

## Installation and Operating Instructions

### Product Information

[Product Features](#) • [LightFrame™ for Windows](#) • [Technical Specifications](#) • [Automatic Power Saving](#) • [Physical Specification](#) • [Pin Assignment](#) • [Product Views](#)

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#### Product Features

##### 107B40/43

- 17" -inch (16.0" VIS) color monitor with excellent front of screen performance for use with MACs and PCs
- Autoscan covers horizontal frequencies up to 86kHz offering a maximum resolution of 1600 x 1200 with flicker free display of 1024 x 768 at up to 107 Hz
- Flat square high contrast CRT with high-resolution 0.25 mm dot pitch (0.21 hdp)
- LightFrame™ for brightest and sharpest display of movie and photo windows
- XSD-Xtra Space Design for large screen display in a small footprint: World's shortest 17-inch conventional monitor with maximum depth of only 408 mm/16.1"
- Multimedia Base and USB Hub option
- [sRGB](#) for true on screen color representation.
- FCC, CE (in selected countries only) and ISO9241, ISO14001 certified

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#### LightFrame™ for Windows

##### Introduction

Philips LightFrame™ feature enriches the experience of pictures and video on a Philips CRT (picture tube) monitor. LightFrame™ will boost the brightness and sharpness of photos and videos on the monitor screen.

To control the LightFrame™ feature in your monitor, you have to install the LightFrame™ application which you will find on this CD-ROM.

##### Note

Philips LightFrame™ will only work with monitors that have been built to use this software. Earlier Philips monitors or other manufacturers' monitors will not work with this special software. It is recommended that you install this software only on a Philips monitor designed to use it. These monitors can be identified by the LightFrame™ logo on the front of the monitor.

This software is not designed for use with LCD flat screen monitors.

LightFrame™ will work with true Windows-based programs and DOS-based programs that

pictures.

You can decrease this effect by lowering the sharpness setting in the LightFrame™ 3 control panel.

**Q: How can I tell if my monitor comes with LightFrame™ 3?**

**A:** All Philips LightFrame™ 3 monitors display this logo on their front bezel:



**Q: How do I use the LightFrame™ 3 control bar that appears at the top my screen?**

**A:** The control bar is another upgrade that helps you run all LightFrame™ 3's neat, new features. The illustration below describes the tasks each button performs.



Accustomed to working with the original LightFrame™ tray icon? No problem: It's still there and can be used to turn LightFrame™ on or off and check LightFrame™ status.

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## Technical Specifications\*

### CRT

- |                       |  |
|-----------------------|--|
| • Size and deflection | 17 inch / 41 cm ; 90° deflection angle   |
| • Dot pitch           | 0.25 mm  |
| • Horizontal pitch    | 0.21 mm  |
| • Tube type           | Shadow mask, real flat, high contrast, anti-glare, anti-static, anti reflection, light transmission55% |

- |                            |                             |
|----------------------------|-----------------------------|
| • Phosphor                 | P22                         |
| • Recommended display area | 12.0" x 9.0" / 306 x 230 mm |
| • Maximum display area     | 12.9" x 9.6" / 327 x 244 mm |

## SCANNING

- |                       |             |
|-----------------------|-------------|
| • Horizontal scanning | 30 - 86KHz  |
| • Vertical scanning   | 50 - 160 Hz |

## VIDEO

- |                       |                       |
|-----------------------|-----------------------|
| • Video dot rate      | 176 MHz               |
| • Input impedance     |                       |
| - Video               | 75 ohm                |
| - Sync                | 2.2 kOhm              |
| • Input signal levels | 0.7 Vpp               |
|                       | Separate sync         |
| • Sync input signal   |                       |
|                       | Composite sync        |
| • Sync polarities     | Positive and negative |

## WHITE COLOR TEMPERATURE

Chromaticity CIE coordinates:

- |                     |                         |
|---------------------|-------------------------|
| • at 9300 K degrees | $x = 0.283 / y = 0.297$ |
| • at 6500 K degrees | $x = 0.313 / y = 0.329$ |
| • at 5500 K degrees | $x = 0.332 / y = 0.347$ |

## sRGB

sRGB is a standard for ensuring correct exchange of colors between different devices (e.g. digital cameras, monitors, printers, scanners, etc.)

