

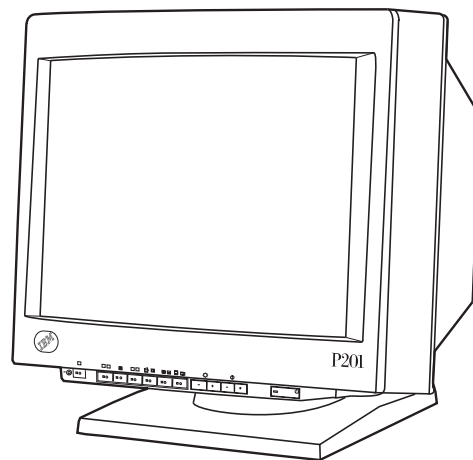


IBM Monitors

Product Information Guide

IBM PC Company

April 1997



Product Guide

April 1997

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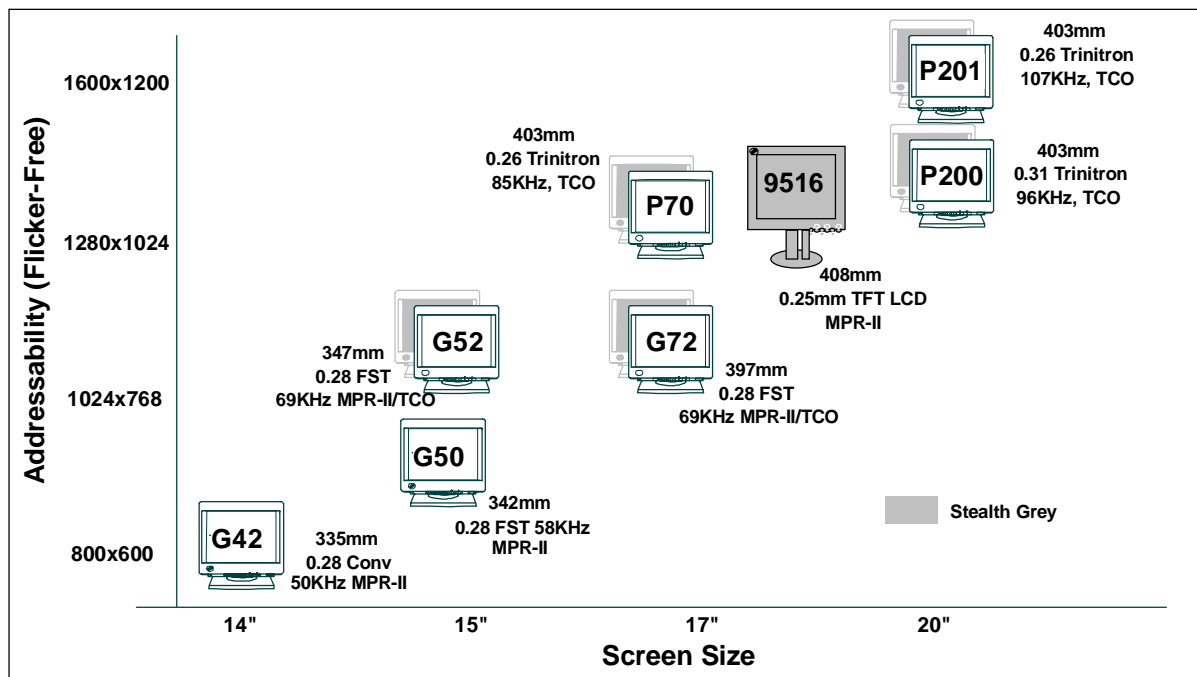
Monitors Overview

IBM started developing computer display units long before the PC appeared in 1981. Continuing from the first mono and colour PC displays, we have improved and expanded our range of PC monitors - always working closely with the developers of IBM PC system units to ensure complete compatibility.

IBM monitors optimise your system's graphics capabilities and help increase your productivity. Our monitors are IBM-designed and tested for your IBM system. Some models offer a choice of pearl white or stealth grey finish to complement the look of your IBM system.

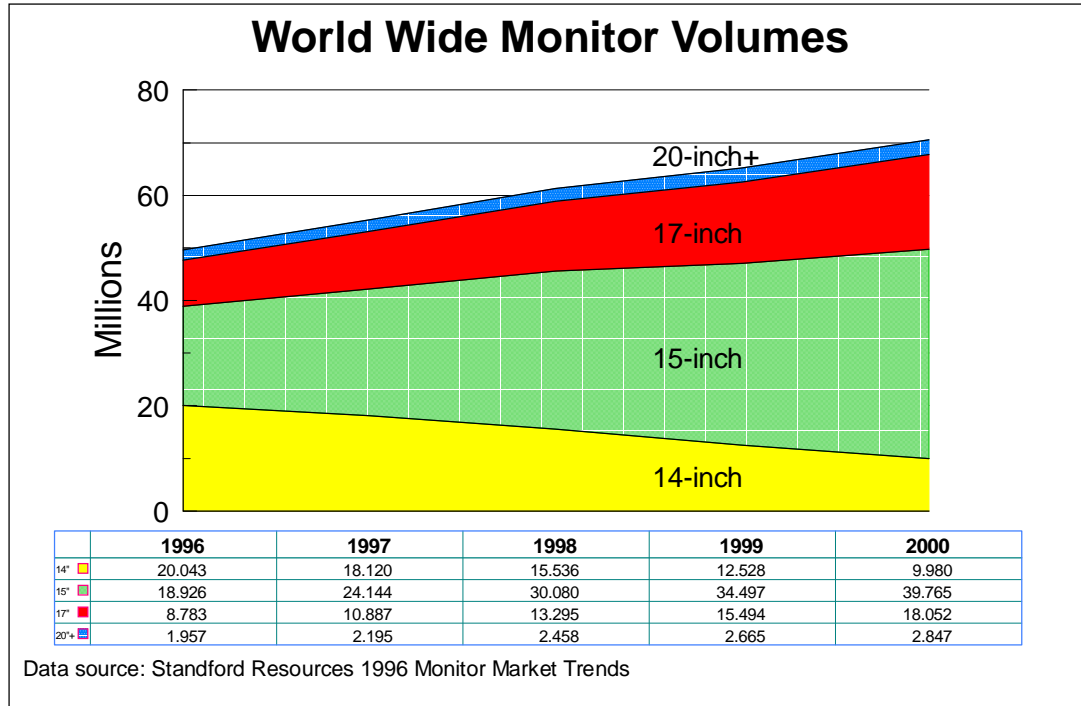
Our G Series Monitors work like a charm when you're running home or standard business applications such as word processing, data entry and basic graphics. Our P Series Monitors thrive in graphics-intensive environments such as desktop publishing, CAD and imaging, or in any application where superb image quality is required.

In addition to the CRT monitors covered in this guide, IBM also markets a 16-inch TFT LCD panel, the 9516, specifically for use with IntelliStation systems.



Monitor Market Trends

The CRT market continues to grow, with Stanford Resources predicting a compound average growth rate of 8% from 1996 to 2000. The 14-inch CRT share is declining, being replaced by 15-inch and 17-inch tubes, while 20-inch-plus sizes only gradually increase their presence.



The graphics capabilities of PCs are improving all the time, with 2MB video memory commonplace, and even 8MB not exceptional. Such systems can support a large number of colours even at high addressabilities, and so users require monitors that will display these modes well - i.e. large screens with a high line rate for flicker-free operation.

The EU Directive 90/270/EEC mandates the minimum requirements for both office equipment and the environment necessary to protect the health and safety of the office workforce within the European Union. While it has been in force for new installations since 1993, it became mandatory for all display equipment (existing and new installations) on 1 January 1997.

Also important are the Swedish MPR II-1990 guidelines, which cover electromagnetic, electric and electrostatic emissions from monitors. In some countries, the more stringent recommendations from TCO (the Swedish Confederation of Professional Employees) are considered necessary requirements.

The purpose of these standards is to safeguard the health, safety and comfort of people using monitors, as well as helping to improve their productivity.

Flat panels remain a niche market, as they are still much more expensive than CRT monitors of equivalent size.

What to Consider when Buying

Screen size

Monitors are often identified by the size of their CRT—e.g., 14-inch, 15-inch. A portion of the CRT is usually hidden behind the monitor cover; the area of the screen you can actually view is the "viewable image size." The average 14-inch monitor, for example, has a viewable image size of between 12 and 13 inches.

Monitors with a 15-inch CRT are the standard for most systems today and are generally used for word processing, spreadsheets as well as games. Monitors with a 17-inch CRT are suitable for people who will be using multiple windows, graphics, desktop publishing and multimedia. Monitors with CRTs that are 20 inches and larger are best for people performing high-end desktop publishing, CAD/CAE, and other graphic-intensive applications that require great detail and clarity.

Tube Technology

Monitors generally employ one of two types of tube technology—shadow mask or aperture grille. A conventional CRT, or cathode ray tube, is a common example of shadow mask picture technology still available in the marketplace today. FST, or flatter squarer tube, is a more current variation of the shadow mask technology, offering a flatter, squarer outside face. Aperture grille tubes, such as Trinitron, are an alternate technology, offering improved clarity and sharpness; their vertically flat screens reduce reflections from overhead lighting.

