



▶ safety and troubleshooting

▶ about this manual

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107S
107G
107X

electronic
USER'S MANUAL



Safety and Troubleshooting Information

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

Safety precautions and maintenance



WARNING: Use of controls, adjustments, or procedures other than those specified in this documentation may result in exposure to shock, electrical hazards, and/or mechanical hazards.

Read and follow these instructions when connecting and using your computer monitor:

- Disconnect the monitor from the power supply if the monitor is not to be used for an extended period of time.
- Do not attempt to remove the back cover, as you will be exposed to a shock hazard. The back cover should only be removed by qualified service personnel.
- Do not place objects on top of the monitor cabinet, objects could fall into vents or cover them and prevent proper cooling of the monitor's electronic devices.
- To avoid the risk of shock or permanent damage to the set, do not expose the monitor to rain or excessive moisture.
- Do not use alcohol or ammonia-based liquid to clean the monitor. If necessary, clean with a slightly damp cloth. Disconnect the monitor from the power supply before cleaning.
- When positioning the monitor, make sure the power plug and outlet are easily accessible.

Consult a service technician if the monitor does not operate normally when operating instructions of this manual are followed.

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About This Electronic User's Manual

[About This Guide](#) • [Other Documents You May Need](#) • [Notational Descriptions](#)

About This Guide

This electronic user's guide is intended for anyone who uses the Philips 109S Color Monitor. It describes the monitor's features, setup, operation and all other information, which is the same exact information described in our printed version.

The sections are as follows:

- [Safety and Troubleshooting Information](#) provides tips and solutions for common problems, and other related information you may need.
- About This Electronic User's Manual gives overview of what information are included as well as notation icon descriptions and other documentation you can refer to.
- [Product Information](#) gives an overview of the monitor's features and as well as the technical specifications for this monitor.
- [Installing Your Monitor](#) describes the initial setup process and gives an overview of how to use the monitor.
- [On Screen Display](#) provides information on adjusting the settings on your monitor.
- [Customer Care and Warranty](#) is a list of worldwide Philips consumer information centers along with the help desk phone numbers and information on the applicable warranty of your product..
- [Glossary](#) provides more information for technical terms.
- Download Option allows you to consumer keep a copy of the entire manual in your hard drive.

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Other Documents You May Need

In addition to this *Electronic User's Guide*, you may need to refer to the following documentation:

- *Philips Color Monitor Quick Start Guide* which summarizes the steps for setting up the monitor. This is included with this product.

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Notational Descriptions

The following subsections describe notational conventions used in this document.

Notes, Cautions, and Warnings

Throughout this guide, blocks of text may be accompanied by an icon and printed in bold type or in italic type. These blocks are notes, cautions, and warnings, and they are used as follows:



NOTE: This icon indicates important information and tips that help you make better use of your computer system.



CAUTION: This icon indicates information that tells you how to avoid either potential damage to hardware or loss of data.



WARNING: This icon indicates the potential for bodily harm and tells you how to avoid the problem.



SMART HELP: This icon indicates helpful information when adjusting the On Screen Display of your monitor.

Some warnings may appear in alternate formats and may be unaccompanied by an icon. In such cases, the specific presentation of the warning is mandated by regulatory authority.

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Product Information

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

Product Features

107S10 / 107G10

- 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 70 kHz offering a maximum resolution of 1280 x 1024 with flicker free display of 1024 x 768 at up to 88 Hz
- Flat square High Contrast CRT with high-resolution 0.27 mm dot pitch (0.23 hdp).
- 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
- TCO99, E2000, NUTEK, EPA, FCC, CE and ISO9241 certified

107S11

- 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 70 kHz offering a maximum resolution of 1280 x 1024 with flicker free display of 1024 x 768 at up to 88 Hz
- Flat square High Contrast CRT with high-resolution 0.27 mm dot pitch (0.23 hdp).
- 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
- MPR-II, E2000, NUTEK, EPA, FCC, CE and ISO9241 certified

107S15 (TCO99) / 107S16 (MPR II) / 107X15(TCO99)

- 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 70 kHz offering a maximum resolution of 1280 x 1024 with flicker free display of 1024 x 768 at up to 88 Hz
- Flat square High Contrast CRT with high-resolution 0.27 mm dot pitch (0.23 hdp).
- 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 complete with 32 W PMPO stereo output, bass boost, headphones and microphone connector
- TCO99 / MPR II, E2000, NUTEK, EPA, FCC, CE and ISO9241 certified

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Technical Specifications*

CRT

- Size and deflection 17 inch / 41 cm ; 90° deflection angle
- Dot pitch / Grille pitch 0.27 mm
- Horizontal pitch 0.23 mm
- Tube type Shadow mask, flat square, high contrast, anti-glare, anti-static, anti reflection, light transmission 47%
- Phosphor P22
- Recommended display area 12.0" x 9.0" / 306 x 230 mm
- Maximum display area 12.9" x 9.7" / 327 x 245 mm

SCANNING

- Horizontal scanning 30 - 70 KHz
- Vertical scanning 50-160 Hz

VIDEO

- Video dot rate 108 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 $x = 0.313 / y = 0.329$

* *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	< 75W	0 %	Green
Stand-by	Blanked	No	Yes	< 8W	89%	Yellow
Suspend	Blanked	Yes	No	< 8W	89%	Yellow
OFF	Blanked	No	No	< 2.5W	97%	Amber

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
 - 107S10
 - / 107S11 / 107G10 - 15.7" x 16.1" x 16.1"
 - / 399 x 410 x 408
 - mm (including base) 107S15/107S16/107X15
 - 15.7" x 17.2" x 16.1" / 399 x 438 x 408 mm (including base)
 - 107S10 / 107S11
 - / 107G10 - 15.7" x 14.7" x 16.1"
 - / 399 x 373 x 408
 - mm (excluding base) 107S15/107S16/107X15
 - 15.7" x 14.7" x 16.1" / 399 x 373 x 408 mm (excluding base)
- Weight
 - 107S10 and 107S11 - 15.0 kg / 107S15 - 15.5 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%

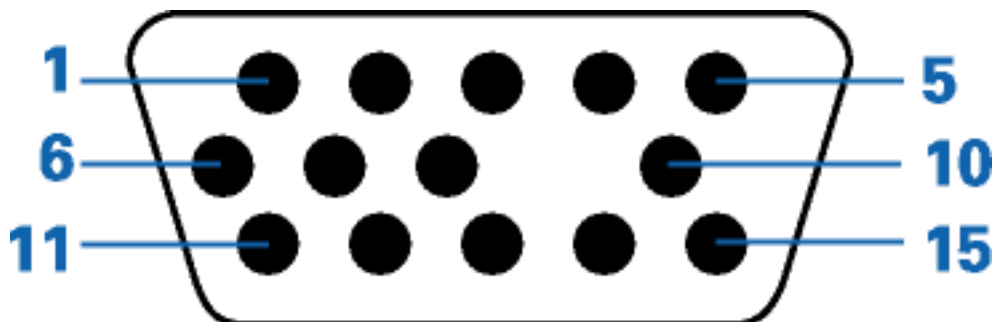
* Resolution 1280 x 1024, standard size, contrast max., brightness 50%, 9300°, full white pattern.

