

**6517-6LN  
E74M Color Monitor  
User Guide**

**ENGLISH**



## Safety: Read first

Before installing this product, read the Safety Information.

Avant d'installer ce produit, lisez les consignes de sécurité.

Vor der Installation dieses Produkts die Sicherheitshinweise lesen.

Πριν εγκαταστήσετε το προϊόν αυτό, διαβάστε τις πληροφορίες ασφάλειας (safety information).

לפני שתתקינו מוצר זה, קראו את הוראות הבטיחות.

A termék telepítése előtt olvassa el a Biztonsági előírásokat!

Prima di installare questo prodotto, leggere le Informazioni sulla Sicurezza

Antes de instalar este produto, leia as Informações de Segurança.

Läs säkerhetsinformationen innan du installerar den här produkten.

Prije instalacije ovog produkta obavezno pročitajte Sigurnosne Upute.

Les sikkerhetsinformasjonen (Safety Information) før du installerer dette produktet.

Przed zainstalowaniem tego produktu, należy zapoznać się z książką "Informacje dotyczące bezpieczeństwa" (Safety Information).

Пред да се инсталира овој продукт, прочитајте информацијата за безбедност.

Pred inštaláciou tohto zariadenia si peôitajte Bezpeônostné predpisy.

Pred namestitvijo tega proizvoda preberite Varnostne informacije.

Ennen kuin asennat tämän tuotteen, lue turvaohjeet kohdasta Safety Information

Pred instalací tohoto produktu si přečteš příručku bezpečnostních instrukcí.

在安裝本產品之前，請仔細閱讀 **Safety Information** (安全信息)。

安裝本產品之前，請先閱讀「安全資訊」。

مع، يجب قراءة ذات السلامة

Læs sikkerhedsforskrifterne, før du installerer dette produkt.

製品の設置の前に、安全情報をお読みください。

본 제품을 설치하기 전에 안전 정보를 읽으십시오.

Antes de instalar este producto lea la información de seguridad.

Antes de instalar este produto, leia as Informações de Segurança.

Перед установкой продукта прочтите инструкции по технике безопасности.

Lees voordat u dit product installeert eerst de veiligheidsvoorschriften.

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## First Edition (April / 2002)

Note : For important information, refer to the Monitor Safety and Warranty manual that comes with this monitor.

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## Precautions

### Workplace Preparation

#### Positioning the Monitor

Choose a suitable place to position the monitor where it is not near fluorescent desk lighting or any equipment that produces magnetic fields that could cause interference. Ensure that the furniture or equipment can support the weight of the monitor. Allow at least 50mm (2 in.) ventilation space around the monitor.

#### Height

Position the monitor so that the top of the screen is slightly below your eye level when you sit at your workstation.

#### Orientation

- Choose a position that gives the least reflection from lights and windows, usually at a right angle to any windows.
- Position the monitor directly in front of you so that you do not have to twist your body.
- Tilt the monitor to a comfortable viewing angle.

### Working Practices

#### Rest

Take regular breaks. Vary your posture, and stand up and stretch occasionally as prolonged use of computer workstations can be tiring.

#### Back

Sit back in the chair and use the back rest.

#### Hands

Use a light touch on the keyboard, keeping your hands and fingers relaxed. Allow a space in front of the keyboard to rest your wrists when not typing. Consider using a wristpad.

#### Eyesight

Working with monitors, in common with any prolonged close work, can be visually demanding. Look away from the screen periodically and have your eyesight checked regularly.

## Precautions

### Screen settings

Set the screen brightness and contrast to a comfortable level. You may have to adjust this as the lighting changes during the day. Many application programs let you select color combinations which can help you to view in comfort.

### Power Cord

For safe operation, use the power cord supplied with the unit.

### Notes

- Do not install the monitor in a location near heat sources such as radiators or air ducts, or in a place subject to direct sunlight, or excessive dust or mechanical vibration or shock.
- Save the original shipping carton and packing materials, as they will come in handy if you ever have to ship your monitor.
- To keep the monitor looking new, periodically clean it with a soft cloth. Stubborn stains may be removed with a cloth lightly dampened with a mild detergent solution. Never use strong solvents such as thinner, benzene, or abrasive cleaners, since these will damage the cabinet. As a safety precaution, always unplug the monitor before cleaning it.