Using a standard unified color space, sRGB will help represent pictures taken by an sRGB compatible device correctly on your sRGB enabled Philips monitors. In that way, the colors are calibrated and you can rely on the correctness of the colors shown on your screen.

Important with the use of sRGB is that the brightness and contrast of your monitor is fixed to a predefined setting as well as the color gamut. Therefore it is important to select the sRGB setting in the monitor's OSD.

To do so, open the OSD by pressing the OK button on the front of your monitor. Use the down button to go to Color temperature and press OK again. Then move the down button to go to sRGB and press OK again.

Exit this OSD.

After this, please don't change the brightness or contrast setting of your monitor. If you change either of these, the monitor will exit the sRGB mode and go to a color temperature setting of 6500K.

For more information on sRGB, please visit: [www.srgb.com](http://www.srgb.com)

*\* These information are subject to change without notice.*

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## Automatic Power Saving

If you have VESA's DPMS compliance display card or software installed in your PC, the monitor can automatically reduce its power consumption when not in use. And if an input from a keyboard, mouse or other input device is detected, the monitor will automatically "wake up". The following table shows the power consumption and signaling of this automatic power saving features:

Power Management Definition						
VESA's Mode	Video	H-sync	V-sync	Power Used	Power Saving (%)	LED color
ON	Active	Yes	Yes	Typical 68W	0 %	Green
Stand-by	Blanked	No	Yes	< 2W	96%	Yellow
Suspend	Blanked	Yes	No	< 2W	96%	Yellow
OFF	Blanked	No	No	< 2W	96%	Yellow

This monitor is ENERGY STAR® compliant. As an ENERGY STAR® Partner, PHILIPS has determined that this product meets the ENERGY STAR® guidelines for energy efficiency.

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## Physical Specifications

- Dimensions
  - 15.7" x 16.1" x 16.5" / 399 x 410 x 419 mm (including base)
  - 15.7" x 14.7" x 16.5" / 399 x 373 x 419 mm (excluding base)
- Weight
  - 16.5 kg
- Power supply
  - 90 - 264 VAC, 50/60Hz
- Temperature (operating)
  - 0° to 40°C / 32° to 104°F
- Temperature (storage)
  - 25° to +65°C / -13° to +149°F
- Relative humidity
  - 5% to 95%

\* Resolution 1280 x 1024, standard size, contrast max., brightness 50%, 9300°, full white pattern.

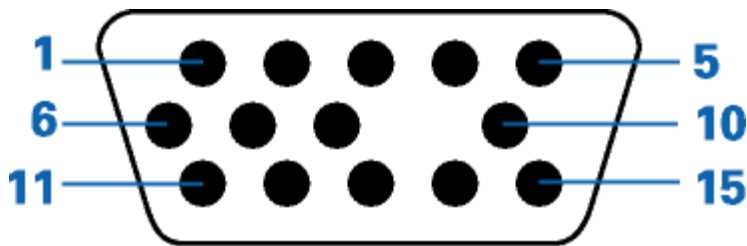
\* These information are subject to change without notice.

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### Pin Assignment

The 15-pin D-sub connector (male) of the signal cable (IBM systems):



Pin No.	Assignment	Pin No.	Assignment
1	Red video input	9	No pin
2	Green video input	10	Logic ground
3	Blue video input	11	Identical output - connected to pin 10
4	Identical output - connected to pin 10	12	Serial data line (SDA)
5	Ground	13	H. Sync / H+V
6	Red video ground	14	V. Sync (VCLK for DDC)
7	Green video ground	15	Data clock line (SCL)
8	Blue video ground		

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### Views

Follow the links to see various views of the monitor and its components.

