# USER'S MANUAL

## 15" TFT LCD MONITOR
## KLT - 1500A

VER 0.0

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# CHAPTER 1

## 1.1 INTRODUCTION

The analog LCD monitor incorporates the latest state-of-art Color liquid crystal display (LCD) technology providing wider viewing angle with higher contrast ratio for IBM compatible PC, Apple Macintosh and NEC PC98 VGA display

The monitor has many advantage characteristics: safe from electromagnetic wave, lights, sharp and slim. This makes the monitor extremely suitable in the environment of administration, transportation system, research, etc

The analog LCD monitor does not emit any X-ray radiation and magnetic emission greatly reduces the eyestrain and any potential health harmful bringing by CRT display. Moreover, our display controls on the behind side of the panel provides flexibility with simple controls. You could use these controls to adjust the display as your desire.

The Analog LCD monitor adopted the advanced active TFT module. It has 1024x768 pixels resolution, high contrast, wide viewing angle and the colors up to 262K.

## 1.2 FEATURES

- Supports IBM compatible PC, Apple Macintosh, NEC PC98.
- Supports DPMS for monitor power management.
- Support DDC1 & DDC2B.
- On Screen Display (OSD);Contrast, Brightness, H-Position, V-Position, Tuning, Fine-tuning, Auto centering etc., Screen Size are adjustable through button.
- Built-in 15.0 inch amorphous silicon TFT(Thin Film Transistor) LCD(Liquid Crystal Display) panel.
- Resolution : up to 1024 × 768 pixels(XGA).
- Color : 262,144 colors support.
- Dot pitch : 0.297(H) × 0.297(V) mm.
- Scanning frequency : 30KHz ~ 64KHz(H), 50Hz ~ 75Hz(V).
- Universal power supply : AC 100 – 250V allowed.
- Power consumption : Normal : 45 Watt Max.
  Standby : 8 Watt Max.
  Suspend : 8 Watt Max.
  Off : 7 Watt Max.
- Outside dimension : 388mm(W) × 406mm(H) × 200.6mm(D)
  [15.28 ″ (W) × 15.98 ″ (H) × 7.90 ″ (D)]
- Weight : 4.5kg (net).

## 1.3 PRECAUTIONS

### ◆ HANDLING

The monitor must be treated with caution and not be exposed to impact and shock. The monitor is made of fragile glass panel.

### ◆ DO NOT EXPOSE TO SHARP SHOCK.

Never touch the display area or rub on it with a hard, stiff object or tools because the panel is easily scratched, even your monitor is protected with one glass product.

### ◆ CLEANING

The display area is highly prone to scratching. Do not use ketone type material (ex. Acetone), Ethyl alcohol, toluene, ethyl acid or Methyl chloride to clear the panel. It might permanently damage the panel.

The desirable cleaners are water, IPA (Iso Prophyl Alcohol) or Hexane.

Don't let water or oil penetrate the monitor. If the droplets are kept for a long time, staining and discoloration may occur.

Keep food particles and fingerprints away from the display area.

### ◆ STORAGE

Do not store the monitor in temperature higher than 40℃(104°F) or humidity higher than 90% and no condensation.

Store in dark places away from sunlight and ultra violet (UV) radiation. Air bubble may develop within the glass panel, if this is not observed.

# CHAPTER 2

## 2.1 INSTALLATION

**This monitor is set the analog LCD monitor to the ultimized performance and visual effect.**

### ◆ PRODUCT PACKAGE

Open the shipping carts on and check the contents. If any items are missing or damaged, contact your dealer immediately.

The package should include the following items.

