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IBM InfoWindow II 3486/3488/3489 Marketing Reference Guide

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Purpose:

This guide provides:

- 3486/3488/3489 Features/Function Information
- · 3486/3488/3489 Feature Comparison Information
- · 3486/3488/3489 Ordering Information
- 3486/3488/3489 Limited Warranty/Service Information
- 3486/3488/3489 Technical Specifications Information
- 3488/3489-IBM PC Monitor attachment Information

This guide is intended for IBM Representatives, IBM Business Partners and IBM customers located in the United States as a reference document only.

For complete descriptions of the 3486/3488/3489, refer to:

- 3486/3487 Introduction and Planning Guide, GA18-7096
- 3486 User's Guide, GA18-7097
- · 3488-V Modular Display Station User's Guide, GA18-7646
- 3489-V Modular Display Station User's Guide, GA18-7492

IBM PSG Fax Systems and IBM Fax Service

To obtain a copy of this document, refer to "3486/3488/3489 Marketing Resources, Manuals," on page 21.

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What is an InfoWindow* II Display?

Family of Display Terminals for the AS/400*

- · IBM's easy to install, easy to use, low-cost AS/400 workstation.
- A choice of integrated (3486) or modular (3488/3489) design.
- · 3488/3489 modular design supports attachments of IBM's newest PC monitors, including:
 - G42: 14" Conventional CRT with a 13.2" viewable image size.
 - G51: 15" FST CRT with a 13.6" viewable image size.
 - G54: 15" FST CRT with a 13.7" viewable image size.
 - G74: 17" FST CRT with a 15.9" viewable image size.
 - G94: 19" FST CRT with a 17.8" viewable image size.
- Meets many international workplace standards and guidelines, such as ISO Standard 9241 Part 3, and MPR-II Guidelines.
- Meets the US Environmental Protection Agency (EPA) "Energy Star" program. Note: EPA, as a matter of policy, does not endorse any particular company or product.

3486/3488/3489 Function Highlights

- 3489 Unique:
 - View and locally print single-page monochrome image and facsimile
 - PC/TV** attachment, 5250 Video Delivery
- 3488/3489 Unique:
 - Modular Design: Modular Logic Unit (desk or wall mount) and Keyboard. Requires attachment of an IBM PC color monitor.
 - Shared-Addressing
 - Four-Display+Printer (DDD+P) host sessions
 - Foreground and Background Color Selection
 - 262,000 color palette
 - Light Pen for mouse emulation
 - Screen Formats: 24 by 80, 32 by 80, 43 by 80, 49 by 80 and 27 by 132 (PC Monitor dependent)
- 3486 Unique:
 - Integrated Design: Green Monochrome Monitor, keyboard and Tilt/Swivel Stand
 - Screen Formats: 24 by 80
- 3486/3488/3489 Common:
 - Enhanced User Interface
 - IBM Mouse
 - Variable Vertical or Horizontal Split Screen
 - 3812-SCS Printer Emulation
 - Support of IBM and non-IBM printers, including: IBM LaserPrinter*, ExecJet*, InkJet* and HEWLETT-PACKARD LaserJet** III
 - Calculator
 - Advanced Power Management, Expansion Cartridge

3486/3488/3489 Functions

Host Display+Printer Sessions

Allows the user to configure the display to have multiple display and printer host sessions. 3486 supports a maximum of Two-display+printer (DDP) sessions, and the 3488/3489 supports a maximum Four-display+printer (DDDDP) sessions.

Physical Screen Formats

- · Allows the user to configure the display in the following physical screen formats:
 - 24 rows by 80 columns (Mode 2)
 - 32 rows by 80 columns (Mode 3)
 - 43 rows by 80 columns (Mode 4)
 - 27 rows by 132 columns (Mode 5)
 - 49 rows by 80 columns (Mode 6 Twin Screen Mode)
- Physical Screen Format support is monitor dependent, refer to "3486/3488/3489 Feature Comparison Table" on page 12 or to "IBM PC Monitor Attachment Support: 3488/3489" on page 17.
- Twin Screen Mode, combined with two or more configured display sessions, allows the user to view two full display (Mode 2) sessions in a top-bottom combination.

Variable Vertical/Horizontal Split Screen

- Combined with two or more configured host display sessions, allows the user to view two simultaneous displays session in physical screen format modes 2-5 either in a topbottom or side-by-side combination.
- The user can dynamically move *Split Line* up/down or left/right using the Alt-F2 or Alt-F3 keys. The user can *swap* the display sessions using the Alt-F8 key. These actions can also be done by using the IBM mouse or light-pen.

Enhanced User Interface

- The Enhanced User Interface improves the user interface of AS/400 applications that display items, such as: menu bars/pull-downs, pop-up windows, selection fields, selection lists, pushbuttons, using the following special symbols: scroll bars, check boxes, radio buttons and window frames.
- Users can use the mouse or light pen for menu bar selections, pushbutton and scroll bar operations which enhances user productivity.
- For programming information on the Enhanced User Interface, refer to the following publications:
 - "Data Description Specification Reference V2.3" SC41-9620
 - "Data Description Specification Reference V3.1" SC41-3712
 - "Guide to Programming Applications and Help Displays" SC41-0011
 - "5494 Remote Control Unit Functions Reference" SC30-3533

Image/Fax-View and Print (3489)