* 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](#)

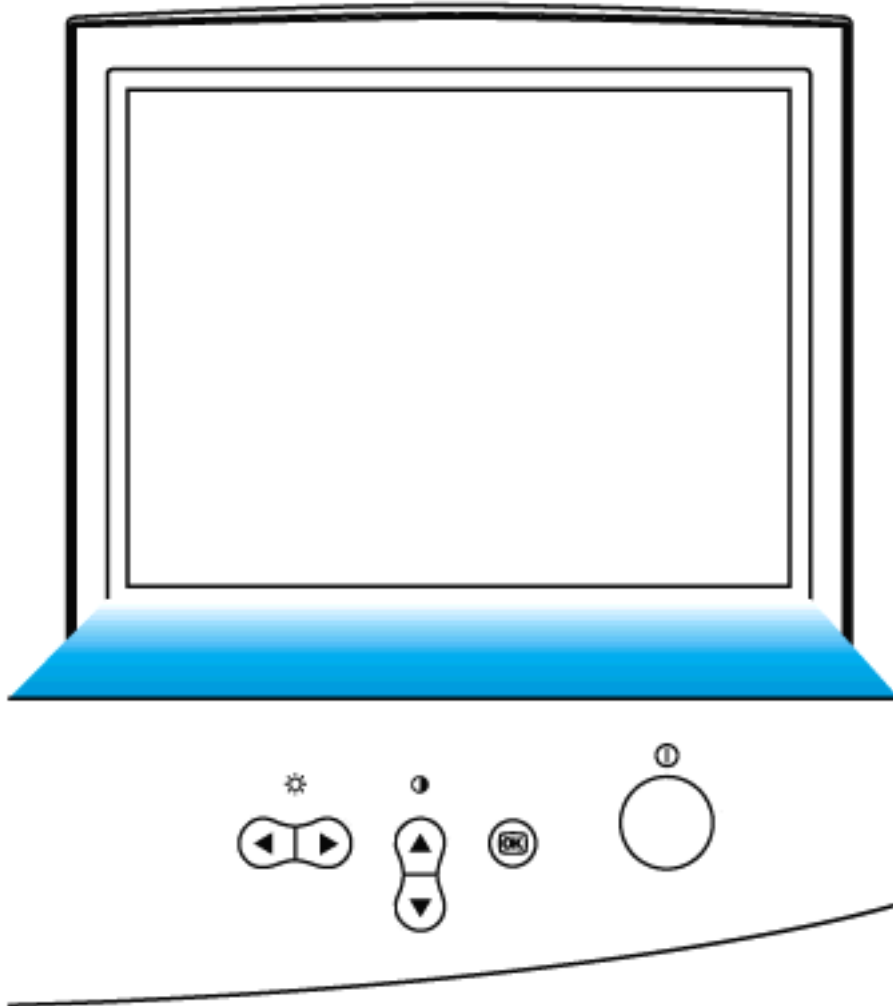
[Rear View](#)

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Installing your Monitor

[Front View](#) • [Rear View](#) • [6G3B1X 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



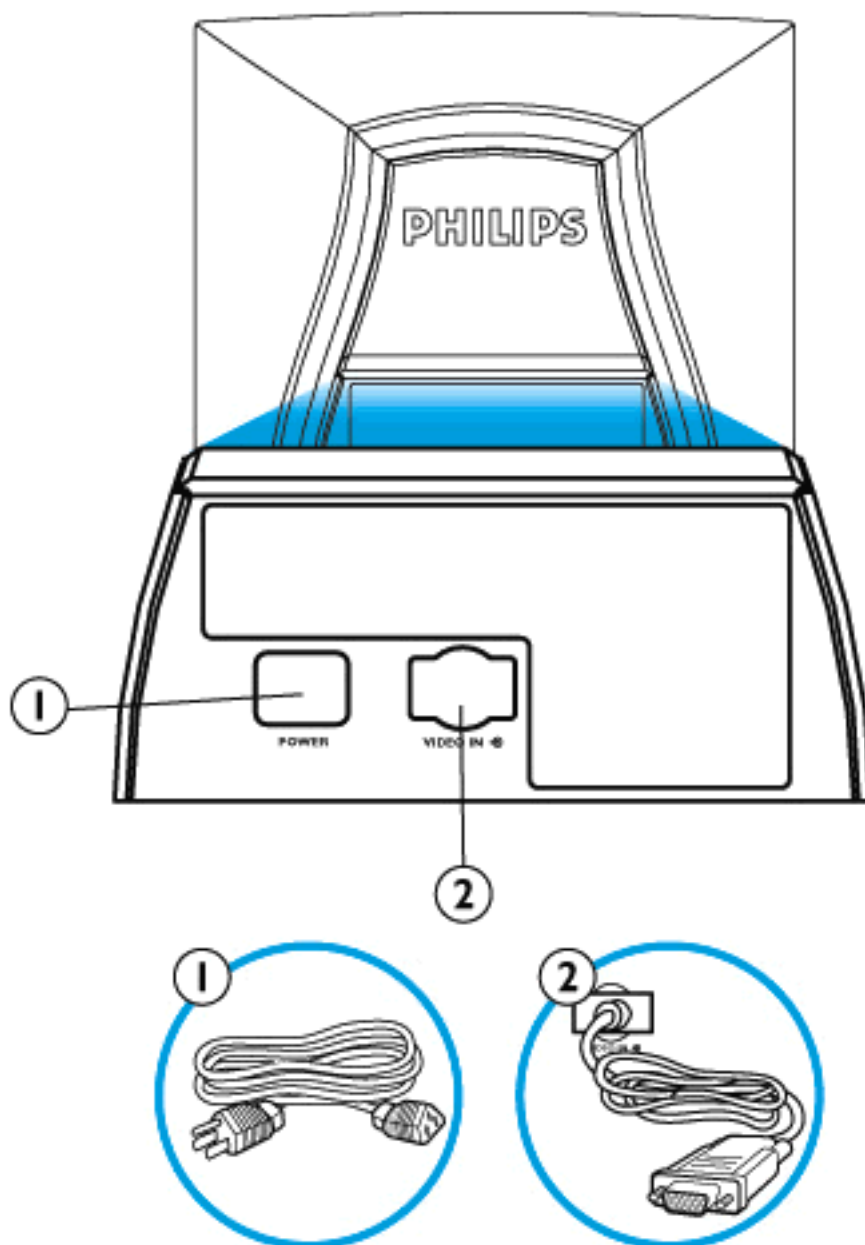
Brightness hotkey. When both the LEFT and RIGHT arrows are pressed at the same time, then the adjustment controls for BRIGHTNESS will show up.



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

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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.

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On-Screen Display






[Description of the On-Screen Display](#) • [The OSD Tree](#) • [The OSD Controls](#)

Description of the On Screen Display

What is the On-Screen Display?

This is a feature in all Philips monitors which allows an end-user to adjust screen performance of monitors directly through an on-screen instruction window. The user interface provides user-friendliness and ease-of-use when operating the monitor.

Basic and simple instruction on the control keys.