[Front View](#)

[Rear View](#)

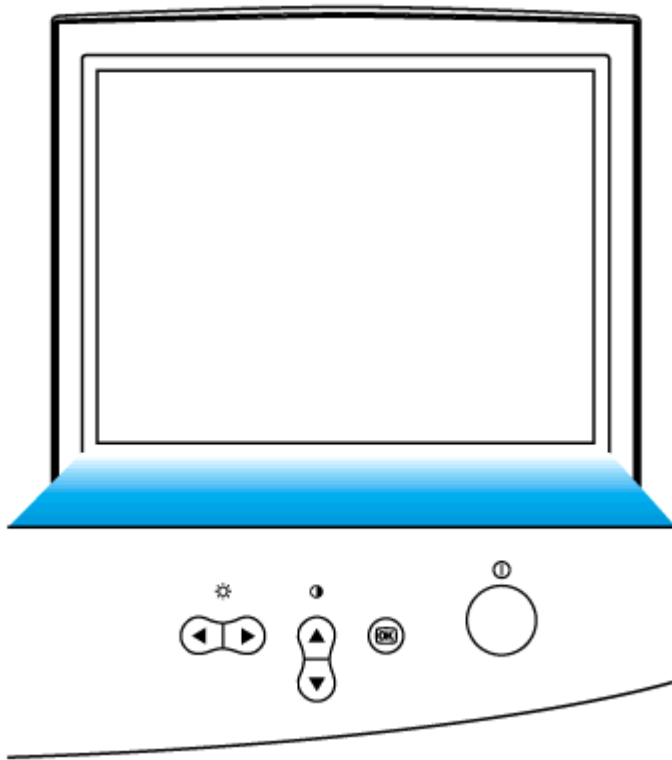
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# Installing your Monitor

[Front View](#) • [Rear View](#) • [6G3B11 Multimedia Base \(option\)](#) • [PCUH411 USB Hub \(option\)](#)

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## Front View



Power button switches your monitor on.



OK button which when pressed will take you to the OSD controls



Contrast hotkey. When the UP arrow is pressed, the adjustment controls for the CONTRAST will show up.



UP and DOWN buttons are used when adjusting the OSD of your monitor

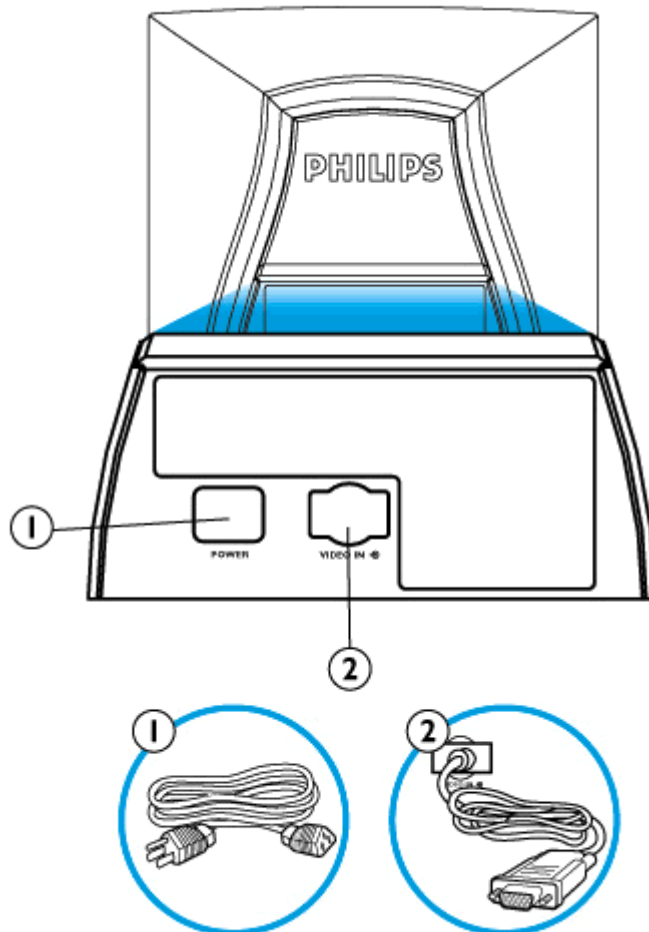


Brightness hotkey. When the RIGHT arrow is pressed, the adjustment controls for BRIGHTNESS will show up.



LEFT and RIGHT buttons, like the UP and DOWN buttons, are also used in adjusting the OSD of your monitor.

## Rear View



1. Power in - attach power cable here.
2. Video In - this is a cable which is already attached to your monitor. Connect the other end of the cable to your PC.

