

USER'S MANUAL

15" DIGITAL COLOR MONITOR
DIGITALE R 15"-FARBMONITOR
MONITEUR COULEUR NUMÉRIQUE À 15"
MONITOR DIGITAL A COLOR

USER'S MANUAL

Operation Instructions

Thank you for purchasing a 15" series high-resolution multi-scan color monitor!

Please read this guide thoroughly before installation.

FCC RADIO FREQUENCY INTERFERENCE STATEMENT

WARNING: (FOR FCC CERTIFIED MODELS)

This monitor has been tested and found compliant with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide proper protection against harmful interference to a residential installation. This monitor generates, uses, and can radiate radio frequency energy. Harmful interference to radio communication may be led as a result if it's not properly installed and used. However, there is no guarantee that interference will not occur in a particular installation. If this monitor does cause serious interference to radio or television reception, resetting the monitor may determine it. Moreover, users are encouraged to correct interference by doing one or more of the following:

- Reorient or relocate the receiving antenna.
- Move the monitor and the receiver further away from each other.
- Connect the monitor into an outlet on a circuit different from that to which the receiver is connected.
- Consult your local dealer or an qualified technician.

FCC Warning:

To assure a continued FCC compliance, a user must use a grounded power supply cord and the provided shielded video interface cable with bonded ferrite cores. Also, any unauthorized changes or modifications to this monitor would void the user's authority to operate this device.

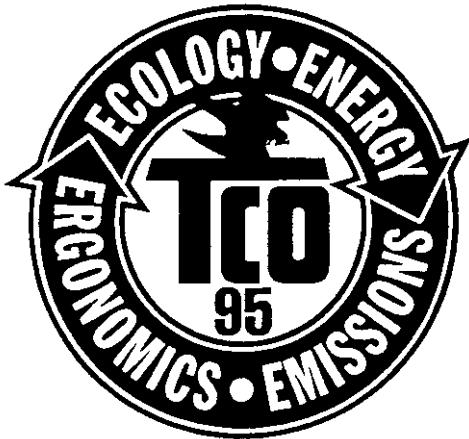
Note: If necessary, shielded interface cables and A.C. power cord must be used to meet the emission level limits.

EMI

The Class B digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulation.

Cet appareil numerique de class B respecte toutes les exigences du Reglement sur le materiel brouilleur du Canada.

*Page 1-2 stand for TCO'95 model only. See back label for model distinction.



Congratulations! You have just purchased a TCO'95 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 labeled computers?

In many countries, environmental labeling 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 labeling involve?

This product meets the requirements for the TCO'95 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), Naturskyddsforeningen (The Swedish Society for Nature Conservation) and NUTEK (The National Board for Industrial and Technical Development in Sweden).

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.

Labeled 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.

On the back page of this folder, you will find a brief summary of the environmental requirements met by this product. The complete environmental criteria document may be ordered from:

TCO Development Unit

S-114 94 Stockholm

Sweden

Fax: +46 8 782 92 07

Email (Internet): development@tco.se

Current information regarding TCO'95 approved and labelled products may also be obtained via the Internet, using the address:

<http://www.tco-info.com/>

TCO'95 is a co-operative project between TCO (The Swedish Confederation of Professional Employees), Naturskyddsforeningen (The Swedish Society for Nature Conservation) and NUTEK (The National Board for Industrial and Technical Development in Sweden).

Environmental Requirements

Brominated flame retardants

Brominated 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. These are related to another group of environmental toxins, PCBs, which are suspected to give rise to similar harm, including reproductive damage in fisheating birds and mammals, due to the bio-accumulative^{*} processes. Flame retardants have been found in human blood and researchers fear that disturbances in foetus development may occur.

TCO'95 demand requires that plastic components weighing more than 25 grams must not contain organically bound chlorine and bromine.

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'95 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'95 requirement states that batteries may not contain more than 25 ppm (parts per million) of cadmium. The colour-generating layers of display screens 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'95 requirement states that batteries may not contain more than 25 ppm (parts per million) of mercury. It also demands that no mercury is present in any of the electrical or electronics components concerned with the display unit.

CFCs (freons)

CFCs (freons) are sometimes used for washing printed circuit boards and in the manufacturing of expanded foam for packaging. 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'95 requirement: Neither CFCs nor HCFCs may be used during the manufacturing 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.