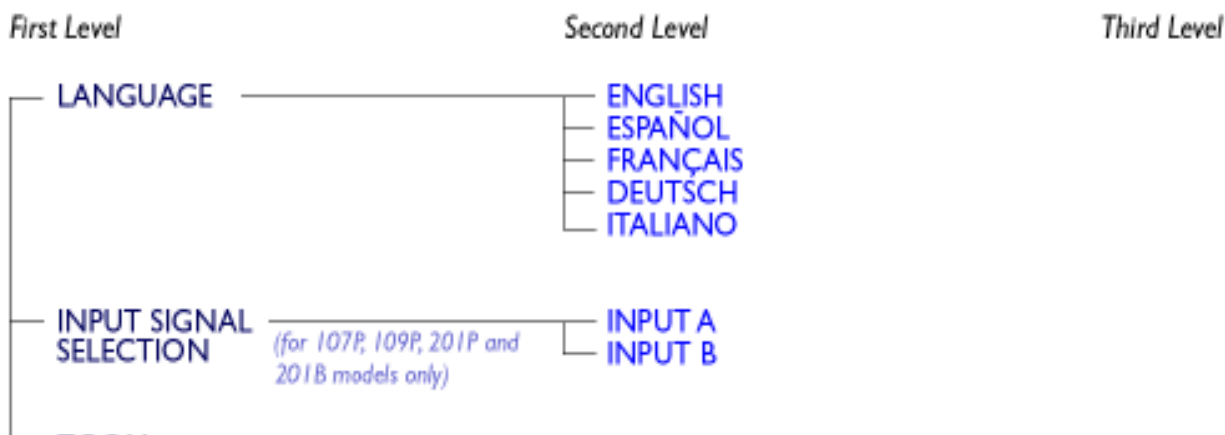
On the front controls of your monitor, once you press the  button, the On Screen Display (OSD) Main Controls window will pop up and you can now start making adjustments to your monitor's various features. Use the   or the   keys to make your adjustments within.

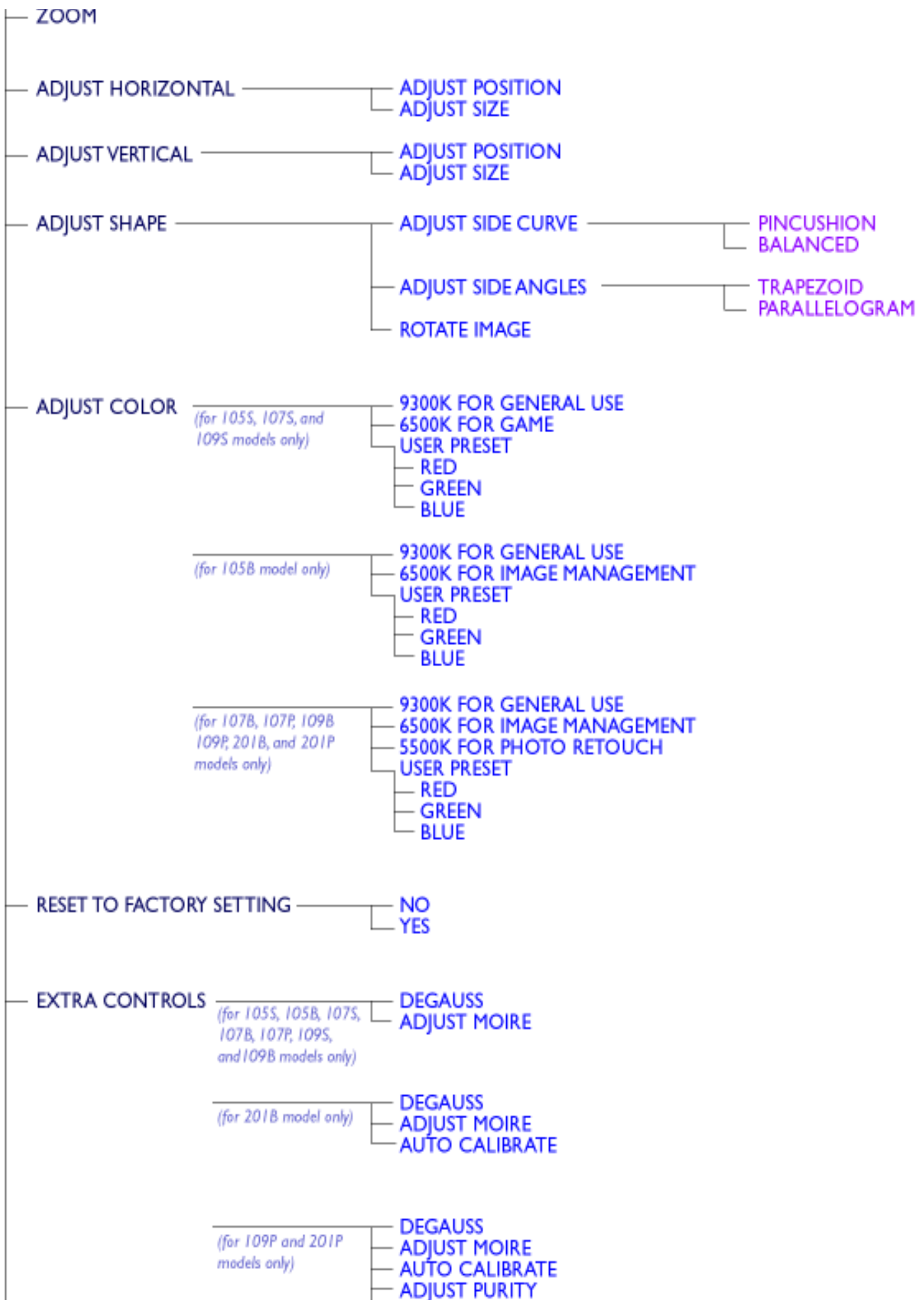


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The OSD Tree

Below is an overall view of the structure of the On-Screen Display. You can use this as reference when you want to later on work your way around the different adjustments.





└─ ADJUST CONVERGENCE

└─ CLOSE MAIN CONTROLS

• Specifications are subject to change without prior notice.

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Customer Care & Warranty

PLEASE SELECT YOUR COUNTRY/AREA TO READ THE WARRANTY COVERED:

WESTERN EUROPE: [Austria](#) • [Belgium](#) • [Cyprus](#) • [Denmark](#) • [France](#) • [Germany](#) • [Greece](#) • [Finland](#) • [Ireland](#) • [Italy](#) • [Luxembourg](#) • [the Netherlands](#) • [Norway](#) • [Portugal](#) • [Sweden](#) • [Switzerland](#) • [Spain](#) • [United Kingdom](#)

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AFRICA: [Morocco](#) • [South Africa](#)

MIDDLE EAST: [Dubai](#) • [Egypt](#)

Glossary

[A](#) [B](#) [C](#) [D](#) [E](#) [F](#) [G](#) [H](#) [I](#) [J](#) [K](#) [L](#) [M](#) [N](#) [O](#) [P](#) [Q](#) [R](#) [S](#) [T](#) [U](#) [V](#) [W](#) [X](#) [Y](#) [Z](#)

A

Autoscan

A microprocessor-based feature of Philips Brilliance monitors is able to detect automatically horizontal and vertical frequencies of input signals with those of the installed video card. An autoscan monitor can thus operate with a wide range of video cards. MultiSync, a registered trademark of NEC, provides a similar function.