## Monitor Driver Installation

### Driver installation for Windows 95 or Windows 98

**To use the Plug and Play feature in Microsoft®Windows®95 or Windows 98, files should be loaded from the *IBM Monitor CD*.**

1. Turn off the computer and all attached devices.
2. Ensure that the monitor is connected correctly.
3. Turn on the monitor and then the system unit. Allow the system to boot into Windows 95 or Windows 98.  
Your computer's Plug and Play code may warn you that your system hardware has changed. This means that it has detected your new monitor for the first time.
4. Open the **DISPLAY PROPERTIES** window by clicking **START, SETTINGS, CONTROL PANEL** and then double - clicking on the **DISPLAY** icon.
5. Click the **SETTINGS** tab.

**• In case of Windows 95 :**

- 6 - 1. Click the **CHANGE DISPLAY TYPE** button.  
2. Click the **CHANGE MONITOR TYPE** button.

**• In case of Windows 98 :**

- 6 - 1. Click the **ADVANCED** button.  
2. Click the **MONITOR** tab.  
3. Open the **UPGRADE DEVICE DRIVER WIZARD** window by clicking on **CHANGE** button and then select the **NEXT** button.  
4. Click the "Display a list of the known drivers for this device so that I can choose a specific driver" and then select the **NEXT** button.
7. Insert the IBM Monitor CD into the CD drive: and click the **HAVE DISK** button.
8. Click OK.
9. Ensure that the CD drive letter is selected.
10. Choose **IBM E74M** monitor and Click OK. The files will be copied from the CD to your hard disk drive.
11. Close all open windows and remove the CD.
12. Restart the system.

The system will automatically select the maximum refresh rate and corresponding Color Matching Profiles.

## Monitor Driver Installation

### Driver installation for Windows 2000 or Windows Me

**To use the Plug and Play feature in Microsoft Windows 2000 or Microsoft Windows Millennium Edition(Me) files should be loaded from the *IBM Monitor CD*.**

1. Turn off the computer and all attached devices.
2. Ensure that the monitor is connected correctly.
3. Turn on the monitor and then the system unit. Allow the system to boot into Windows 2000 or Windows Me.
4. Open the **DISPLAY PROPERTIES** window by clicking **START, SETTINGS, CONTROL PANEL** and then double - clicking on the **DISPLAY** icon.
5. Click the **SETTINGS** tab.
6. Click the **ADVANCED** button.
7. Click the **MONITOR** tab.
8. Click the **PROPERTIES** button.
9. Click the **DRIVER** tab.
10. Open the **UPGRADE DEVICE DRIVER WIZARD** window by clicking on **UPDATE DRIVER** and then Click the **NEXT** button.
11. Select the "Display a list of the known drivers for this device so that I can choose a specific driver" and then Click the **NEXT** button.
12. Insert the IBM Monitor CD into the CD drive: and click the **HAVE DISK** button.
13. Click OK.
14. Ensure that the CD drive letter is selected.
15. Choose **IBM E74M** monitor and Click OK. The files will be copied from the CD to your hard disk drive.
16. Close all open windows and remove the CD.
17. Restart the system.

The system will automatically select the maximum refresh rate and corresponding Color Matching Profiles.

## Monitor Driver Installation

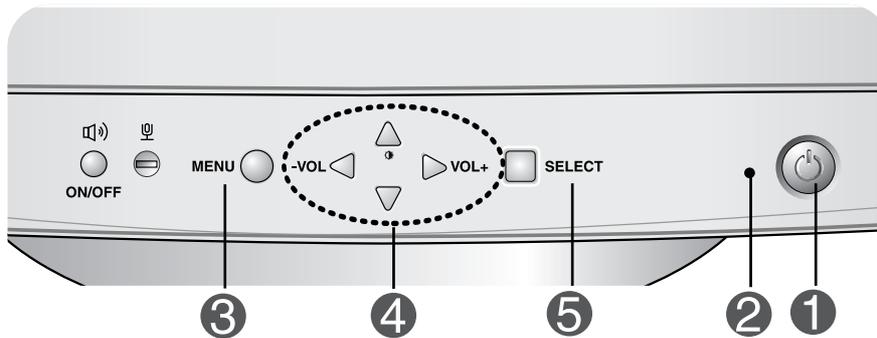
### Driver installation for Windows XP

To use the **Plug and Play** feature in Microsoft Windows XP files should be loaded from the *IBM Monitor CD*.