# Regulatory Information

[TCO '99 Information](#) • [TCO Environmental Requirements](#) • [CE Declaration of Conformity](#) • [Energy Star Declaration](#) • [Federal Communications Commission \(FCC\) Notice \(U.S. Only\)](#) • [Commission Federale de la Communication \(FCC Declaration\)](#) • [EN 55022 Compliance \(Czech Republic Only\)](#) • [VCCI Class 2 Notice \(Japan Only\)](#) • [MIC Notice \(South Korea Only\)](#) • [Polish Center for Testing and Certification Notice](#) • [North Europe Information](#) • [BSMI Notice \(Taiwan Only\)](#) • [Ergonomie Hinweis \(nur Deutschland\)](#) • [Philips End-of-Life Disposal](#) • [Information for UK only](#)

[Safety Precautions and Maintenance](#) • [Troubleshooting](#) • [Other Related Information](#)

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## TCO '99 Information

• TCO '99 : Available on 105S, 105B, 107E, 107T, 107B, 107P, 109S, 109B.



**Congratulations!** You have just purchased a TCO '99 approved and labeled product! Your choice has provided you with a product developed for professional use. Your purchase has also contributed to reducing the burden on the environment and also to the further development of environmentally adapted electronics products.

### *Why do we have environmentally labeled computers?*

In many countries, environmental labeling has become an established method for encouraging the adaptation of goods and services to the environment. The main problem, as far as computers and other electronics equipment are concerned, is that environmentally harmful substances are used both in the products and during their manufacture. Since it is not so far possible to satisfactorily recycle the majority of electronics equipment, most of these potentially damaging substances sooner or later enter nature.

There are also other characteristics of a computer, such as energy consumption levels, that are important from the viewpoints of both the work (internal) and natural (external) environments. Since all methods of electricity generation have a negative effect on the environment (e.g. acidic and climate-influencing emissions, radioactive waste), it is vital to save energy. Electronics equipment in offices is often left running continuously and thereby consumes a lot of energy.

### *What does labeling involve?*

This product meets the requirements for the TCO'99 scheme which provides for international and environmental labeling of personal computers. The labeling scheme was developed as a joint effort by the TCO (The Swedish Confederation of Professional Employees), Svenska Naturskyddsforeningen (The Swedish Society for Nature Conservation) and Statens Energimyndighet (The Swedish National Energy Administration).

Approval requirements cover a wide range of issues: environment, ergonomics, usability, emission of electric and magnetic fields, energy consumption and electrical and fire safety.

The environmental demands impose restrictions on the presence and use of heavy metals,



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## Energy Star Declaration

**PHILIPS**

**107B4\***

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 supports VESA DPMS to fulfill the requirements in the NUTEK specification 803299/94. Time settings are adjusted from the system unit by software. From indicated inactivity to Power Saving Position A2, the total time must not be set to more than 70 minutes.

NUTEK	VESA State	LED Indicator	Power Consumption
Normal operation	ON	Green	< 75W
Power Saving	Suspend	Yellow	< 2 W
Position A1			
Power Saving	OFF	Yellow	< 2 W
Position A2			



As an ENERGY STAR® Partner, PHILIPS has determined that this product meets the ENERGY STAR® guidelines for energy efficiency.



We recommend you switch off the monitor when it is not in use for quite a long time.

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## Federal Communications Commission (FCC) Notice (U.S. Only)



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 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.



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

Use only RF shielded cable that was supplied with the monitor when connecting this monitor to a computer device.

To prevent damage which may result in fire or shock hazard, do not expose this appliance to rain or excessive moisture.

THIS CLASS B DIGITAL APPARATUS MEETS ALL REQUIREMENTS OF THE CANADIAN INTERFERENCE-CAUSING EQUIPMENT REGULATIONS.