Dot Pitch/Stripe Pitch

Dot pitch is the distance in millimeters between adjacent dots of the same color that make up your screen image on a conventional or FST CRT. *Stripe pitch* is the distance between adjacent stripes of the same color in aperture grille CRTs. In both cases, the smaller the measured distance at a given CRT size, the better the picture. You may commonly find monitors on the market today with a dot pitch as low as 0.26mm or as high as 0.41mm, or a stripe pitch as low as 0.25mm or as high as 0.31mm.

Addressability

Unlike with dot pitch, you'll want to aim high with addressability. The amount of detail you see on the monitor screen, as determined by the total number of pixels your monitor can display, is called addressability. A pixel is an addressable point of the screen composed of multiple color phosphor dots. The more pixels shown on the screen, the tighter they are packed together and the higher the picture content.

The current standard for addressability among desktop monitors—XGA—is 1024 x 768, which represents 768 lines, each made up of 1024 pixels. Older monitors may only have VGA capability, with 640 x 480 addressability.

Refresh rate

While not always apparent to the naked eye, your monitor is constantly at work, rapidly redrawing (i.e., refreshing) images on the screen. Images on monitors are continually being redrawn from left to right and top to bottom by an electron “gun” or beam. The only time that you might notice this is when you experience screen “flicker.” Flicker occurs when your screen is not refreshed quickly enough, or when it uses an interlace refresh technique. The “refresh rate” is the number of times the monitor redraws the screen per second. When the image on the screen is refreshed by redrawing every other vertical line - requiring two passes to refresh the entire picture - it is termed “interlace.”

User eye discomfort may result from repeated screen flicker. You will probably want to look for a “flicker-free” refresh rate of at least 72Hz noninterlaced for monitors with 14- and 15-inch CRTs and between 75 and 85Hz noninterlaced for larger monitors.

Compatibility

Your main concern should be that the monitor you choose is compatible with your current PC. But if you anticipate that your monitor will outlast your current system—which is often the case—you may want to choose a monitor that is compatible with the majority of popular systems on the market and can support higher-performance graphics adapter cards.

Ergonomics

The EU Directive 90/270/EEC mandates the minimum requirements for both office equipment and the environment necessary to protect the health and safety of the office workforce within the European Union. While it has been in force for new installations since 1993, it became mandatory for all display equipment (existing and new installations) on 1 January 1997.

EU Directive 90/270/EEC is implemented by legislation in each member country of the European Union. Typically this legislation refers to ISO 9241 or EN 29 241 (which are identical in content) as appropriate standards which will ensure compliance with the Directive. The purpose of these standards is to safeguard the health, safety and comfort of people using monitors, as well as helping to improve their productivity. And they are very comprehensive - as well as the monitor and PC (hardware and software) itself, they give guidelines on the total environment in which it is used, including the desk, chair, lighting, noise and heat - in fact, almost every aspect of the working environment. ISO 9241 Part 3 addresses CRT monitors

Many of these (such as lighting levels or the type of chair) are under your direct control, and can be easily altered if they are not right. But when you are choosing monitors, mistakes are less easily changed, and can be costly too. As a premier supplier of high quality monitors IBM understands this, and provides equipment that meets and frequently exceeds the requirements of these standards.

What’s more, IBM issues a Supplier’s Declaration for each of its PC system units. This sets down the results of tests and verifications performed by certified IBM laboratories under the control of independent certification bodies and details which combinations of monitors, system units, keyboards, fonts and application software have been tested to ensure compliance with the standard. A copy of the appropriate declaration is available on request. What other supplier offers you as much?

Ease of Use

No one wants equipment that is hard to set-up, including monitors. VESA DDC 1/2B Plug & Play technology eliminates hassles related to setup and installation by automatically configuring the monitor to your system, setting your refresh rate and resolution to achieve optimum performance on that particular system. To take advantage of this technology, choose a monitor which supports Plug & Play and make sure your system hardware and software includes this capability.

Controls

There are two types of monitor controls: analogue and digital. Analogue (or wheel) controls were prevalent on early monitors and continue to be used on some monitors today for those controls that require a continuous smooth operation (such as brightness). Digital controls provide push-button simplicity, a wide range of capabilities and memory functions. To take advantage of the latest technology you may also want on-screen display, which gives you a pictorial indication of the current control settings.

Consider your monitor size and the applications you will be using when determining the range of controls you wish to have. The larger the monitor and the more graphics-intensive your work, the greater the number of control settings you may require. Brightness, picture size, and positioning may be the only controls you need for a monitor with a 15-inch CRT. But if you are planning to use a monitor with a 17-inch or larger CRT for desktop publishing and graphics, you might want to choose a monitor with more detailed controls such as pincushion, barreling, colour, convergence, trapezoid, and possibly image tilt correction.

Energy Efficiency

Energy Star compliance guidelines set by the Environmental Protection Agency require a monitor to idle down to 30 watts or less when not in use. Swedish NUTEK guidelines are more stringent, calling for 8 watts or less when not in use. In order to meet Energy Star and NUTEK guidelines, a monitor must be attached to a suitably configured system.

Emissions

Most electrical appliances give off small amounts of electromagnetic emissions. To be sure your monitor meets industry-leading standards on low emissions, purchase a monitor that meets MPR-II guidelines or the more stringent TCO-91, also included in TCO-92 and TCO-95, requirement.

Footprint

The “footprint” of a monitor is its width and depth, or the actual space it takes up when sitting on a desk or table. Generally, monitors with larger screen sizes have larger footprints. Be aware of potential limitations imposed on available desk space, including the monitor's height.

Warranty

A good, comprehensive warranty is one sure way to protect your investment. Before you buy, be sure the warranty covers your entire monitor—not just individual parts—and is backed by fast, reliable service and support.

Monitors: New Models

G Series Colour Monitors

Description

With the new G Series monitors from IBM you'll enjoy a clear, more detailed picture with addressabilities of up to 1280 x 1024. The latest graphical operating systems need such high-detail modes - spread over a big screen - to fully exploit their ease-of-use and multi-tasking features. These monitors have preset VESA modes and refresh rates for flicker-free operation, including standard 85Hz refresh rates, creating a clearer image on the screen and increasing user comfort. User-defined settings are automatically placed in memory.

The G Series, like all IBM monitors, comply with ISO 9241 Part 3, the international standard covering front-of-screen ergonomics. That makes them exceptionally easy on your eyes. And IBM is the first manufacturer in the world to test complete systems and certify compliance through a Supplier's Declaration.

Marketing Highlights

- ◆ New, exciting, system integrated look and feel
- ◆ Full system synergy and support
- ◆ Comprehensive range
- ◆ Stealth grey models to match Intellistation and ThinkPad
- ◆ TCO-95 models (available in some geographics) comply with the most stringent environmental labelling programs

Availability

<i>Description</i>	<i>CRT Size</i>	<i>Viewable Image Size</i>	<i>Part Number</i>	<i>Availability</i>
G42 Colour Monitor	14-inch	335mm	See next page	24th April
G52 Colour Monitor	15-inch	347mm	See next page	8th May
G52 Colour Monitor - TCO	15-inch	347mm	See next page	27th May
G52 Colour Monitor - stealth grey	15-inch	347mm	See next page	8th May
G72 Colour Monitor	17-inch	397mm	See next page	8th May
G72 Colour Monitor - TCO	17-inch	397mm	See next page	27th May
G72 Colour Monitor - stealth grey	17-inch	397mm	See next page	8th May

Part Numbers

CRT based monitors are sensitive to the earth's magnetic field and hence the model chosen has to be appropriate for the local conditions. Monitors are generally offered in three versions - NH (Northern Hemisphere), EQ (Equatorial) and SH (Southern Hemisphere).

- Southern Hemisphere models are optimised for Australia and New Zealand.
- Equatorial models are optimised for all countries in continental Africa and Madagascar (except Algeria, Egypt, Libya, Morocco and Tunisia), Southern Asian countries and Indonesia, and South and Central America.
- Northern Hemisphere models are optimised for use in all other countries in Europe, Middle East and Africa, North America, and Asia.

In some instances, product performance and design considerations remove the need for an Equatorial model. In these cases, the Southern Hemisphere version should be used as though it were the Equatorial model.