- The 3489 can display and locally print a single-page monochrome image or facsimile.
- Designed for AS/400 applications that support image or facsimile. For example; IBM's Facsimile Support/400* (V2 R3, V3 R0.5 or V3 R1) and IBM's ImagePlus* Workfolder Application Facility/400 (V2 R4).
- The 3489 supports IOCA, PCX and TIFF image formats. The 3489 supports scrolling, reverse image, rotation and scaling image viewing manipulations. All image manipulations are performed within the 3489.
- The AS/400 application displays a pop-up Image/Fax Viewport. The AS/400 application determines the size and location of the Image/Fax Viewport.
- Using the IBM mouse or lightpen, the user can locally scroll the image in any direction. The image moves at the same rate and direction as the IBM mouse moves. Using the Local Control Scale Up feature, the user can define a magnify area in the Image/Fax Viewport. The magnify area is scaled to the size of the Image/Fax Viewport. Through the AS/400 application, the user can rotate the image 0, 90, 180 or 270 degrees. Also through the AS/400 application, the user can scale up/down the image. The 3489 supports a scaling range of 3% to 400%.
- An image, either displayed or non-displayed, in the 3489 can be printed on the following 3489 locally attached printers: IBM's LaserPrinter* (4019, 4029, 4039), IBM's ExecJet* II (4076) or HEWLETT-PACKARD LaserJet** III. Note: Depending on the resolution of the image/fax and the orientation of the image printing (landscape or portrait), additional memory for the printers may be required.
- For programming information on Image/Fax, refer to "5494 Remote Control Unit Functions Reference" SC30-3533

Shared-Addressing (3488/3489)

- Allows up to four display sessions use, in other words, share a single workstation address. Shared Addressing increases the total number of possible display sessions per twinaxial workstation controller port from 7 to 28, which increases the total number of possible display sessions that can be supported by the workstation controller. Shared Addressing reduces workstation controller and cabling costs when two, three, or four display sessions is required.
- For 3488 support of Shared-Addressing, PTF MF10166 or later is required.

PC/TV** Attachment, 5250 Video Delivery (3489)

- Supports attachment of TECMAR Multimedia PC/TV** which provides end users the capability to display and control audio as well as full-motion color analog video using an antenna, cable, or external video source, in a movable, sizable pop-up window. Control of audio and full-motion color analog video is possible through local 3489 keyboard control and/or through an AS/400 application with the capability of OS/400 5250 Video Delivery.
- Potential applications include: education/training, closed circuit monitoring for medical, banking, or warehouse/distribution operations.
- Requires the following attachment cables: RJ(Male) to Mini-Din(Female) Cable, part number 66G8046, and RJ(Female) to Mini-Din(Male) Cable, part number 66G8047.
- For programming information on 5250 Video Delivery, refer to "5494 Remote Control Unit Functions Reference" SC30-3533.

IBM Mouse

- An IBM mouse can be attached to enhance keyboard operation of advanced host and local functions. Designed for use with:
 - Advanced Host Functions:
 - Enhanced User Interface
 - AS/400 Simple Hot Spots
 - Automatic Cursor Position
 - Copy/Paste
 - Reset Operator Error
 - Advanced Local Functions:
 - Moving the image in the Image/Fax Viewport (3489)
 - Locally scale up the image in the Image/Fax Viewport (3489)
 - Moving the vertical/horizontal split line when in split screen mode
 - Jumping between sessions
 - Scrolling the session window
 - Changing the split screen format between vertical and horizontal
 - Calculation using the calculator help screen
 - Selecting display and printer setup parameters in the setup menus
 - Sizing of the trim frame for local print or calculator box summation

Lightpen (3488/3489)

 A FTG Data Systems, PXL-780 light pen can be attached to the mouse port for mouse emulation of left button, right button, and double click for use with host and local functions. Note: The IBM mouse can be used with the light-pen concurrently.

Record-Play-Pause

• Enables the user to store 1,500 (3486) or 6,000 (3488/3489) frequently used keystroke sequences for later playback, thereby increasing productivity. 3488/3489 also supports record/play of local (print, calculator) function keys.

Vital Product Data

 Sends display information to the AS/400 for centralized asset management. Display information includes: Machine Type, Model and Serial Number.

Address Lock-out (3488/3489)

• The 3488/3489 automatically senses already active addresses so a customer does not select an occupied address which result in device errors.

Calculator

- Allows the user to perform calculations locally without the need for host application support. Provides for storing and retrieving of numeric data, as well as frequently used mathematical expressions.
- Calculation operations occur in the Operator Information Area keeping the session totally viewable, and a help screen is available to assist the user when required.
- The user can import data from an application to perform a calculation. Calculator Export provides export capability of data from OIA area to the AS/400 application.
- 3488/3489 provides box summation capability.

262,000 Color Palette (3488/3489)

 Allows the user to change the displayed color of: foreground colors, background colors for each display session, ruler/bar cursor, window frame/pushbutton frame, mouse pointer, vertical/horizontal display session divider line, image foreground/background colors.

Foreground/Background Color Selection (3488/3489)

- 3488/3489 allows the user to select the foreground and a background color from a 262,000 color palette. Background colors provide for quick host display session identification when multiple sessions are configured.
- Foreground/Background color can be specified for the image/fax displayed in the Image/Fax Viewport (3489). The user can change the black-on-white image/fax to whatever combination of two preferred colors.

Extended Foreground Colors (3488/3489)

- Extended Foreground Colors increases the number of AS/400 application displayed colors from 7 to 14, enhancing the appearance of color applications.
- For programming information on Extended Foreground Colors, refer to "5494 Remote Control Unit Functions Reference" SC30-3533.

Reverse Image

- Allows the host to reverse the screen image, display dark characters on light background or light characters on dark background.
- Supported on the 3486 monochrome models or 3488/3489 with an attached Black-on-White capable monitor.

Auto Dim

 Blanks the display screen after a period of inactivity thereby preserving the screen phosphor. See also "Advanced Power Management (3486)." and "Advanced Power Management (3488/3489)."

Advanced Power Management (3486)

- Turns off components not used during periods of inactivity which reduces power consumption up to 66%.
- Stages of power management are: Standby, and Inactive Standby.
- Meets the US EPA "Energy Star" program.

Advanced Power Management (3488/3489)

 Supports power management to US EPA Energy Star levels for selected IBM PC monitors. For a list of supported monitors, refer to "IBM PC Monitor Attachment Support: 3488/3489" on page 17.

