Packard Bell®

2160
Color Monitor ●

FCC ID: DK 42160

Customer's Record

The serial number of this product appears on the back of the unit.

You should note this serial number in the space provided below and retain this manual as a permanent record of your purchase to aid in identification in the event of theft or loss.

Model number: 2160
Serial number:

Warning To reduce the risk of fire or electric shock, do not expose this computer display to rain or moisture.

Caution

For 120V operation, use only with a power cord plug having a parallel blade, grounding type plug, rated 125V 10A.

Federal Communications Commission Requirements

Note

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

* Reorient or relocate the receiving antenna.
* Increase the separation between the equipment and the receiver.
* Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
* Consult the dealer or an experienced radio/TV technician for help.

If necessary, consult your dealer's service representative for additional suggestions. The user may find the booklet, "How To Identify and Resolve Radio/TV Interference Problems", prepared by the Federal Communications Commission, helpful. This booklet is available from

the U.S. Government Printing Office Washington DC, 20402, Stock No. 004-000-00345-4.

Caution: Changes or modifications not expressly approved by the manufacturer for compliance could void the user's (or your) authority to operate the equipment. Only peripherals (digital input/output devices, etc.) certified to comply with the Class B limits may be attached to this monitor. Operation with non-certified peripherals is likely to result in interference to radio and TV reception.

Only shielded power and signal cables may be used with your system. The use of a non-shielded interface cable is prohibited.

The manufacturer is not responsible for any radio or TV interference caused by unauthorized modification to this equipment.

Canadian department of Communications Requirements

This Class B digital apparatus meets all requirements of the Canadian Interference Causing Equipment Regulations.

Cet appareil numerique de la class B respecte toutes les exigences du Régiement sur le matèriel brouilleur du Canada.

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I. Introduction

Congratulations on purchasing a Packard Bell 2160 monitor. One of the most versatile monitors available today, the 2160 monitor automatically adjusts its vertical and horizontal scanning frequencies to those of your computer's graphic displays, when used with SUPER VGA compatible graphics adapters and video chip sets (see Specifications).

II. Safety Precautions

A. To prevent electric shock do not remove screws or cover. There are no user-serviceable parts inside the monitor. Service should be done only by a qualified service person.

B. Input power source:
   In the United States and Canada, most AC wall outlets are 120V in a range from 100 to 125V.

   The 2160 monitor with a universal power supply can work from AC 100 to 120V.

C. The monitor is equipped with a three-pronged grounding plug, which will only fit a grounded power outlet.

   This is a safety feature. If you are unable to insert the plug into the outlet, contact an electrician. Your outlet may be obsolete.

D. Do not put anything on the cord. A Damaged power cord may cause fire or electric shock. If your power cord is damaged, do not use it. Contact Packard Bell Customer Service for information on obtaining a replacement.

E. Keep children and pets away from the monitor. Also, do not insert objects into the monitor's cabinets. They may touch dangerous voltage points, which can be harmful or fatal, or cause electric shock, fire or equipment failure.

F. Do not allow liquids to get into the cabinet.

G. To reduce eye fatigue, avoid using the display in direct sunlight or under bright lights.

H. Do not operate the monitor beyond the specified temperature and humidity range (see specifications).

I. For proper operation, keep the monitor adequately ventilated.

J. Keep the monitor away from strong magnetic fields produced by transformers, motors, fans, or other devices.

K. If the monitor does not operate properly, turn the power Off and unplug the monitor.

L. When irregular AC Voltage is supplied, a protective circuit will turn off the monitor (the power indicator will also go off). If this happens, turn off the power switch and wait at least 30 seconds before turning it on again.

III. Features

A. The 2160 monitor automatically adapts to the vertical and horizontal frequencies of VGA, SVGA, 8514/A and compatible graphics adapters.

B. The monitor's design allows you to use it with a variety of graphics adapters and supports DDC1/2B.

C. The monitor features maximum resolutions of 1024 pixels (horizontal) and 768 lines (vertical) in non-interlaced or interlaced modes.

D. This monitor accepts analog signal inputs and can display up to 262,144 colors, depending upon the type of graphics board and software used.

