NEC

PART NO. 599910721

SERVICE MANUAL

COLOR MONITOR

AccuSync™ LCD72VM

MODEL ID LCD72VM-BK (Q)

This model has one type of LCD panel.

The LCD panel manufactured by Quanta (QDI): Brightness is 250cd/m^2.

The classification code of the serial number is [0, 1]: QDI Panel (Luminosity is 250cd/m^2)

VERY IMPORTANT! Prior to servicing, confirm the classification code in the serial number of the unit. For more details of the serial number, refer to “Serial Number Information”.

1st Edition

NEC-MITSUBISHI ELECTRIC VISUAL SYSTEMS CORPORATION

SEPTEMBER 2004

200410
08F14QAN 08F14QBN

WARNING

The SERVICE PERSONNEL should have the appropriate technical training, knowledge and experience necessary to:

- Be familiar with specialized test equipment, and
- Be careful to follow all safety procedures to minimize danger to themselves and their coworkers.

To avoid electrical shocks, this equipment should be used with an appropriate power cord.

This equipment utilized a micro-gap power switch. Turn off the set by first pushing power switch. Next, remove the power cord from the AC outlet.
To prevent fire or shock hazards, do not expose this unit to rain or moisture.

This symbol warns the personnel that un-insulated voltage within the unit may have sufficient magnitude to cause electric shock.

This symbol alerts the personnel 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.

PRODUCT SAFETY CAUTION

1. When parts replacement is required for servicing, always use the manufacturer's specified replacement.
2. When replacing the component, always be certain that all the components are put back in the place.
3. As for a connector, pick and extract housing with fingers properly since a disconnection and improper contacts may occur, when wires of the connector are led.
4. Use a proper screwdriver. If you use screwdriver that does not fit, you may damage the screws.

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NEC

USER'S MANUAL

AccuSync™ LCD52VM/LCD72VM/LCD92VM

To learn about other special offers, register online at www.necmitsubishi.com/productregistration

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WARNING

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.

CAUTION

CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK, MAKE SURE POWER CORD IS UNPLUGGED FROM WALL SOCKET. TO FULLY DISENGAGE THE POWER TO THE UNIT, PLEASE DISCONNECT THE POWER CORD FROM THE AC OUTLET. DO NOT REMOVE COVER (OR BACK). NO USER SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

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.

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.

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 CAN/CSA C22.2 No. 60950-1.

FCC Information

1. Use the attached specified cables with the AccuSync LCD52VM (L154F0), AccuSync LCD72VM (L174F1), or AccuSync LCD92VM (L194F2) color monitor so as not to interfere with radio and television reception.
   (1) Please use the supplied power cord or equivalent to ensure FCC compliance.
   (2) Please use the supplied 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.

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Contents

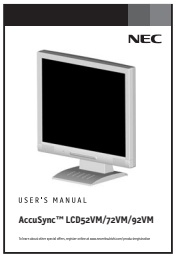
Your new NEC AccuSync LCD monitor box* should contain the following:

- AccuSync LCD Monitor
- Audio Cable
- User's Manual
- Cable Holder
- Video Signal Cable
- Power Cord
- Base Stand

Power Cord

Video Signal Cable

Audio Cable



User's Manual

AccuSync LCD monitor
(stand not connected)

Cable Holder

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

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Quick Start

To attach the Base to the LCD Stand:

1. Insert the front of the LCD Stand into the holes in the front of the Base **(Figure 1)**.
2. Next, position the locking tabs on the back side of the LCD Stand with the holes on the Base. Lower the Stand until locking tabs are secure.
3. Attach the clip into the base **(Figure 2)**.

Figure 1

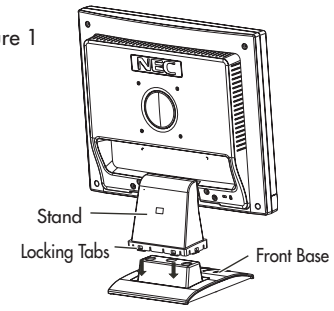
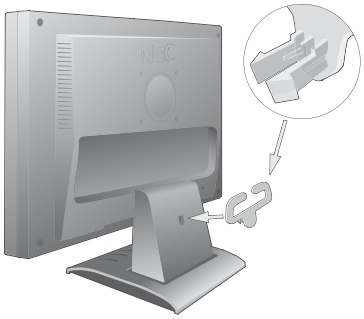


Figure 2



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

1. Turn off the power to your computer.
2. For the PC with Analog output: Connect the 15-pin mini D-SUB signal cable to the connector of the display card in your system **(Figure A.1)**. Tighten all screws.
   For the MAC: Connect the AccuSync Macintosh cable adapter to the computer, then attach the 15-pin mini D-SUB signal cable to the AccuSync Macintosh cable adapter **(Figure A.2)**. Tighten all screws.

NOTE: To obtain the AccuSync Macintosh cable adapter, call NEC-Mitsubishi Electronics Display of America, Inc. at (800) 632-4662.

3. Connect the 15-pin mini D-SUB of the video signal cable to the appropriate connector on the back of the monitor **(Figure B.1)**. Connect the audio cable to AUDIO-INPUT on the back of the monitor and the other end to the "Audio out" terminal of the computer. Headphones may be connected to the "Headphones" output on the front of the monitor "🎧". While the headphones are connected, the sound from the speakers will be disabled. Headphones can be purchased from your local electronics store.
4. Connect one end of the power cord to the LCD and the other end to the power outlet. Place the video signal cable, power cord and audio cable between the cable holder **(Figure B.1)**.

NOTE: Adjust the position of cables between the holder to avoid damage.

NOTE: If you use this monitor at AC125-240V, please refer to Recommended Use section of this manual for proper selection of power cord.

5. Turn on the monitor with the front power button and the computer. **(Figure C.1)**
6. No-touch Auto Adjust automatically adjusts the monitor to optimal settings upon initial setup for most timings. For further adjustments, 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/Me/2000/XP INF file for your AccuSync 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.

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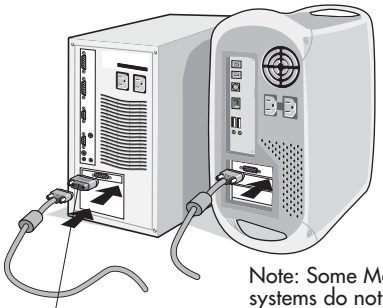
Quick Start *–continued*

Figure A.1



Macintosh Cable Adapter (not included)

Figure A.2

Note: Some Macintosh systems do not require a Macintosh Cable Adapter

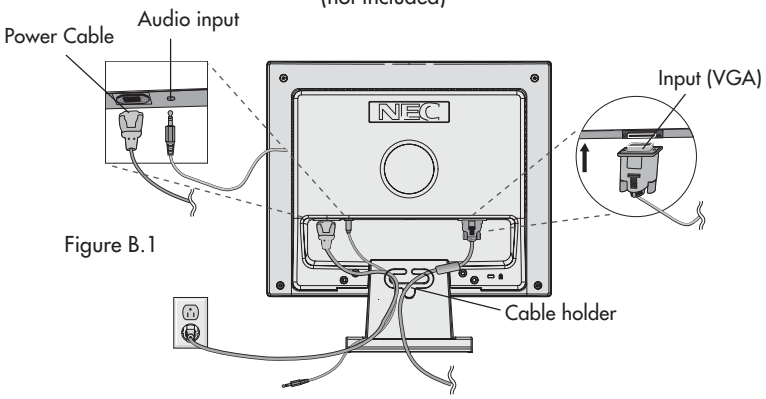


Figure B.1

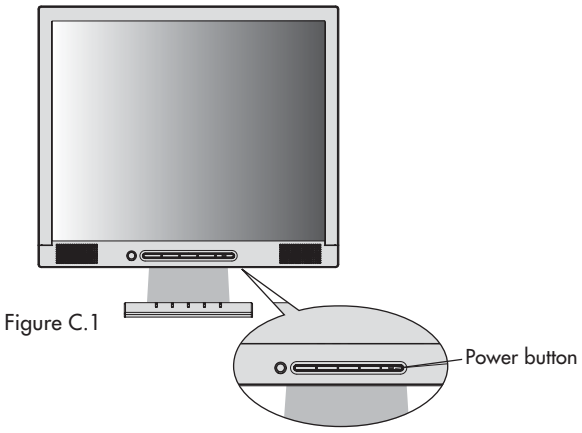


Figure C.1

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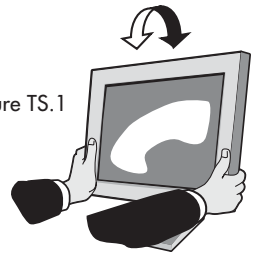
Quick Start *–continued*

Tilt

Grasp both sides of the monitor screen with your hands and adjust the tilt as desired **(Figure TS.1).**

NOTE: Handle with care when tilting the monitor screen.

Figure TS.1



Remove Monitor Stand for Mounting

To prepare the monitor for alternate mounting purposes:

1. Disconnect all cables.
2. Place monitor face down on a nonabrasive surface **(Figure R.1)**.
3. Remove the 4 screws connecting the monitor to the stand and slide the stand off from the LCD **(Figure R.2)**.

   The monitor is now ready for mounting in an alternate manner.
4. Connect the AC cord and signal cable to the back of the monitor **(Figure R.3)**.
5. Reverse this process to reattach stand.

NOTE: Use only VESA-compatible alternative mounting method.
NOTE: Handle with care when removing monitor stand.