Security Lock

- Allows the user to lock the display preventing its unauthorized use.
 - 3486 A removable physical key is used to lock the display.
 - 3488/3489 A software password is used to lock the display.

Extended Character Buffer (ECB)

- · Displays the attributes in hexadecimal format.
- Presentation Space (PS), Primary ECB (ECB1), Secondary ECB (ECB2) and Foreground Color ECB (ECB3) are supported.

Local/Host Print

 The parallel printer port can be used for local printing, or for host directed printing. For a description of Local and Host Print, refer to "3486/3488/3489 Parallel Printer Port: Printer Attachment" on page 9.

Printer Definition Table (PDT) Download

- Allows the user to customize their printer environment; to support printers not listed in "3486/3488/3489 Parallel Printer Port: Printer Attachment" on page 9, or to enable additional functions (color support, font mapping, EBCDIC to ASCII translation, or multiple bin support) on printers by downloading a PDT from the AS/400.
- For programming information on the Printer Definition Table Download, refer to "AS/400 OS/400 Workstation Customization Guide Version 2.2" SC41-0056.

ASCII Transparency Mode

- Enables the display to "pass through" ASCII Hex data to the attached device (printer) to the parallel port. This could be used to control printer special features, such as, color printing, bar code printing, and enhanced laser printer features.
- For programming information on ASCII Transparency Mode, refer to "AS/400 Printing II"GG24-3704.

Code Update Table

• Enables support personnel to update the software code in the 3486, 3488 or 3489 from the AS/400 without requiring display hardware to be changed. This allows for IBM to provide functional enhancements based on unique customer requirements, or correct possible field reported problems.

AS/400, S/36 System Attachment

Programming Support (3486)

IBM System Configuration	3486 as
AS/400 with OS/400 V2 R2.0 or later	3486
AS/400 with OS/400 V1 R2.0 to V2 R1.1	3476
AS/400 with OS/400 V1 R1.0 or R1.1	3196
5494 R1.1 on AS/400 with OS/400 V2 R2.0 or later	3486
5494 R1.0 on AS/400 with OS/400 V2 R1.1 or later	3476
5394 R2.0 on AS/400 with OS/400 V1 R2.0 or later	3476
5394 R1.0 on AS/400 with OS/400 V1 R1.0 or later	3196
S/36, or 5394 on S/36, or 5259, or 5294	3196

Programming Support (3488)

IBM System Configuration	Group 1	Group 2
AS/400 with OS/400 V2 R2.0 or later AS/400 with OS/400 V1 R2.0 to V2 R1.1 AS/400 with OS/400 V1 R1.0 or R1.1 5494 R1.1 on AS/400 with OS/400 V2 R2.0 or later 5494 R1.0 on AS/400 with OS/400 V2 R1.1 or later 5394 R2.0 on AS/400 with OS/400 V1 R2.0 or later 5394 R1.0 on AS/400 with OS/400 V1 R1.0 or later 5394 R1.0 on AS/400 with OS/400 V1 R1.0 or later S/36, or 5394 on S/36, or 5259, or 5294	3487 HC 3197 C 3197 C 3487 HC 3197 C 3197 C 3197 C 3197 C 3197 C	3487 HC 3477 FC 3197 C 3487 HC 3477 FC 3477 FC 3197 C 3197 C

Group IBM PC Monitor

80-column capable IBM PC color monitors

132-column capable IBM PC color monitors

Note: For more information, including information on the viewable image size, refer to "IBM PC Monitor Attachment Support: 3488/3489" on page 17.

Programming Support (3489)

1

2

IBM System Configuration	Group 1	Group 2
AS/400 with OS/400 V2 R2.0 or later	3487 HC	3487 HC
5494 R1.1 on AS/400 with OS/400 V2 R2.0 or later	3487 HC	3487 HC
5394 R2.0 on AS/400 with OS/400 V1 R2.0 or later	3197 C	3477 FC

Group IBM PC Monitor

1 80-column capable IBM PC color monitors

2 132-column capable IBM PC color monitors

Note: For more information, including information on the viewable image size, refer to "IBM PC Monitor Attachment Support: 3488/3489" on page 17.

5250: Advanced Functions

Description

Enhanced User Interface, Image/Fax, Shared Addressing, Extended Foreground Colors, 5250 Video Delivery, Calculator Export and PDT Download, is described in "3486/3488/3489 Functions" on page 2.

Copy/Paste: Allows the user to copy and paste characters within the same display session or between two separate display sessions. Two modes are supported: Linear (sequential string marked by starting and ending positions) and Block (rectangular area). Linear copy requires shift key, followed by primary button press, dragging, and then releasing. Block copy requires the shift key, followed by primary button press/release/press (within user-specified double click interval), dragging, and then releasing. Paste operations occur by pressing shift key, followed by secondary button press. The same data can be pasted unlimited times, until display is powered off, or another copy is performed.

AS/400 Simple Hotspots: AS/400 Menu Hotspots allows navigation through AS/400 (or similarly constructed) menus without keyboard interaction by placing the mouse pointer on a menu item and clicking the primary mouse button. AS/400 Menu Hotspots have the following form: "xxn.yzzzzz" where x is a blank, null, or display attribute; n is a one to two digit number; y is a blank or null; zzzzz is text. Command Key Hotspots allows the user to place the mouse pointer on the command (F1-F24) keys and press the primary mouse button. Command Key Hotspots have the following form: "Fn=", where n is a one or two digit number between 1 and 24. The user can scroll a file by pressing the primary mouse button on "+", "-", "More...", or "Bottom" characters. Pressing the secondary mouse button simulates the pressing of the Enter key.

