12	DDC Data
13	H-Sync.
14	V-Sync.
15	DDC Clock

Sync. Type	DB9 Connector (Figure 2)	
Pin No.	CGA	EGA
1	GND	GND
2	GND	Sec. Red
3	Red	Red
4	Green	Green
5	Blue	Blue
6	Intensity	Sec. Green/Intensity
7	Reserved	Sec. Blue
8	H-Sync	H-Sync
9	V-Sync	V-Sync

Figure 1: Female Type

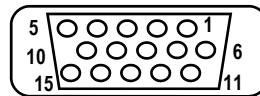
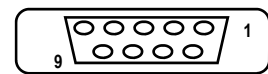


Figure 2: Female Type



## SECTION 4: CONTROLS AND ADJUSTMENTS

Once you have installed the monitor with your system, this section gives you some guidelines on how to use it more efficiently. It leads you through the various functions of the user controls as well as explains how to adjust the monitor to your individual preference.

### 4.1 REAR USER CONTROLS:\*

**Brightness Control** - Used to set the background brightness of the monitor.

**Contrast Control** - Adjusts the gain or contrast of the video image.

**Horizontal Width Control** - Located at rear of chassis. Adjusts horizontal size of displayed image.

**Horizontal Centering Control** - Located at rear of chassis. Adjusts horizontal position of displayed image.

**Vertical Size Control** - Located at rear of chassis. Adjusts vertical size of displayed image.

**Vertical Centering Control** - Located at rear of chassis. Adjusts vertical position of displayed image.

**Pincushion Control** - Located at rear of chassis. Adjusts image for 'pincushion' distortion.

**Keystone Control** - Located at rear of chassis. Adjusts image for 'keystone' distortion.

\***NOTE:** For VT14A-D the front controls are Power, Brightness, Contrast, H. Size, H. Centering, V. Size, V. Centering.

### 4.2 INTERNAL CONTROLS:

B+ adjust, V-Linearity, H-hold, H-center, Sub-Horiz Position, V-hold, Video Gain, Focus screen bias, Video bias, ABL, sub-contrast.

### 4.3 BNC/D-SUB SWITCH:

Select the BNC position when the video source is connected with either 3, 4, or 5 coaxial cable at the BNC connectors. Select the D-SUB position when the video source is connected to the HD15(F) or DB9(F) Input.

## SECTION 5: TROUBLESHOOTING GUIDE

Problem	Item to check
No picture	The video card should be completely seated in its slot.
	Computer power switch should be in the ON position.
	The signal cable(s) should be completely connected to the video card/computer.
	Check the position of the BNC/D-SUB switch.
Display image is not centered, too small, or too large	Adjust Horizontal and Vertical Size and Position Controls to correct the image.
Image is scrolling or unstable	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 Brightness and Contrast Controls.
Edges of the display are curved or sloping	Adjust Keystone Control
	Adjust Pincushion Control
Color looks blotchy	If remote degauss option is present, press Degauss Button once, otherwise, power cycle the unit.
Picture bounces or a wave pattern is present in the picture	Move electrical devices that may be causing electrical interference away from the monitor
	See the inside front cover of this manual for FCC information.

## SECTION 3: SPECIFICATIONS

3.1 Technical Specifications	
Picture Tube	14 inches(VT14A-x), 15 inches(VT15A-x) medium-short persistence phosphor. Anti-glare, Anti-reflection
Dot Pitch	0.28mm; Black Matrix
Misconvergence	Center 0.3mm; Corner 0.4mm (maximum)
Brightness	60FL Peak White; 30FL Flat Field
Input Signal	Analog Composite Video: 1.0V p-p/75 ohm, White Positive, Sync Negative. Separate Analog Video: 0.7V p-p/75 ohm, White Positive.
Input Signal	Separate Sync: TTL Level Composite or Separate H&V, Positive/Negative Polarity
Input Connectors	Analog Video: 3/4/5 BNC; HD15; Switchable Digital Video: DB9
Input Connectors	Power: IEC Outlet.
Synchronization	Horizontal: 15 to 48kHz (Automatically) Vertical: 50 to 120Hz (Automatically)
Video Bandwidth	80MHz
Display Size	Horizontal: 9.84" (250mm) to overscan (Adjustable) Vertical: 7.28" (185mm) to overscan (Adjustable)
Power Supply	90-264VAC Universal, 60/50Hz (Automatically)
Power Consumption	100 Watts typical < 20 Watts maximum - Standby/Suspend modes
Environmental Considerations	Operating Temperature: 0°C to 50°C @ Humidity: 20% to 80%NC Storage Temperature: -20°C to 60°C @ Humidity: 10% to 90%NC

3.2 Video Timing						
Video Mode	RS170	RS343	RS343	RS343	RS343	
H Resolution	510	674	809	874	946	Pixels
V Resolution	480	475	575	600	650	Lines/Frame
Interlace	2:1	2:1	2:1	2:1	2:1	
Horizontal Frequency	15.75	21.87	26.25	28.35	30.69	kHz
Vertical Frequency	70	60	60	60	60	Hz/Frame
H Image Size	191	191	191	191	191	mm
V Image Size	280	280	280	280	280	mm

### 3.3 POWER MANAGEMENT SYSTEM

The monitor supports the VESA power saving Protocol or Green PC Power Management System.

VESA DPMS Standard		
Comp Sync	Power Mode	Recovery Time
On	ON	N/A
Off	Standby/Suspend	1 sec.

**STAND-BY/SUSPEND MODE** - When the monitor detects an absence of sync, the deflection circuitry will shut down, the monitor will drop below 20 watts.

**ON MODE** - When the monitor detects a sync signal from the PC, it will restart automatically, as in normal turn-on.

**VARTECH SYSTEMS INC.**

**HEADQUARTERS**

11529 Sun Belt Ct.

Baton Rouge, Louisiana 70809

Toll-Free: 800.223.8050

International Phone: 001.225.298.0300

Fax: 225.297.2440

E-mail: [sales@vartechsystems.com](mailto:sales@vartechsystems.com)

**[www.vartechsystems.com](http://www.vartechsystems.com)**

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