Figure R.1

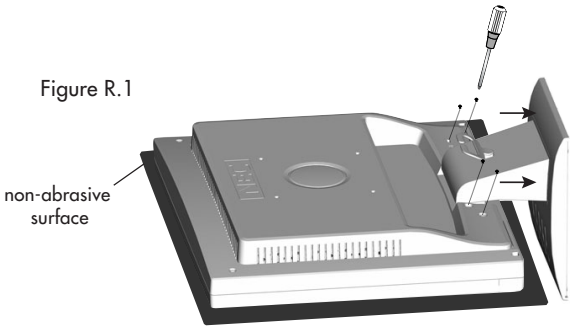
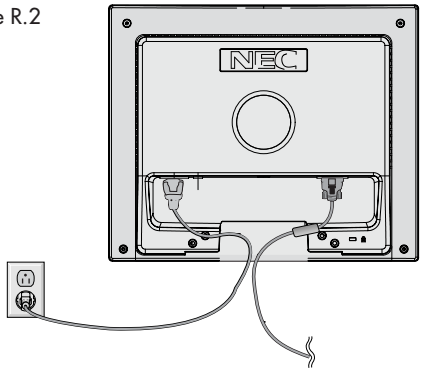


Figure R.2



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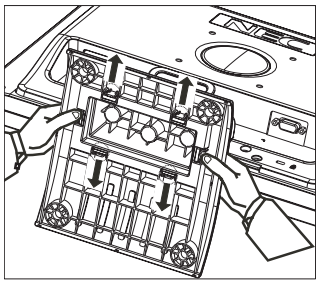
Quick Start *–continued*

Removing the Base



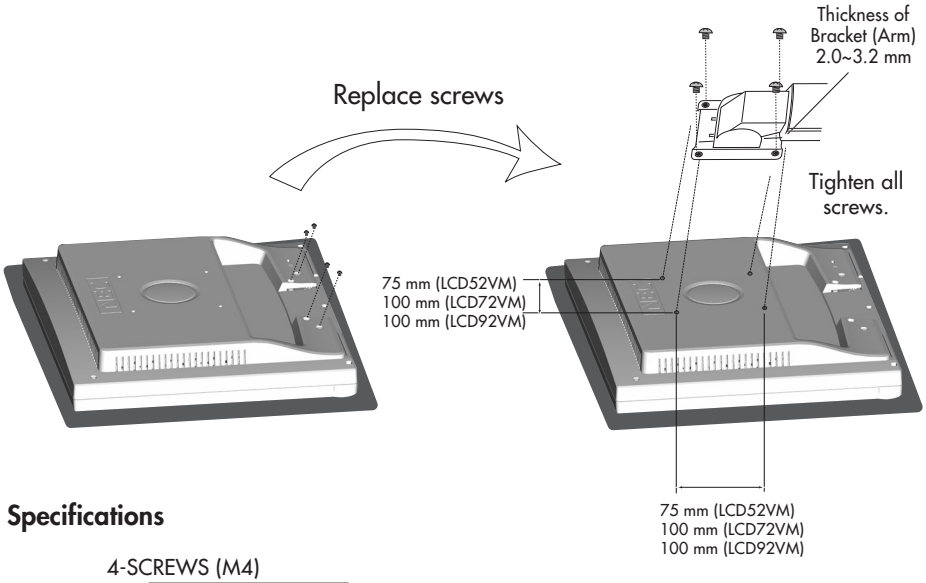
Note: Always remove the Base when shipping the LCD.

1. Place monitor face down on a non-abrasive surface.
2. While using your thumbs, press the tabs in the direction of the arrows to unlock the stand.
3. Pull the unlocked base off the stand.

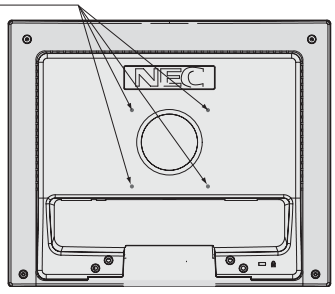
Connecting a Flexible Arm

This LCD monitor is designed for use with a flexible arm. Please use the attached screws (4pcs) as shown in the picture when installing.

To meet the safety requirements, the monitor must be mounted to an arm which guaranties the necessary stability under consideration of the weight of the monitor. The LCD monitor should only be used with an approved arm (e.g. GS mark).



Specifications



Weight of LCD assembly:
2.9 kg - LCD52VM (MAX)
4.3 kg - LCD72VM (MAX)
5.5 kg - LCD92VM (MAX)

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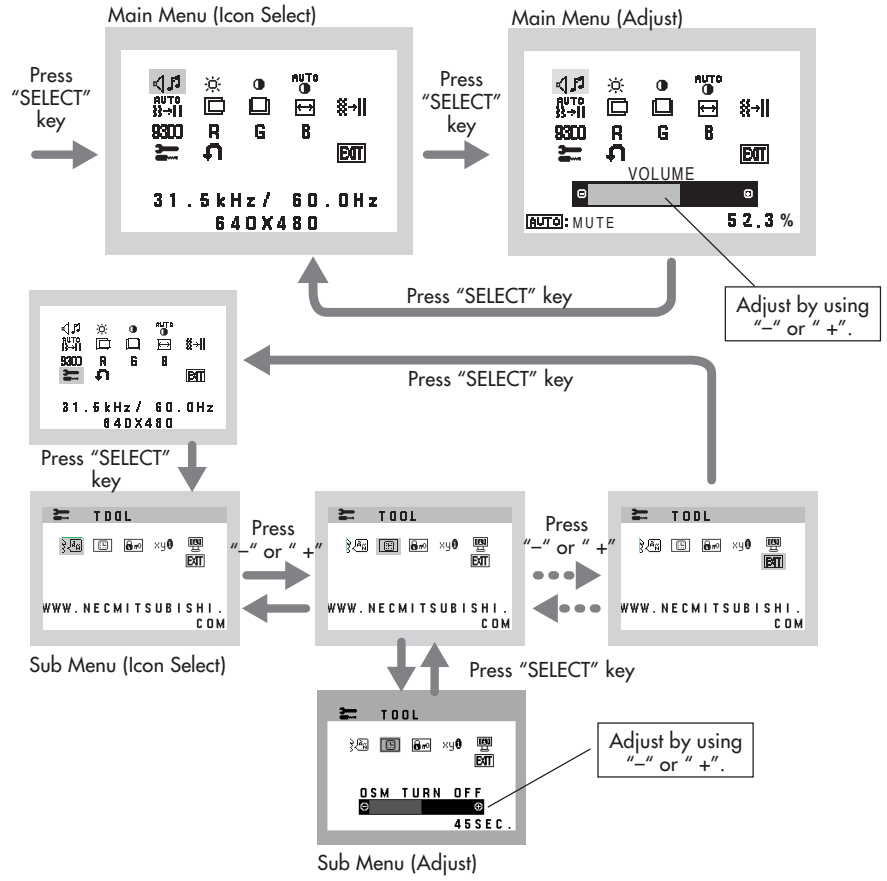
Controls

OSM® (On-Screen Manager) control buttons on the front of the monitor function as follows:

1. Basic key function

Button	SELECT	–	+	AUTO / RESET
OSM Off	OSM displayed	Shortcut to bright adjust window	Shortcut to volume adjust window	"Auto adjust" function
OSM On (Icon selection stage)	Moves to Adjustment stage	Cursor moves left	Cursor moves right	
OSM On (Adjustment stage)	Moves to Icon selection stage	Adjust value decrease or Cursor for adjust moves left	Adjust value increase or Cursor for adjust moves right	Reset operation Mute off/on Volume adjustment window

2. OSM Structure



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Controls *–continued*

AUDIO
Control the sound volume of speakers and headphone.
To mute the speaker sound, press the AUTO/RESET key.

BRIGHTNESS
Adjusts the overall image and background screen brightness.

CONTRAST
Adjusts the image brightness in relation to the background.

AUTO CONTRAST
Adjusts the image displayed for non-standard video inputs.

AUTO ADJUST
Automatically adjusts the Image Position, the H. Size and Fine setting.

LEFT/RIGHT
Controls Horizontal Image Position within the display area of the LCD.

DOWN/UP
Controls Vertical Image Position within the display area of the LCD.

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

FINE
Improves focus, clarity and image stability by increasing or decreasing this setting.

COLOR CONTROL SYSTEMS
Four color presets (9300/7500/6500/USER) select the desired color setting.

COLOR RED
Increase or decreases Red. The change will appear on screen.

COLOR GREEN
Increase or decreases Green. The change will appear on screen.

COLOR BLUE
Increase or decreases Blue. The change will appear on screen.

TOOL
Selecting TOOL allows you to get into the sub menu.

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 tage effect. Individual settings can be reset by highlighting the control to be reset and pressing the RESET button.

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Controls *–continued*

EXIT

Selecting EXIT allows you exit OSM menu/sub menu.

LANGUAGE

OSM control menus are available in seven languages.

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 - 120 seconds in 5 second intervals.

OSM LOCK OUT

This control completely locks out access to all OSM control functions without Brightness and Contrast. When attempting to activate OSM controls while in the Lock Out mode, a screen will appear indicating the OSM are locked out. To activate the OSM Lock Out function, press "AUTO/ RESET", then "+" key and hold down simultaneously. To de-activate the OSM Lock Out, press "AUTO/ RESET", then "+" key and hold down simultaneously.