Europe, Middle East and Africa

	P70	P200	P201	G42	G50	G52	G72
NH - MPR II				654002N	6543303	654601N	654701N
NH - TCO	6554673	6555773	6555803			654621N	654721N
NH - Stealth Grey	65546E3	65557E3	65558E3			654641N	654741N
EQ				654002E	6543305	654601E	654701E
SH	6554674	6555774			6543304		

North America

	P70	P200	P201	G42	G50	G52	G72
NH	6554673	6555773	6555803	654000N	6543303	654600N	654701N
NH - Stealth Grey	65546E3	65557E3	65558E3		6543333	654640N	654741N

Asia-Pacific South

	P70	P200	P201	G42	G50	G52	G72
NH	6554675	6555775					
EQ				654002E	6543305	654601E	654701E
EQ - Stealth Gre						654641E	
SH	6554674	6555774		654002S	6543304	654601S	654701S
SH - Stealth Gre						654641S	

IBM G Series Monitors at a glance

	G72 colour monitor	G52 colour monitor	G50 colour monitor	G42 colour monitor
Screen				
CRT size	17-inch	15-inch	15-inch	14-inch
Viewable image size	15.6-inch	13.7-inch	13.4-inch	13.2-inch
	397mm	347mm	342mm	335mm
Tube type/dot pitch	FST/.28mm	FST/.28mm	FST/.28mm	CRT/.28mm
Function				
Syncing	Multifrequency	Multifrequency	Multifrequency	Multifrequency
Horizontal scan range	30-69 kHz	30-69 kHz	31-58 kHz	30-50 kHz
Vertical scan range	50-120 Hz	50-120 Hz	50-100 Hz	50-120 Hz
Top flicker-free VESA	1,024x768 at 85 Hz NI	1,024x768 at 85 Hz NI	1,024x768 at 72 Hz NI	800x600 at 75 Hz NI
Max addressability	1,280x1,024	1,280x1,024	1,024x768	1,024x768
Onscreen display	Yes	Yes	No	No
Power management	VESA DPMS; Energy Star ² and NUTEK	VESA DPMS; Energy Star ² and NUTEK	VESA DPMS; Energy Star ² and NUTEK	VESA DPMS; Energy Star ²
Plug and Play (VESA) ³	DDC 1 & 2B capable; Windows 95 compliant	DDC 1 & 2B capable; Windows 95 compliant	DDC 1 & 2B capable; Windows 95 compliant	DDC 1 & 2B capable; Windows 95 compliant
Factory preset modes	8: 720x400 at 70Hz NI, 640x480 at 60/75/85Hz NI, 800x600 at 75/85Hz NI 1,024x768 at 75/85Hz NI	9: 720x400 at 70Hz NI, 640x480 at 60/75/85Hz NI, 800x600 at 75/85Hz NI 1,024x768 at 75/85Hz NI	11: 720x400 at 70Hz NI, 640x480 at 60/72/75/ 85Hz NI, 800x600 at 72/75/85Hz NI, 1,024x768 at 70/72Hz NI and 43Hz I	8: 720x400 at 70Hz NI, 640x480 at 60/72/75/ 85Hz NI, 800x600 at 60/75Hz NI, 1,024x768 at 60Hz NI
User modes	8	8	9	8
Digital controls	Contrast, brightness, horiz./vert. size/position, reset, pincushion, trapezoid	Contrast, brightness, horiz./vert. size/position, reset, pincushion, trapezoid, image rotation, colour tint, manual degauss	Contrast, brightness, horiz./vert. size/position, reset, pincushion, trapezoid, image rotation, colour tint manual degauss	Contrast, brightness, horiz./vrt. size/position, reset, pincushion, trapezoid, DDC disable, Control panel disable
Other				
Worldwide compliance				
Ergonomics	ISO 9241 Part 3 ¹ , GS	ISO 9241 Part 3 ¹ , GS	ISO 9241 Part 3 ¹ , GS	ISO 9241 Part 3 ¹ , GS
Emissions	MPR II, FCC Class B, ICES-003 Class B, EMI (B), VCCI Class 2, EN 55022, EN 55022 Class B	MPR II, FCC Class B, ICES-003 Class B, EMI (B), VCCI Class 2, EN 55022, EN 55022 Class B	MPR II, FCC Class B, ICES-003 (B), EMI (B), VCCI Class 2, EN 55022, EN 55022 Class B	MPR II, FCC Class B, ICES-003 (B), EMI (B), VCCI (2), EN 55022, EN 55022 Class B
Safety	UL 1950 First Edition, CSA C22.2 No. 950, CE Mark, SEMKO, FDA/DHHS, DNHW, NOM, PTB, GS	UL 1950 First Edition, CSA C22.2 No. 950, CE Mark, SEMKO, FDA/DHHS, DNHW, NOM, PTB, GS	UL 1950 First Edition, CSA C22.2 No. 950, CE Mark, SEMKO, FDA/DHHS, DNHW, NOM, PTB, GS	UL 1950 First Edition, CSA C22.2 No. 950, CE Mark, SEMKO, FDA/DHHS, DNHW, NOM, PTB, GS, TUV< DEMKO, NEMKO, CCIB/CCEE, SASO, C-tick
Black version	Yes	Yes	No	No
TCO version	Yes	Yes	No	No
Dimensions (HxWxD)	16.4 x 16.9 x 17.3 inches 417 x 428 x 439mm	16.2 x 14.6 x 16.6 inches 385 x 370 x 421mm	14.4 x 14.1 x 15.5 inches 367 x 359 x 395mm	14.4 x 14 x 16.3 inches 366 x 356 x 414mm
Weight	40lb 18kg	30lb 13.5kg	32lb 14.5kg	26lb 11.7kg
Warranty	Three years	Three years	One year	One year

¹ When forming part of an ISO-compliant system.

² As an Energy Star partner, IBM has determined that these products meet the Energy Star guidelines for energy efficiency.

³ When attached to a DDC-enabled system.

IBM P Series Monitors at a glance

	P201 colour monitor	P200 colour monitor	P70 colour monitor
Screen			
CRT size	20-inches	20-inches	17-inches
Viewable image size	19.1-inches 486mm	19.1-inches 486mm	15.9-inches 403mm
Tube type/aperture grille	Trinitron** CRT/.26mm	Trinitron** CRT/.31mm	Trinitron** CRT/.26mm
Screen treatment	Multilayer antireflective bonded panel	Multilayer antireflective bonded panel	Multilayer antireflective film
Function			
Syncing	Multifrequency	Multifrequency	Multifrequency
Horizontal scan range	30-107 kHz	30-96 kHz	30-85 kHz
Vertical scan range	50-160 Hz	48-160 Hz	48-150 Hz
Top flicker-free VESA mode	1,600x1,200 at 85Hz NI	1,600x1,200 at 75 Hz NI	1,280x1,024 at 75 Hz NI
Maximum addressability	1,600x1,280	1,600x1,280	1,600x1,200
Onscreen display	No	Yes	Yes
Self-diagnostics	Yes	Yes	Yes
Power management	VESA DPMS; Energy Star ² and NUTEK compliant	VESA DPMS; Energy Star ² and NUTEK compliant	VESA DPMS; Energy Star ² and NUTEK compliant
Plug and Play ³	VESA DDC 1 & 2B capable	VESA DDC 1 & 2B capable	VESA DDC 1 & 2B capable
Factory preset modes	9: 720x400 at 70 Hz NI, 640x480 at 60 Hz NI, 1,280x1,024 at 77/85 Hz NI, 1,600x1,200 at 66/75/85 Hz NI, 1,600x1,280 at 60/77 Hz NI	15: 720x400 at 70 Hz NI, 640x480 at 60/75 Hz NI, 800x600 at 75/85 Hz NI, 1,024x768 at 75/85 Hz NI & 87 Hz I, 1,280x1,024 at 60/75/ 77, 85Hz NI, 1,600x1,200 at 66, 75Hz NI, 1,600x1,200 at 75 Hz NI, 16,00x1,280 at 60Hz NI	15: 720x400 at 70 Hz NI, 640x480 at 60/75/85 Hz NI, 800x600 at 72/75/85 Hz NI, 1,024x768 at 70/75/85 Hz NI & 87 Hz I, 1,280x1,024 at 60/75/77 Hz NI
User modes	9	10	10
Digital controls	Geometry reset, brightness, contrast, horiz./vert. size/position/convergence, pincushion, image rotation, colour tint, trapezoid, colour purity, moire cancellation	Geometry reset, brightness, contrast, horiz./vert. size/position/convergence, pincushion, image rotation, colour tint, moire cancel	Geometry reset, brightness, contrast, horiz./vert. size/position/convergence, pincushion, image rotation, colour tint
Other			
Worldwide compliance	TCO 92 environmental label	TCO 92 environmental label	TCO 92 environmental label
Ergonomics	ISO 9241 Part 3 ¹ , VESA 85 Hz NI support, GS	ISO 9241 Part 3 ¹ , VESA 85 Hz NI support, GS	ISO 9241 Part 3 ¹ , VESA 85 Hz NI support, GS
Emissions	MPR II, TCO 91, FCC Class B, VCCI Class 1, ICES-003	MPR II, TCO 91, FCC Class B, VCCI Class 2, ICES-003	MPR II, TCO 91, FCC Class B, VCCI Class 2, ICES-003
Safety	Class B, EN 55022 Class B UL 1950 First Edition, CSA C22.2 No. 950, CE Mark, DEMKO, SEMKO, FDA/DHHS, DNHW, NOM, PTB, GS	Class B, EN 55022 Class B UL 1950 First Edition, CSA C22.2 No. 950, CE Mark, DEMKO, SEMKO, FDA/DHHS, DNHW, NOM, PTB, GS	Class B, EN 55022 Class B UL 1950 First Edition, CSA C22.2 No. 950, CE Mark, DEMKO, SEMKO, FDA/DHHS, DNHW, NOM, PTB, GS
Workstation compatible	Yes	Yes	Yes
Black versions	Yes	Yes	Yes
Dimensions (H x W x D)	18.7 x 18.7 x 19.9 inches 474mm x 474mm x 505mm	19.4 x 18.6 x 19.7 inches 494mm x 472mm x 501mm	16.8 x 15.9 x 17.7 inches 426mm x 403mm x 450mm
Weight	68lb 31kg	66lb 30kg	44lb 20kg
Warranty ²	Three years	Three years	Three years

¹ When forming part of an ISO-compliant system.