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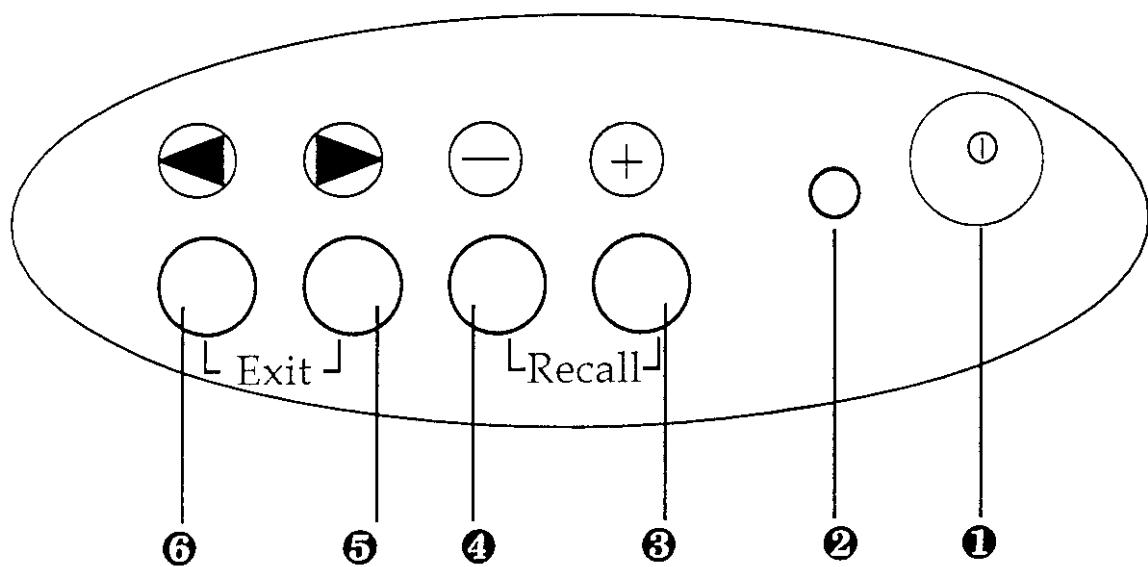
GENERAL DESCRIPTION

This color monitor is a microprocessor controlled multi-frequency system device. The monitor is compatible with many standard graphic formats, including VGA, SVGA, and XGA. The key features include:

- 15" CRT color display.
- Support for graphic cards with VESA compatible DDC1/2B (Display Data Channel 1/2B) interface for monitor-to-PC communication.
- Easy to use On Screen Display (OSD) adjustment interface.
- Support EPA, NUTEK A/B, VESA compatible 4-staged power management systems.