RESOLUTION NOTIFIER

If ON is selected, a message will appear on the screen after 30 seconds, notifying you that the resolution is not at optimal resolution.

MONITOR INFO

Indicates the model and serial numbers of your monitor.

OSM® Warning: OSM Warning menus disappear with SELECT button.
NO SIGNAL: This function gives a warning when there is no signal present. After power is turned on or when there is a change of input signal or video is inactive, the **No Signal** window will appear.
RESOLUTION NOTIFIER: This function gives a warning of use with optimized resolution. After power is turned on or when there is a change of input signal or the video signal doesn't have proper resolution, the **Resolution Notifier** window will open. This function can be disabled in the TOOL menu.
OUT OF RANGE: This function gives a recommendation of the optimized resolution and refresh rate. After the power is turned on or there is a change of input signal or the video signal doesn't have proper timing, the **Out Of Range** menu will appear.

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Recommended Use

Safety Precautions and Maintenance

FOR OPTIMUM PERFORMANCE, PLEASE NOTE THE FOLLOWING WHEN SETTING UP AND USING THE ACCUSYNC 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 AccuSync LCD monitor with its AC 125-240V 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. (Type H05VV-F should be used in Europe)
- 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.
- Do not place any objects onto the monitor and do not use the monitor 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.
- Do not bend power cord.
- Do not use monitor in high temperature, humid, dusty, or oily areas.
- If glass is broken, handle with care.
- Do not cover vent on monitor.

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.
- If monitor or glass is broken, do not come in contact with the liquid crystal and handle with care.

- 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.
- 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.

Image Persistence

Image persistence is when a residual or "ghost" image of a previous image remains visible on the screen. Unlike CRT monitors, LCD monitors' image persistence is not permanent, but constant images being displayed for a long period of time should be avoided.

To alleviate image persistence, turn off the monitor for as long as the previous image was displayed. For example, if an image was on the monitor for one hour and a residual image remains, the monitor should be turned off for one hour to erase the image.

NOTE: As with all personal display devices, NEC-Mitsubishi Electronics Display recommends using a moving screen saver at regular intervals whenever the screen is idle or turning off the monitor when not in use.

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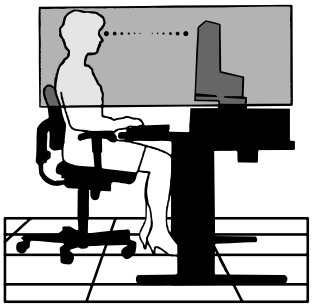
Recommended Use *–continued*

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 20 inches.
- 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 antiglare filter.
- Clean the LCD monitor surface with a lint-free, nonabrasive 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 (afterimage effects).
- Get regular eye checkups.

Ergonomics

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

- 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, 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, California 90406.

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Specifications

Monitor Specifications		AccuSync LCD52VM Monitor	Notes
LCD Module	Diagonal: Viewable Image Size: Native Resolution (Pixel Count):	15.0 inch 15.0 inch 1024 x 768	Active matrix; thin film transistor (TFT) liquid crystal display (LCD); 0.297 mm dot pitch; 250cd/m² white luminence; 400:1 contrast ratio, typical
Input Signal	Video: Sync:	ANALOG 0.7 Vp-p/75 Ohms Separate sync TTL Level (Positive/Negative) Horizontal sync Positive/Negative Vertical sync Positive/Negative	
Display Colors	Analog input:	16,194,277	Depending on display card used.
Maximum Viewing Angles	Left/Right: Up/Down:	60°/60° (CR>10) 45°/45° (CR>10)	
Synchronization Range	Horizontal: Vertical:	31.5 kHz to 60 kHz 55 Hz to 76 Hz	Automatically Automatically
Resolutions Supported		720 x 400*1 :VGA text 640 x 480*1 at 60 Hz to 75 Hz 800 x 600*1 at 56 Hz to 75 Hz 832 x 624*1 at 75 Hz 1024 x 768 at 60 Hz to 75 Hz	Some systems may not support all modes listed. NEC-Mitsubishi Electronics Display cites recommended resolution at 75 Hz for optimal display performance.
Active Display Area	Horizontal : Vertical :	304.1 mm/12.0 inches 228.1 mm/9.0 inches	
Power Supply		100-240 V ~ 50/60 Hz	
Speaker Practical Audio Output		1 + 1 Watts	
Current Rating		0.5 - 0.3A/100-120V	
Dimensions		344.6 mm (W) x 352.7 mm (H) x 165 mm (D) 13.6 inches (W) x 13.9 inches (H) x 6.5 inches (D)	
Weight		3.3 kg 7.3 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 40,000 Feet	

*1 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 nonnative 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.

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Specifications *–continued*

Monitor Specifications		AccuSync LCD72VM Monitor	Notes
LCD Module	Diagonal:	17.0 inch	Active matrix; thin film transistor (TFT)
	Viewable Image Size:	17.0 inch	liquid crystal display (LCD); 0.264 mm dot
	Native Resolution (Pixel Count):	1280 x 1024	pitch; 250cd/m² white luminence; 450:1 contrast ratio, typical
Input Signal	Video:	ANALOG 0.7 Vp-p/75 Ohms	
	Sync:	Separate sync TTL Level (Positive/Negative) Horizontal sync Positive/Negative Vertical sync Positive/Negative	
Display Colors	Analog input:	16,194,277	Depending on display card used.
Maximum Viewing Angles	Left/Right:	70°/70° (CR>10)	
	Up/Down:	65°/60° (CR>10)	
Synchronization Range	Horizontal:	31.5 kHz to 81.1 kHz	Automatically
	Vertical:	55 Hz to 76 Hz	Automatically
Resolutions Supported		720 x 400*[1] : VGA text 640 x 480*[1] at 60 Hz to 75 Hz 800 x 600*[1] at 56 Hz to 75 Hz 832 x 624*[1] at 75 Hz 1024 x 768*[1] at 60 Hz to 75 Hz 1152 x 864*[1] at 70 Hz 1152 x 870*[1] at 75 Hz 1280 x 960*[1] at 60 Hz to 75 Hz 1280 x 1024 at 60 Hz to 75 Hz.....	Some systems may not support all modes listed. NEC-Mitsubishi Electronics Display cites recommended resolution at 60 Hz for optimal display performance.
Active Display Area	Horizontal :	338 mm/13.3 inches	
	Vertical :	270.3 mm/10.6 inches	
Power Supply		100-240 V ~ 50/60 Hz	
Speaker Practical Audio Output		1 + 1 Watts	
Current Rating		0.6 - 0.4A/100-120V	
Dimensions		375.4 mm (W) x 389 mm (H) x 180 mm (D) 14.8 inches (W) x 15.3 inches (H) x 7.1 inches (D)	
Weight		4.7 kg 10.4 lbs	
Environmental Considerations			
	Operating Temperature:	5°C to 35°C/41°F to 95°F	
	Humidity:	30% to 80%	
	Feet:	0 to 10,000 Feet	
	Storage Temperature:	-10°C to +60°C/14°F to 140°F	
	Humidity:	10% to 85%	
	Feet:	0 to 40,000 Feet	

*[1] 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.

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Specifications *–continued*

Monitor Specifications		AccuSync LCD92VM Monitor	Notes
LCD Module	Diagonal:	19.0 inch	Active matrix; thin film transistor (TFT)
	Viewable Image Size:	19.0 inch	liquid crystal display (LCD); 0.294 mm dot
	Native Resolution (Pixel Count):	1280 x 1024	pitch; 250cd/m² white luminence; 450:1 contrast ratio, typical
Input Signal	Video:	ANALOG 0.7 Vp-p/75 Ohms	
	Sync:	Separate sync TTL Level (Positive/Negative) Horizontal sync Positive/Negative Vertical sync Positive/Negative	
Display Colors	Analog input:	16,194,277	Depending on display card used.
Maximum Viewing Angles	Left/right:	65°/65° (CR>10)	
	Up/Down:	65°/65° (CR>10)	
Synchronization Range	Horizontal:	31.5 kHz to 81.1 kHz	Automatically
	Vertical:	55 Hz to 76 Hz	Automatically
Resolutions Supported		720 x 400*[1] : VGA text 640 x 480*[1] at 60 Hz to 75 Hz 800 x 600*[1] at 56 Hz to 75 Hz 832 x 624*[1] at 75 Hz 1024 x 768*[1] at 60 Hz to 75 Hz 1152 x 864*[1] at 70 Hz 1152 x 870*[1] at 75 Hz 1280 x 960*[1] at 75 Hz 1280 x 1024 at 60 Hz to 75 Hz.....	Some systems may not support all modes listed. NEC-Mitsubishi Electronics Display cites recommended resolution at 60 Hz for optimal display performance.
Active Display Area	Horizontal :	376 mm/14.8 inches	
	Vertical :	301 mm/11.9 inches	
Power Supply		100-240 V ~ 50/60 Hz	
Speaker Practical Audio Output		1 + 1 Watts	
Current Rating		0.8 - 0.5A/100-120V	
Dimensions		418 mm (W) x 427.8 mm (H) x 199.5 mm (D) 16.5 inches (W) x 14.6 inches (H) x 7.9 inches (D)	
Weight		6.5 kg 14.3 lbs	
Environmental Considerations			
	Operating Temperature:	5°C to 35°C/41°F to 95°F	
	Humidity:	30% to 80%	
	Feet:	0 to 10,000 Feet	
	Storage Temperature:	-10°C to +60°C/14°F to 140°F	
	Humidity:	10% to 85%	
	Feet:	0 to 40,000 Feet	

*[1] 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.