² As an Energy Star partner, IBM has determined that these products meet the Energy Star guidelines for energy efficiency.

³ When attached to a DDC-enabled system.

**Trinitron is a registered trademark of Sony Corporation.

New G Series Compared to Previous Monitors

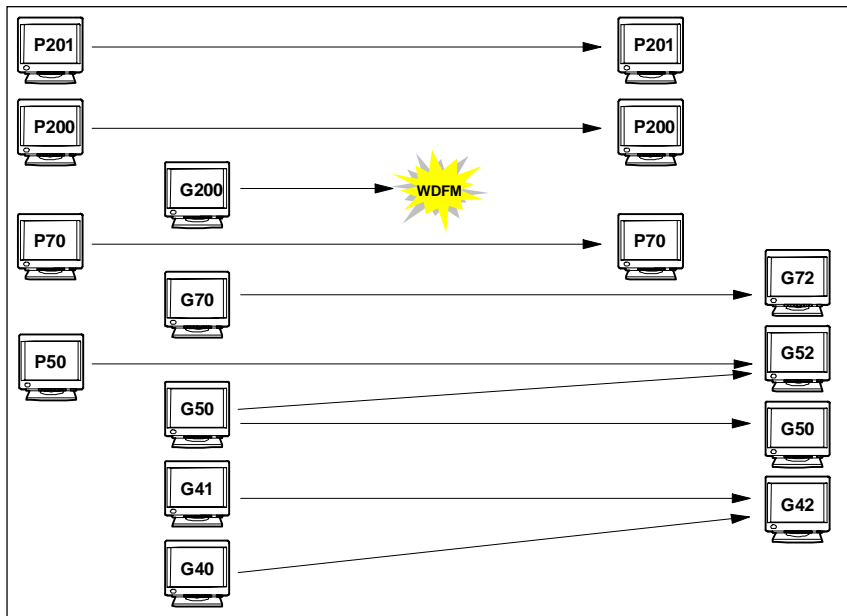
The new G Series monitors (G42, G52, G72) have the following in common with IBM's earlier general purpose monitors (G40, G41 and G70):

- ◆ Multifrequency operation
- ◆ Digital controls
- ◆ ISO 9241 Part 3 capable
- ◆ VESA DDC 1/2B Plug and Play support
- ◆ MPR-II compliance
- ◆ Energy Star and/or NUTEK power management
- ◆ Black (stealth grey) models

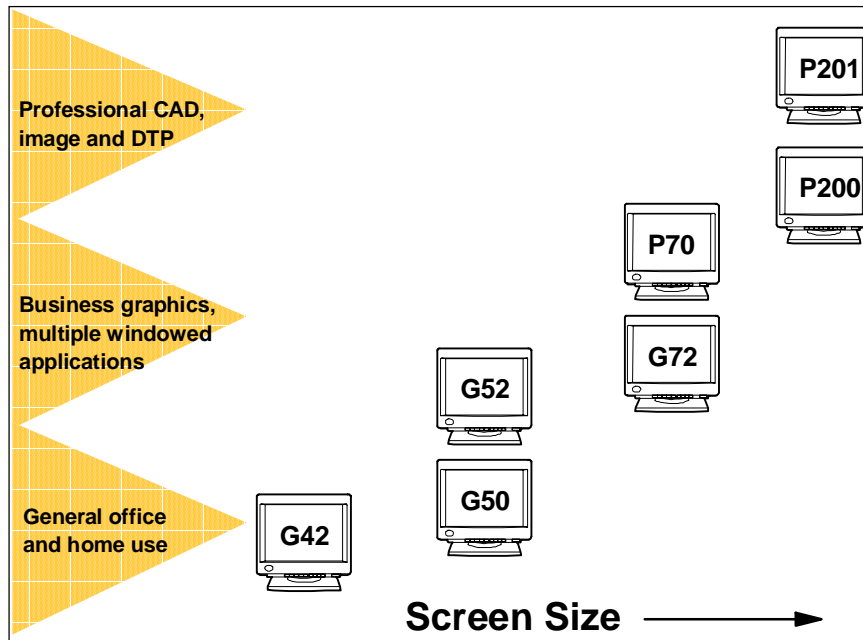
The following features of the G Series are new, or improved, from previous monitors:

- ◆ New design to match the latest IBM system units
- ◆ Higher addressabilities supported
- ◆ On Screen Display on G52 and G72
- ◆ Additional controls
- ◆ TCO-95 models
- ◆ 3 year warranty on G52 and G72

Product Transition



Positioning



What are the differences between the ranges?

- ◆ G Series monitors for general purpose use
 - G42, G50, G52, G72
 - FST/Conventional CRTs
 - Highly competitive price/performance
 - MPR II compliant (TCO option on some models)
 - VESA DDC Plug and Play

- ◆ P Series monitors for professional users
 - P70, P200, P201
 - Larger screen sizes
 - Trinitron CRTs for ultimate image clarity
 - Support faster refresh rates
 - TCO compliant for ultra low emissions
 - In addition to connecting to PC systems, provide Workstation attachment
 - Designed for intensive use

IBM G and P Series Features and Benefits

Feature	Benefit
Space saving design	These monitors are designed to squeeze the largest screen sizes into smaller, lighter casings. Resulting in monitors that take less of your precious desk space than other leading products on the market today.
Universal attachment	Suitable for IBM and IBM-compatible computers, including PC 300 and 700 series, PC Servers, Aptivas, ThinkPads and IntelliStation computers. P Series also support RISC System/6000 and Apple.
Trinitron Cathode Ray Tube	P Series monitors feature these tubes that are even flatter than FST CRTs. Trinitron CRTs use aperture grille technology and high performance, dynamic focusing systems which provide a brighter, clearer, distortion-free image
Flicker-free images	All models ¹ have preset VESA flicker-free operation at 1024x768 or better. And they also support the ultra-stable 85Hz refresh rate, creating a clearer image on the screen and increasing user comfort.
ISO 9241 Part 3	This provides, as part of a complete ISO 9241 Part 3 system, compliance with the international standard for front-of-screen ergonomics, making these monitors exceptionally easy on the eyes. IBM is the first manufacturer in the world to test and guarantee complete systems for compliance.
Plug and Play	These monitors support the VESA Display Data Channel (DDC) 1 and 2B protocols, allowing similarly enabled system units to identify the monitor and its capabilities. So you get automatic display mode optimisation: a lot better picture with a lot less effort.
Power management	All IBM monitors support VESA DPMS power management to provide Energy Star, and the more stringent NUTEK ¹ , compliance - dramatically reducing the amount of electricity used when they are left unattended.
Emissions compliance	Naturally, all IBM monitors feature MPR-II compliance to ensure low electric, magnetic and electrostatic emissions. All P Series , and some G Series models comply to TCO, which demands even lower emissions from the monitor, to provide added reassurance in the working environment.

¹ G42 is flicker-free to 800x600, and is Energy Star compliant only

Competitive Analysis

Introduction

This section contains technical comparisons between each of the G and P Series monitors and some key competitors.

For each model, a “Competitive Analysis Matrix” showing the basic specification of the IBM product and its competitors is given. This is followed by a set of “Competitor Comparisons” of the IBM model against each competitor in turn, pulling out key points of comparison. Finally, a glossary explains the terms used in the tables.

The information in this section is believed to be correct, but errors may have been copied from the manufacturer's literature, or they may change their specifications

Further Information

Data is held in Monitor Development in Greenock on a large number of other monitors. If there is a real need for information on a competitor not included in this document, it may be possible to supply tables similar to those included here. The “Competitor Comparisons” would not normally be available.

If further information is required, please contact Donny Mcfadyen, DMCFADYE at GNKVM.

More detailed information on the technology used in monitors is contained in the document “Technical Guide to IBM Personal Computer Monitors”, by Terry Barcock (see Available Marketing Material).

G42 Competitive Analysis Matrix

Vendor Name	IBM	Compaq	HP	ADI	Samsung
Model Name	G42	140	Low 1024	Pro14	Sync 3NE
Size (Ins)	14	14	14	14	14
Viewable image size (In)	13.27	12.9	13.2	13.3	13.2
Glass Type	Conv	Conv	Conv	Conv	Conv
Dot Pitch (mm)	0.28	0.28	0.28	0.28	0.28
Glass Treatment	AG/AS	AG/AS	AG	AG/AS	AG
Chassis	Multifreq	Multifreq	Multifreq	Multimode	Multifreq
Max H Freq. (kHz)	50	48	48.4	50	48
Addressability 800x600	75Hz	75Hz	60Hz	75Hz	75Hz
640x480	85Hz	75Hz	75Hz	75Hz	75Hz
User Controls	Analogue/ Digital	Analogue	Digital	Analogue	Analogue
No. of Controls	9	5	7		7
OSD	No	No	No	No	No
No. of Presets	8	6	5		
MPR-II	Yes	No	Yes	No	No
TCO-92/95	No	No	No	No	No
Power Save	Energy	Energy	Nutek	Nutek	Nutek
ISO-9241-3	Yes	Yes	Yes	No	No
Plug & Play	DDC1/2B	DDC1/2B	DDC1/2B	No	DDC1/2B
Footprint WxD mm	356x414	356x384	356x388	363x389	356x381
Warranty	1yr P&L	1yr On-site	3yrs	2yrs P&L	3yrs P&L

G42 - Competitive Comparisons

G42 Compared to Compaq 140

The G42 has a larger viewable image size than the Compaq 140 (0.3 inch).