Advanced 5250 Function	OS/400 Prerequisite	Local Twinax Controller	5494 Remote Controller	
Image/Fax	V3 R1 with PTF MF09310 later V3 R0.5 with PTF MF08864 or later V2 R3 with PTF MF08863 or later	New	R3.0 or later	
Shared Addressing	V3 R1 or later	New	R3.0 or later	
5250 Video Delivery	Video Delivery V3 R1 with PTF MF09310 or later V3 R0.5 with PTF MF08864 or later V2 R3 with PTF MF08863 or later		R3.1 or later	
Extended Foreground Colors	V2 R3 or later	Any	R2.0 or later	
Enhanced User Interface	V2 R2 or later	New	R1.1 or later	
Calculator Export, Copy/Paste, Hot Spots	V2 R2 or later	New	R2.0 or later	
PDT Download	V2 R2 or later	Any	R2.0 or later	
Keyboard Customization, Code Update Table	V2 R2 or later	Any	R1.1 or later	
Note: New: Refers to new (V2	R2 or later) local twinax controllers: #2661, #6	6050, #915A type	controller.	
-	22.0 or later) local twinax controllers: #2661, # controllers: #2638, #6040, #6140.	#6050, #915A type	controller and	

System Prerequisites:

3486/3488/3489 Parallel Printer Port: Printer Attachment

• The parallel printer port can be used for local printing, or for host directed printing when the display is configured for a printer session.

Local Print

- · Screen Print: All screen data is printed.
- Trim Print: All the data defined by the trim area (rectangle) on the screen is printed.
- Image Print (3489): The image in the 3489 can be printed on the IBM 4019, 4029, 4039, 4076 and HEWLETT-PACKARD LaserJet** III printers.

Host Print

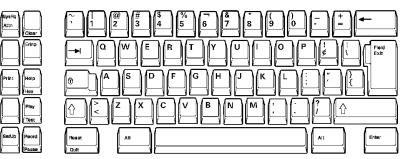
- The display emulates IBM 5256, IBM 4214, or IBM 3812-SCS printers. The following table lists the supported printers. For other printers not listed, refer to "Printer Definition Table (PDT) Download" on page 6
- IBM 3812-SCS Printer includes support for Computer-Output Reduction (COR) function. COR, along with Automatic Page Orientation, provides automatic adjustment of print output on selected page printers. Automatic adjustment includes: page orientation (rotation), font selection, lines per inch, and top/left margins. COR allows printer output to be modified automatically without changing paper settings.

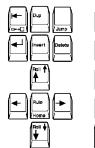
Printer	5256	4214	3812-SCS		
IBM Proprinter* I (4201-1)	Yes	Yes			
IBM Proprinter II (4201-2)	Yes	Yes			
IBM Proprinter III (4201-3)	Yes	Yes			
IBM Proprinter XL (4202-1,2)	Yes	Yes			
IBM Proprinter XL III (4202-3)	Yes	Yes			
IBM Proprinter X24E (4207-2)	Yes	Yes	Yes		
IBM Proprinter XL24E (4208-2)	Yes	Yes	Yes		
IBM Quietwriter* Printer (5201-1)	Yes				
IBM Quietwriter II Printer (5201-2)	Yes				
IBM Quietwriter III Printer (5202)	Yes	Yes	Yes		
IBM Quickwriter Printer (5204)	Yes	Yes	Yes		
IBM Personal Page Printer (4216-10)	Yes	Yes	Yes		
IBM Proprinter 24P (IBM 4212)	Yes	Yes	Yes		
IBM LaserPrinter (4019-001, E01)	Yes	Yes	Yes-COR		
IBM LaserPrinter (4029) ¹	Yes	Yes	Yes-COR		
IBM LaserPrinter (4039)	Yes	Yes	Yes-COR		
IBM Personal Printer Series II (2380/2381)	Yes	Yes			
IBM Personal Printer Series II (2390/2391)	Yes	Yes	Yes		
IBM InkJet* (IBM 4070)	Yes	Yes	Yes		
IBM ExecJet* (IBM 4072)	Yes	Yes	Yes		
IBM ExecJet* (IBM 4076)	Yes	Yes	Yes		
IBM 4226 Printer Model 302	Yes	Yes			
HEWLETT-PACKARD** ThinkJet**	Yes	Yes			
HEWLETT-PACKARD LaserJet** III	Yes	Yes	Yes-COR		
Notes:	•		1		
The IBM LaserPrinter 4039 is supported by the 3489 only.					

3486/3488/3489 Keyboards

122-Key Typewriter Keyboard

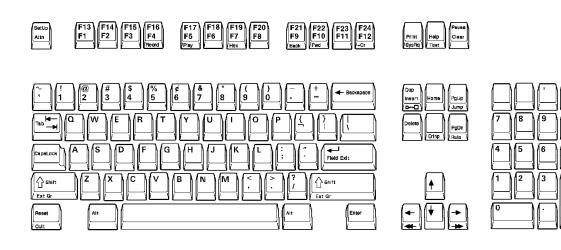








102-Key IBM Enhanced Keyboard



International Standards, Guidelines and Programs

ISO Standard 9241 Part 3

This standard, developed by the ISO (International Organization for Standardization), addresses the following aspects of the monitor's operation:

- Character size, spacing, shape and clarity
- · Screen linearity, "squareness", image stability -flicker and jitter
- Reflections and glare
- · User controls brightness and contrast

MPR-II Guidelines

This guideline, developed by the SWEDAC (Swedish Board for Technical Accreditation), recommends the limits for electric, magnetic, and electrostatic fields from workstations.

US EPA "Energy Star" Program

A voluntary US EPA program for facilitating energy efficient office technology products.

The 3486 all models, and the 3488/3489 with selected IBM monitors meets the EPA "Energy Star" Program. For a list of supported monitors for attachment to the 3488/3489 refer to "IBM PC Monitor Attachment Support: 3488/3489" on page 17.