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Features

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 Systems: 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.

No-touch Auto Adjust™: No-touch Auto Adjust automatically adjusts the monitor to optimal settings upon initial setup.

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 and TCO guidelines for lower emissions.

Plug and Play: The Microsoft® solution with the Windows®95/98/Me/2000/XP 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.

VESA® Standard Mounting Interface: Allows users to connect their AccuSync monitor to any VESA standard third party mounting arm or bracket. Allows for the monitor to be mounted on a wall or an arm using any third party compliant device.

OSM Display Screen Copyright 2004 by
NEC-Mitsubishi Electronics Display of America, Inc.

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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.
- Front 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.

Power Button does not respond

- Unplug the power cord of the monitor from the AC outlet to turn off and reset the monitor.

Image Persistence

- Image persistence is when a residual or "ghost" image of a previous image remains visible on the screen. Unlike CRT monitors, LCD monitors' image persistence is not permanent, but constant images being displayed for a long period of time should be avoided.

  To alleviate image persistence, turn off the monitor for as long as the previous image was displayed. For example, if an image was on the monitor for one hour and a residual image remains, the monitor should be turned off for one hour to erase the image.

  NOTE: As with all personal display devices, NEC-Mitsubishi Electronics Display recommends using a moving screen saver at regular intervals whenever the screen is idle or turning off the monitor when not in use.

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 control. When the display mode is changed, the OSM Image Adjust settings may need to be readjusted.
- Check the monitor and your display card with respect to compatibility and recommended signal timings.
- If your text is garbled, change the video mode to non-interlace and use 60Hz refresh rate.

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.

Display image is not sized properly

- Use the OSM Image Adjust controls to increase or decrease the H.SIZE.
- 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.)

No Video

- If no video is present on the screen, turn the Power button off and on again.
- Make certain the computer is not in a power-saving mode (touch the keyboard or mouse).

No Sound

- Check to see if speaker cable is properly connected.
- Check to see if mute is activated.
- Check to see if volume in OSM is set at minimum.

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References

NEC-Mitsubishi Monitor Customer Service & Support

Customer Service and Technical Support:	(800) 632-4662
Fax:	(800) 695-3044
Parts and Accessories/Macintosh Cable Adapter:	(888) NEC-MITS [888-632-6487]
Warranty Information:	www.necmitsubishi.com/warranty

Online Technical Support www.necmitsubishi.com/support

Sales and Product Information

Sales Information Line:	(888) NEC-MITS [888-632-6487]
Canadian Customers:	(866) 771-0266, Ext#: 4037
Government Sales:	(800) 284-6320
Government Sales email:	gov@necmitsubishi.com

Electronic Channels

World Wide Web:	www.necmitsubishi.com
Product Registration:	www.necmitsubishi.com/productregistration
European Operations:	www.nec-mitsubishi.com

Drivers and Downloads www.necmitsubishi.com/downloads

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Limited Warranty

NEC-Mitsubishi Electronics Display of America, Inc. (hereinafter "NMD-A") 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 NMD-A'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 unit 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 NMD-A-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 NMD-A No warranty service is provided outside of the U.S.A. or Canada. Proof of Purchase will be required by NMD-A 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 NMD-A 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 NMD-A 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 NMD-A 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.

NMD-A SHALL NOT BE LIABLE FOR DIRECT, INDIRECT, INCIDENTAL, CONSEQUENTIAL, OR OTHER TYPES OF DAMAGES RESULTING FROM THE USE OF ANY NMD-A 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 NMD-A 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 NMD-A.

For the name of your nearest authorized NEC-Mitsubishi Electronics Display service facility, contact NEC-Mitsubishi Electronics Display of America at 1-800-632-4662.

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TCO'99

Congratulations! You have just purchased a TCO'99 approved and labelled 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-

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TCO'99 *–continued*

accumulative* processes. Flame retardants have been found in human blood and researchers fear that disturbances in fetus 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 color generating layers of certain computer displays. Cadmium damages the nervous system and is toxic in high doses.

TCO'99 requirement states that batteries, the color generating 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:

TCO Development Unit
SE-114 94 Stockholm
SWEDEN
FAX Number: +46 8 782 92 07
E-mail (Internet): development@tco.se

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

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Declaration of the Manufacturer

We hereby certify that the color monitor
AccuSync LCD52VM (L154F0),
AccuSync LCD72VM (L174F1), or
AccuSync LCD92VM (L194F2)
are in compliance with
Council Directive 73/23/EEC:
– EN 60950-1

Council Directive 89/336/EEC:
– EN 55022
– EN 61000-3-2
– EN 61000-3-3
– EN 55024

and marked with

CE

NEC-Mitsubishi Electric Visual
Systems Corporation
4-13-23, Shibaura,
Minato-Ku
Tokyo 108-0023, Japan

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NEC LCD Series

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The NEC-Mitsubishi Electronics Display of America product(s) discussed in this document are warranted in accordance with the terms of the Limited Warranty Statement accompanying each product. However, actual performance of each such product is dependent upon factors such as system configuration, customer data and operator control. Since implementation by customers of each product may vary, the suitability of specific product configurations and applications must be determined by the customer and is not warranted by NEC-Mitsubishi Electronics Display of America.

To allow for design and specification improvements, the information in this document is subject to change at any time without notice. Reproduction of this document or portions thereof without prior approval of NEC-Mitsubishi Electronics Display of America is prohibited.

DECLARATION OF CONFORMITY

This device complies with Part 15 of FCC Rules. Operation is subject to the following two conditions. (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

U.S. Responsible Party:	**NEC-Mitsubishi Electronics Display of America, Inc.**
Address:	**500 Park Blvd, Suite 1100** **Itasca, Illinois 60143-1248**
Tel. No.:	**(630) 467-3000**

Type of Product:	Display Monitor
Equipment Classification:	Class B Peripheral
Model:	AccuSync LCD52VM (L154F0) / LCD72VM (L174F1)/LCD92VM (L194F2)

We hereby declare that the equipment specified above conforms to the technical standards as specified in the FCC Rules.

Windows is a registered trademark of Microsoft Corporation. NEC is a registered trademark of NEC Corporation. ENERGY STAR is a U.S. registered trademark. All other brands and product names are trademarks or registered trademarks of their respective owners.

As an ENERGY STAR® Partner, NEC-Mitsubishi Electronics Display of America has determined that this product meets the ENERGY STAR guidelines for energy efficiency. The ENERGY STAR emblem does not represent EPA endorsement of any product or service.

NEC

Part No.
Printed in China

AccuSync LCD52VM
AccuSync LCD72VM
AccuSync LCD92VM

User's Manual

NEC

WARNING

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.

CAUTION

RISK OF ELECTRIC SHOCK • DO NOT OPEN

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.

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.

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.

Caution:

When operating the AccuSync LCD52VM/AccuSync LCD72VM/AccuSync LCD92VM with a 220-240V AC power source in Europe, use the power cord provided with the monitor.

In the UK, a BS approved power cord with a moulded plug has a Black (five Amps) fuse installed for use with this equipment. If a power cord is not supplied with this equipment please contact your supplier.

For all other cases, use a power cord that matches the AC voltage of the power outlet and has been approved by and complies with the safety standard of your particular country.

Declaration

Declaration of the Manufacturer

We hereby certify that the colour monitor AccuSync LCD52VM (L154F0)/AccuSync LCD72VM (L174F1)/ AccuSync LCD92VM (L194F2) are in compliance with

Council Directive 73/23/EEC:
- EN 60950-1

Council Directive 89/336/EEC:
- EN 55022
- EN 61000-3-2
- EN 61000-3-3
- EN 55024

and marked with

CE

NEC-Mitsubishi Electric Visual Systems Corporation
4-13-23, Shibaura,
Minato-Ku
Tokyo 108-0023, Japan

As an ENERGY STAR Partner, NEC-Mitsubishi Electronics Display of America, Inc. has determined that this product meets the ENERGY STAR guidelines for energy efficiency. ENERGY STAR is a U.S. registered mark. The ENERGY STAR emblem does not represent EPA endorsement of any product or service.

ErgoDesign is a registered trademark of NEC-Mitsubishi Electric Visual Systems Corporation in Austria, Benelux, Denmark, France, Germany, Italy, Norway, Spain, Sweden, U.K..
IBM PC/XT/AT, PS/2, MCGA, VGA, 8514/A and XGA are registered trademarks of International Business Machines Corporation.
Apple and Macintosh are registered trademarks of Apple Computer Inc.
Microsoft and Windows are registered trademarks of the Microsoft Corporation.
NEC is a registered trademark of NEC Corporation.
All other trademarks or registered trademarks are property of their respective owners.

For the Customer to use in U.S.A. or Canada

Canadian Department of Communications Compliance Statement

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

Cet appareil numérique de la classe B respecte toutes les exigences du Règlement sur le matériel brouiller du Canada.

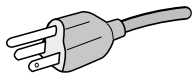
C-UL: Bears the C-UL Mark and is in compliance with Canadian Safety Regulations according to CSA C22.2 No. 60950-1.

Ce produit porte la marque 'C-UL' et se conforme aux règlements de sûrele Canadiens selon CAN/CSA C22.2 No. 60950-1.

FCC Information

1. Use the attached specified cables with the AccuSync LCD52VM/AccuSync LCD72VM/AccuSync LCD92VM colour monitor so as not to interfere with radio and television reception.