The G42 has digital controls which are easier to use than the analogue controls of the Compaq monitor. The G42 also has more controls than the 140.

The G42 complies to MPR-II which covers electromagnetic emissions as standard, this is not available on the Compaq 140.

The G42 has a larger screen than the Compaq 140, and more features and meets MPR-11.

G42 Compared to HP Low 1024

The G42 has a marginally larger viewable image size than that quoted for the HP monitor.

The G42 has AGS (anti glare,anti static), while the 1024 has only anti-glare.

The G42 has a higher horizontal screen frequency, and also has a higher maximum addressability compared to the 1024.

The G42 has more preset modes, and controls than the 1024.

The 1024 has Nutek power management compared to the G42's Energy Star. The 1024 has a 3yr warranty compared to a 1yr parts and labour for the G42.

The G42 has more preset/controls and anti-static screen coating.

G42 Compared to ADI Provista 14

The G42 has digital controls which are easier to use than the analogue controls of the ADI monitor.

The G42 meets the requirements of the MPR-II standard on emissions as standard. This is not available on the Provista 14. The G42 also has ISO compliance which the ADI monitor lacks.

The G42 has DDC1/2B capability, enabling it, when used with a DDC capable PC, to automatically select the optimal display mode to suite the video adapter and the application. The Provista 14 does not have this ability.

The Provista has 2yrs parts and labour compared to the one year warranty for the G42. The Provista has Nutek power management..

The G42 has MPR-II as standard, and has DDC capability. It is also ISO compliant.

G42 Compared to Samsung Syncmaster 3NE

The G42 has digital controls which are easier to use than the analogue controls of the Samsung monitor.

The G42 has MPRII, which the Syncmaster 3NE does not have. The G42 is also TCO and ISO compliant, the Samsung monitor lacks these standards.

The Syncmaster has a 3yr parts and labour warranty against the one year warranty that comes with the G42.

The G42 has better controls than the Samsung Syncmaster 3NE. It also has MPRII compliance.

G50 Competitive Analysis Matrix

Vendor Name	IBM	Compaq	HP	NEC	Philips	Goldstar
Model Name	G50	V50	1024	3V Multi	15B	1505s
Size (Ins)	15	15	15	15	15	15
Viewable image size (In)	13.4	13.77	13.8	13.8	13.8	13.7
Glass Type	FST	FST	FST	FST	FST	FST
Dot Pitch (mm)	0.28	0.28	0.28	0.28	0.28	0.28
Glass Treatment	AGS	AGS	AG/ESF	AS	AG/AS	AG/AS
Chassis	Multifreq	Multifreq	Multifreq	Multifreq	Multifreq	Multimode
Max H Freq. (kHz)	58.5	60	50	50	50	48
Addressability 1024x768	70Hz	75Hz	60Hz	60Hz	60Hz	60Hz
800x600	85Hz	85Hz	75Hz	75Hz	72Hz	75Hz
User Controls	Digital	Digital	Digital	Digital	Analogue	Analogue
No. of Controls	9	7	8	8		7
OSD	No	No	No	No	No	No
No. of Presets	11	4	9		13	5
MPR-II	Yes	Yes	Yes	Yes	Yes	Yes
TCO-92/95	No	No	No	No	92	No
Power Save	Nutek	Energy	Nutek	Energy	Nutek	
ISO-9241-3	Yes	No	Yes	No	Yes	ISO9001
DDC	DDC1/2B	DDC1/2B	DDC1/2B	No	DDC1/2B	DDC1/2B
FootPrint WxD, mm	359x395	369x393	364x400	372x414	367x395	371x394
Warranty	1yr P&L	1yr On-site P&L	3yrs	3yrs P&L	3yrs P&L	3yrs P&L

G50 Competitor Comparisons

G50 Compared to Compaq V50

The Compaq monitor claims a larger viewable image size (13.77 inches diagonal, compared to 13.4 inches for the G50).

The V50 has a slightly higher line rate and can perform at a slightly higher addressability.

The G50 is ISO compliant, the V50 is not. Further the G50 has the benefit of Nutek power management, the V50 has only Energy Star.

The G50 has ISO9241/3 capability and NUTEK.

G50 Compared to HP 1024

The G50 has a higher line rate and can operate at a higher addressability than the 1024.

The 1024 has a 3yr warranty compared to a 1yr warranty on the G50.

The G50 supports higher resolutions than the HP 1024.

G50 Compared to NEC 3V

Although the G50 has a smaller screen than the 3V, it operates at a faster speed and at a higher addressability.

It is physically smaller than the NEC monitor and therefore takes up less desk space.

Although the 3V comes with a 3yr parts and labour warranty, the G50 has Nutek power management, the 3V having only Energy Star.

The G50 takes up less space and is faster than the NEC 3V.

G50 Compared to Goldstar 1505S

The G50 has digital controls, which are easier to use and more repeatable than analogue controls like those used on the Goldstar monitor.

The G50 operates at a faster speed than the 1505S and has a higher addressability. It also has Nutek power management.

The 1505S has a 3yr parts and labour warranty.

The G50 has a higher horizontal frequency and addressability than the Goldstar 1505S.

G50 Compared to Philips 15B

The G50 has digital controls, which are easier to use and more repeatable than analogue controls like those used on the Philips monitor.

The G50 has controls for the adjustment of any pincushion or trapezoid error, and a button which resets all the geometry adjustments to their factory pre-set values. The Philips 15B lacks all of these controls.

The G50 operates at a higher line rate and addressability than the Philips 15B. The 15B is TCO-92 compliant and has a 3yr parts and labour warranty.

The G50 has easier to use, and more comprehensive controls than the Philips 15B.

G52 Competitive Analysis Matrix

Vendor Name	IBM	Compaq	HP	NEC	Sony	Philips
Model Name	G52	P50	ERGO 1024	XV15	100SX	Brill105
Size (Ins)	15	15	15	15	15	15
Viewable image size (In)	13.6	13.67	13.8	13.8	13.9	13.8
Glass Type	FST	FST	Conv	FST	Trin	FST
Dot Pitch (mm)	0.28	0.28	0.28	0.28	0.25	0.28
Glass Treatment	AG/AS	AGS	AG/ESF	AG/AS	AG/AS	AG/AS
Chassis	Multifreq	Multifreq	Multifreq	Multifreq	Multifreq	Multifreq
Max H Freq. (kHz)	69	69	64	65	65	66
Addressability 1024x768	85Hz	85Hz	75Hz	80Hz	80Hz	80Hz
800x600	85Hz	85Hz	75Hz	85Hz	85Hz	85Hz
User Controls	Digital	Digital	Digital	Digital	Digital	Digital
No. of Controls	12	14	9	8	9	
OSD	Yes	Yes	Yes	No	Yes	Yes
No. of Presets	8	6	12		8	13
MPR-II	Yes	Yes	Yes	Yes	Yes	Yes
TCO-92/95	95OPT	95OPT	No	92OPT	No	95
Power Save	Nutek	Energy	Nutek	Nutek	Nutek	Nutek
ISO-9241-3	Yes	Yes	No	Yes	Yes	Yes
DDC	DDC1/2B	DDC1/2B	DDC1/2B	DDC1/2B	Yes	Yes
FootPrint WxD, mm	376x421	373x417	354x400	372x414	368x414	388x393
Warranty	3yrs P&L	3yrs, 1yr On-site L	3yrs	3yrs P&L	3yrs	3yrs P&L

G52 Competitor Comparisons

G52 Compared to Compaq P50

The G52 has a larger viewable image size (13.78 inches diagonal, compared to 13.67 inches for the P50).

Further the G52 has the benefit of Nutek power management, the P50 only claims Energy Star as standard.

The G52 has a larger viewable image size.

G50 Compared to HP ERGO 1024

The G52 has a higher horizontal screen frequency and can operate at a higher addressability than the ERGO 1024.

The G52 has achieved ISO compliance and optionally comes with TCO-95, which the HP monitor lacks.

Further, the G52 has a FST tube, the ERGO 1024 has only a conventional tube.

The G52 supports higher resolutions than the HP ERGO 1024.

G52 Compared to NEC XV15

The G52 has the advantage of a higher horizontal screen frequency than the XV15, it also has a TCO-95 option, whereas the NEC monitor has the earlier version TCO-92 as an option.

The G52 is faster than the NEC XV15.

G52 Compared to Sony 100SX

The G52 operates at a faster speed than the 100SX. Also, the G52 optionally has TCO-95, the 100SX does not have this.

The G52 has a higher horizontal frequency than the Sony 100SX.

