



NEC LCD Series

MultiSync[®] LCD1525V[™]

User's Manual

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productregistration](http://www.nectech.com/productregistration)

NEC



NEC Technologies

MultiSync LCD1525V



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	WARNING	
<p>TO PREVENT FIRE OR SHOCK HAZARDS, DO NOT EXPOSE THIS UNIT TO RAIN OR MOISTURE. ALSO, DO NOT USE THIS UNIT'S POLARIZED PLUG WITH AN EXTENSION CORD RECEPTACLE OR OTHER OUTLETS UNLESS THE PRONGS CAN BE FULLY INSERTED. REFRAIN FROM OPENING THE CABINET AS THERE ARE HIGH VOLTAGE COMPONENTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.</p>		

	CAUTION	
<p>RISK OF ELECTRIC SHOCK • DO NOT OPEN</p>		
<p>CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE COVER (OR BACK). NO USER SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.</p>		
	<p>This symbol warns user that uninsulated voltage within the unit may have sufficient magnitude to cause electric shock. Therefore, it is dangerous to make any kind of contact with any part inside this unit.</p>	
	<p>This symbol alerts the user that important literature concerning the operation and maintenance of this unit has been included. Therefore, it should be read carefully in order to avoid any problems.</p>	

Canadian Department of Communications Compliance Statement

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

C-UL: Bears the C-UL Mark and is in compliance with Canadian Safety Regulations according to C.S.A. C22.2 No. 950.

FCC Information

1. Use the attached specified cables with the LCD1 525V color monitor so as not to interfere with radio and television reception.
 - (1) Please use the supplied power cable or equivalent to ensure FCC compliance.
 - (2) Please use the supplied AC Adapter.
 - (3) Shielded video signal cable.Use of other cables and adapters may cause interference with radio and television reception.

2. 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 receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult your dealer or an experienced radio/TV technician for help.

If necessary, the user should contact the dealer or an experienced radio/television technician for additional suggestions. The user may find the following booklet, prepared by the Federal Communications Commission, helpful: "How to Identify and Resolve Radio-TV Interference Problems." This booklet is available from the U.S. Government Printing Office, Washington, D.C., 20402, Stock No. 004-000-00345-4.