   (1) The power supply cord you use must have been approved by and comply with the safety standards of U.S.A., and meet the following condition.

Power supply cord	Non shield type, 3-conductor
Length	1.8 m
Plug shape	 U.S.A

   (2) Please use the supplied 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.

Declaration of Conformity

This device complies with Part 15 of FCC Rules. Operation is subject to the following two conditions. (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

U.S. Responsible Party:	**NEC-Mitsubishi Electronics Display of America, Inc.**
Address:	**500 Park Blvd, Suite 1100** **Itasca, Illinois 60143**
Tel. No.:	**(630) 467-3000**
Type of Product:	Display Monitor
Equipment Classification:	Class B Peripheral
Model:	AccuSync LCD52VM (L154F0)/AccuSync LCD72VM (L174F1)/ AccuSync LCD92VM (L194F2)

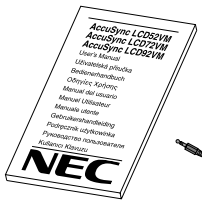
FC

We hereby declare that the equipment specified above conforms to the technical standards as specified in the FCC Rules.

Contents

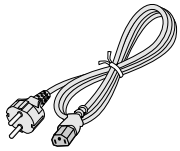
Your new NEC AccuSync LCD monitor box* should contain the following:

- AccuSync LCD monitor with tilt base
- Audio Cable
- Power Cord
- Video Signal Cable
- User's Manual
- CD-ROM
- Base Stand
- Cable Holder

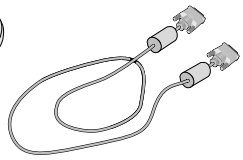


User's Manual

Audio Cable

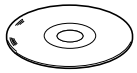


Power Cord



Video Signal Cable

Cable Holder



CD-ROM

Base Stand

AccuSync LCD monitor
(base stand not connected)

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

Quick Start

To attach the Base to the LCD Stand:

1. Insert the front of the LCD stand into the holes in the front of the Base (**Figure S.1**).
2. Next, position the locking tabs on the back side of the LCD stand with the holes on the Base. Lower the Stand in place until locking tabs are secure (**Figure S.1**).

To attach the Cable Holder:

1. Insert the tabs of Cable Holder into the hole of Stand neck (**Figure S.1**).

NOTE: Please confirm that the tabs are completely secure.

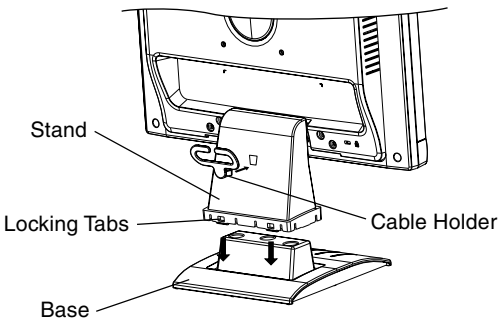


Figure S.1

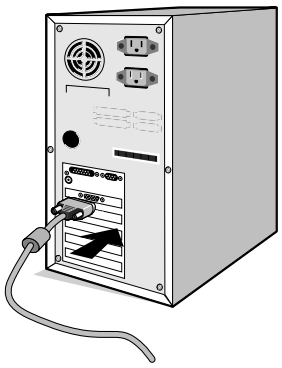


Figure A.1

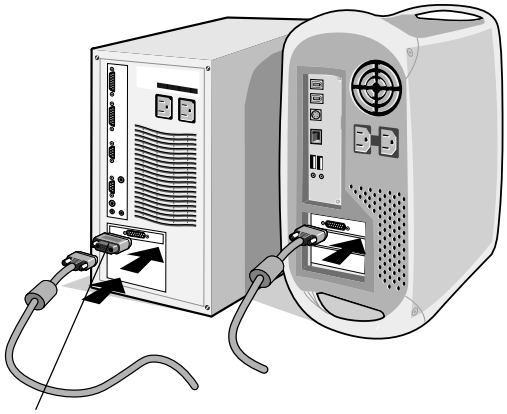


Figure A.2

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

1. Turn off the power to your computer.
2. **For the PC with Analog output:** Connect the 15-pin mini D-SUB signal cable to the connector of the display card in your system (**Figure A.1**). Tighten all screws.

   For the Mac: Connect the MultiSync Macintosh cable adapter (not included) to the computer. Attach the 15-pin mini D-SUB signal cable to the MultiSync Macintosh cable adapter (**Figure A.2**). Tighten all screws.

NOTE: Some Macintosh systems do not require a Macintosh cable adapter.

3. Connect the 15-pin mini D-SUB of the video signal cable and Audio Cable to the appropriate connector on the back of the monitor (**Figure B.1**). Connect the Headphone (not included) to the appropriate connector at the front of the monitor (**Figure C.1**).
4. Connect one end of the power cord to the monitor and the other end to the power outlet. Place the Video Signal Cable and power cord to the Cable holder (**Figure B.1**).

NOTE: Adjust position of cable that place under the Cable holder to avoid damage for cable or monitor.

NOTE: Please refer to Caution section of this manual for proper selection of power cord.

5. Turn on the monitor with the front power button and the computer (**Figure C.1**).

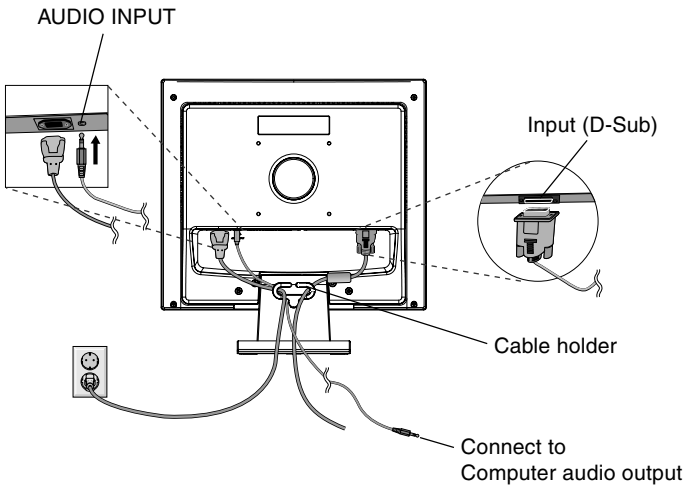


Figure B.1

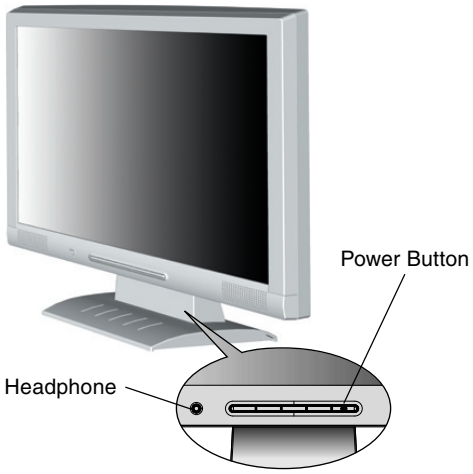


Figure C.1

6. No-touch Auto Adjust automatically adjusts the monitor to optimal settings upon initial setup for most timings. For further adjustments, 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: If you have any problem, please refer to the **Troubleshooting** section of this User's Manual.

Tilt

Grasp both sides of the monitor screen with your hands and adjust the tilt as desired (**Figure TS.1**).

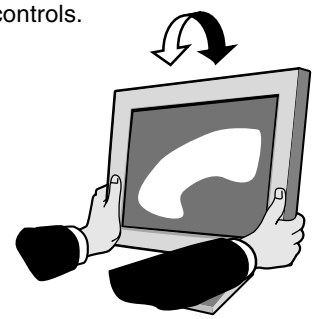


Figure TS.1

Remove Monitor Stand for Mounting

To prepare the monitor for alternative mounting purposes:

1. Disconnect all cables.
2. Place monitor face down on a non-abrasive surface (**Figure R.1**).
3. Remove the 4 screws connecting the monitor to the stand and remove the stand as indicated (**Figure R.2**). The monitor is now ready for mounting in an alternative manner.
4. Connect the AC cord and signal cable to the back of the monitor (**Figure R.3**).
5. Reverse this process to re-attach stand.

NOTE: Use only VESA-compatible alternative mounting method.

NOTE: Handle with care when removing monitor stand.

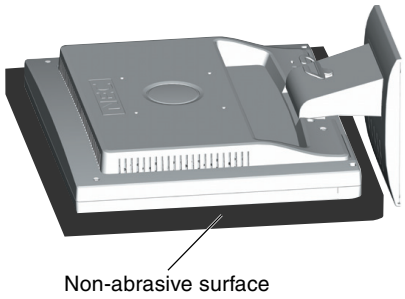


Figure R.1

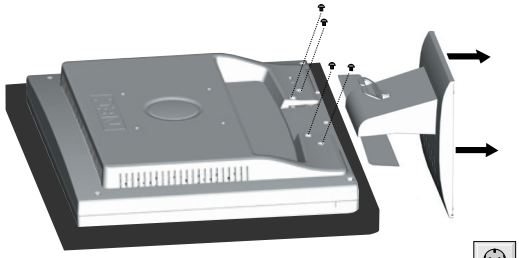


Figure R.2

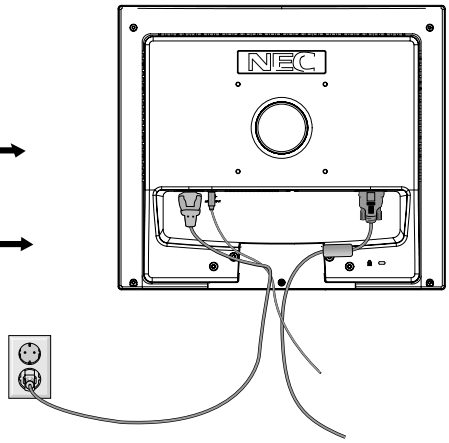
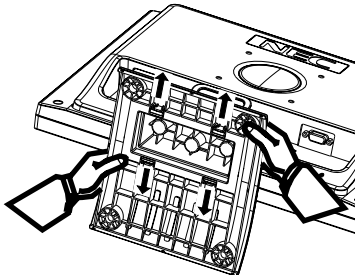


Figure R.3

Removing the Base



NOTE: Always remove the Base when shipping the LCD.