3486/3488/3489 Warranty, Maintenance, Service (US only)

Limited Warranty

- 3486 includes a one-year or a three-year IBM On-Site Repair (IOR) limited warranty for the entire warranty period.
- 3488/3489 includes a one-year or a three-year limited warranty. First year of warranty is IBM On-site Repair (IOR). The second and third year of warranty is Customer Carry-In Repair (CCR) via mail-in. Note: Customers can upgrade to IOR for the second and third year of warranty.
- For information regarding the terms and conditions of IBM's statement of limited warranty, please call 1-800-772-2227 in the U.S. or 1-800-465-7999 in Canada. In other countries, contact your IBM representative. Copies of IBM's statement of limited warranty are available upon request.

Maintenance

• Following the warranty period, optional IBM On-Site Repair (IOR) maintenance, for a fee, is available.

Service

 To obtain service, contact your reseller or call IBM at 1-800-IBM-SERV (426-7378). Note: Proof of purchase may be required.

3486/3488/3489 Feature Comparison Table

Feature	3486-BG	3488-V	3489-V
Design	Integrated	Modular	Modular
CRT Monitor	14" Mono	Selectable	Selectable
Viewable Image Size	11.3"	Note 1	Note 1
Refresh Rate (hz)	75	Note 1	Note 1
Brightness Control	Yes	Yes ¹	Yes ¹
Contrast Control	Yes	Yes ¹	Yes ¹
Tilt/Swivel Stand	Yes	Yes ¹	Yes ¹
Desk/Floor/Wall Mount		Yes	Yes
24 x 80 (Mode 2) Screen Format	Yes	Yes	Yes
32 x 80 (Mode 3) Screen Format		Yes	Yes
43 x 80 (Mode 4) Screen Format		Yes ¹	Yes ¹
27 x 132 (Mode 5) Screen Format		Yes ¹	Yes ¹
49 x 80 (Twin) Screen Format		Yes ¹	Yes ¹
Maximum Host Sessions	DDP	DDDDP	DDDDP
Shared Addressing		Yes	Yes
			X
Image/Fax PC/TV** Attachment			Yes Yes
5250 Video Delivery			Yes
Variable Split Screen	Yes	Yes	Yes
Enhanced User Interface	Yes	Yes	Yes
IBM Mouse	Yes	Yes	Yes
Light Pen		Yes	Yes
		165	165
Color Palette (colors)		262,000	262,000
Background Color Selection		Yes ¹	Yes ¹
Foreground Color Selection		Yes ¹	Yes ¹
Extended Foreground Colors		Yes ¹	Yes ¹
Reverse Image	Yes	Yes ¹	Yes ¹
Record/Play/Pause (keystrokes)	1,500	6,000	6,000
Address Lock-out		Yes	Yes
Vital Product Data	Yes	Yes	Yes
Extended Character Buffer	Yes	Yes	Yes
Calculator	Yes	Yes	Yes
Parallel Printer Port	Yes	Yes	Yes
Host, Local Screen-Trim Print	Yes	Yes	Yes
Local Image Print			Yes
5256/4214/3812 Printer Emulations	Yes	Yes	Yes
Printer Definition Table Download	Yes	Yes	Yes
ASCII Transparency Mode	Yes	Yes	Yes
Code Update Table	Yes	Yes	Yes
Auto Dim	Yes	Yes	Yes
Advanced Power Management	Yes	Yes ¹	Yes ¹
Security Lock	Key	Password	Password
MPR-II Guidelines	Yes	Yes ¹	Yes ¹
ISO Standard 9241 Part 3	Yes	Yes ¹	Yes ¹
US EPA "Energy Star" Program	Yes	Yes ¹	Yes ¹
One or three-year Limited Warranty	Yes	Yes	Yes
Notes:		I	I
1 Function is monitor dependent			

3486/3488/3489 Ordering: Machine-Model-Feature (via AAS)

Machine-Model Feature Code	Description				
3486-BG1	Green video element, 1-year limited warranty 4				
3486-BG3	Green video element, 3-year limited warranty 4				
3486-BGZ	AS/400 Total System Package (TSP) model 3486-BG3 3				
3488-V11	3488 Modular Logic Unit only (no IBM PC monitor), 1-year limited warranty 4				
3488-V13	3488 Modular Logic Unit only (no IBM PC monitor), 3-year limited warranty ⁴				
3488-V1Z	AS/400 Total System Package (TSP) model 3488-V13 3,5				
3489-V11	3489 Modular Logic Unit only (no IBM PC monitor), 1-year limited warranty ⁴				
3489-V13	3489 Modular Logic Unit only (no IBM PC monitor), 3-year limited warranty 4				
3489-V1Z	AS/400 Total System Package (TSP) model 3489-V13 3,5				
FC5000	AS/400 Total Systems Package Specify (TSP only, required)				
FC5900	AS/400 Total Systems Package Twinax 20-ft cable (TSP only1)				
FC9122	3486/3488/3489 122-key Typewriter Keyboard				
FC9131	3486/3488/3489 102-key IBM Enhanced Keyboard				
FC9201	3486 Tilt/Swivel Stand				
FC9986	3486/3488/3489 Power cord 6 foot for Chicago, IL.				
FC5182	IBM Mouse ²				
Notes:	1				
1 Orderable for u	1 Orderable for up to two TSP models per AS/400.				
2 Not available of	n TSP models.				
3 Available only v	vith AS/400 Total System Package (TSP) system orders.				
	nation, refer to "3486/3488/3489 Warranty, Maintenance, Service (US only)" on page 11.				