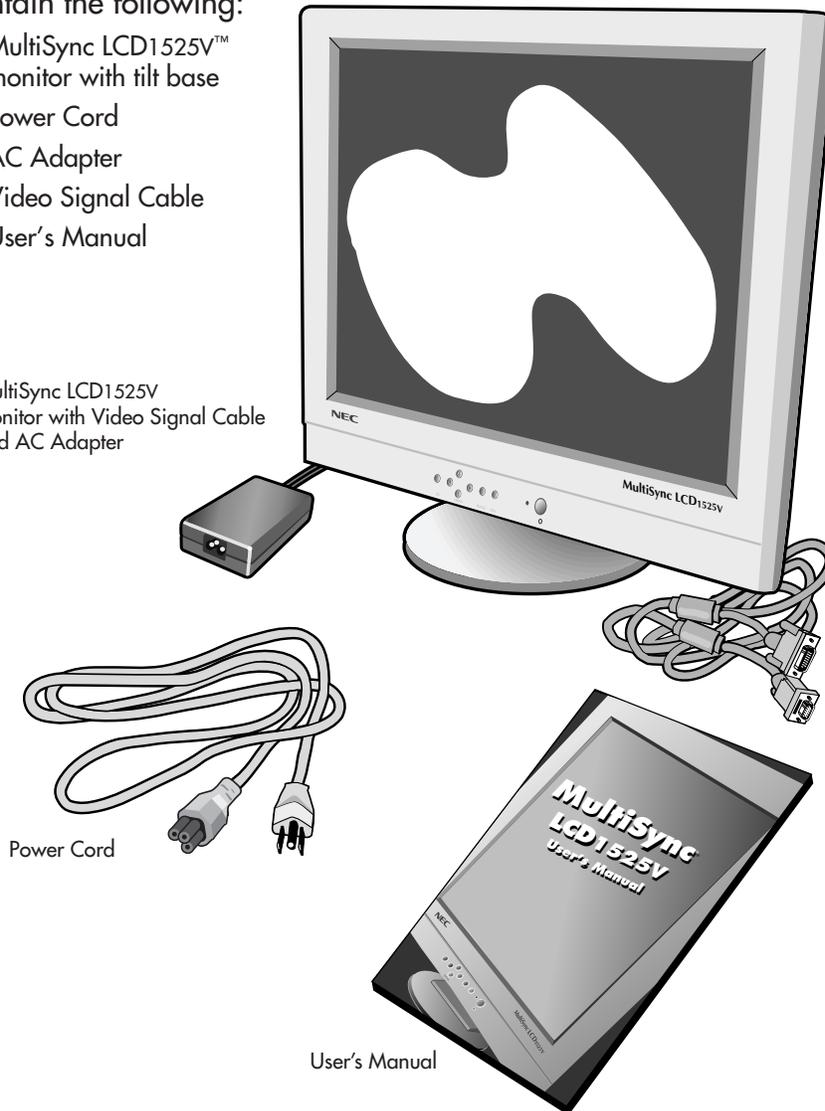
Contents

**You can register your product online at
www.nectech.com/productregistration**

Your new NEC Technologies MultiSync® LCD monitor box* should contain the following:

- MultiSync LCD1525V™ monitor with tilt base
- Power Cord
- AC Adapter
- Video Signal Cable
- User's Manual

MultiSync LCD1525V
monitor with Video Signal Cable
and AC Adapter



* Remember to save your original box and packing material to transport or ship the monitor.

Quick Start

To attach the MultiSync® LCD monitor to your system, follow these instructions:

1. Turn off the power to your computer.
2. For the PC: Connect the 15-pin mini D-SUB of the appropriate signal cable to the connector of the display card in your system (**Figure A.1**). Tighten all screws.
For the Mac: Connect the MultiSync LCD1525V™ Macintosh cable adapter to the computer (**Figure B.1**). Attach the 15-pin mini D-SUB end of the appropriate signal cable to the MultiSync LCD1525V Macintosh cable adapter (**Figure B.1**). Tighten all screws.

NOTE: To obtain the MultiSync LCD1525V Macintosh cable adapter, call NEC Technologies at (800) 820-1230.

Remove connector cover and cable cover on back of monitor.

3. Connect the 15-pin mini D-SUB of the video signal cable to the appropriate connector on the back of the monitor (**Figure C1**).
Place the Video Signal Cable under Clip A. Then place AC Adapter Cable under Clip B.
Replace connector cover and cable cover.

NOTE: Incorrect cable connections may result in irregular operation, damage display quality/components of LCD module and/or shorten the module's life.

4. Connect one end of the power cord to the MultiSync LCD Series monitor and the other end to the power outlet (**Figure D.1**).
5. Turn on the monitor (**Figure E.1**) and the computer.
6. To complete the setup of your MultiSync LCD monitor, use the following OSM™ controls:
 - Auto Adjust Contrast
 - Auto Adjust

Refer to the **Controls** section of this User's Manual for a full description of these OSM controls.

NOTE: For download information on the Windows 95/98 INF file for your MultiSync LCD1525V monitor, refer to the **References** section of this User's Manual.

NOTE: If you have any problems, please refer to the **Troubleshooting** section of this User's Manual.

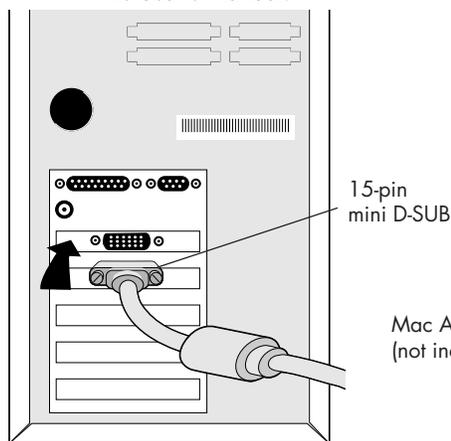


Figure A.1

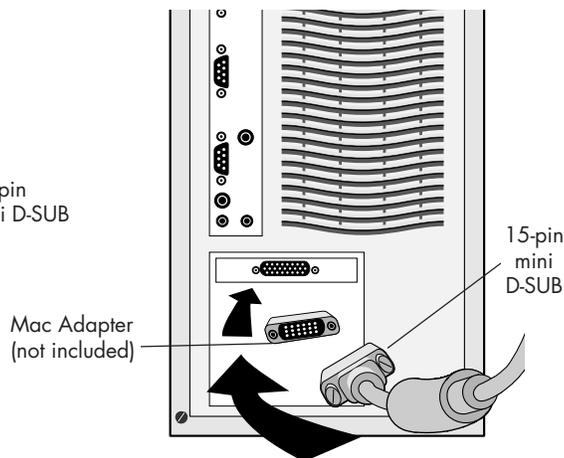


Figure B.1



Quick Start cont.