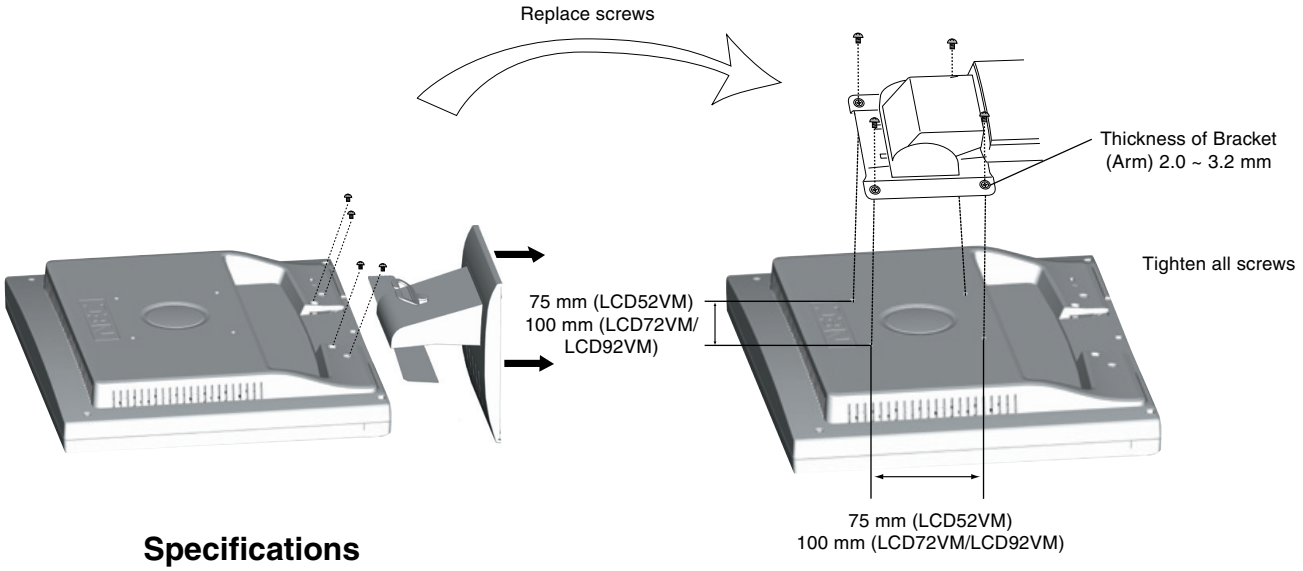
1. Place monitor face down on a non-abrasive surface (**Figure R.1**).
2. While using your thumbs, press the bottom tabs upward to unlock.
3. Press the top tabs down to unlock and pull off the stand.

Connecting a Flexible Arm

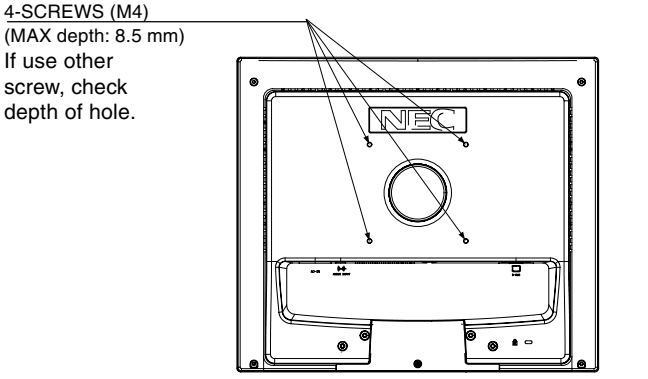
This LCD monitor is designed for use with a flexible arm.

Please use the attached screws (4pcs) as shown in the picture when installing. To meet the safety requirements, the monitor must be mounted to an arm which guaranties the necessary stability under consideration of the weight of the monitor.

The LCD monitor shall only be used with an approved arm (e.g. GS mark).



Specifications



Weight of LCD assembly: 2.9 kg - LCD52VM (MAX)
4.3 kg - LCD72VM (MAX)
5.5 kg - LCD92VM (MAX)

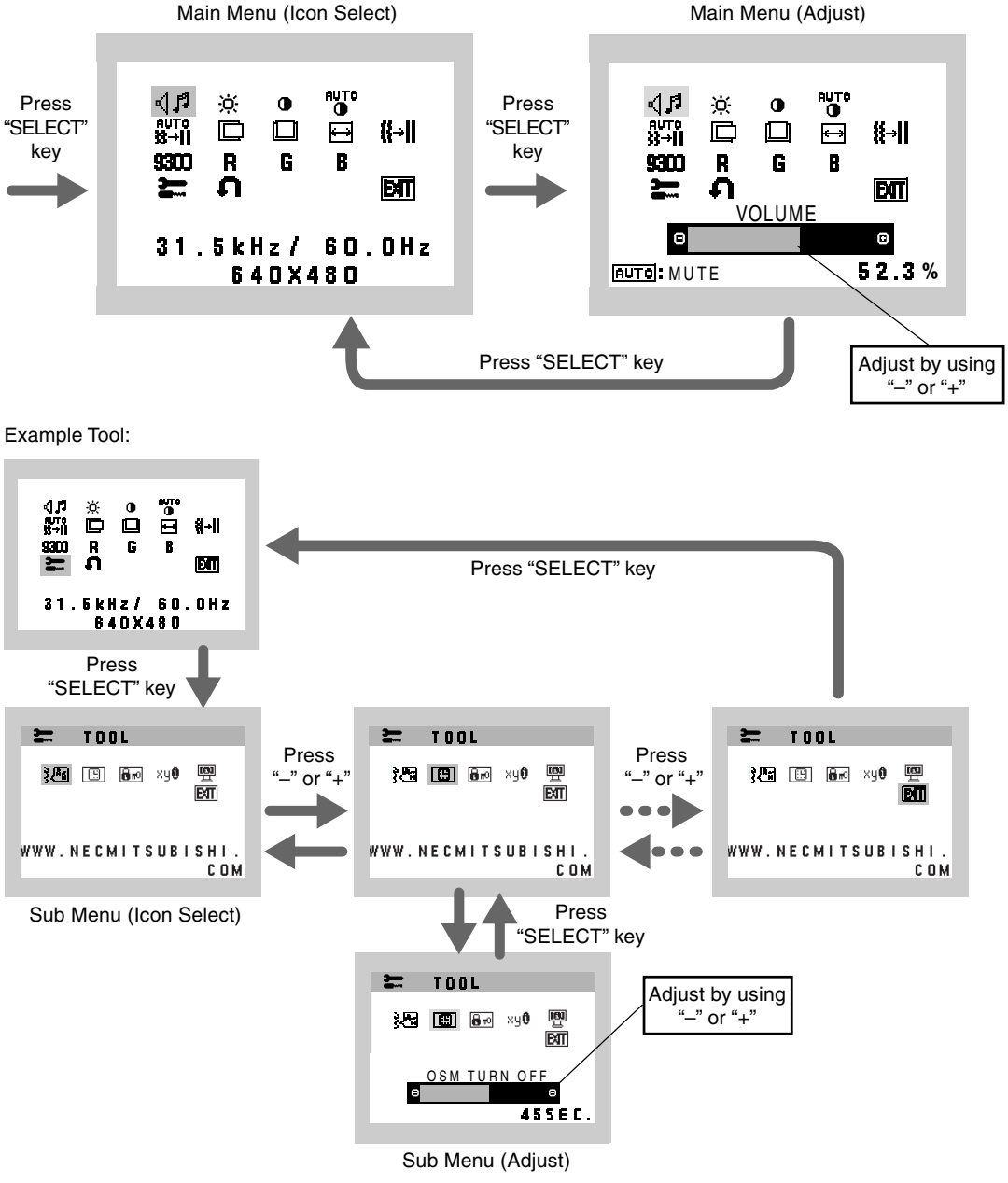
Controls

OSM (On-Screen Manager) control buttons on the front of the monitor function as follows:

1. Basic function at pressing each key

Button	SELECT	–	+	AUTO / RESET
At No OSD showing	Showing OSM.	Shortcut to Bright adjust window.	Shortcut to Volume adjust window.	"Auto adjust" operate.
At OSD showing (Icon selection stage)	Go to Adjustment stage.	Cursor goes to left.	Cursor goes to right.	
At OSD showing (Adjustment stage)	Go to Icon selection stage.	Adjust value decrease or Cursor for adjust goes to left.	Adjust value increase or Cursor for adjust goes to right.	Reset operation. Mute off/on switch on Volume adjustment window.