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## **Commission Federale de la Communication (FCC Declaration)**



Cet équipement a été testé et déclaré conforme aux limites des appareils numériques de class B, aux termes de l'article 15 Des règles de la FCC. Ces limites sont conçues de façon à fournir une protection raisonnable contre les interférences nuisibles dans le cadre d'une installation résidentielle. CET appareil produit, utilise et peut émettre des hyperfréquences qui, si l'appareil n'est pas installé et utilisé selon les consignes données, peuvent causer des interférences nuisibles aux communications radio. Cependant, rien ne peut garantir l'absence d'interférences dans le cadre d'une installation particulière. Si cet appareil est la cause d'interférences nuisibles pour la réception des signaux de radio ou de télévision, ce qui peut être décelé en fermant l'équipement, puis en le remettant en fonction, l'utilisateur pourrait essayer de corriger la situation en prenant les mesures suivantes:

- Réorienter ou déplacer l'antenne de réception.
- Augmenter la distance entre l'équipement et le récepteur.
- Brancher l'équipement sur un autre circuit que celui utilisé par le récepteur.
- Demander l'aide du marchand ou d'un technicien chevronné en radio/télévision.



Toutes modifications n'ayant pas reçu l'approbation des services compétents en matière de conformité est susceptible d'interdire à l'utilisateur l'usage du présent équipement.

N'utiliser que des câbles RF armés pour les connections avec des ordinateurs ou périphériques.

CET APPAREIL NUMERIQUE DE LA CLASSE B RESPECTE TOUTES LES EXIGENCES DU REGLEMENT SUR LE MATERIEL BROUILLEUR DU CANADA.

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## **Brief Description of Circuit Functions**

### **The brief ckt. description of M38** **107B4 17" Monitor**

0. Functional Block Diagram
1. General Description
2. Description of Circuit Diagram
  - A. Power Supply
  - B. Horizontal Deflection/Vertical Deflection/EHT Generator
  - C. Video board & DDC
  - D. Micro-controller

## 1. GENERAL DESCRIPTION

The new refreshed M32 using conventional 17" CRT, it is so-called "Digital Controlled Auto-scan Color Display Monitor" with high resolution which can operate at horizontal scan frequency from 30KHz up to 70KHz, and the vertical scan frequencies can operate from 50 to 160 Hz.

The monitors are equipped with an micro-controller, which is adjustable for all modes by OSD control,

The monitors comply with TCO99/MPRII low emission standard and also fulfill E2000 automatic power saving requirements; to reduce power consumption less than 2 watts in power saving mode, the monitor also can complies with VESA standard and energy star computer program initiated by the EPA.

## 2. DESCRIPTION OF CIRCUIT DIAGRAM

This description mainly introduces the functions including power supply, horizontal / vertical deflection, video amplifier, micro-controller, etc.

### A. POWER SUPPLY

The monitor is designed to adopt switching mode power supply which can operate mains input from 90VAC to 264VAC, this switching power supply apply an IC TEA1507controller, that power MOSFET is packed inside as well. The control scheme transforms a switching converter from a voltage source into a multi-output voltage, the control concept is exhibited many desirable properties such as inherent over-load protection, stable and fast system response, the maximum output power capability is up to 90 watts for different models, then a power limiting circuit is added for different power delivery and safety reason, on main power supply circuit, secondary feedback via a photo-coupler is used to obtain a stable output voltage, the secondary outputs supply all necessary voltages for deflection and video and rest except micro-controller.

In order to meet the power consumption less 2 watts @ off mode, introduction the new controller IC TEA1507, this design has been considered and executed in low and high mains voltage.

All rectified diodes on secondary site are without lead frame ( heat-sink), it gains some cost saving in thermal design, but the turn ratios of main transformer should be fixed to maintain a adequate voltage derating of primary switching MOSFET and secondary +190V rectified diode BYV36C (with better thermal performance), this is trade off design in between, the other hand, a primary DC power switch which can replace AC power switch is also reserved but symbol on the bezel must be modified for the approbation reason.

This monitor can save power consumption while no sync pulses and automatically recover to normal power on when sync signals are detected by micro-controller, the power saving off mode still exist in new designed monitors but suspend / stand-by mode are deleted due to pattern infringement issue, but still reserve them for the option and future implementation required.

During Off mode operation, all the output voltages of main power are reduced to zero, only the required voltage of micro-controller is supplied by second power, then it will be used to restart the main power while monitor wake-up is required.