Figure C.1

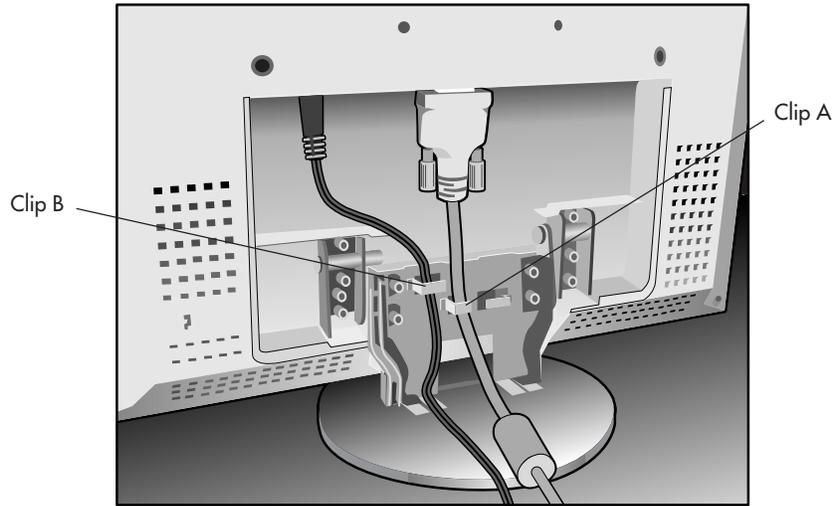


Figure D.1

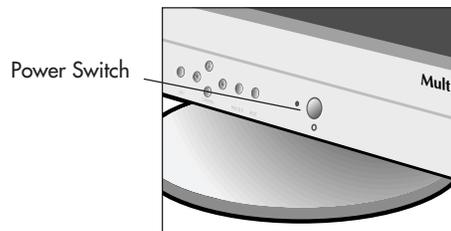
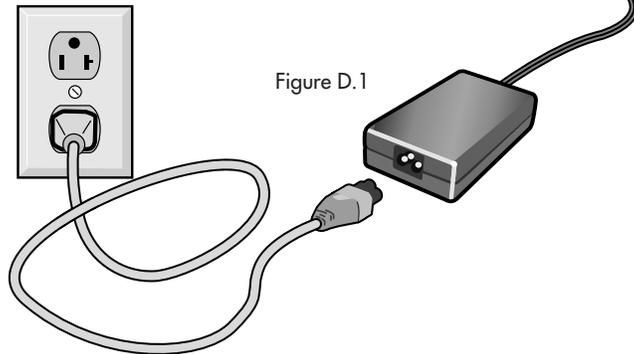
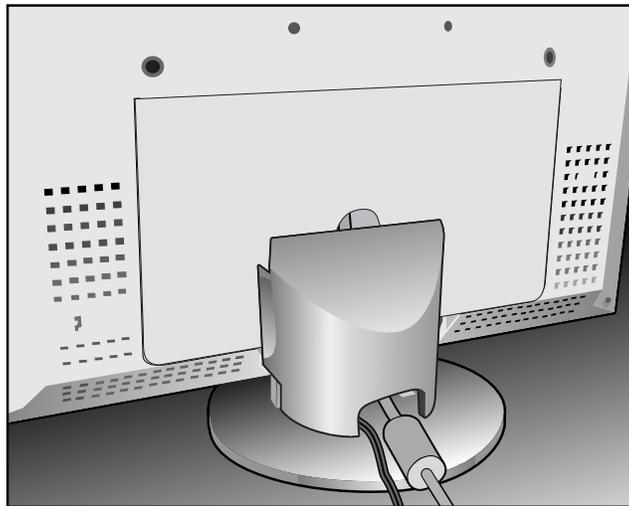
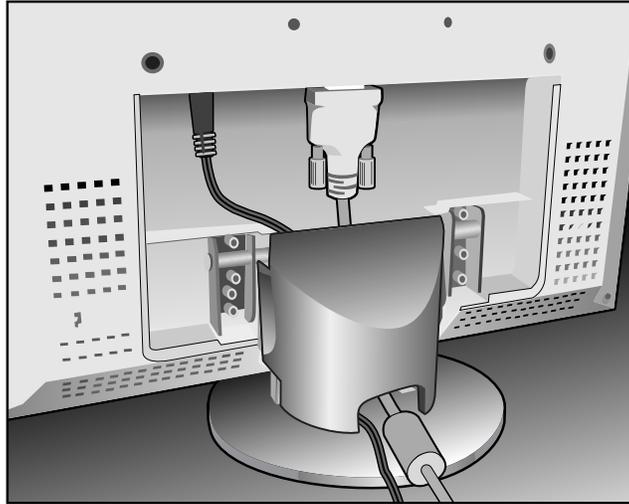