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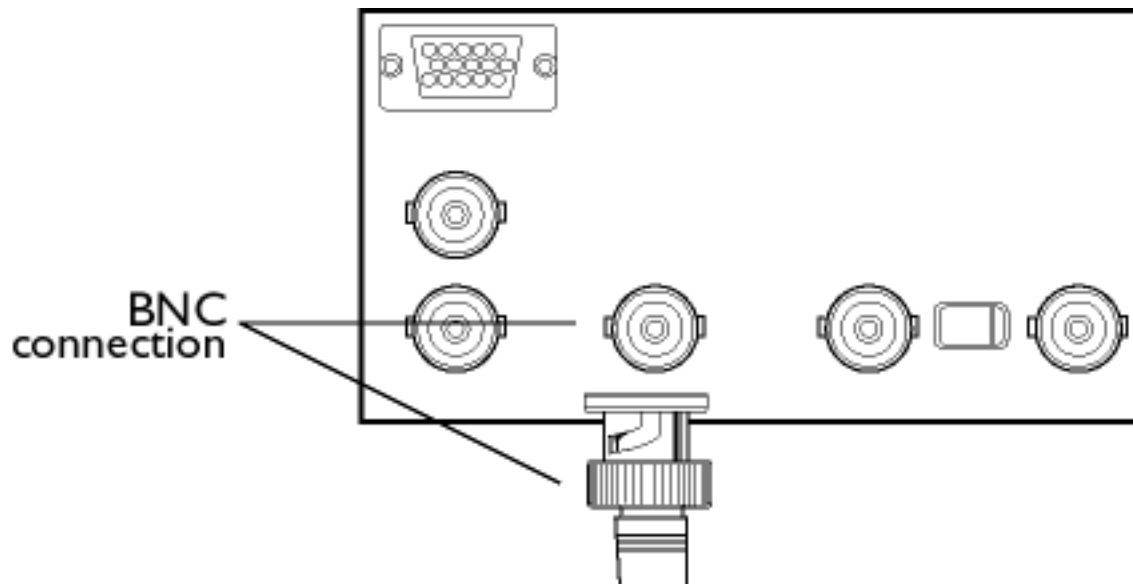
B

Balanced pincushion

See Geometric distortion

BNC connection

A special construction of connector used in some monitors with higher horizontal scanning frequency. The BNC connection can provide the optimum shielding and matching characteristic impedance of video signal path to ensure the best video performance.



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C*CE Mark*

CE mark is displayed on products per EMC and LV (low Voltage Device) directives in compliance with European Community safety, EMI and EMS requirements and is compulsory on products for sale in the European Community.

Color temperature

A way of describing the color of a radiating source in terms of the temperature (in degrees Kelvin) of a black body radiating with the same dominant frequency as the source.

Most Philips monitors offer the possibility of setting the color temperature to any desired value.

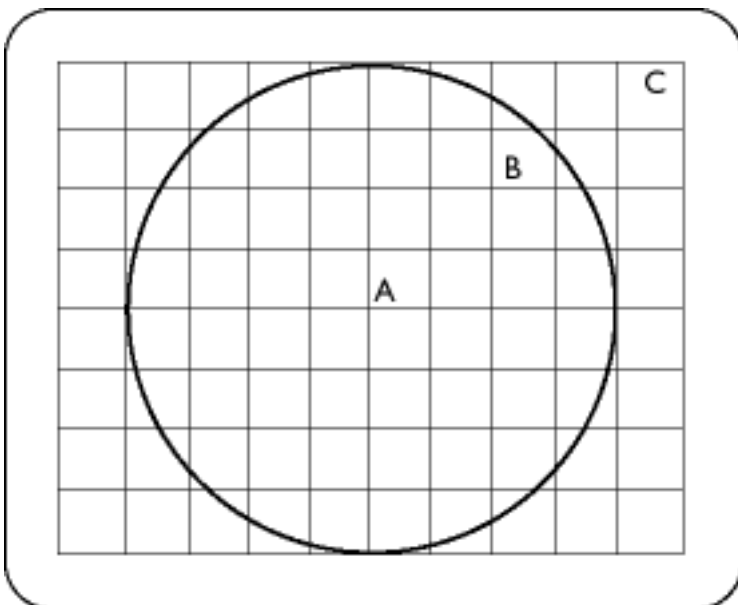
Contrast

The ratio between the brightness of the brightest and darkest parts of a picture. The darkest part of a picture is set by the brightness of the unexcited phosphor, which is governed by the degree with which ambient light is reflected. Contrast is therefore reduced in conditions of high ambient light levels. Black Matrix tubes reflect less ambient light so exhibit higher contrast than other tubes.

Convergence error

Beam misalignment causing one or more of the three beams passing through the wrong aperture in the shadow mask and striking a phosphor dot in the wrong triad.

Convergence error is expressed in mm often at three well-defined points on the screen, designated A, B and C (see figure). Also known as misconvergence.



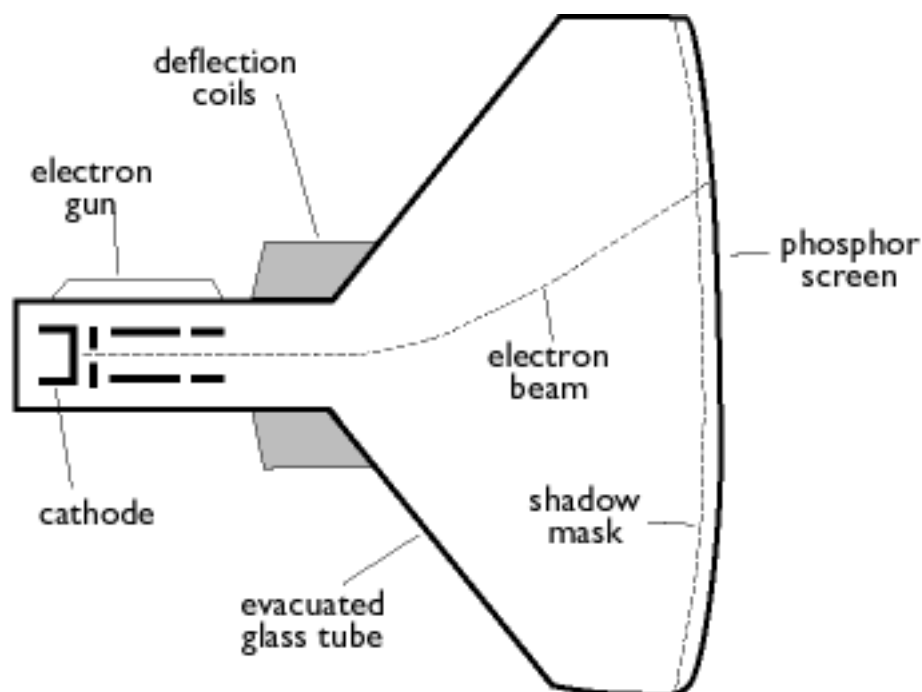
Points where convergence error is specified.

Convergence-error correction

A method of correcting for convergence error to insure that all three beams land simultaneously in the same triad. This is usually accomplished by means of special convergence-error correction coils in the deflection yoke.

CRT

Cathode-ray tube - the general term for all tubes in which one or more electron beams emitted by a cathode are periodically scanned across a phosphor screen by means of deflection circuitry. A special form of the cathode-ray tube is the TV and monitor picture tube.



CustoMax

Philips proprietary monitor control software that allows users to control parameters (e.g., Size, Color, Geometry) using software running in Windows. CustoMax is compatible with existing VGA cards. See CrystalClear FAQ and USB Bay FAQ.

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D

DDC (Display Data Channel)

DDC is a communication channel for displays and computers. The DDC feature allows the monitor controller to be automatically configured to make optimal use of the display without manual user interaction. DDC is implemented as part of the new Plug & Play approach introduced into the PC market to increase user friendliness.

The three levels developed for Plug & play are: (1) DDC1, monitor send data to the PC; (2) DDC2B, PC can request information from monitor; and (3) DDC2Bi which is a two-way communication - monitor can be addressed and PC or graphics board can give commands to monitor.

DDC 1/2B

See DDC.

DDC 2Bi

See DDC.