- Analog Color TFT LCD Monitor
- Accessory Box :
  1. AC to DC adapter × 1
  2. Power Cord × 1
  3. User's manual × 1

### ◆ POWER REQUIREMENTS

The monitor is equipped with an auto-sensing power supply for voltage ranges from 100-120VAC/200-250VAC, 60/50Hz. Confirm the line voltage designation attached the bottom of the monitor

### ◆ FOLLOW THESE STEPS TO INSTALL THE MONITOR

1. Before you connect the cables, make sure that the monitor and system unit power switches are **OFF.**
2. Plug one end of the 15pin-signal cable to the rear of your system. Tighten the two screws on the cable connector, otherwise the screen may be abnormal operate.
3. Connect the power jack to the power cable witch located at rear of the signal cable through the AC/DC adapter.
4. Connect the power cord on the AC outlet; see the Fig.1.

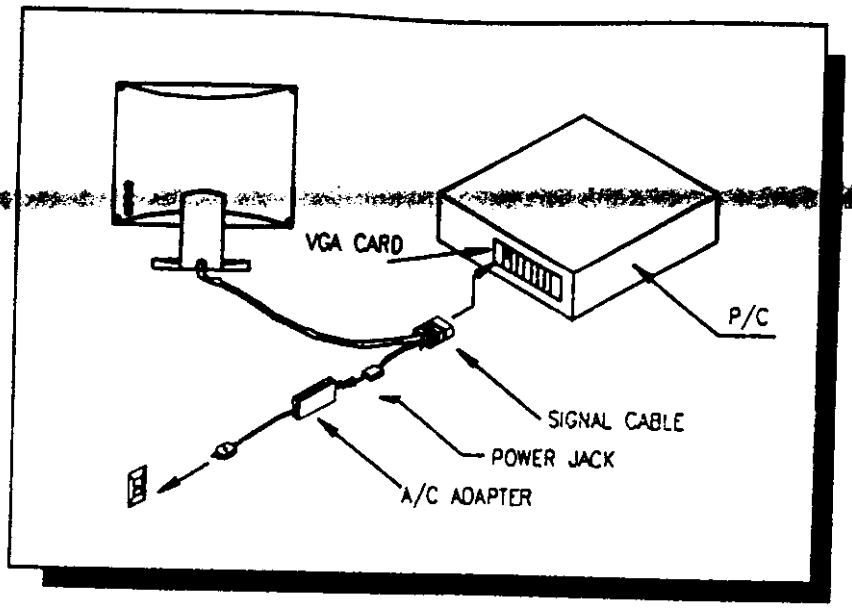
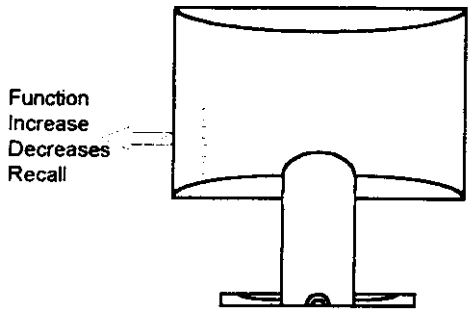



FIG. 1

## 2.2 OSD CONTROL FUNCTIONS

The OSD control keys are located on the rear right bottom side of the monitor. They are shown in the fig.2 below and described in the following paragraphs.

**※ The "Recall" key is moved back compare to the other keys. That's not fault. It's a prevention of the mis-operating.**