5 IBM offers a 6546-0AZ (G54 TSP) PC Monitor.

3486/3488/3489 Ordering: Part Number (via GEMS)

Part Number	Machine-Model	Monitor ¹	Limited Warranty ²	Keyboard	Stand
49G2461	3486-BG1	Green Video	1 year	122-Typewriter	Tilt-Swivel
49G2462	3486-BG1	Green Video	1 year	102-Enhanced	Tilt-Swivel
49G2473	3486-BG3	Green Video	3 year	122-Typewriter	Tilt-Swivel
49G2474	3486-BG3	Green Video	3 year	102-Enhanced	Tilt-Swivel
66G1845	3488-V11	Not Included	1 year	122-Typewriter	
66G1847	3488-V11	Not Included	1 year	102-Enhanced	
66G1860	3488-V13	Not Included	3 year	122-Typewriter	
66G1862	3488-V13	Not Included	3 year	102-Enhanced	
66G7725	3489-V11	Not Included	1 year	122-Typewriter	
66G7727	3489-V11	Not Included	1 year	102-Enhanced	
66G7740	3489-V13	Not Included	3 year	122-Typewriter	
66G7742	3489-V13	Not Included	3 year	102-Enhanced	

- 1 For more information on IBM PC Monitor attachment to the 3488/3489, refer to "IBM PC Monitor Attachment Support: 3488/3489" on page 17.
- 2 For more information, refer to "3486/3488/3489 Warranty, Maintenance, Service (US only)" on page 11.

3486/3488/3489 What Is Provided

3486 Model BG

- 14" FST (11.3" Viewable Image Size) Green Monochrome CRT Video Element.
- · Tilt/Swivel (T/S) Stand
- · Connecting the IBM 3486 to System/36 or AS/400 manual

3488 Model V

• 3488 Modular Logic Unit without an IBM monitor. Note: For more information about IBM monitors, refer to "IBM PC Monitor Attachment Support: 3488/3489" on page 17.

3489 Model V

• 3489 Modular Logic Unit without an IBM PC monitor. Note: For more information about IBM PC monitors, refer to "IBM PC Monitor Attachment Support: 3488/3489" on page 17.

3486/3488/3489 Common

- Keyboard:
 - 122-key Typewriter or
 - 102-key IBM Enhanced
- · Power Cord 9 foot or 6 foot (Chicago only)
- Auto Termination Unit
- · User's Guide
- 1-year or 3-year limited warranty. For warranty information, refer to "3486/3488/3489 Warranty, Maintenance, Service (US only)" on page 11.

3486/3488/3489 Element Part Numbers

Item	Manufactured Part Number	Ordering Part Number
3486-BG Green Video	06G6331	06G6330
3486 Tilt/Swivel (T/S) Stand	09F4221	23F1841
3486 User's Guide Ship Group	06G9677	06G9669
3488-V Modular Logic Unit	66G1721	66G1721
3488 User's Guide Ship Group	66G1733	66G1764
3489-V Modular Logic Unit	66G7665	66G7665
3489-V User's Guide Ship Group	66G7671	66G7687
122-key Typewriter Keyboard	1394167	1394167
102-key IBM Enhanced Keyboard	1394193	1394193
Power Cord 9 ft.	6952300	6952300
Power Cord 6 ft. (Chicago)	6952301	6952301
Auto Termination Unit	23F3794	23F3794
RJ (Male) to Mini-Din (Female) Converter Cable	66G8046	66G8046
RJ (Female) to Mini-Din (Male) Converter Cable	66G8047	66G8047

3486 Technical Specifications

Physical

Element	Width	Depth	Height	Weight
Video with tilt/swivel stand	334 mm (13.1 in.)	328 mm (12.9 in.)	344 mm (13.5 in.)	9.1 kg (20.0 lb)
122-key Typewriter Keyboard	533 mm (21.0 in.)	215 mm (8.5 in.)	64 mm (2.5 in.)	2.5 kg (5.5 lb)
102-key IBM Enhanced Keyboard	488 mm (19.2 in.)	210 mm (8.3 in.)	40 mm (1.6 in.)	2.3 kg (5.1 lb)

Element	Tilt	Swivel
Tilt/Swivel Stand	+15 ° to -5 °	+/- 90 °

Format, Resolution, Viewable Image Size

Format	Resolution	Viewable Image Size
80 columns by 24 rows (Mode 2)	720 pels by 404 pels	235 mm by 166 mm
Notes:		
Resolution and Viewable Image Size includes the	divider and Operator Information	n Area (OIA).

Environmental

Environment	Temperature	Relative Humidity	Wet Bulb
Operating	10.0 - 40.0°C (50 - 105°F)	8 - 80%	27.0°C (80°F)
Non-Operating	10.0 - 52.0°C (50 - 125°F)	8 - 80%	27.0°C (80°F)

Electrical

Voltage	Power	Consumption	Heat Output
100 - 250 V ac, 50/60 Hz, Single Phase	0.06 kV A, 0.3 - 0.6 A	30 watts (Avg.)	102 BTU/hr

3488/3489 Technical Specifications

Physical

Element	Width	Depth	Height	Weight
Modular Logic Unit	322 mm (12.7 in.)	322 mm (12.7 in.)	60 mm (2.4 in.)	2.6 kg (5.7 lb)
Modular Logic Unit Floor mount	322 mm (12.7 in.)	60 mm (2.4 in.)	360 mm (14.2 in.)	3.2 kg (7.1 lb)
122-key Typewriter Keyboard	533 mm (21.0 in.)	215 mm (8.5 in.)	64 mm (2.4 in.)	2.5 kg (5.5 lb)
102-key IBM Enhanced Keyboard	488 mm (19.2 in.)	210 mm (8.3 in.)	40 mm (1.6 in.)	2.3 kg (5.1 lb)

Screen Formats, Resolution

Supported screen formats and screen resolution is monitor dependent. For a list, refer to "IBM PC Monitor Attachment Support: 3488/3489" on page 17.