1. Turn off the computer and all attached devices.
2. Ensure that the monitor is connected correctly.
3. Turn on the monitor and then the system unit. Allow the system to boot into Windows XP.
4. Open the **DISPLAY PROPERTIES** window by clicking **START, SETTINGS, CONTROL PANEL** and then double - clicking on the **DISPLAY** icon.
5. Click the **SETTINGS** tab.
6. Click the **ADVANCED** button.
7. Click the **MONITOR** tab.
8. Click the **PROPERTIES** button.
9. Click the **DRIVER** tab.
10. Open the **HARDWARE UPDATE WIZARD** window by clicking on **UPDATE DRIVER** and then Click the **NEXT** button.
11. Select the "Install from a list or Specific location(Advanced)" and then Click the **NEXT** button.
12. Insert the IBM Monitor CD into the CD drive: and click the **HAVE DISK** button.
13. Click OK.
14. Ensure that the CD drive letter is selected.
15. Choose **IBM E74M** monitor and Click OK. The files will be copied from the CD to your hard disk drive.
16. Close all open windows and remove the CD.
17. Restart the system.  
The system will automatically select the maximum refresh rate and corresponding Color Matching Profiles.

# Control Panel Functions

## Front Panel Controls



Control	Function
<b>1</b> Power Button	Use this button to turn the monitor on or off.
<b>2</b> Power Indicator	This Indicator lights up green when the monitor operates normally. If the monitor is in power saving mode, this indicator color changes to amber.
<b>3</b> MENU (or OSD) Button	Use this button to enter or exit the on screen display.
<b>4</b> ▲▼/◀▶ Buttons	Use these buttons to choose or adjust items in the on screen display.
<b>5</b> SELECT (or SET) Button	Use this button to enter a selection in the on screen display.

Control	Direct Access Function
	▲→◀▶ Buttons Bring up Contrast adjustment
	▲→▲▼ Buttons Bring up Brightness adjustment
The Contrast and Brightness functions are also available in the On Screen Display (OSD) menu.	

## On Screen Display (OSD) Control Adjustment

### Screen Adjustment

#### NOTE

- Allow the monitor to stabilize for at least 30 minutes before making image adjustments.

To make adjustments in the On Screen Display, follow these steps:

**MENU** → ▲ ▼ → **SELECT** → ▲ ▼ ◀ ▶ → **SELECT** → **MENU**

- 1** Press the **MENU** (or **OSD**) Button, then the main menu of the OSD appears.
- 2** To access a control, use the ▲ or ▼ Buttons. When the icon you want becomes highlighted, press the **SELECT** (or **SET**) Button.
- 3** Use the ▲ ▼/◀ ▶ Buttons to adjust the item to the desired level.
- 4** Accept the changes by pressing the **SELECT** (or **SET**) Button.
- 5** Exit the OSD by pressing the **MENU** (or **OSD**) Button.

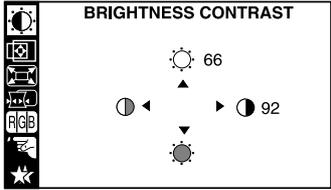
## On Screen Display(OSD) Selection and Adjustment

The following table indicates all the On Screen Display control, adjustment, and setting menus.

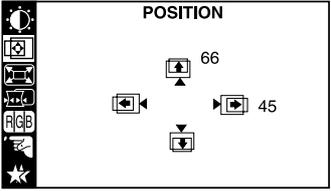
Main menu	Sub menu		Reference	
 BRIGHTNESS/ CONTRAST	Brightness	●	To adjust the brightness and contrast of the screen	
	Contrast	●		
 POSITION	V Position	●	To adjust the position of the screen	
	H Position	●		
 SIZE	V Size	●	To adjust the size of the screen	
	H Size	●		
 SHAPE	Tilt	●	To adjust the shape of the screen	
	Side Pincushion	●		
	S Pincushion Balance	●		
	Parallelogram	●		
	Trapezoid	●		
 COLOR	PRESET	6500K	●	To customize the color of the screen
		9300K	●	
	Temp	●		
	R/G/B(User Color)	●		
 SETUP	Video Level	●	To customize the screen status for a user's operating environment	
	Language	●		
	OSD Time	●		
 SPECIAL	Degauss	●	To improve the clarity and stability of the screen	
	Recall	●		
	Reset	●		
	Moire	H Moire		●
		V Moire		●
● : Adjustable				