OSD CONTROL

FIG. 2

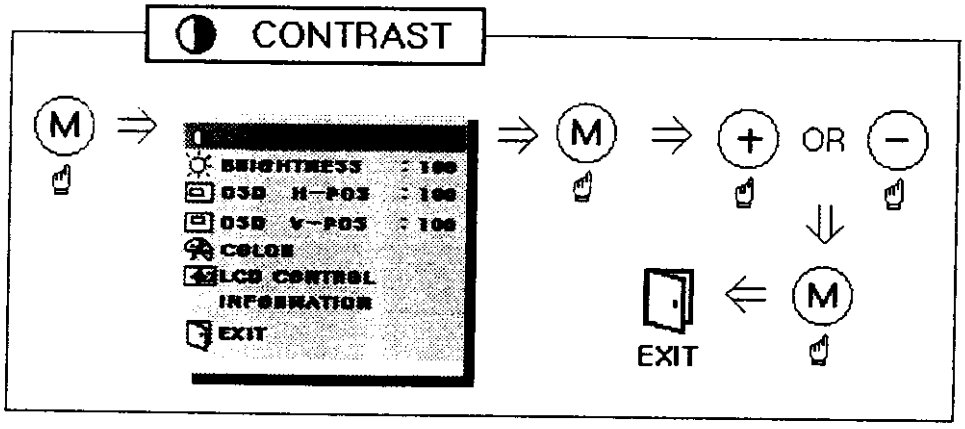
## The OSD keys are described as follow

1. FUNCTION : Displayed menu. Activate, select and save item.
2. + : Move item to upwards and increase a setting value.
3. − : Move item to downwards and decrease a setting value.
4. RECALL : The preset of all function for current mode will be recalled.

## Details are as follows

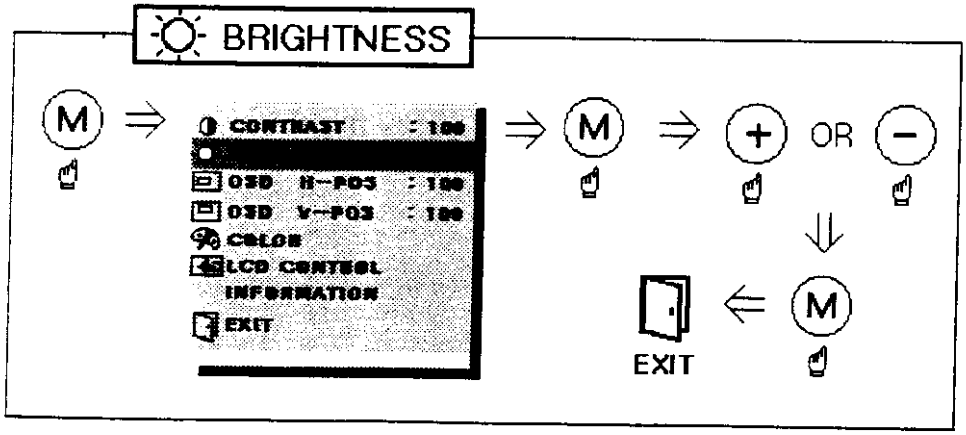
### 1. CONTRAST (1 – 100) CONTROL

Contrast adjusts foreground white level of screen image.
[+] increases contrast, [-] decreases contrast.




### 2. BRIGHTNESS (1 – 100) CONTROL

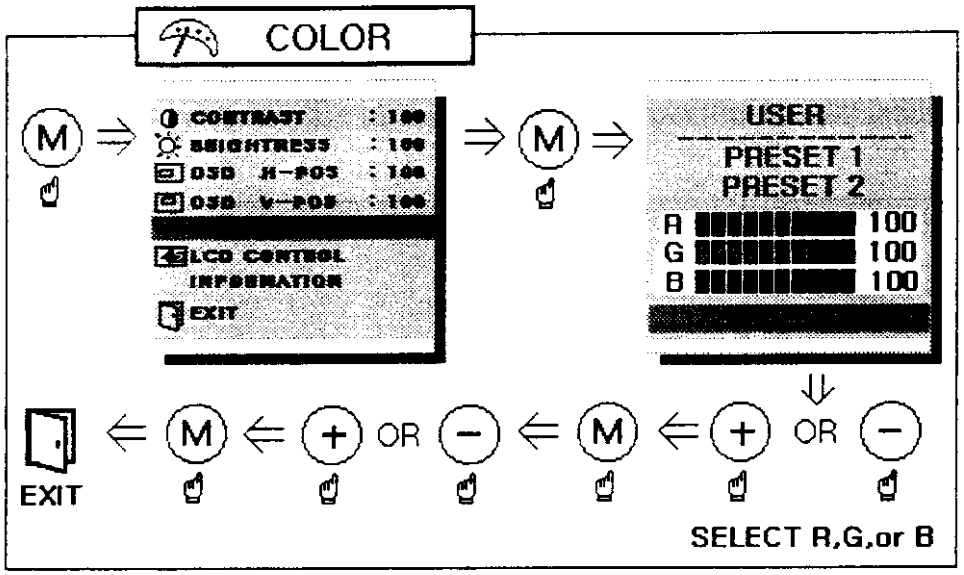
Brightness adjusts background black level of screen image.
[+] increases brightness, [-] decreases brightness.