E. Power Management Systems:
When used with a Packard Bell PC that features a power management system, the monitor's power consumption will automatically be reduced by the PC when the computer has not been used for a period of time. This monitor has a three level power-saving feature indicated by the changing color of the power LED on the front panel. When the power saving feature is initiated, the LED will change from green to amber and the monitor's power consumption will be reduced from approximately 80 watts to less than 15 or 8 watts. There will be no image on the monitor when power management is working. To display the image again, move the mouse or press a key on the keyboard. It may take up to 10 seconds for the image to reappear. This power-saving feature exceeds the Environmental Protection Agency (EPA) Energy Star requirements for Display Power Management Signals.

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F. Speaker Attachments:

On each side of the 2160 monitor are sockets that accept special Packard Bell Multimedia speakers. Attaching Packard Bell special speakers to the monitor provides an attractive and convenient way to house your speakers. After attaching the special Packard Bell speakers to the monitor, connect the plug-end of the audio input wire to the sound card at the back of the main CPU box. For the best appearance, the wires can be hidden by placing them into the grooves located under the monitor and directing them to the back of the CPU for connection to the sound card. Full instructions for mounting the speakers can be found with the speakers.

IV. Specifications

Power Source: AC 100~120V, 60Hz
Power Consumption: 80W

LED Color	States	Power Consumption
Green	On	Normal
Dark Amber	Stand by/Suspend	<=15 watts
Dark Amber	Off	<=8 watts

Picture Tube: 15" (diagonal), Glare, 90 deflection,
                         0.28 mm dot pitch,

Viewable Image Size: 13.5" diagonal

Maximun Resolution
 * Horizontal: 1024 pixels (Noninterlaced)
 * Vertical: 768 lines (Noninterlaced)

Input Signals
 * Video: Analog 0.7 Vp-p / 75 ohm Positive
 * Separate Sync: TTL Level
                         Horizontal .... Positive/Negative
                         Vertical .... Positive/Negative

Synchronization
 * Horizontal: 30~54 KHz continuous
 * Vertical: 50Hz to 90Hz continuous

Display Colors
 * Analog Input: Infinite colors (282,144 color range)

Active Display area
 * Horizontal: 10.2" (260 mm typical)
 * Vertical: 7.67" (195 mm typical)

Plug & Play: DDC1/2B

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Environmental Conditions

* Operating Temperature: +5°C ~ +35°C
* Operating Humidity: 10% ~ 80% (non-condensing)
* Storage Temperature: -20°C ~ +65°C
* Storage Humidity: 5% ~ 90%

High Voltage: 25 KV

Dimension (WxHxD):   20.7" (525mm) x 17.7" (450mm) x
   18.1" (460mm)

Weight (Net):   32.1 lbs (14.6 Kg)

Tilt and Swivel Operation:

Swivel movement has a range of 135 right or left of the center position.
Tilt movements are limited to angles of -5 forward and +15 backward.
These ranges allow you to set the screen to the viewing position most
comfortable for you.
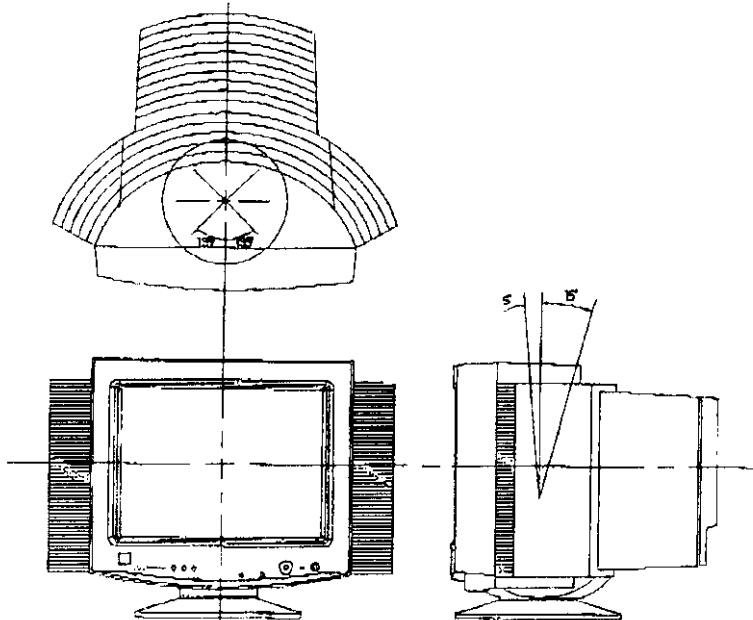
Specifications subject to change without notice.