Degaussing

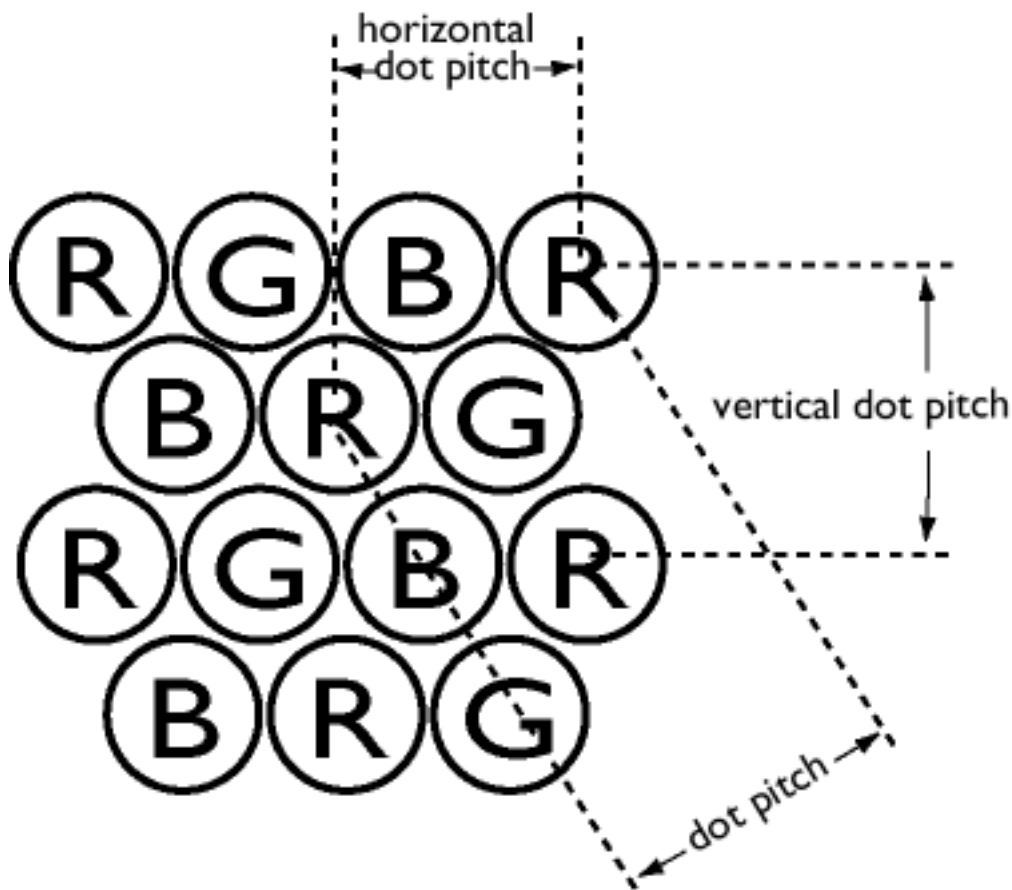
The procedure of demagnetizing the shadow mask and associated metal parts of a picture tube at switch-on to minimize picture distortion. This is usually accomplished by means of a special degaussing coil through which a decaying alternating current is passed to generate an alternating magnetic field that gradually decays to demagnetize the tube. Some monitors offer a manual degaussing facility that can be activated at any time.

Digital control

Microprocessor-based digital control of picture parameters and video modes for complete control of picture settings and modes and instant recall of all settings at the push of a button. This is a very advanced feature that allows the user to switch to any required mode at any instant without having to spend time readjusting the picture. It is currently available in most Philips monitors.

Dot pitch

The shortest distance between two phosphor dots of the same color on the screen. The smaller the dot pitch, the better the resolution of the monitor.



Dot rate

Frequency in MHz of the dot clock. It is a measure of the speed with which data is transferred between the video card and subsequent processing circuitry.

Also known as video dot rate.

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E

Electromagnetic radiation standards

International standards set to limit electromagnetic emissions from monitors. There are currently two important standards both derived from regulations originally laid down by Swedish authorities.

MPR-II

The standard originally proposed by the Swedish National Board of Measurement and Testing. It set maximum levels of electromagnetic radiation emitted by monitors, and has now been adopted as a world standard. MPR-II defines maximum permitted electrostatic, magnetic and electric field levels measured at a distance of 50 cm from the center of the monitor (see table).

TCO

In 1991, the Swedish Tjänstemannens Central Organization (TCO, Swedish confederation of Professional Employees) set a standard even more severe than MPR-II, especially for alternating electric fields (AEF). The TCO standard is more severe since not only are the permitted field levels reduced compared with MPR-II, but the measuring distance is also reduced (see table).

Electromagnetic radiation standards

EMI (Electrical Magnetic Interference)

The electrical and/or magnetic radiation coming from the working electrical or electronic equipment.

EMS (Electrical Magnetic Sustainment)

The ability of electrical or electronic equipment to function properly in the environment with electrical and/or magnetic interference.

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F

Flicker

Very rapid variations in picture intensity caused by the finite time required for the electron beam to scan a picture onto the screen. Two kinds of flicker occur: line flicker caused by the electron beam scanning-in each line of the picture; and frame flicker (or field flicker if the picture is interlaced) caused by the frame repetition rate of 50 frames/second. Frame flicker is noticeable with GUI and DTP software (which have a light background), and can be very disturbing, especially for those who work regularly with displays - contributing to eye strain, headaches, visual blurring, stress, etc. The problem can, however, be eliminated by increasing the refresh rate (number of frames/second) of the monitor to a value above around 70 Hz. Sensitivity to flicker appears to diminish with increasing age.

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H

Hertz

The unit of frequency named after the physicist Heinrich Hertz (1857-1894). 1 hertz (Hz) is equal to 1 cycle/second.

Horizontal dot pitch

See Dot pitch.

Horizontal scanning frequency

Also called line frequency and expressed in kHz, it is the number of video lines written on the screen every second (from left to right). The higher the horizontal scanning frequency, the better the resolution (i.e., the higher the resolution and/or the higher the refresh rate).

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INF File

INF file (Information File)

Information (INF) files store information in a specific format. The set-up functions retrieve information from the INF file to use when performing installation operations. Examples of the type of information stored in an INF file include INI and registry changes, file names, and locations of the source files on source media.

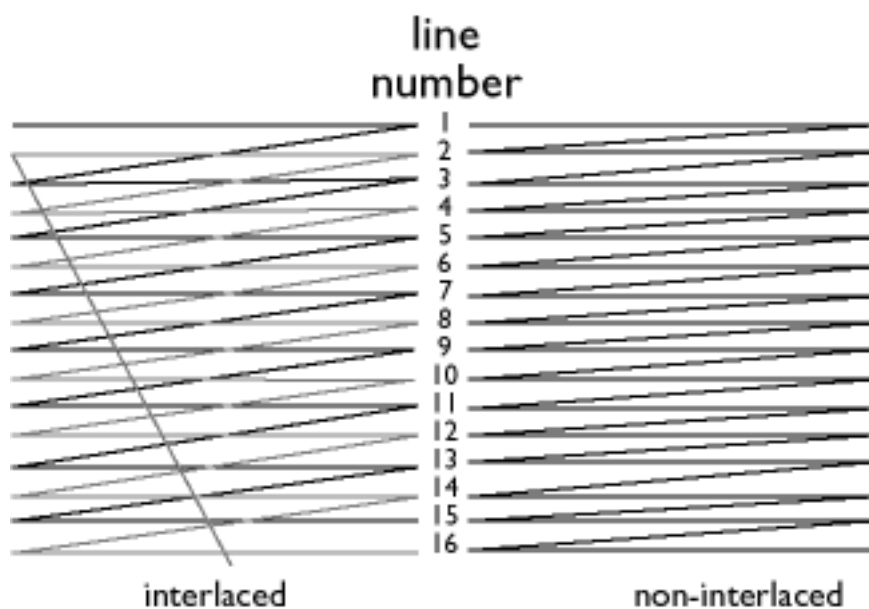
Interlaced/non-interlaced

Interlaced.