## 3. OSD POSITION (1 – 100) CONTROL( H-POS & V-POS)

OSD POSITION moves OSD screen horizontally & vertically and left & right. [+] moves OSD to right or upward, [-] moves OSD to left or downward.

## 4. COLOR




4-1. With the above menu on screen, highlight the preset 1 (or 2) you want or individually adjust R, G or B by pressing [+] or [-]. A shaded box highlights the control.

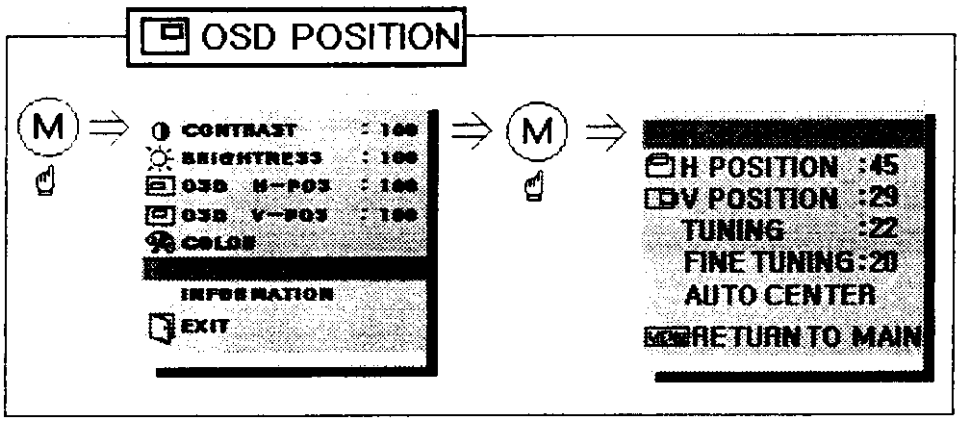
4-2. To activate the highlighted control, press [MENU] .

4-3. To adjust the activated control item, press [+] or [-].

4-4. To de-activate the control, press [MENU]. The COLOR control is no longer highlighted. To adjust another control on the color control menu, repeat steps 4-1 ~ 4-4 to exit the color screen, highlight RETURN and press [MENU].

## 5. LCD CONTROL

LCD CONTROL displays the LCD Control Menu as below.




**** For the best image quality, do the following.****

Ⅰ. Assuming that you set your computer's graphic card so that it outputs a video signal 1024 × 768 @ 60Hz.

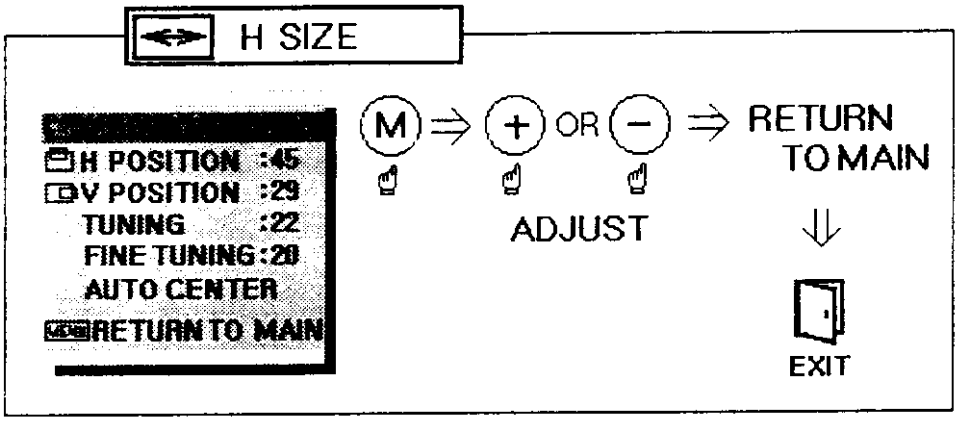
Ⅱ. Activate AUTO CENTER

Ⅲ. If necessary, make small adjustments using H SIZE and H POSITION until the screen image is completely visible. (The black border around the edge of the screen should barely touch the illuminated "active area" of the LCD.