# On Screen Display(OSD) Selection and Adjustment

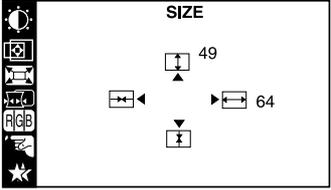
## To adjust the brightness and contrast of the screen

OSD Adjust	Description
	<p><b>Brightness</b> To adjust the brightness of the screen.</p> <p><b>Contrast</b> To adjust the contrast of the screen.</p>

## To adjust the position of the screen

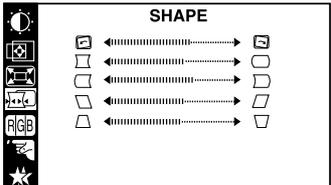
OSD Adjust	Description
	<p><b>Vertical Position</b> To move image up and down.</p> <p><b>Horizontal Position</b> To move image left and right.</p>

## To adjust the size of the screen

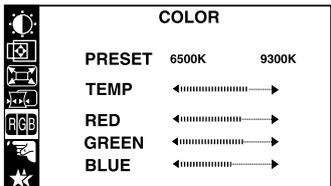
OSD Adjust	Description
	<p><b>Vertical Size</b> To adjust image height.</p> <p><b>Horizontal Size</b> To adjust image width.</p>

## On Screen Display(OSD) Selection and Adjustment

### To adjust the shape of the screen

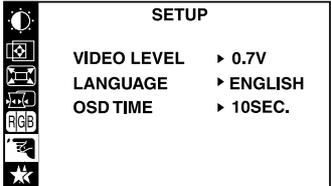
OSD Adjust	Description
	<p><b>Tilt</b> To correct image rotation.</p> <p><b>Side Pincushion</b> To correct a concave or convex bowing of the image.</p> <p><b>Side Pincushion Balance</b> To correct the balance of both sides bowing.</p> <p><b>Parallelogram</b> To correctly adjust the skew of the image.</p> <p><b>Trapezoid</b> To correct geometric distortion.</p>

### To customize the color of the screen

OSD Adjust	Description
	<p><b>PRESET 6500K/ 9300K</b> Select the screen color. • 6500K: Slightly reddish white. • 9300K: Slightly bluish white.</p> <p><b>TEMP</b> Select the screen temperature which you prefer among reddish or bluish or any color in between.</p> <p><b>RED</b> <b>GREEN</b> <b>BLUE</b> Set your own color levels.</p>

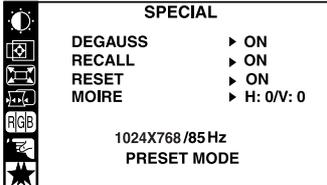
## On Screen Display(OSD) Selection and Adjustment

To customize the screen status for a user's operating environment

OSD Adjust	Description
 A screenshot of the OSD Setup menu. On the left is a vertical column of icons: a sun, a monitor, a language icon, a clock, and a star. The main area contains the text: 'SETUP', 'VIDEO LEVEL ▶ 0.7V', 'LANGUAGE ▶ ENGLISH', and 'OSD TIME ▶ 10SEC.'	<p><b>VIDEO LEVEL</b> This item is used to select the monitor's input signal level. The normal level used for most PCs is 0.7V. If the screen becomes suddenly washed-out or blurred, please select 1.0V and try again.</p> <p><b>LANGUAGE</b> To choose the language in which the control names are displayed. OSD Menus are available in 11 languages: English, German, French, Spanish, Italian, Swedish, Finnish, Portuguese, Korean, Chinese and Russian.</p> <p><b>OSD TIME</b> Set the OSD time, i.e. the length of time a menu will remain on-screen before it shuts off automatically. Adjust the time to 5, 10, 20, 30 or 60 seconds.</p>