The method of writing a picture on the screen by initially writing all even lines and subsequently writing all odd lines of the picture. Result: The complete picture is composed of two interlaced half pictures (or fields). With interlacing, a vertical (or field) frequency of 50 Hz means a picture (or frame) frequency of 25 Hz.

Non-interlaced.

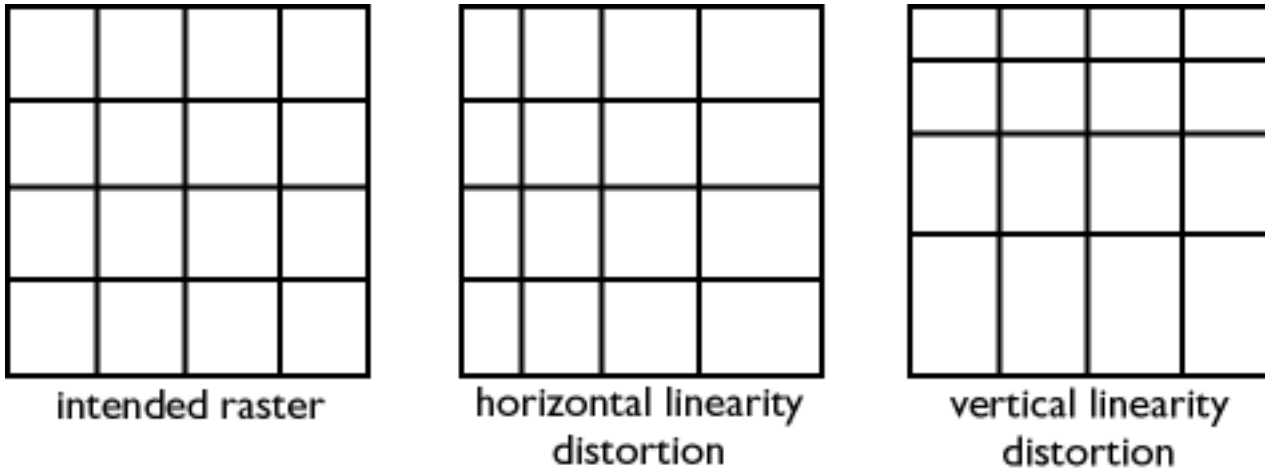
The method of writing a picture on the screen by successive video lines of the picture so that a full frame is written onto the screen in one vertical sweep of the beams. With a non-interlaced display, a vertical frequency of 50 Hz means a picture (or frame) frequency of 50 Hz. At any given resolution, non-interlaced modes are preferable to interlaced modes; however, generation of non-interlaced modes is more expensive.



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L*Linearity*

The degree to measure the actual location of a pixel on the screen corresponds with its intended location. (see figure)

*Line frequency*

See Horizontal scanning frequency.

Low-emission monitor

A monitor that complies with international standards on radiation.

See Electromagnetic radiation standards.

Low-frequency electric and magnetic fields

Alternating fields generated by the deflection yoke. These are subject to increasing attention, notably by governing authorities, the trade and the press. Although there is no scientific evidence that monitor emissions are harmful, much effort has gone into reducing emissions on the principle of better safe than sorry. Currently, there are two areas of interest: very-low frequency (VLF) electric and magnetic fields extending from 2 kHz to 400 kHz, and extreme low frequency (ELF) fields extending from 5 Hz to 2 kHz.

See also *Electromagnetic radiation standards*.

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M

Moiré effect

A fringe pattern arising from the interference between two superimposed line patterns.

In a monitor it comes from the interference between the shadow mask pattern and the video information (video moiré), and between the shadow mask pattern and the horizontal line pattern (scan moiré). It shows itself as wavy patterns on the screen and becomes more noticeable as monitor resolution increases. Since the video signal varies continuously, little can be done about video moiré. Scan moiré depends on the horizontal scanning frequency and can be alleviated by appropriate choice of frequency. Autoscan (MultiSync) monitors, which operate over a range of scanning frequencies, may sometimes exhibit moiré in certain video modes.

MPR

See Electromagnetic radiation standards.

MultiSync monitor

See Autoscan monitor.

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N

Non-interlaced

See Interlaced/non-interlaced.

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O

OSD (On Screen Display)

The feature that allows an end user to adjust screen performance and parameters of monitors directly through an on-screen instruction window. See CustoMax in CrystalClear section.

Overscan

The practice in which areas without useful video information are scanned outside the visible screen area in order to make maximum use of the screen for display of active video information. This practice is occasionally necessary because some video cards generate a video pattern that is smaller than the visible

screen area, resulting in an image that is smaller (and less legible) than it needs to be.

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P

Parallelogram Distortion

See Geometric distortion.

Phosphor

Generic name for the class of substances that exhibit luminescence. To produce a picture on screen, phosphors are deposited on the inner surface of the picture-tube screen and excited into luminescence by the electron beam. Typical examples of phosphors are P22 medium short-persistence phosphor and EBU high-color-saturation phosphor.

Pin-cushion Distortion

See Geometric distortion.

Pixel

Abbreviation for picture element, the smallest element of the picture that can be displayed on the screen. The smaller the pixel size, the better the resolution of the monitor. Pixel size is determined by the size of the electron spot on the screen and not necessarily by the phosphor dot pitch (the size of the triad). Thus, a monitor with a large electron spot covering several triads can exhibit poor resolution even though its dot pitch is small.

Pixel frequency

The number of pixels that can be written in a video line per second.

Pixel rate

See pixel frequency

Plug-and-Play

See DDC. See USB section.

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R

Raster

The area on screen that electron beam can reach.

Refresh rate

See Vertical scanning frequency.

Resolution

The number of pixels that can be displayed on the screen. The resolution is specified as the number of pixels in a line multiplied by the number of horizontal lines.

See also video graphic adapter.