2. OSM structure



AUDIO
Audio volume icon is chosen, depending on the volume condition (AUTO/RESET).

BRIGHTNESS
Adjusts the overall image and background screen brightness.

CONTRAST
Adjusts the image brightness in relation to the background.

AUTO CONTRAST
Adjusts the image displayed for non-standard video inputs.

AUTO ADJUST
Automatically adjusts the Image Position, the H. Size and Fine setting.

LEFT/RIGHT
Controls Horizontal Image Position within the display area of the LCD.

DOWN/UP
Controls Vertical Image Position within the display area of the LCD.

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

FINE
Improves focus, clarity and image stability by increasing or decreasing this setting.

COLOUR CONTROL SYSTEMS
Four colour presets (9300/7500/6500/USER) select the desired colour setting.

COLOUR RED
Increase or decreases Red. The change will appear on screen.

COLOUR GREEN
Increase or decreases Green. The change will appear on screen.

COLOUR BLUE
Increase or decreases Blue. The change will appear on screen.

TOOL
Selecting TOOL allows you to get into the sub menu.

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 tage effect. Individual settings can be reset by highlighting the control to be reset and pressing the RESET button.

EXIT
Selecting EXIT allows you exit OSM menu/ sub menu.

LANGUAGE
OSM control menus are available in seven languages.

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 - 120 seconds by 5 seconds step.

OSM LOCK OUT

This control completely locks out access to all OSM control functions without Brightness and Contrast. When attempting to activate OSM controls while in the Lock Out mode, a screen will appear indicating the OSM are locked out. To activate the OSM Lock Out function, press “AUTO/ RESET”, then “+” key and hold down simultaneously. To de-activate the OSM Lock Out, press “AUTO/ RESET”, then “+” key and hold down simultaneously.

RESOLUTION NOTIFIER

If ON is selected, a message will appear on the screen after 30 seconds, notifying you that the resolution is not at optimal resolution.

MONITOR INFO

Indicates the model and serial numbers of your monitor.

OSM Warning

OSM Warning menus disappear with Exit button.

NO SIGNAL: This function gives a warning when there is no signal present. After power is turned on or when there is a change of input signal or video is inactive, the **No Signal** window will appear.

RESOLUTION NOTIFIER: This function gives a warning of use with optimized resolution. After power is turned on or when there is a change of input signal or the video signal doesn’t have proper resolution, the **Resolution Notifier** window will open. This function can be disabled in the TOOL menu.

OUT OF RANGE: This function gives a recommendation of the optimized resolution and refresh rate. After the power is turned on or there is a change of input signal or the video signal doesn’t have proper timing, the **Out Of Range** menu will appear.

Recommended use

Safety Precautions and Maintenance

FOR OPTIMUM PERFORMANCE, PLEASE NOTE
THE FOLLOWING WHEN SETTING UP AND
USING THE ACCUSYNC LCD COLOUR 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 LCD monitor with its AC 125-240V power supply, use a power supply aord 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. (Type H05VV-F should be used in Europe).
- In U.K, 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.
- Do not place any objects onto the monitor and do not use the monitor 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.
- Do not bend power cord.
- Do not use monitor in high temperature, humid, dusty, or oily areas.
- Do not cover vent on monitor.

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.
- If monitor is broken, do not come in contact with the liquid crystal and handle with care.

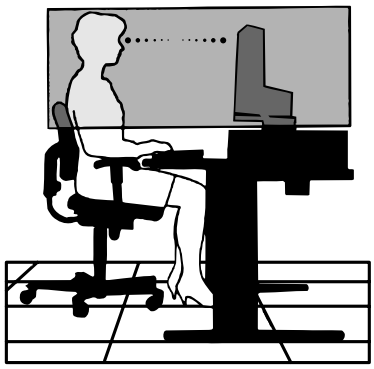
CAUTION

- 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.
- 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.

- **Image Persistence:** Image persistence is when a residual or “ghost” image of a previous image remains visible on the screen. Unlike CRT monitors, LCD monitors’ image persistence is not permanent, but constant images being displayed for a long period of time should be avoided.
  To alleviate image persistence, turn off the monitor for as long as the previous image was displayed. For example, if an image was on the monitor for one hour and a residual image remains, the monitor should be turned off for one hour to erase the image.

  NOTE: As with all personal display devices, NEC-Mitsubishi Electronics Display-Europe recommends using a moving screen saver at regular intervals whenever the screen is idle or turning off the monitor when not in use.

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 40 cm and no further away than 70 cm from your eyes. The optimal distance is 50 cm.
- Rest your eyes periodically by focusing on an object at least 6 m 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 antiglare 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:

- Use the preset Size and Position controls with standard signals.
- Use the preset Colour Setting.
- Use non-interlaced signals with a vertical refresh rate between 60-75 Hz.
- Do not use primary colour blue on a dark background, as it is difficult to see and may produce eye fatigue to insufficient contrast.

Specifications AccuSync LCD52VM Monitor

Monitor Specifications		AccuSync LCD52VM Monitor	Notes
LCD Module	Diagonal:	38 cm/15 inches	Active matrix; thin film transistor (TFT) liquid crystal display (LCD); 0.297 mm dot pitch; 250 cd/m^2 white luminance, 400:1 contrast ratio, typical.
	Viewable Image Size:	38 cm/15 inches	
	Native Resolution (Pixel Count):	1024 x 768	
Input Signal	Video:	ANALOG 0.7 Vp-p/75 Ohms	
	Sync:	Separate sync.TTL Level (Positive/Negative) Horizontal sync. Positive/Negative Vertical sync. Positive/Negative	
Display Colours	Analog input:	16,2 M	Depends on display card used.
Synchronization Range	Horizontal:	31.5 kHz to 61 kHz	Automatically
	Vertical:	55 Hz to 76 Hz	Automatically
Viewing Angle	Left/Right:	-60°/+60°(CR>10)	
	Up/Down:	-45°/+45°(CR>10)	
Resolutions Supported	Landscape:	720 x 400*1 : VGA 640 x 480*1 @ 60 Hz to 75 Hz 800 x 600*1 @ 56 Hz to 75 Hz 832 x 624*1 @ 75 Hz 1024 x 768 @ 60 Hz to 75 Hz.....	Some systems may not support all modes listed. NEC-Mitsubishi Electronics Display cites recommended resolution at 75 Hz for optimal display performance.
Active Display Area	Horizontal:	304.1 mm	
	Vertical:	228.1 mm	
Speakers	Practical Audio Output:	1.0 W + 1.0 W	
Power Supply		100 - 240 V ~ 50/60 Hz	
Power Consumption		23 W	
Dimensions	Landscape:	344.6 mm (W) x 352.7 mm (H) x 165.0 mm (D) (with stand) 344.6 mm (W) x 285.0 mm (H) x 57.5 mm (D) (without stand)	
Weight		3.3 kg	
Environmental Considerations			
	Operating Temperature:	5 °C to 35 °C	
	Humidity:	30% to 80%	
	Altitude:	0 to 3,048 m	
	Storage Temperature:	-10 °C to +60 °C	
	Humidity:	10% to 85%	
	Altitude:	0 to 12,192 m	

*1 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.

Specifications AccuSync LCD72VM Monitor

Monitor Specifications		AccuSync LCD72VM Monitor	Notes
LCD Module	Diagonal:	43 cm/17 inches	Active matrix; thin film transistor (TFT) liquid crystal display (LCD); 0.264 mm dot pitch; 250 cd/m^2 white luminance, 450:1 contrast ratio, typical.
	Viewable Image Size:	43 cm/17 inches	
	Native Resolution (Pixel Count):	1280 x 1024	
Input Signal	Video:	ANALOG 0.7 Vp-p/75 Ohms	
	Sync:	Separate sync.TTL Level (Positive/Negative) Horizontal sync. Positive/Negative Vertical sync. Positive/Negative	
Display Colours	Analog input:	16,2 M	Depends on display card used.
Synchronization Range	Horizontal:	31.5 kHz to 81.1 kHz	Automatically
	Vertical:	55 Hz to 76 Hz	Automatically
Viewing Angle	Left/Right:	-70°/+70°(CR>10)	
	Up/Down:	-65°/+60°(CR>10)	
Resolutions Supported	Landscape:	720 x 400*1 : VGA 640 x 480*1 @ 60 Hz to 75 Hz 800 x 600*1 @ 56 Hz to 75 Hz 832 x 624*1 @ 75 Hz 1024 x 768*1 @ 60 Hz to 75 Hz 1152 x 864*1 @ 70 Hz 1152 x 870*1 @ 75 Hz 1280 x 960*1 @ 60 Hz to 75 Hz 1280 x 1024 @ 60 Hz to 75 Hz.....	Some systems may not support all modes listed. NEC-Mitsubishi Electronics Display cites recommended resolution at 60 Hz for optimal display performance.
Active Display Area	Horizontal:	337.9 mm	
	Vertical:	270.3 mm	
Speakers	Practical Audio Output:	1.0 W + 1.0 W	
Power Supply		100 - 240 V ~ 50/60 Hz	
Power Consumption		34 W	
Dimensions	Landscape:	375.4 mm (W) x 389.0 mm (H) x 180 mm (D) (with stand) 375.4 mm (W) x 326.5 mm (H) x 61 mm (D) (without stand)	
Weight		4.7 kg	
Environmental Considerations			
	Operating Temperature:	5 °C to 35 °C	
	Humidity:	30% to 80%	
	Altitude:	0 to 3,048 m	
	Storage Temperature:	-10 °C to +60 °C	
	Humidity:	10% to 85%	
	Altitude:	0 to 12,192 m	

*1 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.