Environmental (Modular Logic Unit Only)

Environment	Temperature	Relative Humidity	Wet Bulb
Operating	10.0 - 40.0°C (50 - 104°F)	8 - 80%	27.0°C (81°F)
Non-Operating	10.0 - 60.0°C (34 - 140°F)	5 - 80%	29.0°C (84°F)

Electrical (Modular Logic Unit Only)

Voltage	Power	Consumption	Heat Output
100 - 250 V ac, 50/60 Hz, Single Phase	0.020 kVA, 0.2 A	11 watts (Avg.)	37 BTU/hr

IBM PC Monitor Attachment Support: 3488/3489

General

The following table lists the supported IBM monitors:

- **Monitor**: Lists the Machine Type-Model. Optional monitor Brand Name is listed in parenthesis. Not all monitors are available in every geography.
- **Tube Size and Type**: Tube Size is the CRT diagonal dimension and the Tube Type is the CRT technology.
- · Viewable Image Size: Lists the monitor's viewable image size.
- · Notes: List any notes that may apply to a monitor.
- M2 (Mode 2): Supports 24 rows by 80 columns (Mode 2) screen format. Italics/Underscore indicate ISO 9241 Part 3 compliant.
- M3 (Mode 3): Supports 32 rows by 80 columns (Mode 3) screen format. Italics/Underscore indicate ISO 9241 Part 3 compliant.
- M4 (Mode 2): Supports 43 rows by 80 columns (Mode 4) screen format. Italics/Underscore indicate ISO 9241 Part 3 compliant.
- **M5 (Mode 5)**: Supports 27 rows by 132 columns (Mode 5) screen format. Italics/Underscore indicate ISO 9241 Part 3 compliant.
- M6 (Mode 6): Supports 49 rows by 80 columns twin screen (Mode 6) format.
- RR (Refresh Rate): Lists the monitor's operating refresh rate.
- **Group**: Defines the screen resolution (Group A or Group B) when operating in M2, M3, M4, M5 or M6.

Screen Formats	Resolution - Group A	Resolution - Group B
80 columns by 24 rows (M2/Mode 2)	960 pels by 529 pels	720 pels by 479 pels
80 columns by 32 rows (M3/Mode 3)	960 pels by 499 pels	720 pels by 466 pels
80 columns by 43 rows (M4/Mode 4)	960 pels by 664 pels	720 pels by 444 pels
132 columns by 27 rows (M5/Mode 5)	1188 pels by 508 pels	1188 pels by 480 pels
80 columns by 49 rows (M6/Twin Screen)	960 pels by 654 pels	Not Supported

Notes:

Resolution - Group A allows the monitor the capability to display characters using an ergonomic character font.

- Monitor Adapter: The monitor adapter part number required. IBM includes an adapter with every 3488 or 3489. If the adapter is not used, monitor operates as follows:
 - M2, M3, M4 is supported, M5 or M6 is not supported.
 - Power Management to US EPA Energy Star levels are not supported.
 - Monitors operate in 60 hz refresh rate.
 - Monitors operate in Group B screen resolution (ergonomic character font is not supported).

Monitor	Tube and Size Type	Viewable Image Size	M2	М3	M4	M5	M6	RR	Group	Monitor Adapter
6540(G42)	14" Conv.	13.2"	Yes	Yes		Yes		75	А	96G1999
6540(G42) 4	14" Conv.	13.2"	Yes	Yes	Yes	Yes		75	В	
6541(G51)	15" FST	13.6"	Yes	Yes		Yes		75	A	96G1999
6541(G51) ⁴	15" FST	13.6"	Yes	Yes	Yes	Yes		75	В	
6546-xAx(G54)	15" FST	13.7"	Yes	Yes	Yes	Yes	Yes	75	A	96G1999
6547-xAx(G74)	17" FST	15.9"	Yes	Yes	Yes	Yes	Yes	75	A	96G1999
6549-x0x(G94)	19" FST	17.8"	<u>Yes</u>	Yes	Yes	Yes	Yes	75	A	96G1999
6542-1xx(G40)	14" Conv.	12.3"	Yes	Yes	Yes			60	В	
6542-1xx(G40) 1,2	14" Conv.	12.3"	Yes	Yes	Yes	Yes		72	В	
6542-3xx(G41)	14" Conv.	13.0"	Yes	Yes	Yes	Yes	Yes	75	A	96G1999
6543-3xx(G50)	15" FST	13.4"	Yes	Yes	Yes	Yes	Yes	75	A	96G1999
6546-x0x(G52)	15" FST	13.6"	Yes	Yes	Yes	Yes	Yes	75	A	96G1999
6544-xxx(G70) ³	17" FST	15.7"	Yes	Yes	Yes	Yes	Yes	75	A	96G1999
6547-x0x(G72)	17" FST	15.7"	Yes	Yes	Yes	Yes	Yes	75	A	96G1999
6545-xxx(G200)	20" Conv.	18.4"	Yes	Yes	Yes	Yes	Yes	75	A	96G1999
6324(14V)	14" Conv.	13.0"	Yes	Yes	Yes	Yes	Yes	75	A	
6325(15V)	15" FST	13.7"	Yes	Yes	Yes	Yes	Yes	75	A	
6327(17V)	17" FST	15.6"	Yes	Yes	Yes	Yes	Yes	75	A	
9524(14P)	14" Conv.	13.0"	Yes	Yes	Yes	Yes	Yes	75	A	
9525(15P)	15" FST	13.7"	Yes	Yes	Yes	Yes	Yes	75	A	
9527(17P) ³	17" Conv.	15.4"	Yes	Yes	Yes	Yes	Yes	75	A	
6527	9" Conv.	8.0"	Yes	Yes	Yes			60	В	

Notes:

1 By default, the 6542-1xx operates at M2, M3, M4 at 60Hz Refresh Rate. The 6542-1xx is capable of operating in M2, M3, M4, M5 at 72Hz Refresh Rate. Function must be manually selected by:

 To enable M2, M3, M4, M5 at 72Hz Refresh Rate, using '3488/3489 Resolution Override Option: From the 3488/3489, press 'ALT-F20' from 'Test Workstation' menu, press 'F3' to change the indicator on status line to "M2", then press 'Enter' to save.