## On Screen Display(OSD) Selection and Adjustment

### To improve the clarity and stability of the screen

OSD Adjust	Description
 <p>The screenshot shows the OSD menu with the following text:</p> <pre> SPECIAL DEGAUSS      ▶ ON RECALL       ▶ ON RESET        ▶ ON MOIRE        ▶ H: 0/V: 0  1024X768 /85Hz PRESET MODE                     </pre>	<p><b>DEGAUSS</b> To manually demagnetize the screen to avoid showing incorrect images or colors.</p> <p><b>RECALL</b> You can use this function to reload the modified parameters for screen display operation, as specified by the user after purchase: <i>Position, Size, Side Pincushion, Side Pincushion Balance, Parallelogram, Trapezoid</i> (These recalled options may differ depending on the mode selected: <i>Preset, User, or New</i>). If you don't want to recall the monitor to these modified settings, use the ▲ ▼ button to select CANCEL and then press the SELECT (or SET) button.</p> <p><b>RESET</b> Return to all factory default settings except "LANGUAGE, BRIGHTNESS, CONTRAST": <i>Tilt, Color 9300K, Video Level, OSD Time, Moire</i> (These reset options may differ depending on the mode selected: <i>Preset, User, or New</i>). If you don't want to reset the monitor, use the ▲ ▼ button to select CANCEL and then press the SELECT (or SET) button.</p> <p><b>MOIRE</b> This item allows you to reduce the degree of moire. (Moire is caused by interference Horizontal Scan Line with the periodical dot screen). It is normally OFF(H:0/V:0). The moire adjustments may affect the focus of the screen. Moire adjustments may shake slightly while the moire reduction function is on.</p>

## Troubleshooting

### No image appears

- |  |  |
|--|--|
| <ul style="list-style-type: none"><li>● <b>Is the power cord of the monitor connected?</b></li><li>● <b>Is the power indicator light on?</b></li><li>● <b>Is the power on and the power indicator green?</b></li><li>● <b>Is the power indicator amber?</b></li><li>● <b>Do you see an "OUT OF FREQUENCY" message on the screen?</b></li><li>● <b>Do you see a "SELF DIAGNOSTICS" message on the screen?</b></li></ul> | <ul style="list-style-type: none"><li>• Check and see if the power cord is connected properly to the power outlet.</li><li>• Press the Power button.</li><li>• Adjust the brightness and the contrast.</li><li>• If the monitor is in power saving mode, try moving the mouse or pressing any key on the keyboard to bring up the screen.</li><li>• This message appears when the signal from the PC (video card) is out of horizontal or vertical frequency range of the monitor. See the 'Specifications' section of this manual and configure your monitor again.</li><li>• This message appears when the signal cable between your PC and your monitor is not connected. Check the signal cable and try again.</li></ul> |
|--|--|

### The screen is flickering.

- |   |   |
|---|---|
| <ul style="list-style-type: none"><li>● <b>Is the vertical frequency less than 70Hz or is your monitor set to the interlaced mode?</b></li><li>● <b>Do you have any magnetic material such as adapter, or high-voltage line near to your monitor?</b></li><li>● <b>Do you hear a "~ding" sound while the monitor is flickering?</b></li></ul> | <ul style="list-style-type: none"><li>• Set the vertical frequency to 72Hz or higher, and consult the video card user manual for instructions on converting to a non-interlaced mode. (You can set this option under the Display icon of the Control Panel.)</li><li>• Remove magnetic sources, such as power adapters, speakers, or high-voltage lines, away from the monitor.</li><li>• Use the normal degaussing function. This function clears the screen and reduces any screen blur that may occur due to the surrounding magnetic field. The screen may flicker for about 5 seconds, accompanied by a "~ding" sound.</li></ul> |
|---|---|