Figure E.1





Controls

OSM™ (On-Screen-Manager) Controls

The OSM controls on the front of the monitor function as follows:

Control	Main Menu	Sub-Menu
EXIT	Exits the OSM controls.	Exits to the OSM controls main menu.
CONTROL ▲/▼	Moves the highlighted area up/down to select one of the controls.	Moves the highlighted area up/down to select one of the controls.
CONTROL ◀/▶	Moves the highlighted area left/right to select control menus.	Moves the bar left/right to increase or decrease the adjustment.
PROCEED	Has no function.	Activates Auto Adjust feature. In Tool and Information Mode, opens additional window.
RESET: The currently highlighted control to the factory setting.	Resets all the controls within the highlighted menu.	Resets the highlighted control.

NOTE: When RESET is pressed, a warning window will appear allowing you to cancel the reset function.

Brightness and Contrast

Brightness: Adjusts the overall image and background screen brightness.

Contrast: Adjusts the image brightness in relation to the background.

Auto Adjust: Corrects the image displayed for non-standard video inputs.

AUTO Auto Adjust

Automatically adjusts the Position and H. Size and fine settings.

Position

Controls horizontal and vertical image position within the display area of the LCD.

Auto Adjust: Automatically sets the horizontal and vertical image position within the display area of the LCD.

Image Adjust

H.SIZE: Adjusts the horizontal size by increasing or decreasing this setting.

Fine: Improves focus, clarity and image stability by increasing or decreasing the Fine setting.

Auto Adjust: Automatically adjusts the H. Size or Fine settings.



AccuColor® Control System

Five color presets select the desired color setting. If a setting is adjusted, the name of the setting will change to Custom.

Color Gain (Red, Green, Blue): Increases or decreases Red, Green or Blue color depending upon which is selected. The change in color will appear on screen and the direction (increase or decrease) will be shown by the color bars.



Tools

Language: OSM control menus are available in seven languages.

OSM™ Position: You can choose where you would like the OSM control image to appear on your screen. Selecting OSM Location allows you to manually adjust the position of the OSM control menu left, right, up or down.

OSM Turn Off: The OSM control menu will stay on as long as it is in use. In the OSM Turn Off submenu, you can select how long the monitor waits after the last touch of a button to shut off the OSM control menu. The preset choices are 10, 20, 30, 60 and 120 seconds.

OSM Lock Out: This control completely locks out access to all OSM control functions. When attempting to activate OSM controls while in the Lock Out mode, a screen will appear indicating the OSM controls are locked out. To activate the OSM Lock Out function, press PROCEED, then ▲ and hold down simultaneously. To de-activate the OSM Lock Out, press PROCEED, then ▲ and hold down simultaneously.

Factory Preset: Selecting Factory Preset allows you to reset all OSM control settings back to the factory settings. The RESET button will need to be held down for several seconds to take effect. Individual settings can be reset by highlighting the control to be reset and pressing the RESET button.

Resolution Notifier: This optimal resolution is 1024 x 768. If ON is selected, a message will appear on the screen after 2 minutes, notifying you that the resolution is not at 1024 x 768.



Information

Display Mode: Provides information about the current resolution display and technical data including the preset timing being used and the horizontal and vertical frequencies.



Recommended Use

Safety Precautions and Maintenance



FOR OPTIMUM PERFORMANCE, PLEASE NOTE THE FOLLOWING WHEN SETTING UP AND USING THE MULTISYNC® LCD COLOR MONITOR:



- **DO NOT OPEN THE MONITOR.** There are no user serviceable parts inside and opening or removing covers may expose you to dangerous shock hazards or other risks. Refer all servicing to qualified service personnel.
- Do not spill any liquids into the cabinet or use your monitor near water.
- Do not insert objects of any kind into the cabinet slots, as they may touch dangerous voltage points, which can be harmful or fatal or may cause electric shock, fire or equipment failure.
- Do not place any heavy objects on the power cord. Damage to the cord may cause shock or fire.
- Do not place this product on a sloping or unstable cart, stand or table, as the monitor may fall, causing serious damage to the monitor.
- When operating the MultiSync LCD monitor with its AC 220-240V power supply, use a power supply cord that matches the power supply voltage of the AC power outlet being used. The power supply cord you use must have been approved by and comply with the safety standards of your country.
- Use supplied AC Adapter. Do not place any objects onto the AC Adapter and do not use the AC Adapter outdoors.
- The inside of the fluorescent tube located within the LCD monitor contains mercury. Please follow the bylaws or rules of your municipality to dispose of the tube properly.
- In UK, use a BS-approved power cord with molded plug having a black (5A) fuse installed for use with this monitor. If a power cord is not supplied with this monitor, please contact your supplier.