FEATURES

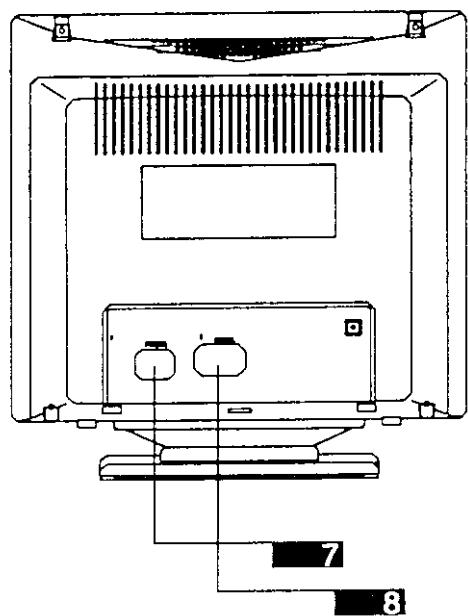
A. Front Exterior



① POWER ON/OFF SWITCH
② POWER ON/OFF INDICATOR
③ INCREASE BUTTON

④ DECREASE BUTTON
⑤ FUNCTION Right
⑥ FUNCTION Left

B. Rear Exterior

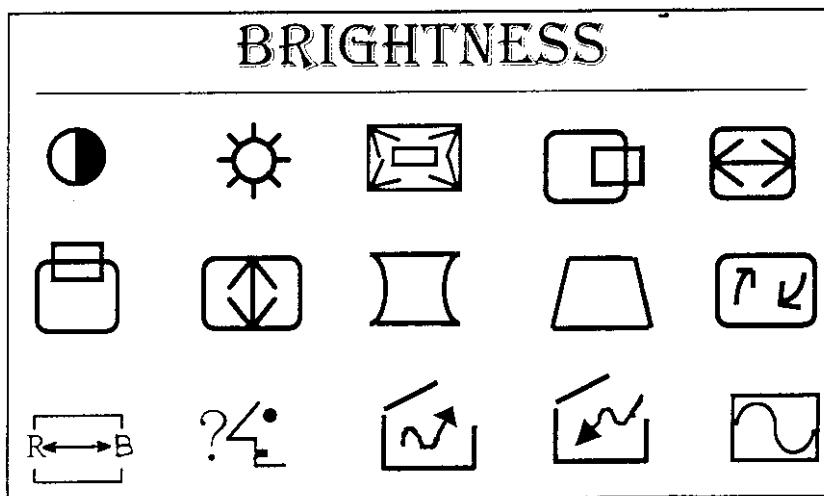


⑦ AC SOCKET

⑧ 15 PIN D-TYPE CONNECTOR

USING OSD FUNCTIONS

- Press Function $\leftarrow \rightarrow$ function buttons to activate OSD functions and adjust with $+$ $-$ (up/down) buttons for function parameter.
- OSD icons:



FUNCTION

A. External Control

SYMBOL	ITEM	DESCRIPTION
	① Power switch	-Controls Power
	② Power Indicator	-Green lit gives confirmation of power on. Lit orange gives confirmation of power saving mode.
	③ Increase	-Increase function parameter
	④ Decrease	-Decrease function parameter
	⑤ Function right	-Scroll through OSD icons and menus to select function items to right.
	⑥ Function left	- Scroll through OSD icons and menus to select function items to left.

B. Digital Features

1. This monitor has an adapted advance CPU to control the Contrast, Brightness, Zoom, H-phase, H-size, V-center, V-Size, Pincushion, Trapezoid, Color temperature, and Rotation (for 70 KHz model only). It also auto saves the configuration set up by users.
2. This monitor has 12 sets of factory preset timing and 7 sets of user definable timing.

ICON	ITEM	DESCRIPTION
	CONTRAST	Increases / decreases video gain.
	BRIGHTNESS	Increases / decreases raster black level.
	ZOOM	Zoom In or Zoom Out the video pattern.
	HORIZONTAL PHASE	Adjusts the H-phase of the picture.
	HORIZONTAL WIDTH	Adjusts the H-width of the picture.
	VERTICAL POSITION	Adjusts the vertical placement of the picture .
	VERTICAL SIZE	Adjusts the vertical size of the picture .
	PINCUSHION	Controls the straight of the vertical line on both sides of the picture .
	TRAPEZOID	Controls the top of the H-width equal to the bottom of the picture .
	ROTATION (70 KHz model only)	Controls the tilt of the display image .
	COLOR TEMPERATURE	Selects color temperature & adjust user color mode.
	LANGUAGE	Multi-language select Use - and + key to select OSD display language.
	RECALL (70 KHz model only)	When use PRESET MODE, press - and + to recall the factory default .
	SAVE (70 KHz model only)	Saves the latest adjustment..
	MODEL DISPLAY	Shows current horizontal & vertical frequency & mode type.