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V. Control Locations and Functions

Note: The LEDs indicate the control item whose description is found on the following page.

Front View

Digital Control Area

Brightness

Contrast

Volume control

Power Indicator

Power switch

Rear View

AC Power Connector

Signal Cable

ID Label

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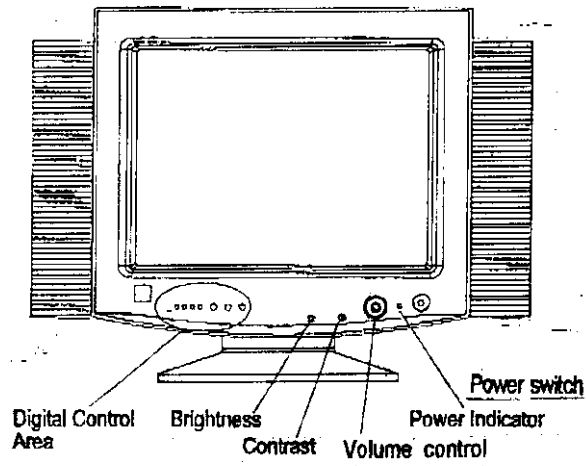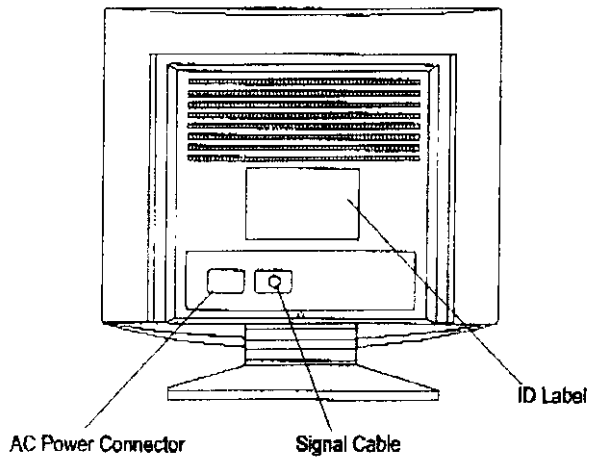
Non-Digital Controls

- Contrast adjusts the display's contrast.
- Brightness adjusts the brightness of the screen.
- Power Switch turns the power ON or OFF.
- Power Indicator lights when the power is ON.

Digital Control Area
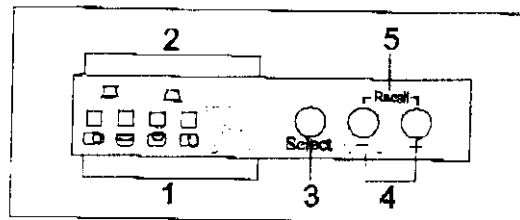
1. Digital Control Icons:

   ⊡ Horizontal Position   ⊟ Horizontal Width
   ⊡ Vertical Position   ⊡ Vertical Height
   ⏄ Pincushion   ⬜ Trapezoid

2. Digital Control Indicator:
   When one of the six digital controls is selected, the LED above that control icon is lit.

3. Select Button:
   Push this button to select which control to change.

4. +/- Buttons:
   By pressing the UP or DOWN button, you can change the settings for each of the digital control items.

5. + - Buttons (Recall Function):
   To return to one of the factory settings, press the + and - buttons simultaneously.
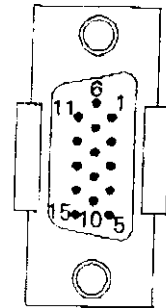
VI. Connections

A. Your monitor has two connection cables:
   1. A Power Cord, which connects directly to a grounded AC outlet or to a surge protector that is connected to a grounded AC outlet.