Immediately unplug your monitor from the wall outlet and refer servicing to qualified service personnel under the following conditions:

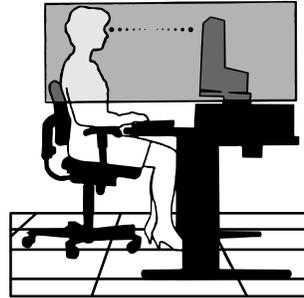
- When the power supply cord or plug is damaged.
 - If liquid has been spilled, or objects have fallen into the monitor.
 - If the monitor has been exposed to rain or water.
 - If the monitor has been dropped or the cabinet damaged.
 - If the monitor does not operate normally by following operating instructions.
-  Allow adequate ventilation around the monitor so that heat can properly dissipate. Do not block ventilated openings or place the monitor near a radiator or other heat sources. Do not put anything on top of monitor.
- CAUTION** The power cable connector is the primary means of detaching the system from the power supply. The monitor should be installed close to a power outlet which is easily accessible.
- Handle with care when transporting. Save packaging for transporting.



CORRECT PLACEMENT AND ADJUSTMENT OF THE MONITOR
CAN REDUCE EYE, SHOULDER AND NECK FATIGUE. CHECK THE
FOLLOWING WHEN YOU POSITION THE MONITOR:



- For optimum performance, allow 20 minutes for warm-up.
- Adjust the monitor height so that the top of the screen is at or slightly below eye level. Your eyes should look slightly downward when viewing the middle of the screen.
- Position your monitor no closer than 16 inches and no further away than 28 inches from your eyes. The optimal distance is 21 inches for the MultiSync® LCD 1525V™ monitor.
- Rest your eyes periodically by focusing on an object at least 20 feet away. Blink often.
- Position the monitor at a 90° angle to windows and other light sources to minimize glare and reflections. Adjust the monitor tilt so that ceiling lights do not reflect on your screen.
- If reflected light makes it hard for you to see your screen, use an anti-glare filter.
- Clean the LCD monitor surface with a lint-free, non-abrasive cloth. Avoid using any cleaning solution or glass cleaner!
- Adjust the monitor's brightness and contrast controls to enhance readability.
- Use a document holder placed close to the screen.
- Position whatever you are looking at most of the time (the screen or reference material) directly in front of you to minimize turning your head while you are typing.
- Avoid displaying fixed patterns on the monitor for long periods of time to avoid image persistence (after-image effects).
- Get regular eye checkups.



Ergonomics

To realize the maximum ergonomics benefits, we recommend the following:

- Do not position the Contrast control to its maximum setting
- Use the preset Size and Position controls with standard signals
- Use the preset Color Setting
- Use non-interlaced signals with a vertical refresh rate between 60-75Hz
- Do not use primary color blue on a dark background, as it is difficult to see and may produce eye fatigue to insufficient contrast

For more detailed information on setting up a healthy work environment, call NEC at (800) 820-1230, NEC FastFacts™ information at (800) 366-0476 and request document #900108 or write the American National Standard for Human Factors Engineering of Visual Display Terminal Workstations – ANSI-HFS Standard No. 100-1988 – The Human Factors Society, Inc. P.O. Box 1369, Santa Monica,



Specifications

Monitor Specifications	MultiSync® LCD1525V™	Notes
LCD Module Diagonal: Viewable Image Size: Native Resolution (Pixel Count):	15.1 inch 15.1 inch 1024 x 768	Active matrix; thin film transistor (TFT) liquid crystal display (LCD); 0.30 mm dot pitch; 200cd/m ² white luminance; 200:1 contrast ratio, typical
Input Signal Video: Sync:	ANALOG 0.7 Vp-p/75 Ohms Separate sync. TTL Level Horizontal sync. Positive/Negative Vertical sync. Positive/Negative	
Display Colors Analog input:	16,194,277 colors with dithering	Depends on display card used.
Viewing Angle Left/Right: Up/Down:	± 55° 40°	
Synchronization Range Horizontal: Vertical:	24.8 kHz to 48.4 kHz 56.2 Hz to 75.0 Hz	Automatically Automatically
Resolutions Supported Resolution based on horizontal and vertical frequencies only	720 x 400* VGA text 640 x 480* at 60 Hz to 75 Hz 800 x 600* at 56 Hz to 75 Hz 1024 x 768 at 60 Hz	Some systems may not support all modes listed. NEC cites recommended resolution at 60 Hz for optimal display performance.
Active Display Area Horizontal: Vertical:	307 mm/12.1 inches 230 mm/9.1 inches	Dependent upon signal timing used, and does not include border area.
Power Supply	AC 100 – 240 V @ 50/60 Hz	
Current Rating	0.4 A @ 100 – 120 V/0.25 A @ 220 – 240 V	
Dimensions	370 mm (W) x 325 mm (H) x 151 mm (D) 14.6 inches (W) x 12.8 inches (H) x 5.9 inches (D)	
Weight	4 kg 8.8 lbs	
Environmental Considerations Operating Temperature: Humidity: Feet: Storage Temperature: Humidity: Feet:	5°C to 35°C/41°F to 95°F 30% to 80% 0 to 10,000 Feet -10°C to +60°C/14°F to 140°F 10% to 85% 0 to 45,000 Feet	