2 The 6542-1xx supports power saver to US EPA Energy Star Levels. Function must be manually selected by:

- To enable Power Management: From the 3488/3489, press 'ALT-F18' from 'Test Workstation' menu, press 'F2' to change the indicator on status line to "S1", then press 'Enter' to save.
- 3 The 6544, 9527 are capable of ISO compliance in M2. Function must be manually selected by:
 - To enable ISO compliant Alternate Font type, using '3488/3489 Resolution Override Option: From the 3488/3489, press 'ALT-F20' from 'Test Workstation' menu, press 'F7' to change the indicator on status line to "M6", then press 'Enter' to save.
- **4** The 6540, 6541 is capable of operating in M2, M3, M4, M5 at 75Hz Refresh Rate, Group 'B' Screen Resolution, and Power Management. Function must be manually selected by:
 - · Remove the Monitor adapter.
 - To enable Power Management: From the 3488/3489, press 'ALT-F18' from 'Test Workstation' menu, press 'F2' to change the indicator on status line to "S1", then press 'Enter' to save
 - To enable M2, M3, M4, M5 at 75Hz Refresh Rate, using '3488/3489 Resolution Override Option: From the 3488/3489, press 'ALT-F20' from 'Test Workstation' menu, press 'F5' to change the indicator on status line to "M4", then press 'Enter' to save.

Resolution Override Option

This sections describes the 3488/3489 Resolution Override option. This option overrides the default resolution and refresh rate, of the monitor attached, with one of Resolution Override Modes shown in the table below. The following may be used for the monitor to display Mode 5 (27 rows by 132 columns) or Mode 6 Twin Screen (49 rows by 80 columns) if the monitor has the capability.

Note: If you do override with a resolution which does not meet, or exceeds, the capability of the monitor attached, unpredictable results can occur.

ased on IBM Monitor ¹ attached 60 60 60 72 72 72 72 72 72 72 75	Based on IBM Monitor 1 attached 31.5 KHz 31.5 KHz 31.5 KHz 37.8 KHz 37.8 KHz 37.8 KHz 37.8 KHz 37.8 KHz
60 60 72 72 72 72 72 75	31.5 KHz 31.5 KHz 37.8 KHz 37.8 KHz 37.8 KHz 37.8 KHz
72 72 72 72 75	37.8 KHz 37.8 KHz 37.8 KHz
-	20 E KU-
75 75	39.5 KHz 39.5 KHz 39.5 KHz
75 75 75 75	39.5 KHz 39.5 KHz 39.5 KHz 39.5 KHz 39.5 KHz
75 75 75 75 75 75	41.7 KHz 41.7 KHz 55.3 KHz 46.6 KHz 55.3 KHz
75 75 75 75 75 75	41.7 KHz 41.7 KHz 55.3 KHz 46.6 KHz 55.3 KHz
-	75 75 75 75 75 75 75 75 75 75

2 The character font displayed meets the ISO Standard 9241 Part 3

The following steps can be followed for Resolution Override.

- 1. Enter 3488/3489 'Off-line Setup' by press and holding the spacebar while the 3488/3489 is powered on.
- 2. In 'Off-line Setup' select 'Test Workstation'.
- Display current resolution mode by pressing and holding the Alt key, then press the F20 key. One of the following symbols appears in the Operator Information Area which indicate the current mode, resolution and refresh rate:

 M0 The resolution, refresh rate are set in the default mode of the monitor attached.
 M1 The resolution, refresh rate are set in Resolution Override Mode 1.
 M2 The resolution, refresh rate are set in Resolution Override Mode 2.
 M3 The resolution, refresh rate are set in Resolution Override Mode 3.
 M4 The resolution, refresh rate are set in Resolution Override Mode 4.
 M5 The resolution, refresh rate are set in Resolution Override Mode 5.
 M6 The resolution, refresh rate are set in Resolution Override Mode 6.

 Select desired Resolution Override Mode by pressing one of the following function keys to change the mode of the resolution and refresh rate.
 - F1: Set the resolution, refresh rate to the default mode.
 - F2: Set the resolution, refresh rate to Resolution Override Mode 1.
 - F3: Set the resolution, refresh rate to Resolution Override Mode 2.
 - F4: Set the resolution, refresh rate to Resolution Override Mode 3.
 - F5: Set the resolution, refresh rate to Resolution Override Mode 4.
 - F6: Set the resolution, refresh rate to Resolution Override Mode 5.
 - F7: Set the resolution, refresh rate to Resolution Override Mode 6.
- 5. Save the new Resolution Override Mode by pressing the Enter key. To cancel and not change the current Resolution Mode, press the Reset key.
 - **Note:** In off-line mode the screen panel is displayed with the default resolution. The resolution override is not activated until you exit to on-line operation.

3486/3488/3489 Marketing Resources, Manuals,

IBM PSG Fax System (1-800-IBM-3395)

Fax Doc#	Item
10015	InfoWindow II 3486/3488/3489 - Marketing Reference Guide
11103	General Purpose Monitors (G42,G51,G54,G74,G94) - Specification Sheet
11152	Monitors (G42,G51,G54,G74,G94,P72,P92,P202,9514,9516) Product Reference Guide

IBM Fax Service (1-800-IBM-4FAX)

Fax Doc#	Item
1712	InfoWindow II 3486/3488/3489 - Marketing Reference Guide
4261	General Purpose Monitors (G42,G51,G54,G74,G94) - Specification Sheet
4262	Monitors (G42,G51,G54,G74,G94,P72,P92,P202,9514,9516) Product Reference Guide

Manuals

Form Number	Item
GA18-7096	InfoWindow II 3486/3487 Introduction and Installation Planning Guide
GA18-7097	InfoWindow II 3486 User's Guide
GA18-7646	InfoWindow II 3488-V User's Guide
GA18-7492	InfoWindow II 3489-V User's Guide
GA18-7099	Connecting the InfoWindow II 3486 to System/36 or AS/400
SY18-2335	InfoWindow II 3481 and 3486 Maintenance Information
SY18-2338	InfoWindow II 3483-V and 3488-V Maintenance Information
SY18-2345	InfoWindow II 3489-V Maintenance Information

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