Ⅳ. Adjust TUNING or FINE TUNING so that the screen image looks focused, crisp, and sharp.

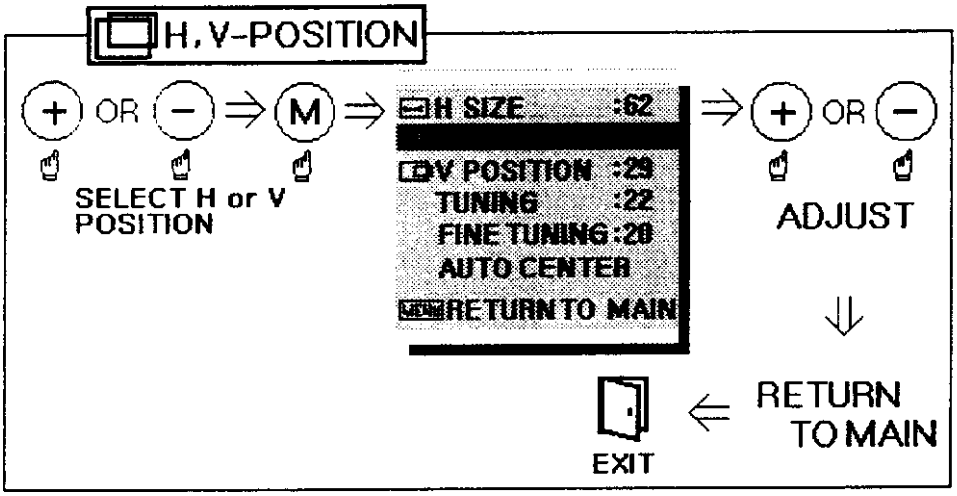
## 5-1. H SIZE.

H SIZE(width) adjusts the horizontal size (width)of screen image.
[+] increases width of screen image, [-] decreases width.




## 5-2. H. V-POSITION

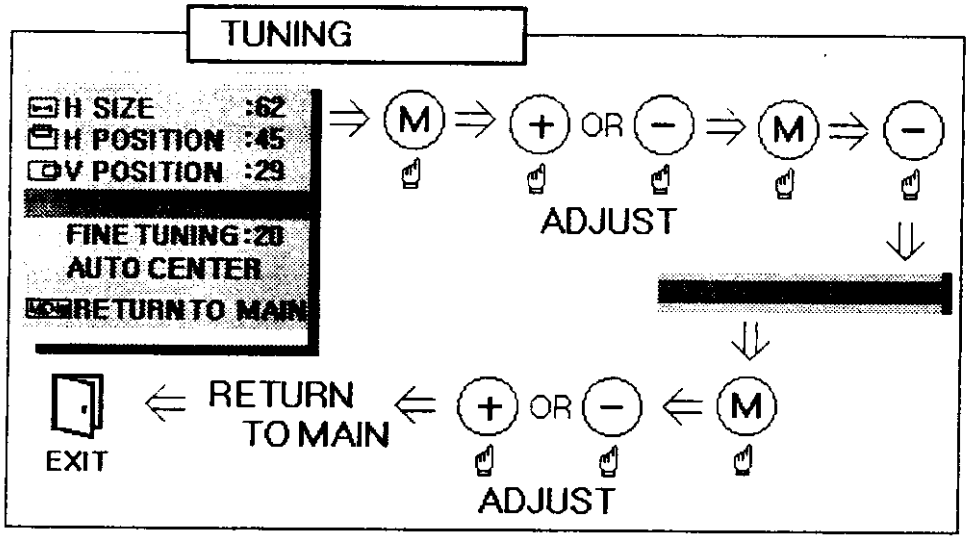
Moves screen image left, right, up, or down [+] moves screen image to right, or up, [-] moves screen image to left, or down.