* Interpolated Resolutions: When resolutions are shown that are lower than the pixel count of the LCD module, text may appear different. This is normal and necessary for all current flat panel technologies when displaying non-native resolutions full screen. In flat panel technologies, each dot on the screen is actually one pixel, so to expand resolutions to full screen, an interpolation of the resolution must be done.

NOTE: Technical specifications are subject to change without notice.



Features

Wider Compatibility: Because the MultiSync LCD monitor is analog through and through, it does not require special analog to digital display or interface cards but can accept RGB input directly.

Reduced Footprint: Provides the ideal solution for environments requiring superior image quality but with size and weight limitations. The monitor's small footprint and low weight allow it to be moved or transported easily from one location to another.

AccuColor® Control System: Allows you to adjust the colors on your screen and customize the color accuracy of your monitor to a variety of standards.

OSM™ (On-Screen Manager) Controls: Allow you to quickly and easily adjust all elements of your screen image via simple to use on-screen menus.

ErgoDesign® Features: Enhance human ergonomics to improve the working environment, protect the health of the user and save money. Examples include OSM controls for quick and easy image adjustments, tilt base for preferred angle of vision, small footprint and compliance with MPRII guidelines for lower emissions.

Plug and Play: The Microsoft® solution with the Windows®95/98 operating system facilitates setup and installation by allowing the monitor to send its capabilities (such as screen size and resolutions supported) directly to your computer, automatically optimizing display performance.

IPM™ (Intelligent Power Manager) System: Provides innovative power-saving methods that allow the monitor to shift to a lower power consumption level when on but not in use, saving two-thirds of your monitor energy costs, reducing emissions and lowering the air conditioning costs of the workplace.

Multiple Frequency Technology: Automatically adjusts monitor to the display card's scanning frequency, thus displaying the resolution required.

FullScan™ Capability: Allows you to use the entire screen area in most resolutions, significantly expanding image size.

OSM Display Screen Copyright 1999 by NEC Technologies, Inc.



Troubleshooting

No picture

- The signal cable should be completely connected to the display card/computer.
- The display card should be completely seated in its slot.
- Power Switch and computer power switch should be in the ON position.
- Check to make sure that a supported mode has been selected on the display card or system being used. (Please consult display card or system manual to change graphics mode.)
- Check the monitor and your display card with respect to compatibility and recommended settings.
- Check the signal cable connector for bent or pushed-in pins.

Image persistence

- Image persistence is when a "ghost" of an image remains on the screen even after the monitor has been turned off. Unlike CRT monitors, LCD monitors' image persistence is not permanent. To alleviate image persistence, turn the monitor off for as long as an image was displayed. If an image was on the monitor for one hour and a "ghost" of that image remains, the monitor should be turned off for one hour to erase the image.

NOTE: As with all personal display devices, NEC Technologies recommends using a screen saver at regular intervals whenever the screen is idle.

Image is unstable, unfocused or swimming is apparent

- Signal cable should be completely attached to the computer.
- Use the OSM Image Adjust controls to focus and adjust display by increasing or decreasing the fine total. When the display mode is changed, the OSM Image Adjust settings may need to be re-adjusted.
- Check the monitor and your display card with respect to compatibility and recommended signal timings.

LED on monitor is not lit *(no green or amber color can be seen)*

- Power Switch should be in the ON position and power cord should be connected.
- Make certain the computer is not in a power-saving mode (touch the keyboard or mouse).

Display image is not sized properly

- Use the OSM Image Adjust controls to increase or decrease the Coarse total.
- Check to make sure that a supported mode has been selected on the display card or system being used. (Please consult display card or system manual to change graphics mode.)