G52 Compared to Philips Brilliance 105

The G52 operates at a higher horizontal screen frequency and addressability than the Philips 105. The 105 and the G52 both have a 3yr parts and labour warranty.

The G52 is faster than the Philips Brilliance 105.

G72 Competitive Analysis Matrix

Vendor Name	IBM	Compaq	HP	NEC	Sony	Philips	Samsung
Model Name	G72	V70	Ultra VGA	XV17	200SX	107B	17GLI
Size (Ins)	17	17	17	17	17	17	17
Viewable image size(In)	15.75	15.67	15.7	15.6	16.05	15.9	15.75
Glass Type	FST	FST	FST	FST	Trin	FST	FST
Dot Pitch (mm)	0.28	0.28	0.28	0.28	0.25	0.28	0.28
Glass Treatment	AG/AS	AGS	AGRAS	AS	AG/AS	ASC	AR/AS
Chassis	Multifreq	Multifreq	Multifreq	Multifreq	Multifreq	Multifreq	Multifreq
Max H Freq. (kHz)	69	69	64	65	70	66	65
Addressability 1280x1024	60Hz	60Hz	60Hz	60Hz	65Hz	60Hz	60Hz
1024x768	85Hz	75Hz	75Hz	75Hz	87Hz	75Hz	75Hz
User Controls	Digital	Digital	Digital	Digital	Digital	Digital	Digital
No. of Controls	12	9	11	17	11		15
OSD	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No. of Presets	11	6	14		9	10	10
MPR-II	Yes	Yes	Yes	Yes	Yes	Yes	Yes
TCO-92/95	95 OPT	95 OPT	No	92	No	92	No
Power Save	Nutec	Nutec	Nutec	Nutec	Nutec	Nutec	Nutec
ISO-9241-3	Yes	No	Yes	Yes	Yes	Yes	Yes
Plug & Play	DDC1/2B	DDC1/2B	DDC1/2B	DDC1/2B	DDC1/2B	DDC1/2B	DDC2B
Footprint WxD mm	428x434	422x439	428x439	417x489	411x462	417x450	429x439
Warranty	3yrs P, 1yr L	1yr On-site P&L	3yrs	3yrs P&L	3yrs, 2yrs CRT	3yrs P&L	3yrs P&L

G72 Competitor Comparisons

G72 compared to Compaq V70

The G72 has a larger viewable image size than the V70.

Further, the G72 has a 3yr warranty compared to only a one year warranty for the Compaq V70.

The G72 has ISO compliance, larger viewable image size and better warranty than the Compaq V70 .

G72 Compared to HP Ultra VGA

The G72 and Ultra VGA are very similar, however, the G72 has a TCO-95 option, which the HP monitor does not have.

The G72 has TCO-95 as an option, which the HP Ultra VGA does not have.

G72 Compared to NEC XV17

The G72 has a larger viewable image size than the XV17, it also has a higher horizontal scan frequency.

The G72 has optional TCO-95, the XV17 has only TCO-92.

The XV17 has an anti-static screen treatment, the G72 has AGS.

The G72 is physically much smaller, has TCO 95 as an option and has better glass treatment.

G72 Compared to Sony 200SX

The Sony 200SX has a Trinitron tube, the G72 has FST. The 200SX also has a smaller dot pitch of 0.25mm compared to the G70's 0.28mm.

The G72 has TCO-95 as an option.

The G72 has optional TCO-95, which the Sony 200SX lacks.

G72 compared to Philips 107B

The G72 has a higher scan frequency than the Philips monitor, and has a TCO-95 option, the 107B has only TCO-92.

The G72 has a higher horizontal scan frequency than the Philips 107B.

G72 Compared to Samsung 17GLI

The G72 has a higher scan frequency and comes with TCO-95 as an option, which the 17GLI does not have.

The G72 has optional TCO-95, the Samsung 17GLI does not.

P70 Competitive Analysis Matrix

Vendor Name	IBM	Compaq	NEC	NEC	Sony	Philips	Samsung
Model Name	P70	P70	P750	XP17	17SE2	Brill 107	17GLSI
Size (Ins)	17	17	17	17	17	17	17
Viewable image size. (In)	15.9	15.68	15.6	15.6	15.9	16.2	15.75
Glass Type	Trin	Trin	FST	FST	Trin	FST	FST
Dot Pitch (mm)	0.26	0.26	0.25	0.28	0.25	0.26	0.26
Glass Treatment	AG AR AS Multi-layer Film	AGS	AS	AS	AG/AS	ARASC	AR/AS
Chassis	Multifreq	Multifreq	Multifreq	Multifreq	Multifreq	Multifreq	Multifreq
Max H Freq. (kHz)	85	92	94	82	85	86	85
Addressability 1280x1024	75Hz	60Hz	85Hz	75Hz	75Hz	75Hz	80Hz
1024x768	85Hz	75Hz	85Hz	85Hz	85Hz	85Hz	85Hz
User Controls	Digital	Digital	Digital	Digital	Digital	Digital	Digital
Advanced Controls	Conver H/V Degauss	Degauss Col Temp Moire	Degauss Moire	Degauss	Col Temp	Degauss	Degauss
OSD	Yes	Yes	Yes	Yes	Yes	No	Yes
No. of Presets	15	8	9	7		16	13
MPR-II	Yes	Yes	Yes	Yes	Yes	Yes	Yes
TCO-92/95	92	95	92OPT	92 OPT	92	95	92
Power Save	Nutec	Nutec	Nutec	Nutec	Nutec	Nutec	Nutec
ISO-9241-3	Yes	Yes	No	Yes	Yes	No	Yes
Plug & Play	DDC1/2B	DDC1/2B	DDC1/2B	DDC1/2B	DDC1/2B	DDC1/2B	DDC1/2B
Footprint WxD, mm	403x450	430x490	403x449	471x489		440x450	422x432
Warranty	3yrs P&L	3yrs P, 1st yr On-site L	3yrs P&L	3yrs P&L	3yrs, 2yrs CRT	3yrs P&L	3yrs P&L

P70 - Competitor Comparisons

P70 Compared to Compaq P70

The P70 has a larger viewable image size (15.9 inches diagonal) than the Compaq P70 (15.68 inches)

The P70 operates at a slightly lower line rate than the Compaq P70.

The P70 has TCO-92 compliance, the Compaq P70 has TCO-95.

The Compaq P70 is physically larger in comparison to the P70, taking up more desk space, Compaq footprint is 430mm x 490mm compared to 403mm x 450mm for the P70.

The P70 uses a superior screen coating which produces lower levels of reflection and crisper/sharper pictures.

The Compaq P70 takes up more desk space and has a smaller viewable image size than the P70.

P70 Compared to NEC P750

The P70 offers a larger viewable image size than the NEC P750.

The P70 uses a Trinitron tube, with its perfectly flat vertical profile, compared to the FST used in the NEC P750.

The P70 is ISO compliant, the P750 lacks this.

The P70 offers the superior Trinitron tube, and a larger viewable image size than the NEC P750.

P70 Compared to Sony 17SE2

The specifications of the P70 and the Sony 17SE2 are very similar.

The Sony CRT warranty is only 2 years, while the P70 has a full 3 year warranty.

The P70 has a full 3 year warranty.

P70 Compared to NEC XP17

The P70 has a larger viewable image size (15.9 inches diagonal) than the NEC XP17 (15.6 inches diagonal). The entire image area of the P70 is fully useable in all modes.

Product Guide

The P70 uses a Trinitron tube, with its perfectly flat vertical profile, compared to the FST used in the NEC XP17.

Compliance to the TCO-92 guidelines on electromagnetic emission is standard on the P70, but is only available as an optional extra on the NEC XP17.

The P70 has a larger viewable image size than the NEC XP17, and uses the superior Trinitron tube.

P70 compared to Philips Brilliance 107

The P70 uses a Trinitron tube, with its perfectly flat vertical profile, compared to the FST used in the Philips Brilliance 107.

Both monitors have digital controls, however the P70 offers an on-screen display which the Brilliance 107 does not have.

Both have TCO compliance, although the Philips monitor has the later TCO-95 version, however it is not ISO compliant unlike the P70.

The P70 has the superior Trinitron tube, and offers an on-screen display that the Brilliance 107 lacks.

P70 Compared to Samsung 17GLSI

The P70 uses a Trinitron tube, with its perfectly flat vertical profile, compared to the FST used in the Samsung 17GLSI.

The P70 has a larger viewable image size than the Samsung monitor.

The P70 has the superior Trinitron tube, which the Samsung 17GLSI lacks.