Rotation function

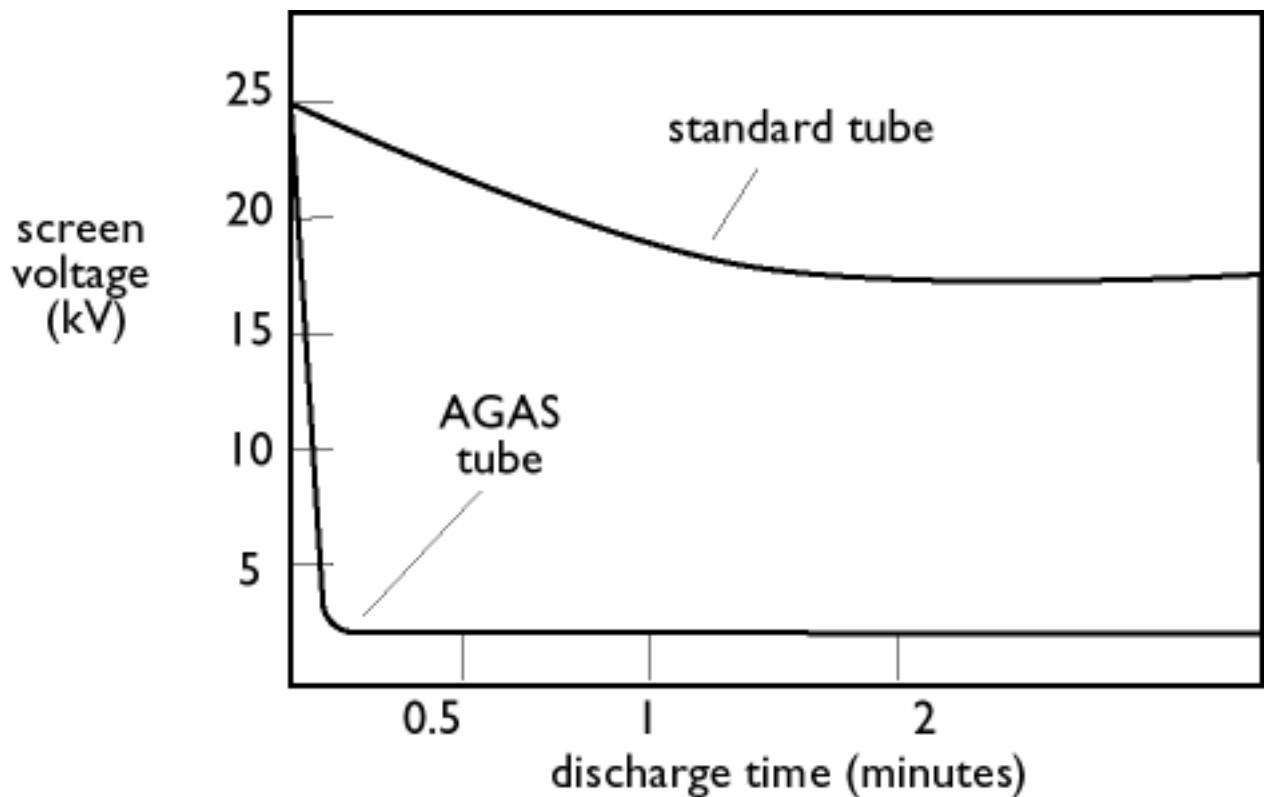
The feature that allows users to adjust the whole screen rotating to be horizontal.

Because of the magnetic field of earth, the screen of monitor will be tilt when the screen faces toward the different direction.

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S

Screen coatings



Anti-Static coatings

Due to bombardment by beam electrons, monitor screens become electrically charged when in use. Electrically charged screens surfaces can attract dust particles. An Anti-Static coating is a conductive coating deposited on the screen (or on a glass panel immediately in front of the screen) that conducts away the charge and prevents screen dust build-up.

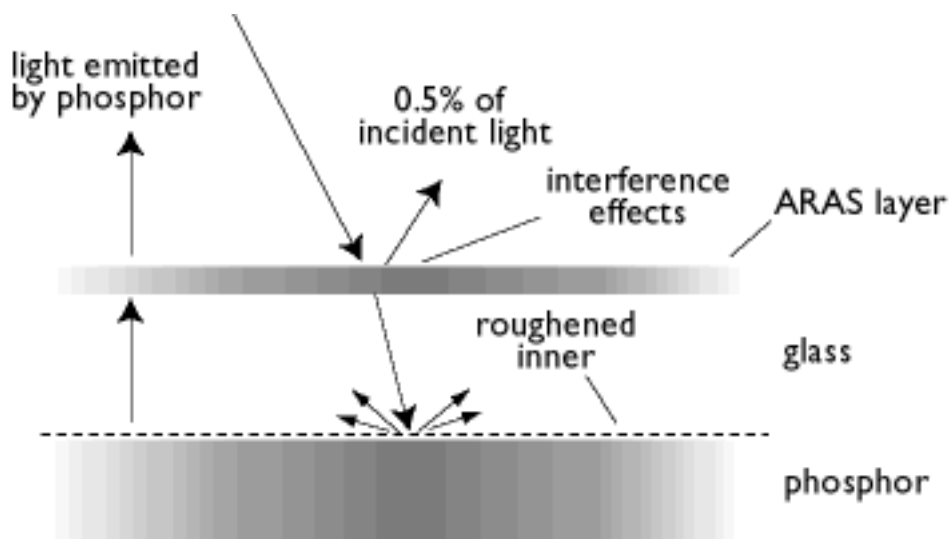
AGAS (Anti-Glare, Anti-Static) coating

AGAS is a silica coating applied to the surface of the screen by a spinning and spraying process. It operates by diffusing reflected light to blur images of light sources on the screen. To provide anti-static properties, the coating is impregnated with small conductive particles.

ARAS (Anti-Reflection, Anti-Static) coating

ARAS is one of the most effective anti-reflection/anti-static screen treatments currently available. It is composed of a multi-layer structure of transparent dielectric material that suppresses specular reflections by broadband interference effects at the screen surface. Anti-static properties are provided by a single conductive layer within the multi-layer structure.

With ARAS, the intensity of reflected light is reduced from around 4.5% of the incident light (the reflectivity of uncoated screens) to less than 0.5%. ARAS also has a major advantage over other screen treatments: It doesn't diffuse or scatter reflected light, so picture contrast and sharpness remain completely unimpaired. It's also easy to clean and tough enough to withstand commercially available cleaning agents.



The ARAS coating reflects only about 0.5% of the incident light.

AGRAS (Anti-Glare anti-Reflection Anti-Static) coating.

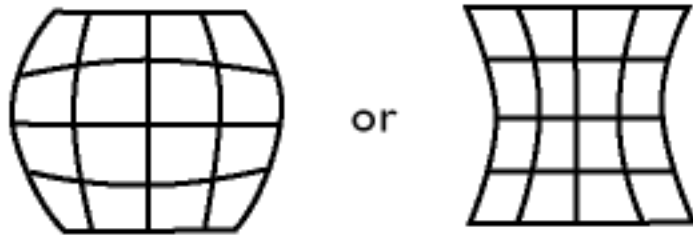
A combined anti-reflection, anti-glare, anti-static coating.

Self-test function

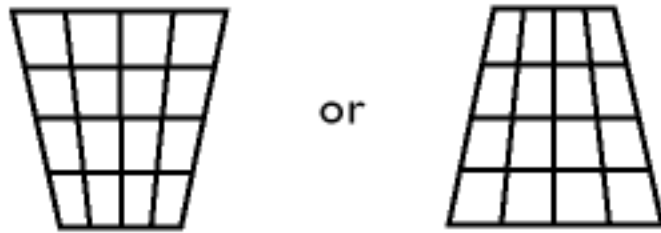
A monitor equipped with hardware or software to automatically detect cable connection status.

Shape

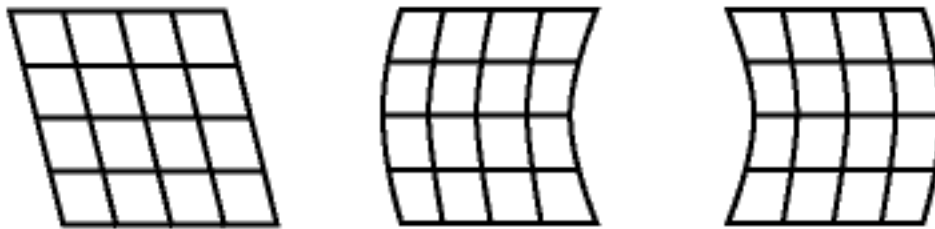
Deviation of a reproduced picture from its intended shape. The following types of distortion are most common:



pincushion distortion



trapezoid distortion

parallelogram
distortionbalanced pincushion
distortion

SOG (Synchronization On Green)

A properly functioning color monitor requires five kinds of signals: horizontal sync pulse, vertical sync pulse, red color signal, green color signal and blue color signal. Signals from a PC are transmitted to a monitor using one of three methods:

1. Separate sync: Horizontal and Vertical sync signals transmitted separately
2. Composite sync: Horizontal and vertical sync pulses mixed into a single signal train.
3. SOG: Horizontal and vertical sync pulses mixed, then combined with the green color signal.