   2. A Signal Cable, which connects to your computer's graphics adapter (VGA connector).

B. To ensure your safety when connecting the cables, always follow these four steps:

   1. Make sure that the power switches on your computer and monitor are OFF. Also, make sure the power cords from both devices are unplugged.

   2. Carefully connect the signal cable from the monitor to your computer's graphics adapter (VGA Connector). The signal cable's connector is shaped so that it must be properly aligned with the computer's graphics adapter (VGA Connector).

   3. Secure the connection by tightening the two screws on the signal cable connector.

   4. Plug the power cord from the computer and monitor into a grounded AC outlet or a surge protector that is connected to a grounded AC outlet.

Power Cord   Audio-in   Signal Cable

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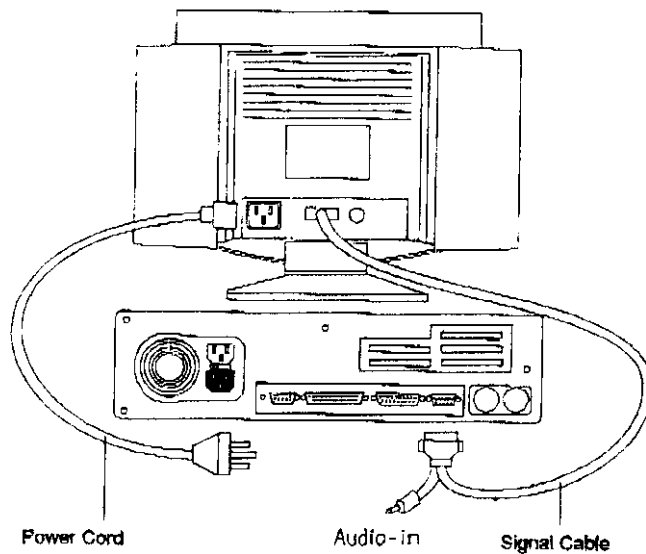
VII. Pin Assignments and Signal Levels

The pin assignments of the video signal cable are shown below:

Connector information is as follows:

PIN		SIGNAL
1	*	Red Signal
2	*	Green Signal
3	*	Blue Signal
4		NC
5		NC
6		R-Ground
7		G-Ground
8		B-Ground
9		5V
10		Ground
11		NC
12		SDA
13		Hor. Sync.
14		Vert. Sync.
15		SCL

Pin Layout &
Pin Assignment

SIGNAL LEVEL

Hor. & Vert. Sync Signal levels are TTL. "*" means 0.7 Vp-p (Video)

VIII. Timing Charts

PRESET TIMING

Mode	1	2	3	4	5	6	7
Hori. Dots	720	640	640	640	1024	800	800
Vert. Lines	400	480	480	480	768	600	600
Hori. Freq. (KHz)	31.47	31.47	37.24	43.27	48.36	46.86	53.7
H. Sync. Polarity	NEG	NEG	NEG	NEG	NEG	POS	NEG
Vert. Freq. (Hz)	70.08	59.95	75.08	85.0	60.00	74.98	85.1
V. Sync. Polarity	POS	NEG	NEG	NEG	NEG	POS	NEG

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IX. Troubleshooting

| Note: |

Before you call a Packard Bell Authorized Service Provider, please check the following items:

If a non-PC type personal computer or graphics adapter is being used, make sure the pin assignments of its signal input connector and the signal timing meet the specifications indicated in the Timing Charts section.

PROBLEM	CHECKS & ADJUSTS	LOCATION
No Picture or Power Indicator off.	* AC Cord plugged in * Power Switch on	Rear Front
No Picture, Power Indicator on.	* Contrast Control * Brightness Control * Power Management Enabled * Check Signal Cable Connector	Front Front Rear
Image is not centered.	* V. Position Control, H. Position Control	Front
Image Distortion	* Adjust Pincushion & Trapezoid Control	Front
Self Test	When the signal cable is disconnected from the PC system, a cross hatch pattern will display on the screen. The feature will help diagnose whether the problem is coming from the monitor or from the PC system	Front

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