Selected resolution is not displayed properly

- Use OSM Display Mode to enter Mode Change sub-menu and confirm that the appropriate resolution has been selected. If not, select corresponding option.



References

• **BBS** **(978) 742-8706**

NEC Technologies' Remote Bulletin Board System is an electronic service accessible with your system and a modem. Communication parameters are: 300/1200/2400/9600/14.4k/28.8k/33.6k bps, no parity, 8-data bits, 1 stop bit

• **Customer Service/
Technical Support** **(800) 632-4662**
Fax **(978) 635-7049**

• **Electronic Channels:**

Internet e-mail: tech-support@nectech.com
Internet ftp site: ftp.nectech.com
World Wide Web: <http://www.nectech.com>
Product Registration: <http://www.nectech.com/productregistration>
Windows® 95/98 INF File: <http://www.nectech.com/drivers/graphic.htm>
then download the file NECMSINF.ZIP.

• **FastFacts™ Information** **(800) 366-0476**

INFORMATION	DESCRIPTION	DOCUMENT #
MultiSync® LCD1525V™ monitor	Detailed monitor information	152501
Glossary	Definition of terms related to functions, features and installation of the MultiSync monitor	900203
More Information	Names and addresses of other groups involved in standards and features of the MultiSync monitor	900204
Macintosh Connection	Detailed information on connecting the MultiSync monitor to a Macintosh	153006
Healthy Work Environment	Detailed information on setting up a healthy work environment	900108

• **Literature & Sales Info** **(800) NEC-INFO [(800) 632-4636]**

• **MultiSync Fulfillment** **(800) 820-1230**
[For software & accessories]

• **TeleSales** **(800) 284-4484**



Limited Warranty

NEC Technologies, Inc. (hereinafter "NECTECH"), warrants this Product to be free from defects in material and workmanship and, subject to the conditions set forth below, agrees to repair or replace (at NECTECH's sole option) any part of the enclosed unit which proves defective for a period of three (3) years from the date of first consumer purchase. Spare parts are warranted for ninety (90) days. Replacement parts or units may be new or refurbished and will meet specifications of the original parts or unit.

This warranty gives you specific legal rights and you may also have other rights which vary from state to state. This warranty is limited to the original purchaser of the Product and is not transferable. This warranty covers only NECTECH-supplied components. Service required as a result of third party components is not covered under this warranty. In order to be covered under this warranty, the Product must have been purchased in the U.S.A. or Canada by the original purchaser. This warranty only covers Product distribution in the U.S.A. or Canada by NECTECH. No warranty service is provided outside of the U.S.A. or Canada. Proof of Purchase will be required by NECTECH to substantiate date of purchase. Such proof of purchase must be an original bill of sale or receipt containing name and address of seller, purchaser, and the serial number of the product.

It shall be your obligation and expense to have the Product shipped, freight prepaid, or delivered to the authorized reseller from whom it was purchased or other facility authorized by NECTECH to render the services provided hereunder in either the original package or a similar package affording an equal degree of protection. All Products returned to NECTECH for service MUST have prior approval, which may be obtained by calling 1-800-632-4662.

The Product shall not have been previously altered, repaired, or serviced by anyone other than a service facility authorized by NECTECH to render such service, the serial number of the product shall not have been altered or removed. In order to be covered by this warranty the Product shall not have been subjected to displaying of fixed images for long periods of time resulting in image persistence (afterimage effects), accident, misuse or abuse or operated contrary to the instructions contained in the User's Manual. Any such conditions will void this warranty.

NECTECH SHALL NOT BE LIABLE FOR DIRECT, INDIRECT, INCIDENTAL, CONSEQUENTIAL, OR OTHER TYPES OF DAMAGES RESULTING FROM THE USE OF ANY NECTECH PRODUCT OTHER THAN THE LIABILITY STATED ABOVE. THESE WARRANTIES ARE IN LIEU OF ALL OTHER WARRANTIES EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. SOME STATES DO NOT ALLOW THE EXCLUSION OF IMPLIED WARRANTIES OR THE LIMITATION OR EXCLUSION OF LIABILITY FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES SO THE ABOVE EXCLUSIONS OR LIMITATIONS MAY NOT APPLY TO YOU.

This Product is warranted in accordance with the terms of this limited warranty. Consumers are cautioned that Product performance is affected by system configuration, software, the application, customer data, and operator control of the system, among other factors. While NECTECH Products are considered to be compatible with many systems, specific functional implementation by the customers of the Product may vary. Therefore, suitability of a Product for a specific purpose or application must be determined by consumer and is not warranted by NECTECH.