P200 Competitive Analysis Matrix

Vendor Name	IBM	Sony	Philips	Eizo
Model Name	P200	20SE2	200T	TXD7S
Size (Ins)	20	20	20	20
Viewable image size (In)	19.1	19	19.1	18.9
Glass Type	Trin	Trin	Trin	Trin
Dot Pitch (mm)	0.31	0.25	0.31	0.25
Glass Treatment	AG AR AS Bonded Panel	AG/AS	AG/AS	AG/AS
Chassis	Multifreq	Multifreq	Multifreq	Multifreq
Max H Freq. (kHz)	96	96	90	95
Addressability 1600x1200	60Hz	75Hz	70Hz	75Hz
1280x1024	75Hz	75Hz	84Hz	88Hz
User Controls	Digital	Digital	Digital	Digital
Advanced Controls	Conver H/V Degauss	Col Temp	RGB Adjust	Degauss Col Temp Conver H/V Moire
OSD	Yes	Yes	Yes	Yes
No. of Presets	15		16	
MPR-II	Yes	Yes	Yes	Yes
TCO-92/95	92	92	92	95
Power Save	Nutek	Nutek	Nutek	Nutek
ISO-9241-3	Yes	No	Yes	Yes
Plug & Play	DDC1/2B	DDC1/2B	DDC1/2B	Yes
Footprint, WxD, mm	474x505		495x546	494x486
Warranty	3yrs P&L	3yrs, 2yrs CRT	3yrs P&L	3yrs P&L

P200 - Competitor Comparisons

P200 Compared to Sony 20SE2

The P200 is ISO compliant, the 20SE2 is not.

The 20SE2 has a smaller dot pitch than the P200 and can perform at a higher addressability.

The P200 has a full 3 year warranty, the 20SE2 CRT is limited to 2 years.

The P200 has ISO compliance which the Sony 20SE2 does not have.

P200 Compared to Philips 200T

The P200 has a higher line rate than the 200T.

The specifications of the P200 and the Philips 200T are very similar.

The P200 has a higher line rate than the Philips 200T.

P200 Compared to Eizo TXD7S

Compliance to the TCO-92 guidelines on electromagnetic emission is standard on the P200, the Eizo monitor has the later TCO-95.

The P200 has a slightly larger screen, it also has a larger stripe pitch, 0.31mm compared to 0.25mm of the TXD7S.

The P200 has a larger display area than the Eizo TXD7S.

P201 Competitive Analysis Matrix

Vendor Name	IBM	Compaq	Sony	Philips	Eizo	Iiyama
Model Name	P201	Q210	20SH	Brill 201	FXE7	Visionmaster 500
Size (Ins)	20	21	20	21	21	21
Viewable image size (In)	19.1	19.5	19.1	20.1	20	20
Glass Type	Trin	FST	Trin	FST	FST	FST
Dot Pitch (mm)	0.26	0.28	0.25	0.26	0.28	0.28
Glass Treatment	AG, AR, AS Bonded Panel	AG/AS	AR	ARASC	AG/AS	AR/AS
Chassis	Multifreq	Multifreq	Multifreq	Multifreq	Multifreq	Multifreq
Max H Freq. (kHz)	107	94	107	107	95	110
Addressability 1600x1200	77Hz	75Hz	85Hz	85Hz	75Hz	85Hz
1280x1024	85Hz	85Hz	85Hz	85Hz	88Hz	85Hz
User Controls	Digital	Digital	Digital	Digital	Digital	Digital
Advanced Controls	Conver H/V Moire	Col Temp Degauss Moire	Raster Rot Moire Conver H/V Col Temp	Degauss Moire	Degauss Conver H/V Moire Col Temp	
OSD	Yes	Yes	Yes	Yes	Yes	Yes
No. of Presets	9	6	9	15		6
MPR-II	Yes	Yes	Yes	Yes	Yes	Yes
TCO-92/95	92	92	92	95	95	No
Power Save	Nutek	Nutek	Nutek	Nutek	Energy	VESA
ISO-9241-3	Yes	Yes	Yes	Yes	Yes	Yes
Plug & Play	DDC1/2B	Yes	DDC1/2B	DDC1/2B	DDC1/2B	DDC1/2B
Footprint, WxD mm	474x505	508x559	474x502	536x551	494x486	493x490
Warranty	3yrs P&L	3yrs, Yr1 On-site L	3yrs P&L, 2yrs CRT	3yrs P&L	3yrs P&L	3yrs P&L

P201 - Competitor Comparisons

P201 Compared to Compaq Q210

The P201 is capable of operating at higher speeds than the Compaq Q210. This is used to permit higher addressability modes to be displayed at flicker free speed.

The Q210 has a FST tube compared to the superior Trinitron tube of the P201.

The P201 is a physically smaller box and therefore takes up less desk space.

The P201 is capable of higher addressability modes than the Compaq Q210.

P201 Compared to Sony 20SH

The P201 has superior screen coating which has lower level of reflection and produces a sharper crisper picture.

Sony 20SH and P201 are very similar in specification, though the CRT warranty on the Sony is only 2 years.

The P201 has a full 3 year warranty and a superior screen coating.

P201 Compared to Philips Brilliance 201

The Philips Brilliance 201 is classed as a 21 inch monitor, and as such provides a larger viewable image size, with a diagonal of 20.1 inches, compared to 19.1 for the P201. However, this is achieved at the expense of desk space. The Brilliance 201 has a footprint of 536 mm by 551 mm, compared to only 474 mm by 505 mm for the P201.

The P201 uses a Trinitron tube, with its perfectly flat vertical profile, compared to the FST used in the Philips monitor.

Compliance to the strict TCO-92 guideline on electromagnetic emission is standard on the P201, the Brilliance 201 has the later TCO-95 version.

The P201 has a smaller display area than the Philips Brilliance 201, but takes up less desk space, and uses the superior Trinitron CRT.

P201 Compared to Eizo FXE7

The Eizo FXE7 is classed as a 21 inch monitor, and as such provides a larger viewable image size, with a diagonal of 20 inches, compared to 19.1 for the P201.

The P201 uses a Trinitron tube, with its perfectly flat vertical profile, compared to the FST used in the FXE7.

Compliance to the TCO-92 guidelines on electromagnetic emissions is standard on the P201, but the FXE7 has the later TCO-95 version.

The P201 has a higher line rate and therefore is capable of higher addressabilities than the FXE7.

The P201 has a superior Trinitron CRT, and supports higher line rates.

P201 Compared to Iiyama Visionmaster 500

The Iiyama monitor is another 21-inch box, and as such, has a larger viewable image size. However, the Visionmaster 500 has only a FST tube compared to the superior Trinitron tube of the P201.

The P201 meets TCO-92 guidelines which the Iiyama monitor does not.

The P201 meets TCO-92 guidelines that the Iiyama Visionmaster 500 does not, and has the superior Trinitron tube.

Competitive Analysis Matrix - Glossary

Size

This refers to the nominal size of the tube used to make the monitor. It is larger than the viewable image size.

Viewable image size

This is the diagonal size, in inches, of the maximum area which the manufacturer claims can be used to display data. This viewable image size may only be achievable in some modes and not in others.

The values given for IBM monitors have been obtained by direct measurement of useable images.

The data for competitive monitors is that supplied in the vendor's sales literature. In some cases it has been determined from the maximum horizontal and vertical dimensions of the display area. This value may exceed the true diagonal measurement of the maximum display area, due to curvature of the glass and the bezel. In addition, different manufacturers define the maximum display area in different ways - the bezel aperture, the phosphor area, or the area swept by the electron beams. Therefore, the actual size of the largest useable image on some competitive monitors may be smaller than the figures given here.

Glass Type

This term describes the technology of the largest component of the monitor, the Cathode Ray Tube (CRT). The alternatives, in ascending order of Front Of Screen (FOS) quality, are

CRT - the conventional CRT.

FST (Flatter Squarer Tube) - a CRT with a much larger radius of curvature. This provides a much flatter surface on which to display an image, and consequently, it is possible to produce a much closer approximation to the printed page or worksheet, which are flat and distortion free.

However, the FST has three drawbacks compared to the conventional CRT.

- ◆ Geometry errors are more difficult to correct.
- ◆ Doming (distortion of the shadow mask, leading to loss of brightness, or in severe cases, losses of colour purity) is more of a problem and requires expensive countermeasures.
- ◆ Convergence is difficult to optimise.

In summary, while FST monitors can show significant FOS improvements over their conventional competitors, there will be a significant increase in cost.

Trinitron - A CRT type developed by Sony, and the similar **DiamondTron****, developed by Mitsubishi, are completely flat in the vertical plane. and only slightly curved in the horizontal plane. In other words, the glass surface of a Trinitron or DiamondTron CRT is a section cut

from a cylinder, rather than a section cut from a sphere in conventional CRT. These are also known as aperture grille CRTs.

In aperture grille CRTs, the different coloured phosphors are arranged in vertical stripes, rather than in the triangular groups of dots found in other types of CRT.

The Trinitron or DiamondTron tube produces less distorted images than other types of CRT. They also reduce glare, compared to other CRTs.

Dot Pitch

The center-to-center distance between two adjacent dots of the same colour. For Trinitron CRTs, the figure given is the stripe pitch.

The dot pitch is one of the factors limiting the size of the smallest feature which the monitor is capable of displaying.

Glass Treatment

AG - Anti Glare.

AR - Anti Reflective.

AS - Anti Static.

Glare, reflection and static can be reduced or eliminated either by coatings applied to the glass, by multi-layer films, or by multi-layer panels bonded to the glass. The most effective is a panel, followed by film. Coatings are the least effective method, with the two layer coatings listed below representing the state-of-the art.

AGS - Anti Glare Silicon coating

AGRAS - A two-layer coating technique with glare, reflection and static reducing properties.