## B. HORIZONTAL DEFLECTION / VERTICAL DEFLECTION / EHT GENERATOR

### *HORIZONTAL DEFLECTION:*

The heart of horizontal/vertical deflection controller is TDA4841, which can offer a complete and efficient small signal sync processing for auto-sync monitors, all functions are controlled via I2C bus.

This controller provides sync processing, which can accept separate and composite (H+V) input signals, a very short settling time after mode change for protection of external power components has been taken into account.

The TDA4841 provides extensive functions like a flexible B+ controller block of H-deflection and a geometry control with facilities, leading to excellent picture quality, this device also can directly drive the vertical deflection output stage, the line driver stage, the E/W output stage and all controls are tracked with the incoming frequencies, picture can be adjusted along horizontal direction by OSD H-shift control, horizontal size, east/west, trapezoid corrections are obtained by varying the supply voltage of H-deflection circuit via buck converter, five or six or seven capacitors plus power MOSFET switches and DC controlled linearity coil are designed for optimal screen linearity.

### *VERTICAL DEFLECTION:*

The majority of vertical deflection function is integrated by two ICs : TDA4841 and TDA8172.

The TDA4841 takes care of sync polarity correction, automatic catching and holding of the vertical oscillator, generation of saw-tooth drive current for vertical output and vertical s-correction, and generation of a correct V-blanking pulse for video blanking during vertical retrace lines.

The TDA8172 is a DC-coupled vertical deflection booster with differential input signals is suitable for color monitor. The output stage has thermal and soar protection, and high linear saw-tooth signal amplification to obtain the required vertical deflection current.

### EHT GENERATOR

The combine circuit is used to generate required extra high voltage for CRT, the transformer (LOT) transfers the voltage to required anode voltage and rest tertiary output voltage.

The adjustable focus (G3) and screen (G2) voltages are internally derived from the anode voltage, other secondary windings are used to generate the voltages for G1, also provides dynamic focus on G4 to get a good focus performance. (G4 is also adjustable).

For safety reasons, x-ray protection circuit is included, that TDA4841 will shut down EHT generator if the anode voltage exceeds a certain value (29kV), this circuit is also used for over beam current protection, it will shut down EHT in case the total beam current exceeds a certain value.

### C. VIDEO AMPLIFIER & DDC2B

#### *VIDEO AMPLIFIER:*

The video circuit mainly consists of pre-amplifier STV9211, STV9556 post amplifier and DC coupling application, the video DC level and gain at cathode are controlled via I2C bus & software.

The red, green and blue video signals are amplified by pre-amplifier and post-amplifier, then DC couple to CRT cathodes, three cut-off adjustments are provided to set the video black level at cathode for all three guns, three individual gain adjustments are also provided to adjust the white balance, both cut-off and gain controls are digital control via micro-controller.

For the beam current limit and preventing the local doming, the beam current limit will automatically reduce the video swing in case the maximum beam current is exceeded.

A spot-killer circuit is also added to prevent the CRT damage due to spot burn out when the set is switched off.

#### *DDC 2B:*

Via SDA and SCL, the data about the information of the monitor, including the serial number, production Codes, CRT type and applicable timings are stored in the EEPROM, to avoid picture interference, the reading and writing processes are executed via I<sup>2</sup>C.

## D. MICRO-CONTROLLER

### *GENERAL DESCRIPTION:*

The Weltrend ET62P2 micro-controller is used to control all required functions of monitors, the preset data are stored in EEPROM M24C16, the most important point is used “ interrupt “ to do the fast detect of mode change, then the MCU deliver a good protection behavior for horizontal output transistor during mode change.

### *HARDWARE DEFINITION:*

#### a) KEY BOARD

There are five keypads at the front of monitor for the OSD control.

- OSD function key:

- Enter

Push it, to confirm the entrance or exit from the OSD window

- UP

To select the parameters which are chosen from OSD.

- DOWN

To select the parameters which are chosen from OSD.

- RIGHT

To adjust the parameter which are chosen from OSD to right side

- LEFT

To adjust the parameter which are chosen from OSD to left side

b) OSD will disappear and SAVE AUTOMATICALLY after non-operation.

c) Software will control the DPMS according to the SYNC status.