## Troubleshooting

### The screen color is not normal.

- |   |   |
|---|---|
| <ul style="list-style-type: none"><li>● <b>Do you see basic discoloration (16 colors)?</b></li><li>● <b>Is the screen color unstable or monochrome?</b></li><li>● <b>Do you see a partial blurring on the screen?</b></li></ul> | <ul style="list-style-type: none"><li>• Set the color depth to 256 colors or higher. use 'Control Panel' → 'Display' → 'Settings' → 'Color Palette'</li><li>• Check the connection of the signal cable.</li><li>• This happens due to interference from surrounding magnetic fields, as created when speakers, steel structures, or high-voltage lines are placed near the monitor. Remove any such materials from the immediate vicinity and use the DEGAUSS icon on the screen adjustment menu to fix the screen.</li></ul> |
|---|---|

### I see an after-image on the screen.

- |   |   |
|---|---|
| <ul style="list-style-type: none"><li>● <b>Do you see the after-image even when you turn off the monitor?</b></li></ul> | <ul style="list-style-type: none"><li>• A premature aging of the monitor pixels may cause the prolonged display of a single image on the screen. Be sure to use a screen saver to maximize the service life of the monitor.</li></ul> |
|---|---|

### I see waves on the screen.

- |  |  |
|--|--|
| <ul style="list-style-type: none"><li>● <b>Do you see the wave directly on the screen?</b></li></ul> | <ul style="list-style-type: none"><li>• This occurs in inverse proportion to the screen focus, which can be caused by a particular frequency or video card. Brighten the screen and use the 'MOIRE' icon on the screen adjustment menu to adjust the screen.</li></ul> |
|--|--|

### Have you installed the monitor driver?

- |   |   |
|---|---|
| <ul style="list-style-type: none"><li>● <b>Have you installed the monitor driver?</b></li></ul> | <ul style="list-style-type: none"><li>• Be sure to install the monitor driver from the IBM Monitor CD that comes with your monitor.</li></ul> |
|---|---|

## Specifications

<b>Picture Tube</b>	17 inches (16.0 inches viewable) 90 degree deflection 0.26mm diagonal, 0.23mm horizontal dot pitch AGARAS(Anti-Glare Anti-Reflective Anti-Static) coating	
<b>Sync Input</b>	<b>Horizontal Freq.</b>	30 - 70kHz (Automatic)
	<b>Vertical Freq.</b>	50 - 160Hz (Automatic)
	<b>Input Form</b>	Separate TTL, Positive/Negative
	<b>Signal Input</b>	15 pin D-Sub Connector
<b>Video Input</b>	<b>Input Form</b>	Separate, RGB Analog, 0.7Vp-p/75 ohm, Positive
	<b>Resolution(max)</b>	1280 x 1024@60Hz
<b>Plug&amp;Play</b>	DDC 2B	
<b>Power Consumption</b>	<b>Normal</b>	≤ 90 W
	<b>Power Off</b>	≤ 5 W
<b>Dimensions &amp; Weight (with tilt/ swivel stand)</b>	<b>Width</b>	45.0 cm / 17.7 inches
	<b>Height</b>	39.9 cm / 15.7 inches
	<b>Depth</b>	41.6 cm / 16.4 inches
	<b>Net</b>	15.2 kg (33.51 lbs)
<b>Power Input</b>	AC 100-240V 50/60Hz 2.0A	
<b>Environmental Conditions</b>	<b>Operating Conditions</b>	
	<b>Temperature</b>	0°C to 40 °C
	<b>Humidity</b>	10 % to 90 % non-Condensing
	<b>Storage Conditions</b>	
	<b>Temperature</b>	-20°C to 60 °C
	<b>Humidity</b>	5 % to 90 % non-Condensing
<b>Tilt/Swivel Stand</b>	Detached	
<b>Signal cable</b>	Attached	
<b>Power cord</b>	Detached	
<b>Regulations</b>	TCO95	

## Specifications

### Preset Modes (Resolution)

	Display Modes (Resolution)		Horizontal Freq. (kHz)	Vertical Freq. (Hz)
1	VESA	640 x 480	31.47	60
2	VESA	640 x 480	37.50	75
3	VESA	640 x 480	43.27	85
4	VESA	720 x 400	31.47	70
5	VESA	720 x 400	37.93	85
6	VESA	800 x 600	46.88	75
7	VESA	800 x 600	53.68	85
8	MFI	960 x 529	41.775	75
9	VESA	1024 x 768	60.02	75
10	VESA	1024 x 768	68.677	85

## Using the Audio Functions

### Side Jacks

	<b>Headphone Jack</b> 	A headphone jack that automatically mutes the speaker volume when headphones plugged in.
	<b>Microphone Jack</b> 	An external microphone can be used instead of the built-in microphone.