5-3. TUNING

TUNING sharpens focus by aligning the illuminated pixels.

**Press [+] or [-] until the screen image looks focused, crisp, and sharp.**



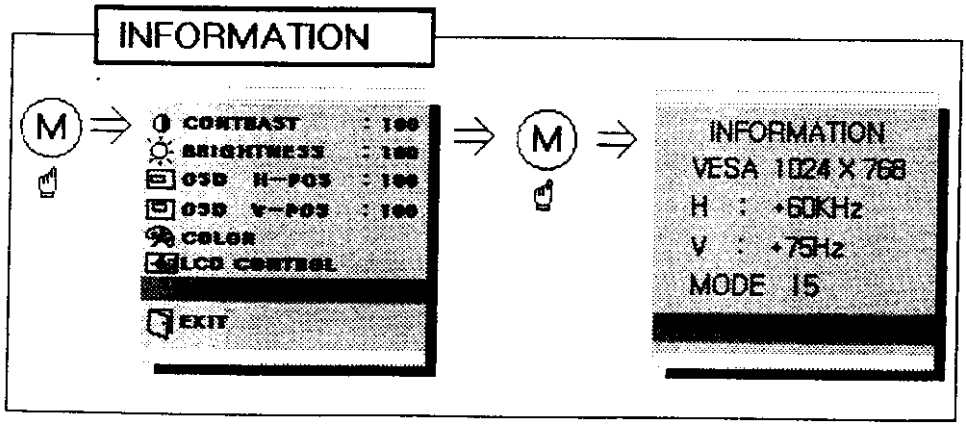

5-4. AUTO CENTER

Automatically centers and sizes the screen image.

Press the [+] or [-] to select ON.

5-5. INFORMATION

Displays the signal input fequency coming from the video card in your computer (horizontal scan, refresh rate, and polarity). See your video card user guides for more details.



# Chapter 3

## 3.1 FACTORY PRESET TIMINGS

Timings shown as below have been pre-adjusted for this KLT-1500A.
For more information, see your graphics card user's guide.

| | Horiz. Freq. (kHz) | Vert. Freq. (Hz) | Polarity(H/V) |
|---|---|---|---|
| VGA 640×350 | 31.47 | 70.00 | +/- |
| VGA 640×480 | 31.47 | 60.00 | -/- |
| VGA 640×400 | 31.47 | 70.00 | -/+ |
| VESA 640×480 | 37.86 | 72.00 | -/- |
| VESA 640×480 | 37.50 | 75.00 | -/- |
| VGA 720×400 | 31.47 | 70.00 | -/+ |
| VESA 800×600 | 35.16 | 56.00 | +/+ |
| VESA 800×600 | 37.88 | 60.00 | +/+ |
| VESA 800×600 | 48.08 | 72.00 | +/+ |
| VESA 800×600 | 46.88 | 75.00 | +/+ |
| ***VESA 1024×768*** | ***48.36*** | ***60.00*** | ***-/-*** |
| VESA 1024×768 | 56.48 | 70.00 | -/- |
| VESA 1024×768 | 60.02 | 75.00 | +/+ |
| MAC 640×480 | 35.00 | 67.00 | -/- |
| MAC 1024×768 | 60.24 | 75.00 | -/- |

## 3.2 TROUBLESHOOTING

### ◆ No power

- ✓ Flip the Power switch ON. The Power Light turns on.
- ✓ Make sure A/C power cord is securely connected to the power Jack and to a power outlet.
- ✓ Plug another electrical device (like a radio) into the power outlet to verify that the power outlet is supplying the proper voltage.

### ◆ Power on but no screen image.

- ✓ Make sure the video cable attached with the KLT-1500A is tightly secured to the video output port on the back of the computer.
- ✓ Adjust the brightness and contrast.