SIGNAL TIMING

Mode	Unit	(1)	(2)	(3)	(4)	(5)	(6)
Resolution		640*350	720*400	720*400	640*480	640*480	640*480
Pixel	(MHz)	25.175	28.3220	35.550	25.175	31.500	36.000
H. Sync Polarity		+	-	-	-	-	-
V. Sync Polarity		-	+	+	-	-	-
H. Frequency	(KHz)	31.469	31.469	37.927	31.469	37.500	43.269
H. Period	(usec)	31.778	31.778	26.366	31.778	26.667	23.111
Sync Width (SW)	(usec)	3.813	3.813	2.028	3.813	2.032	1.556
Back Porch (BP)	(usec)	1.907	1.907	3.042	1.907	3.810	2.222
Active Video	(usec)	25.422	25.422	20.282	25.422	20.317	17.778
Front Porch (FP)	(usec)	0.636	0.636	1.014	0.636	0.508	1.556
V. Frequency	(Hz)	70.087	70.087	85.039	59.940	75.000	85.008
V. Period	(msec)	14.268	14.269	11.759	16.683	13.333	11.764
Front Porch(FP)	(msec)	1.176	0.381	0.026	0.318	0.027	0.023
Sync Width(SW)	(msec)	0.064	0.064	0.079	0.064	0.080	0.069
Back Porch(BP)	(msec)	1.907	1.112	1.107	1.048	0.427	0.578
Active Video	(msec)	11.122	12.711	10.546	15.253	12.800	11.093
Interlaced		No	No	No	No	No	No
Mode		(7)	(8)	(9)	(10)	(11)	(12)
Resolution		800*600	800*600	800*600	1024*768	1024*768	1024*768
Pixel	MHz	50.000	49.500	56.250	65.000	78.750	94.500
H. Sync Polarity		+	+	+	-	+	+
V. Sync Polarity		+	+	+	-	+	+
H. Frequency	(KHz)	48.077	46.875	53.674	48.363	60.023	68.677
H. Period	(usec)	20.800	21.333	18.631	20.677	16.660	14.561
Sync Width (SW)	(usec)	2.400	1.616	1.138	2.092	1.219	1.016
Back Porch (BP)	(usec)	1.280	3.232	2.702	2.462	2.235	2.201
Active Video	(usec)	16.000	16.162	14.222	15.754	13.003	10.836
Front Porch (FP)	(usec)	1.120	0.323	0.569	0.369	0.203	0.508
V. Frequency	(Hz)	72.188	75.000	85.061	60.004	75.029	84.997
V. Period	(msec)	13.853	13.333	11.756	16.666	13.328	11.765
Front Porch (FP)	(msec)	0.770	0.021	0.019	0.062	0.017	0.015
Sync Width (SW)	(msec)	0.125	0.064	0.056	0.124	0.050	0.044
Back Porch (BP)	(msec)	0.478	0.448	0.503	0.600	0.466	0.524
Active Video	(msec)	12.480	12.800	11.179	15.88	12.795	11.183
Interlaced		No	No	No	No	No	No

Note: Timing modes 1-10 apply to 55KHz models.

Timing modes 1-12 apply to 70KHz models.

USER TIMING MODE SETUP

The monitor is capable of storing up to 19 modes for total, with 12 factory programmed, this leaves 7 available set spaces for users.

To successfully install a new timing mode, some certain things have to be considered.

The new mode must have a horizontal frequency difference of 0.5 KHz. Minimum or a vertical frequency difference of 1 Hz. minimum from any single mode previously installed. For example:

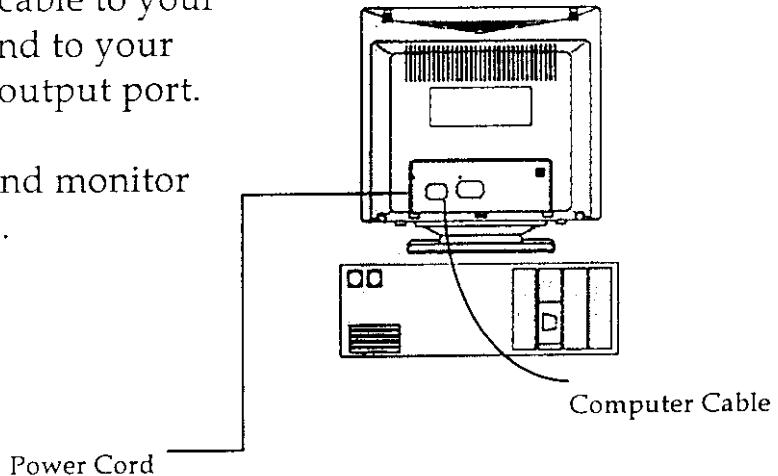
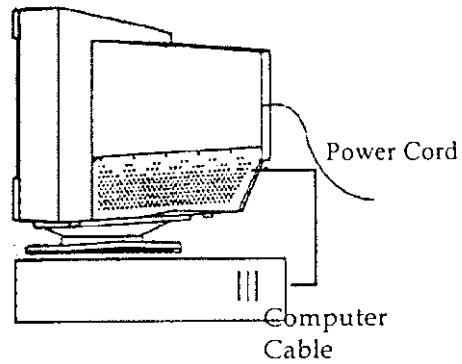
Assuming the timing requirements are met, the new mode is automatically installed when the monitor is connected to the signal source. Thus the front panel controls for horizontal/vertical display and position can be adjusted. The last made horizontal/vertical adjustment last will always be stored with the current timing mode.

