

Installation and Operating Instructions

Product Information

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Product Features

109B40/109B43:

- 19-inch (18.0" VIS) Real Flat color monitor with excellent front of screen performance for use with MACs and PCs
- Autoscan covers horizontal frequencies up to 90 kHz offering a maximum resolution of 1920 x 1440 with flicker free display of 1280 x 1024 at up to 91 Hz
- Real Flat 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 19" Real Flat shadow mask monitor with maximum depth of only 449 mm/17.6" that matches most of today's 19-inch monitors
- 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 operate in a Windows environment. It will not work with DOS-based programs operating only in a DOS environment.

Language Selection

While English is the default language of LightFrame™, the User Interface can be set up to operate in Dutch, French, German, Italian, Portuguese, Spanish, Simplified Chinese, Traditional Chinese or Korean.

Installation

- 1) To install LightFrame™, place the CD in the CD-ROM drive.
- 2) Next, when the menu of items on the CD appears on your screen, click on 'Install LightFrame™'.
- 3) Now, follow the on-screen prompts to properly install the program. The software checks to see if you have a compatible monitor. You must agree to the license agreement terms for the software to install.
- 4) After installation, LightFrame™ automatically loads and the icon appears in the taskbar.

Notes

If LightFrame™ detects that your monitor is not LightFrame™ compatible, a message appears on the monitor screen. If you see this message, you can select to abort or continue the installation. However, if you continue the installation, LightFrame™ will probably not work on the monitor.

How to use LightFrame™

After installation, LightFrame™ starts up automatically whenever the computer is started.

For information about using LightFrame™ please refer to the help information which is available after installation.

Compatibility

This version of LightFrame™ is compatible with

Windows 95

Windows 98

Windows Me (Millenium Edition)

Windows XP

Windows 2000 Professional Edition.

LightFrame™ 3 -- Frequently Asked Questions (and answers)

LightFrame™

Q: Is LightFrame™ 2 compatible with LightFrame™ 3?

A: No. If you run LightFrame™ 1 or 2 software with a Philips LightFrame™ 3 monitor, nothing will happen.



LightFrame™ 3

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 | 19 inch / 46 cm ; 90° deflection angle |
| • Dot pitch / Grille pitch | 0.25 mm |
| • Horizontal pitch | 0.21 mm |
| • Tube type | Shadow mask, Real Flat, high contrast, anti-glare, anti-static, anti reflection, light transmission 45% |
| • Phosphor | P22 |
| • Recommended display area | 14.0" x 10.4" / 355 x 265 mm |
| • Maximum display area | 14.4" x 10.8" / 365 x 270 mm |

SCANNING

- Horizontal scanning 30 - 97 KHz
- Vertical scanning 50 - 160 Hz

VIDEO

- Video dot rate 203 MHz
- Input impedance
 - Video 75 ohm
 - Sync 2.2 kOhm
- Input signal levels 0.7 Vpp
- Sync input signal
 - Separate sync
 - 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

** 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 83 W	0 %	Green
Stand-by	Blanked	No	Yes	< 2W	97%	Yellow
Suspend	Blanked	Yes	No	< 2W	97%	Yellow
OFF	Blanked	No	No	< 2W	97%	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 17.3" x 17.5" x 17.6" / 440 x 446 x 449mm (including base)
17.3" x 16.1" x 17.6" / 440 x 410 x 449 mm (excluding base)
- Weight 21.3 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%

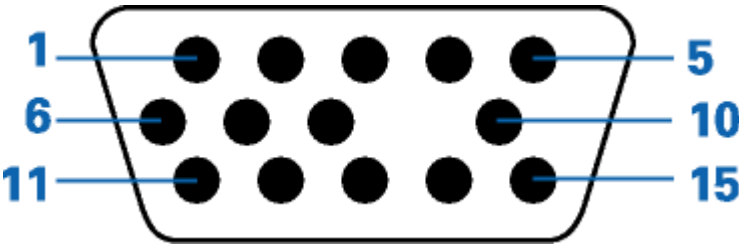
** Resolution 1280 x 1024, standard size, contrast max., brightness 50%, 9300°, full white pattern.*

** 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](#)

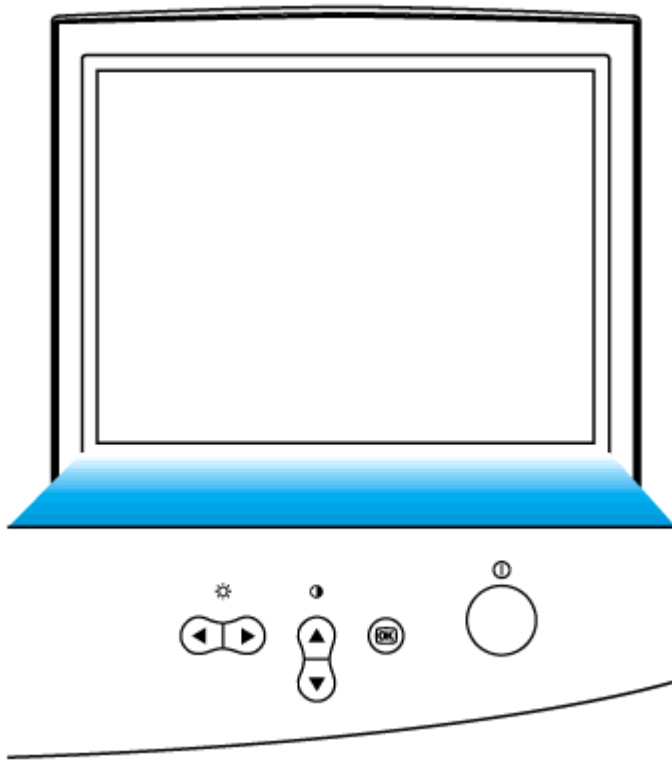
[Rear View](#)