### ◆ Flickering

- ✓ Not enough power is being supplied to the KLT-1500A. Connect the KLT-1500A to a different outlet. If a surge protector is being used, there may be too many devices plugged in.
- ✓ See Factory Preset Timings on page 16 with a list of refreshes rates and frequency settings showing the recommended setting for this KLT-1500A.

### ◆ Wrong or abnormal colors.

- ✓ If any colors (red, green, or blue) are missing, check the video cable to make sure it is securely connected. Loose pins in the cable connector could cause a bad connection.
- ✓ Connect the KLT-1500A to another computer.
- ✓ Check the graphics card for proper sync scheme (or sync polarities) to match the KLT-1500A's specifications.

◆ **Double (spilt) screen image.**

✓ Make sure your graphics card is set to Non-Interlaced mode.

◆ **Entire screen image roll (scrolls) vertically**

✓ Make sure the input signals are within the KLT-1500A's specified frequency range.
✓ Connect the video cable securely.
✓ Try the KLT-1500A with another power source.

◆ **Control buttons do not work**

✓ Press only one button at a time.
✓ Press FUNCTION and [+] simultaneously to unlock control buttons.

# APPENDIX

## ◆ SIGNAL CONNECTOR PINOUTS

### ■ POWER JACK


| | |
|---|---|
| 1 | Ground |
| 2 | DC +15.0V output |

### ■ RGB SINAL CONNECTOR

| | |
|---|---|
| Pin 1 | RED |
| Pin 2 | GREEN |
| Pin 3 | BLUE |
| Pin 4 | NC. |
| Pin 5 | GND |
| Pin 6 | RED GND |
| Pin 7 | GREEN GND |
| Pin 8 | BLUE GND |
| Pin 9 | NC. |
| Pin 10 | GND |
| Pin 11 | GND |
| Pin 12 | SDA |
| Pin 13 | HORIZONTAL SYNC. |
| Pin 14 | VERTICAL SYNC. |
| Pin 15 | SCL |

# ◆ TECHNICAL DATA

## Specifications

| | | |
|---|---|---|
| LCD | Type | 15.0" diagonal viewable screen TFT(Thin Film Transistor), Active Matrix Panel, 0.29mm pixel pitch |
| | Color Filter | R,G,B vertical stripe |
| | Colors | 262,144 |
| | Glass surface | Anti-glare coating |
| Viewing Angles | Left / Right | 60 ° / 60 ° |
| | Up / Down | 55 ° / 55 ° |
| Compatible PC | | IBM XT, AT, 386, 486, Pentium or PS/2 and compatibles(from VGA up to 1024 × 768 @ 75Hz NI.) |
| | Macintosh | Power Macintosh (1024 × 768) |
| Refresh Rate | | Till 1024 × 768 @75Hz NI |
| Connectors | Input Signal | 15-pin mini D-sub |
| | Power | AC In |
| Power | Voltage output | AC 100-250V 50-60Hz |
| | Input | DC 15V / 3A |
| | Consumption | 45 watts (maximum) |
| Display Area | | 304.128(H)×228.096(V)(15.0 inch) |
| Operating | Temperature | 50°F to 104°F(10℃ to 40℃) |
| | Humidity | 20% RH to 90%RH(no condensation) |
| | Altitude | 10,000 feet |
| Storage Conditions | Temperature | -4°F to 122°F(-20℃ to +50℃) |
| | Humidity | 5%RH to 95% RH(no condensation) |
| Dimension | | 388mm(W)×406mm(H)×200.6mm(D) |
| Weight | | 4.5Kg |

# FCC RADIO FREQUENCY INTERFERENCE STATEMENT

Korea Data Systems, Co., Ltd.

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

**FCC ID:** EVOKLT-1500A

**WARNING:**

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 or television communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause 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 or 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/TV technician for help.