This is a trade name. Equivalents are

ARECS

DARC

IRIS and

OPTICLEAR

Chassis

Most monitors produced now have multi-frequency (MultiFreq) chassis, which have the ability to lock in on horizontal and vertical synchronisation signals (from the PC or graphics adapter) of any frequencies within the ranges specified for the monitor. However, there are still some monitors produced at the low end of the market which have MultiMode chassis. These can only operate successfully with a specified set of horizontal and vertical synchronisation signal frequencies.

H Freq.

The minimum and maximum values, in kilohertz, of the horizontal synchronisation frequencies with which the monitor will work correctly. The higher the value of the maximum the better, as this will allow modes with higher addressabilities to be displayed without flickering.

Max. Addressability

Specified here is the maximum number of points which can be addressed on the monitor screen. It is given as the maximum number of points or pixels in a row by the maximum number of rows which can be displayed.

The higher these numbers are, the greater the amount of data the monitor is capable of displaying (assuming that the PC or graphics card is capable of driving that mode). Thus, higher numbers are better. Note, however, that as the number of points and lines increases, the size of features on the screen such as characters decreases. There is therefore a practical limit to worthwhile addressability for a given size of monitor.

User Controls

User controls may be analogue (wheels and knobs which rotate, or slider bars) or digital (buttons which are pressed repeatedly). Some monitors use a mixture of analogue and digital controls - some functions may have controls of one type, and some of another, or buttons may be used to select a function which is then adjusted by a multi-purpose knob.

Digital controls are held to be easier to use, and easier to repeat a previously used value. The other advantage of digital controls is that the electronics required to provide them also permit extra functions, such as remembering sets of preferred values for a number of modes which can be recalled automatically whenever that mode is resumed.

“Basic” controls that most monitors have include Brightness, Contrast, Horizontal Size and Position, Vertical Size and Position, Trapezoidal error (vertical edges of the image not parallel) correction, Pincushion error (vertical edges of the image curved) correction and Reset.

Premium monitors would be expected to have most of these. The one most often omitted is Reset. The P50, P70 and P200 do not have a control for trapezoidal error correction, as this function is performed automatically in these monitors.

Advance Controls

“Advanced” controls which a monitor might have include:

Manual Degauss - degaussing compensates for the magnetic field surrounding the monitor. This field is made up of the earth's magnetic field and the influences of other equipment nearby. Many monitors go through a degauss cycle on power up, but this control (where present) allows a degauss cycle to be performed at any time.

Parallelogram Error Correction - Parallelogram error is the condition where the top and bottom edges of the image are horizontal as required, but the vertical images are tilted. Unlike trapezoidal error, the left and right edges are parallel.

Tilt/Rotation - If the image is perfectly rectangular, but the edges are not parallel to the edges of the bezel aperture, it needs to be rotated.

Pincushion Balance - If there is a pincushion error which is more pronounced on one side of the image than the other, it cannot be corrected by the Pincushion Error Correction control alone. In this situation, it is necessary to balance the degree of pincushion error on each side first.

Hooking correction - If the vertical edges of the image are straight for most of their length, but bent at one or both ends, the monitor is said to suffer from hooking. Some manufacturers provide the means to adjust this type of error.

Vertical Linearity Correction - This is required in the situation where the spacing between a series of supposedly evenly spaced horizontal lines is not, in fact, even.

Focus - Some monitors allow the user to adjust the focus setting. It is quite difficult to differentiate focus errors from, say, misconvergence. It is therefore often better to leave the focus as it is set in the factory. This control is very rarely provided.

Convergence - Misconvergence is said to occur when the red, green and blue elements which together form a white line or character do not line up correctly. Controls may be provided for the correction of Horizontal Convergence, Vertical Convergence, a combination of both, or both individually.

Moiré Correction - this error causes the image, or part of it, to have an appearance like that of watered silk, a faintly perceptible pattern of irregular lines. Controls may be provided for the correction of Horizontal Moiré, Vertical Moiré, a combination of both, or both individually.

Colour Adjust - Some monitors allow the user to change the colour characteristics of the displayed image, either by selecting from a number of "colour points", or by adjusting the strength of the red, green and blue elements individually, or both.

OSD

Some monitors display to the user details of the mode in which it is operating and, during adjustment, feedback on the status of the controls.

This can either take the form of a small LCD (Liquid Crystal Display) or can be superimposed on the screen. This is known as On Screen Display (OSD).

No. of Presets

Multifrequency monitors have preloaded a set of preferred values for a number of modes which can be recalled automatically whenever that mode is resumed. A large number of presets increases the chances of modes suited to a particular graphics adapter and application set being available without the user having to do any adjustment.

MPR-II

A testing and labelling scheme run by SWEDAC, the Swedish Board for Technical Accreditation, concerning the level of electromagnetic emissions from the monitors.

It is thought by some that low-level electromagnetic emissions may have negative effects on health or comfort, although there is no scientific evidence of this. Conformance to MPR-II ensures that the product does not add appreciably to the background field found in a normal office environment.

TCO-91/92/95

The TCO-91 guidelines were produced by the Swedish Confederation of Professional Employees to define further reduced emission levels as compared to MPR-II.

A monitor which meets the NUTEK power management levels as well as TCO-91 then qualifies for TCO-92.

TCO-95 is an environmental labelling program incorporating existing national standards, best industry practice and market requirements into a single scheme. In particular, it incorporates requirements from existing ISO, IEC and EN standards, EC directive 90/270/EEC, TCO-91, NUTEK power saving guidelines, and material content and recycling requirements.

Power Save

VESA (the Video Electronics Standards Association) has set a standard for Display Power Management Signalling (DPMS). This standard has been widely adopted by both monitor manufacturers and PC manufacturers. Automatic Power management will be available and will work correctly for any VESA DPMS capable monitor used in association with and VESA DPMS enabled system unit, no matter who produces it.

The VESA DPMS scheme works by modifying the synchronisation signals sent from the system unit to the monitor. This can be performed either by dedicated circuitry, or by software running on the PC.

Power management may also be performed by other, proprietary methods such as motion detectors, or may require the user to actively switch the monitor into power saving mode.

- ◆ **Energy Star:** The monitor meets the requirements of the EPA's (the US Environmental Protection Agency) Energy Star Program. The requirement is that when idle, the monitor should switch in some manner into a state using no more than 30 Watts of power.
- ◆ **NUTEK:** A Swedish body which has set more stringent power saving criteria than those of the Energy Star program. The chief requirements are that in the lowest power state, power consumption should be less than 8 Watts. In addition, switching to lower power modes should occur automatically after a period of inactivity, and full activity should be rapidly restored when the keyboard is touched or a message is received from the computer or a network. An alternative means of compliance has also been specified, which requires a power consumption of 15 Watts in the lowest power state.

ISO-9241-3

ISO-9241 is an international standard concerning the ergonomics of workstations incorporating Display Screen Equipment, and part 3 relates to monitors and their characteristics, particularly their “Front-Of-Screen” characteristics.

A monitor can not be said to fully comply with ISO-9241-3 in isolation - it is the combination of monitor, system unit and software which complies or does not. A “yes” here simply means that under certain conditions the monitor is capable of compliance. For IBM monitors the conditions under which the monitor has been shown to comply with the standard are listed in the “Suppliers Declaration”, which also contain lists of system units and software with which the monitor has been tested

Plug and Play

DDC is another VESA standard, covering the communication of Data between the monitor and the PC. DDC capability is required to support Plug and Play, and other similar processes.

DDC1 allows the monitor to repeatedly send a packet of information to the PC. This data includes serial number, date of manufacture, model number, power management support, colour information and which display modes are supported.

DDC2, or DDC1/2B is like DDC1, but allows the PC to request particular information on demand.

DDC2A/B sets up a full bi-directional communications link between the PC and the monitor. Among other things, this allows the PC direct access to control the monitor's geometry settings.

Footprint (WxD) mm

The footprint of a monitor is not just the area of the base, contacting the work surface, but the total area occupied by the monitor, either by contact or by over-hanging. The width and depth of this are given in millimetres.

Warranty

The duration, and type, of warranty support

- ◆ P&L - Parts and Labour
- ◆ CRT - where the Cathode Ray Tube assembly has a different length of warranty to the other parts of the monitor (electronics, controls, etc.)

Available Marketing Material

<i>Item</i>	<i>IBM Reference</i>	<i>Description</i>
Monitors Product Reference Guide	OGEE120	1/3 A4, full colour, speeds and feeds for all the monitors, plus brief marketing/positioning text
G Series Monitors for general-purpose use	OGEE180	2pp, B&W, speeds and feeds and marketing
P Series Monitors for professional users	OGEE020	2pp, B&W, speeds and feeds and marketing
EU Regulations for Monitors - Information Brief	N/A	10pp, B&W, covers the EU Directive which mandates the minimum requirements for both office equipment and the environment necessary to protect the health and safety of the office workforce
Choosing the Right Monitor - Information Brief	N/A	7pp, B&W, helps to select the right monitor for a particular application
Tube technology - Information Brief	N/A	3pp, B&W, a closer look at CRT technologies
Graphics - Information Brief	N/A	7pp, B&W, a closer look at graphics subsystems
Technical Guide to IBM Monitors	N/A	140pp, B&W, technical background



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