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T

TCO

See Electromagnetic radiation standards.

Tilt function

See rotation function.

Trapezoid distortion

See Geometrical distortion.

TTL signal

A TTL (Transistor-transistor-logic) signal is a digital signal level for controlling the screen colors. With TTL driving, the red, green and blue signals can only be switched on or off or provided with an intensity signal. A TTL-driven monitor can thus display a maximum of 64 colors. Video standards such as MDA, CGA and EGA are based on TTL level.

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U

USB or Universal Serial Bus

[A smart plug for PC peripherals.](#) USB automatically determines resources (like driver software and bus bandwidth) required by peripherals. USB makes necessary resources available without user intervention.

- USB eliminates "case angst" -- the fear of removing the computer case to install add-on peripherals. And USB also eliminates adjustment of complicated IRQ settings when installing new peripherals.
- USB does away with "port gridlock." Without USB, PCs are normally limited to one printer, two Com port devices (usually a mouse and modem), one Enhanced Parallel Port add-on (scanner or video camera, for example) and a joystick. More and more peripherals for multimedia computers arrive on the market every day. With USB, up to 127 devices can run simultaneously on a computer.
- USB permits "hot plug-in." There's no need to shut down, plug in, reboot and run set-up to install peripherals. And no need to go through the reverse process to unplug a device.

In short, USB transforms today's "Plug-and-Pray" into true Plug-and-Play!

Hub

A Universal Serial Bus device that provides additional connections to the Universal Serial Bus.

Hubs are a key element in the plug-and-play architecture of USB. The Figure shows a typical hub. Hubs serve to simplify USB connectivity from the user's perspective and provide robustness at low cost and complexity.

Hubs are wiring concentrators and enable the multiple attachment characteristics of USB. Attachment points are referred to as ports. Each hub converts a single attachment point into multiple attachment points. The architecture supports concatenation of multiple hubs.

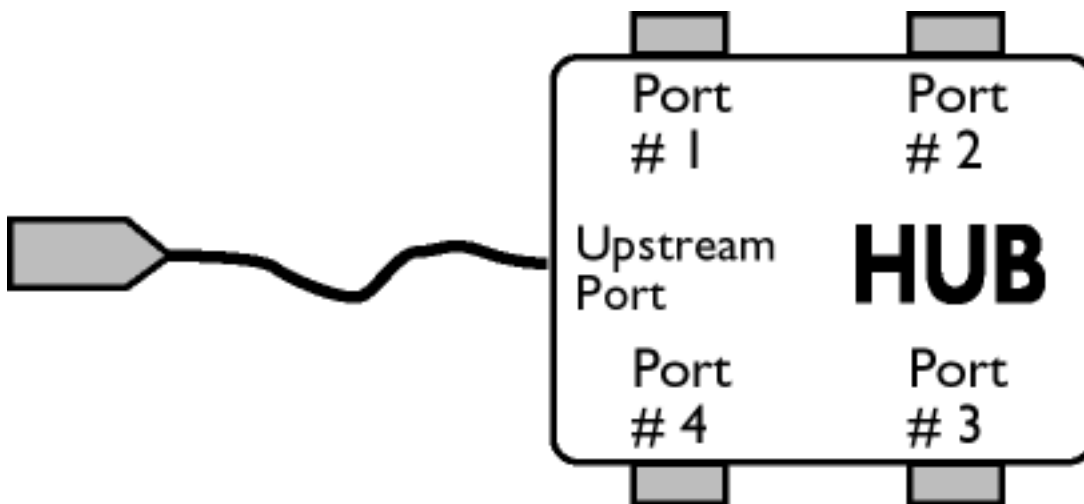
The upstream port of a hub connects the hub towards the host. Each of the other downstream ports of a hub allows connection to another hub or function. Hubs can detect, attach and detach at each downstream port and enable the distribution of power to downstream devices. Each downstream port can be individually enabled and configured at either full or low speed. The hub isolates low speed ports from full speed

signaling.

A hub consists of two portions: the Hub Controller and Hub Repeater. The repeater is a protocol-controlled switch between the upstream port and downstream ports. It also has hardware support for reset and suspend/resume signaling. The controller provides the interface registers to allow communication to/from the host. Hub specific status and control commands permit the host to configure a hub and to monitor and control its ports.

Device

A logical or physical entity that performs a function. The actual entity described depends on the context of the reference. At the lowest level, device may refer to a single hardware component, as in a memory device. At a higher level, it may refer to a collection of hardware components that perform a particular function, such as a Universal Serial Bus interface device. At an even higher level, device may refer to the function performed by an entity attached to the Universal Serial Bus; for example, a data/FAX modem device. Devices may be physical, electrical, addressable, and logical.



Downstream

The direction of data flow from the host or away from the host. A downstream port is the port on a hub electrically farthest from the host that generates downstream data traffic from the hub. Downstream ports receive upstream data traffic.

Upstream

The direction of data flow towards the host. An upstream port is the port on a device electrically closest to the host that generates upstream data traffic from the hub. Upstream ports receive downstream data traffic.

UPS (Universal Power Supply)

The monitor with UPS feature can work in different countries with various mains voltage.

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V*Vertical dot pitch*

See Dot pitch.

Vertical scanning frequency

Expressed in Hz, this is the number of fields written to the screen every second in interlaced mode. In non-interlaced mode vertical scanning frequency is the number of frames (complete pictures) written to the screen every second (also known as refresh rate).

Vertical sync pulses

A train of square shaped waveforms that define the start of a new frame.

VESA

Video Electronic Standards Association, a consortium of manufacturers formed to establish and maintain industry-wide standards for video cards and monitors. VESA was instrumental in the introduction of the Super VGA and Extended VGA video graphics standards (see Video graphics adapters) with a refresh rate of 70 Hz, minimizing flicker and helping to reduce operator eyes fatigue and stress.

Video dot rate

See Dot rate.

Video graphics adapters

A card equipped with a character or graphic generator and video memory, which maps to the screen. A microprocessor scans video memory and translates bit information from the computer into displayable video signals for the monitor. These cards comply with various standards that determine the nature and quality of the display.

[VGA \(Video Graphics Array\)](#), introduced in 1987, was the first analog card. It offered still higher resolution than EGA: 640 X 480 pixels for graphics and 720 x 400 pixels for text, and a color palette of 256 colors. VGA could also emulate EGA and CGA.

[Super VGA](#), devised by VESA in 1989, offers a resolution of 800 x 600 pixels.

[Extended VGA](#), introduced by VESA in 1991, offers a top resolution of 1024 x 768 pixels (non-interlaced) and a refresh rate slightly higher than IBM's XGA 8514A.

[High-end, graphics adapters](#), introduced over the last three years for professional workstations, offer top

resolutions from 1280 x 1024 to 1600 x 1280, horizontal line frequencies up to 90 kHz and bandwidths up to 200 MHz.

VIS (Viewable Image Size)

The real screen dimensions that users can see measured diagonally. The VIS of a monitor is always less than the so called screen size of a monitor. For example, the VIS of a 17-inch monitor is only about 16 inches. It depends on the useful screen size of CRT and the opening of a monitor's front cabinet.

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