For the name of your nearest authorized NECTECH service facility, contact NECTECH at 1-800-632-4662.



TCO'99

Congratulations! You have just purchased a TCO'99 approved and labeled product! Your choice has provided you with a product developed for professional use. Your purchase has also contributed to reducing the burden on the environment and also to the further development of environmentally adapted electronics products.



Why do we have environmentally labelled computers?

In many countries, environmental labelling has become an established method for encouraging the adaptation of goods and services to the environment. The main problem, as far as computers and other electronics equipment are concerned, is that environmentally harmful substances are used both in the products and during the manufacturing. Since it has not been possible for the majority of electronics equipment to be recycled in a satisfactory way, most of these potentially damaging substances sooner or later enter Nature.

There are also other characteristics of a computer, such as energy consumption levels, that are important from the viewpoints of both the work (Internal) and natural (external) environments. Since all methods of conventional electricity generation have a negative effect on the environment (acidic and climate-influencing emissions, radioactive waste, etc.), it is vital to conserve energy. Electronics equipment in offices consume an enormous amount of energy since they are often left running continuously.

What does labelling involve?

This product meets the requirements for the TCO'99 scheme which provides for international and environmental labelling of personal computers. The labelling scheme was developed as a joint effort by the TCO (The Swedish Confederation of Professional Employees), Svenska Naturskyddsforeningen (The Swedish Society for Nature Conservation) and Statens Energimyndighet (The Swedish National Energy Administration).

The requirements cover a wide range of issues: environment, ergonomics, usability, emission of electrical and magnetic fields, energy consumption and electrical and fire safety.

The environmental demands concern restrictions on the presence and use of heavy metals, brominated and chlorinated flame retardants, CFCs (freons) and chlorinated solvents, among other things. The product must be prepared for recycling and the manufacturer is obliged to have an environmental plan which must be adhered to in each country where the company implements its operational policy. The energy requirements include a demand that the computer and/or display, after a certain period of inactivity, shall reduce its power consumption to a lower level in one or more stages. The length of time to reactivate the computer shall be reasonable for the user.

Labelled products must meet strict environmental demands, for example, in respect of the reduction of electric and magnetic fields, physical and visual ergonomics and good usability.

Environmental Requirements

Flame retardants

Flame retardants are present in printed circuit boards, cables, wires, casings and housings. In turn, they delay the spread of fire. Up to thirty percent of the plastic in a computer casing can consist of flame retardant substances. Most flame retardants contain bromine or chloride and these are related to another group of environmental toxins, PCBs, which are suspected to give rise to severe health effects, including reproductive damage in fish-eating birds and mammals, due to the bio-



TCO'99 cont.

accumulative* processes. Flame retardants have been found in human blood and researchers fear that disturbances in foetus development may occur.

TCO'99 demand requires that plastic components weighing more than 25 grams must not contain flame retardants with organically bound chlorine and bromine. Flame retardants are allowed in the printed circuit boards since no substitutes are available.

Lead**

Lead can be found in picture tubes, display screens, solders and capacitors. Lead damages the nervous system and in higher doses, causes lead poisoning.

TCO'99 requirement permits the inclusion of lead since no replacement has yet been developed.

Cadmium**

Cadmium is present in rechargeable batteries and in the colourgenerating layers of certain computer displays. Cadmium damages the nervous system and is toxic in high doses.

TCO'99 requirement states that batteries, the colourgenerating layers of display screens and the electrical or electronics components must not contain any cadmium.

Mercury**

Mercury is sometimes found in batteries, relays and switches, Mercury damages the nervous system and is toxic in high doses.

TCO'99 requirement states that batteries may not contain any Mercury. It also demands that no mercury is present in any of the electrical or electronics components associated with the display unit.

CFCs (freons)

CFCs (freons) are sometimes used for washing printed circuit boards. CFCs break down ozone and thereby damage the ozone layer in the stratosphere, causing increased reception on Earth of ultraviolet light with consequent increased risks of skin cancer (malignant melanoma).

The relevant TCO'99 requirement; Neither CFCs nor HCFCs may be used during the manufacturing and assembly of the product or its packaging.

*Bio-accumulative is defined as substances which accumulate within living organisms.

**Lead, Cadmium and Mercury are heavy metals which are Bio-accumulative.

To obtain complete information on the environmental criteria document, order from:

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You may also obtain current information on TCO'99 approved and labelled products by visiting their website at: <http://www.tco-info.com/>