This equipment has been certified to comply with the limits for a Class B computing device, pursuant to Part 15 of FCC rules. Only peripherals (computer input/output devices, terminals, printers, etc.) certified to comply to the Class B limits may be attached to this computer. Operation with non-certified peripherals is likely to result in interference to radio and TV reception.

**INFORMATION TO USER:**

Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

# APPENDIX C: Conducted and Radiated Test Methodology

## CONDUCTED EMISSIONS MEASUREMENTS

The power line conducted emission measurements were performed in a Series 81 type shielded enclosure manufactured by Rayproof. The EUT was assembled on a wooden table 80 centimeters high. Power was fed to the EUT through a 50 ohm / 50 microhenry Line Impedance Stabilization Network (LISN). The EUT LISN was fed power through an A.C. filter box on the outside of the shielded enclosure. The filter box and EUT LISN housing are bonded to the ground plane of the shielded enclosure. A second LISN, the peripheral LISN, provides isolation for the EUT test peripherals. This peripheral LISN was also fed A.C. power. A metal power outlet box, which is bonded to the ground plane and electrically connected to the peripheral LISN, powers the EUT host peripherals.

The spectrum analyzer was connected to the A.C. line through an isolation transformer. The 50-ohm output of the EUT LISN was connected to the spectrum analyzer input through a Solar 400 kHz high-pass filter. The filter is used to prevent overload of the spectrum analyzer from noise below 400 kHz. Conducted emission levels were measured on each current-carrying line with the spectrum analyzer operating in the CISPR quasi-peak mode (or peak mode if applicable). The analyzer's 6 dB bandwidth was set to 9 kHz. No video filter less than 10 times the resolution bandwidth was used. Average measurements are performed in linear mode using a 10 kHz resolution bandwidth, a 1 Hz video bandwidth, and by increasing the sweep time in order to obtain a calibrated measurement. The emission spectrum was scanned from (150/450) kHz to 30 MHz. The highest emission amplitudes relative to the appropriate limit were measured and have been recorded in this report.

## RADIATED EMISSIONS MEASUREMENTS

Before final measurements of radiated emissions were made on the open-field three/ten meter range, the EUT was scanned indoors at one meter and three meter distances, in order to determine its emissions spectrum signature. The physical arrangement of the test system and associated cabling was varied in order to determine the effect on the EUT's emissions in amplitude, direction and frequency. This process was repeated during final radiated emissions measurements on the open-field range, at each frequency, in order to insure that maximum emission amplitudes were attained.

Final radiated emissions measurements were made on the ten-meter, open-field test site. The EUT was placed on a nonconductive turntable approximately 0.8 meters above the ground plane. The spectrum was examined from 30 MHz to 1000 MHz using a Hewlett Packard 8566B spectrum analyzer, a Hewlett Packard 85650A quasi-peak adapter, and Antenna Research Bilog antenna. In order to gain sensitivity, a RTL PR-1040 preamplifier was connected in series between the antenna and the input of the spectrum analyzer.

At each frequency, the EUT was rotated 360 degrees, and the antenna was raised and lowered from one to four meters in order to determine the maximum emission levels. Measurements were taken using both horizontal and vertical antenna polarizations. The spectrum analyzer's 6 dB bandwidth was set to 120 kHz, and the analyzer was operated in the CISPR quasi-peak detection mode. No video filter less than 10 times the resolution bandwidth was used. When any clock exceeds 108 MHz, the EUT was tested between 1 to 2 Gigahertz in peak mode with the resolution bandwidth set at 1 MHz as stated in ANSI C63.4. The highest emission amplitudes relative to the appropriate limit were measured and recorded in this report.

*Note: Rhein Tech Laboratories, Inc. has implemented procedures to minimize errors that occur from test instruments, calibration, procedures, and test setups. Test instrument and calibration errors are documented from the manufacturer or calibration lab. Other errors have been defined and calculated within the Rhein Tech quality manual, section 6.1. Rhein Tech implements the following procedures to minimize errors that may occur: yearly as well as daily calibration methods, technician training, and emphasis to employees on avoiding error.*