### Rear Panel Jacks

	<b>Audio In</b> - Sky Blue	Connects to the *LINE OUT jack of the PC sound card.
	<b>Mic Out</b> - Pink	Connects to the microphone jack of the PC sound card.

### Microphone Operation

Using this jack reduces the length of cable needed to reach the PC's sound card. In order to use the MIC jack, use a cable to plug into the rear of the monitor (MIC OUT) and into the MIC input jack of your sound card (if available).

### \*LINE OUT

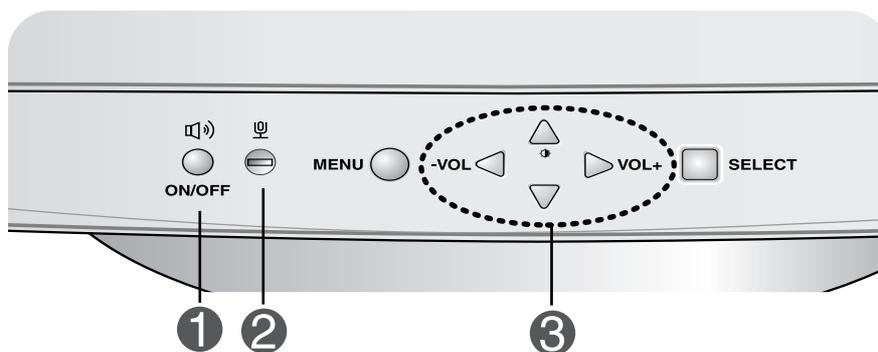
A terminal used to connect to the speaker including a built-in amplifier (Amp). Make sure that the connecting terminal of the PC sound card is checked before connecting. If the Audio Out of PC sound card has only Speaker Out, reduce the PC volume.

#### NOTE

- If the Audio Out of the PC supports both Speaker Out and Line Out, Please use the Line Out function (Refer to the PC Manual).

## Using the Audio Functions

### Front Panel Controls

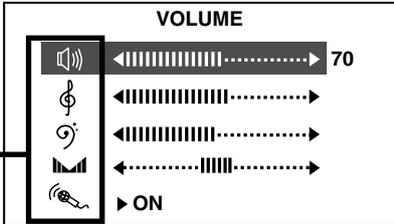


Control	Function
<b>1</b> Audio Mute	Use to mute audio source.
<b>2</b> Microphone	Built-in microphone.
<b>3</b> ◀ ▶ Buttons	Brings up to the audio menu.
▲ ▼/◀ ▶ Buttons	Use these buttons to choose or adjust items in the on screen display.

To make adjustments in the On Screen Display, follow these steps:



## On Screen Display(OSD) Selection and Adjustment



The screenshot shows the AUDIO OSD menu with the following items:

- VOLUME**: A slider set to 70.
- TREBLE**: A slider.
- BASS**: A slider.
- BALANCE**: A slider.
- MICROPHONE**: A toggle switch set to ON.

An arrow points from the VOLUME icon in the screenshot to the first row of the table below.

Main Menu		Description
 VOLUME	●	Raises or lowers audio level.
 TREBLE	●	Raises or lowers treble level.
 BASS	●	Raises or lowers bass level.
 BALANCE	●	Changes levels of left/right speaker.
 MICROPHONE	●	Enables or disables microphone usage.
● : Adjustable		

## Audio Specifications

### Audio Specifications

Audio	RMS Audio Output	1W + 1W (Right + Left)
	Input Sensitivity	0.7 Vrms
	Speaker Impedance	8Ω

### Service Information

The following parts are for use by IBM services, or IBM authorized dealers, to support customer warranty. Parts are for service use only.

PART NUMBER	DESCRIPTION	MACHINE TYPE	MODEL	COLOR
31P8102	E74M FRU MONITOR	6517	6LN	Stealth Black
31P8103	E74M FRU - Tilt/Swivel			
31P8122	E74M FRU color coded audio cables			