After 7 user modes are installed, the first installed ones will be removed when any more modes are added. However, the factory preset modes will not be affected.

INSTALLATION

Follow these step-by-step instruction for proper monitor installation.

1. Make certain your computer's power switch is off before plugging power cord. This is very important!!!
2. Then plug the power cord into your monitor's AC socket and the other end to the power source as shown.
3. Now attach the video cable to your monitor and the other end to your computer' video card output port.
4. Turn your computer and monitor on. Adjust user controls.



SAFETY PRECAUTIONS

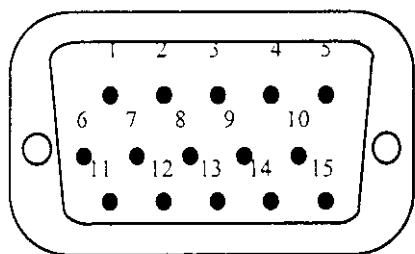
This monitor is manufactured and tested on a ground principle that a user's safety comes first. However, improper use or installation may result danger to the monitor as well as to the user. Carefully go over the following WARNINGS before installation and keep this guide handy.

WARNINGS:

- ◆ This monitor should be operated only at the correct power sources indicated on the label on the rear end of the monitor. If you're unsure of the power supply in your residence, consult your local dealer or power company.
- ◆ Do not try to repair the monitor yourself as it contains no user-serviceable parts. The monitor should only be repaired by a qualified technician.
- ◆ Do not remove the monitor cabinet. There is high-voltage parts inside that may cause electric shock to human bodies, even when the power cord is disconnected .
- ◆ Stop using the monitor if the cabinet is damaged. Have it checked by a service technician.
- ◆ Put your monitor only in a clean, dry environment. Unplug the monitor immediately if gets wet and consult your service technician.
- ◆ Always unplug the monitor before cleaning it. Clean the cabinet with a clean, dry cloth. Apply non-ammonia based cleaner onto the cloth, not directly onto the glass screen.
- ◆ Keep the monitor away from magnetic objects, motors, TV sets, and transformer.
- ◆ Do not place heavy objects on the cable or power cord.

D-SUB CONNECTOR

15-PIN D-SUB CONNECTOR



1. R	6. GND	11. GND
2. G	7. GND	12. SDA
3. B	8. GND	13. H. SYNC
4. GND	9. NC	14. V. SYNC
5. NC	10. GND	15. SCL

SIGNAL LEVEL

CONNECTOR	SIGNAL	DESCRIPTION
R	RED	0.7 VP-P(VIDEO)
G	GREEN	0.7 VP-P(VIDEO)
B	BLUE	0.7 VP-P(VIDEO)
H	H/SYNC	TTL positive or negative
V	V/SYNC	TTL positive or negative
SDA	DDC1/2B	TTL
SCL	DDC1/2B	TTL

SPECIFICATIONS

CRT	Size Viewable Size Dot Pitch Deflection	15-Inch Diagonal Flat Square Type Specified on carton box 0.28mm 90°
Display	Size Color Resolution	260mm x 195mm. Unlimited Colors 1024*768 (55KHz) 1280*1024(70KHz)
Input Signal	Video Signal Sync. Signal Scanning Freq.	RGB Analogue 0.7 Vpp 75 Ohms H/V. Separated, TTL. Level Positive or Negative. Horizontal: 30 KHz to 55/70 KHz Vertical: 50 Hz to 120 Hz
Power Source	Power Supply Power Consumption	AC 100-240 V, 60 Hz/50 Hz. 100W Max.
Weight	Net Weight	Specified on carton box.

POWER MANAGEMENT

The Power Management states are controlled by the presence and /or absence of horizontal and vertical sync signals according to the following:

State	H. Sync.	V. Sync.	Power (nominal)	LED
ON	ON	ON	<90 WATTS	GREEN
STANDBY	OFF	ON	<15 WATTS	ORANGE
SUSPEND	ON	OFF	<08 WATTS	ORANGE
OFF	OFF	OFF	<08 WATTS	ORANGE