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Installing your Monitor

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

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

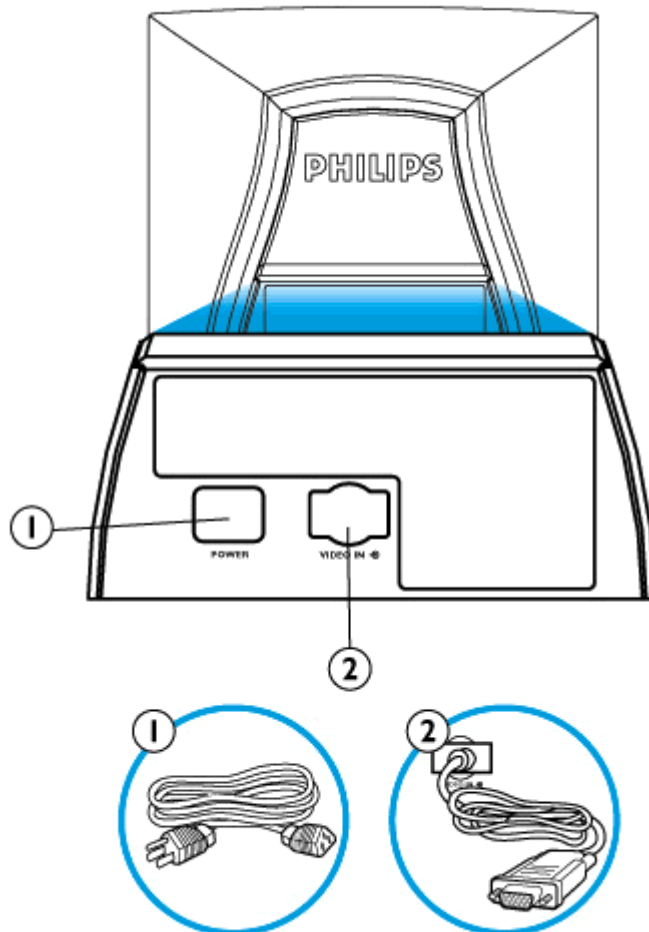


Brightness hotkey. When the RIGHT arrow is pressed, the adjustment controls for BRIGHTNESS will show up.



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](#)

TCO '99 Information (for 109B40 only)

• 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,

Energy Star Declaration

PHILIPS

109B4*

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	< 100 W
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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EN 55022 Compliance (Czech Republic Only)

Exhibit 4

The brief ckt. description of M40
109B4/109S4/107P4” 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
 - D. H / V convergence control
 - E. Micro-controller & DDC 2B

1. GENERAL DESCRIPTION

The M40 platform includes 109B4 using 19" flat shadow mask CRT, 109S4 using 19" convention CRT and 107P4 using 17" flat CRT, they are so-called "Digital Controlled Auto-scan Color Display Monitor" with high resolution which can operate at horizontal scan frequency from 30kHz up to 97KHz, 92KHz and 92KHz for 109B4, 109S4 and 107P4 respectively, and vertical scan frequencies can operate from 50 to 160 Hz.

These monitors are equipped with an embedded micro-controller, which can preset the required modes, the M40 also provides many functions, such as digital adjustable picture, DDC2B, sRGB, LF3, low emission TCO99, high immunity, ---- etc.

These monitors comply with TCO99 low emission standard and also fulfill E2000 automatic power saving requirements; to reduce power consumption less than 2 watts in power saving OFF mode, the monitor also can comply 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 and H / V convergence control, 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 TEA1507 for SOPS controller. 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 110 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 micro-controller.

In order to meet new requirement of E2000 - power consumption less 2 watts @ off mode, The TEA1507 power supply is adopt, the power applies SOPS technology, not only supply the +5V to micro-controller & rest, and to be switched into burst mode via micro-controller for less 2 watts requirement @ off mode (actual measuring data is typical 1 watt)

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.

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 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, the horizontal size, east/west, trapezoid corrections are obtained by varying the supply voltage of H-deflection circuit via buck converter, five 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 IC UC3843AN is used as a controller 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 UC3843AN will feed fold the EHT generator if the anode voltage exceeds a certain value (27—29.5kV), this circuit is also used for over beam current protection, it will feed fold the EHT in case the total beam current can not exceeds a certain value.

C. VIDEO AMPLIFIER

VIDEO AMPLIFIER:

The video circuit mainly consists of Light Frame IC TDA4823, pre-amplifier TDA4886A, post amplifier LM2435T and DC restoration circuit and OSD IC Novatek 68275-00031 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 AC couple to CRT cathodes via DC restoration circuits, 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.

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

D. H / V CONVERGENCE CONTROL (only for 107P4)

The convergence coils are combined with deflection yoke, they are also driven by DC amplifiers. Via OSD menu, two control functions H-convergence and V-convergence can be selected to adjust the convergence of CRT by using digital control.

E. MICRO-CONTROLLER & DDC2B

GENERAL DESCRIPTION:

The Weltrend WT62P2 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. Meanwhile, the DDC2B function is by software control.

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.