Specifications AccuSync LCD92VM Monitor

Monitor Specifications		AccuSync LCD92VM Monitor	Notes
LCD Module	Diagonal:	48.3 cm/19 inches	Active matrix; thin film transistor (TFT)
	Viewable Image Size:	48.3 cm/19 inches	liquid crystal display (LCD); 0.294 mm dot
	Native Resolution (Pixel Count):	1280 x 1024	pitch; 250 cd/m^2 white luminance, 450:1 contrast ratio, typical.
Input Signal	Video:	ANALOG 0.7 Vp-p/75 Ohms	
	Sync:	Separate sync.TTL Level (Positive/Negative)	
		Horizontal sync. Positive/Negative	
		Vertical sync. Positive/Negative	
Display Colours	Analog input:	16,2 M	Depends on display card used.
Synchronization Range	Horizontal:	31.5 kHz to 81.1 kHz	Automatically
	Vertical:	55 Hz to 76 Hz	Automatically
Viewing Angle	Left/Right:	-65°/+65°(CR>10)	
	Up/Down:	-65°/+65°(CR>10)	
Resolutions Supported	Landscape:	720 x 400*1 : VGA	Some systems may not
		640 x 480*1 @ 60 Hz to 75 Hz	support all modes listed.
		800 x 600*1 @ 56 Hz to 75 Hz	
		832 x 624*1 @ 75 Hz	
		1024 x 768*1 @ 60 Hz to 75 Hz	
		1152 x 864*1 @ 70 Hz	
		1152 x 870*1 @ 75 Hz	NEC-Mitsubishi Electronics Display cites
		1280 x 960*1 @ 75 Hz	recommended resolution at 60 Hz for
		1280 x 1024 @ 60 Hz to 75 Hz.....	optimal display performance.
Active Display Area	Horizontal:	376.3 mm	
	Vertical:	301.1 mm	
Speakers	Practical Audio Output:	1.0 W + 1.0 W	
Power Supply		100 - 240 V ~ 50/60 Hz	
Power Consumption		40 W	
Dimensions	Landscape:	418 mm (W) x 427.8 mm (H) x 199.5 mm (D) (with stand)	
		418 mm (W) x 369.8 mm (H) x 68 mm (D) (without stand)	
Weight		6.5 kg	
Environmental Considerations			
	Operating Temperature:	5 °C to 35 °C	
	Humidity:	30% to 80%	
	Altitude:	0 to 3,048 m	
	Storage Temperature:	-10 °C to +60 °C	
	Humidity:	10% to 85%	
	Altitude:	0 to 12,192 m	

*1 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

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

AccuColor Control Systems: Allows you to adjust the colours on your screen and customize the colour 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.

No-touch Auto Adjust: No-touch Auto Adjust automatically adjusts the monitor to optimal settings upon initial setup.

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 and TCO guidelines for lower emissions.

Plug and Play: The Microsoft solution with the Windows 95/98/Me/2000/XP 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.

VESA Standard Mounting Interface: Allows users to connect their AccuSync monitor to any VESA standard third party mounting arm or bracket. Allows for the monitor to be mounted on a wall or an arm using any third party compliant device.

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.
- Check front 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.
- Check the signal input.

Power Button does not respond

- Unplug the power cord of the monitor from the AC outlet to turn off and reset the monitor.

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, but constant images being displayed for a long period of time should be avoided.
  To alleviate image persistence, turn the monitor off for as long as an image was displayed. For example, if an image was on the monitor for one hour and a residual image remains, the monitor should be turned off for one hour to erase the image.

NOTE: As with all personal display devices, NEC-Mitsubishi Electronics Displays recommends using a screen saver at regular intervals whenever the screen is idle or turning off the monitor when not in use.

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.
- If your text is garbled, change the video mode to non-interlace and use 60 Hz refresh rate.

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

- Power Switch should be in the ON position and power cord should be connected.

Display image is not sized properly

- Use the OSM Image Adjust controls to increase or decrease the H.SIZE.
- 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.)

No Video

- If no video is present on the screen, turn the Power button off and on again.
- Make certain the computer is not in a power-saving mode (touch the keyboard or mouse).

No Sound

- Check to see if speaker cable is properly connected.
- Check to see if mute is activated.
- Check to see if volume in OSM is set at minimum.

TCO’99

Congratulations! You have just purchased a TCO’99 approved and labelled 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 fisheating birds and mammals, due to the bioaccumulative* 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:

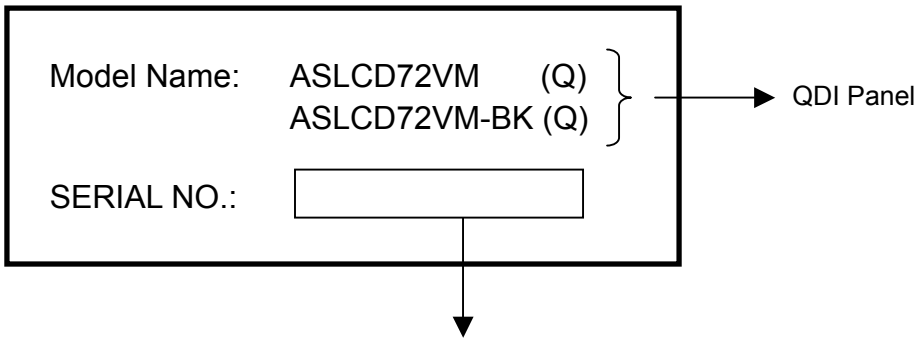
TCO Development Unit
SE-114 94 Stockholm
SWEDEN
FAX Number: +46 8 782 92 07
E-mail (Internet): development@tco.se

You may also obtain current information on TCO’99 approved and labelled products by visiting their website at:
http://www.tcodevelopment.com

Serial Number Information

Refer to the serial number information shown below.

EX.) SERIAL NUMBER LABEL



Manufactured Year :

(Last digit: 2002→2, 2003→3, 2004→4)

Manufactured Month :

January to September:	1 to 9
October:	X
November:	Y
December:	Z

Classification code :

Discriminate by cabinet color
White: 0 (QDI Panel)
Black: 1 (QDI Panel)

Running number :

Note**:** This running number doesn't reset at each month.

(Example)

Jan.: 00001, 00002, 00003, ….., 01234,

Feb.: 01235, 01236, 01237, ….., 99999, 00001,

Mar.: 00002, 00003, 00004, …..

Factory Code:

N: TPV CHINA

Control Code:

For A ver. (U.S.A.):	A
For B ver. (Europe):	B
For C ver. (China):	C
For J ver. (Japan) :	J

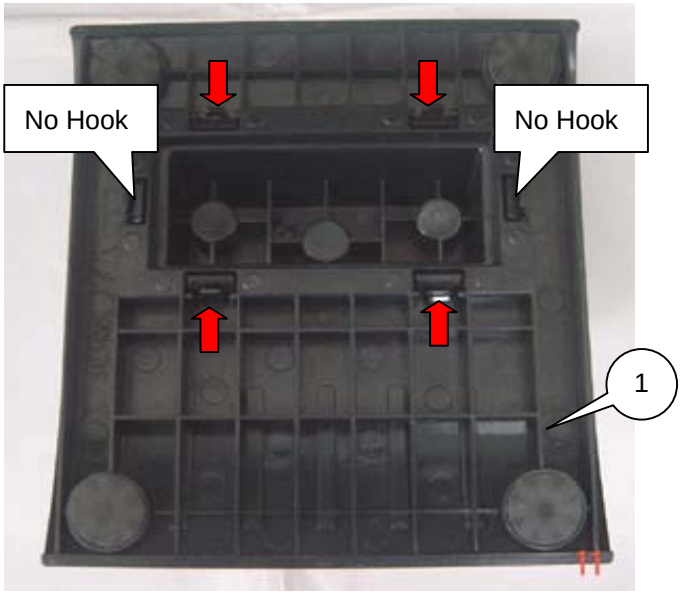
DISASSEMBLY

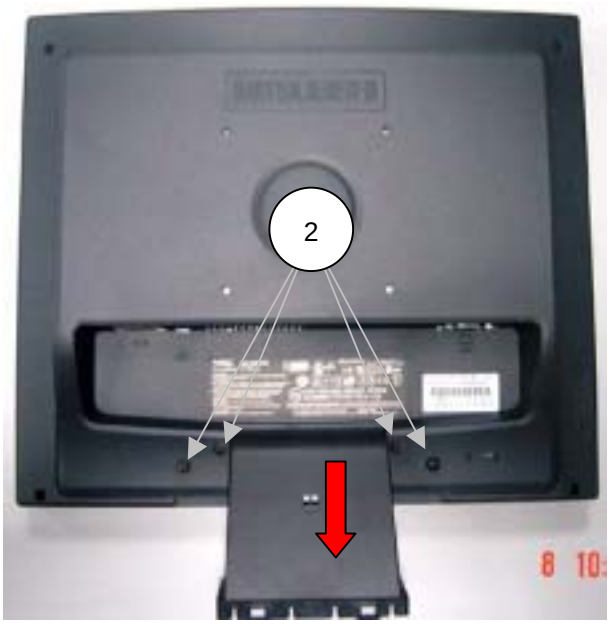
■ Before you disassemble the set, turn off power and pull out the power plug.

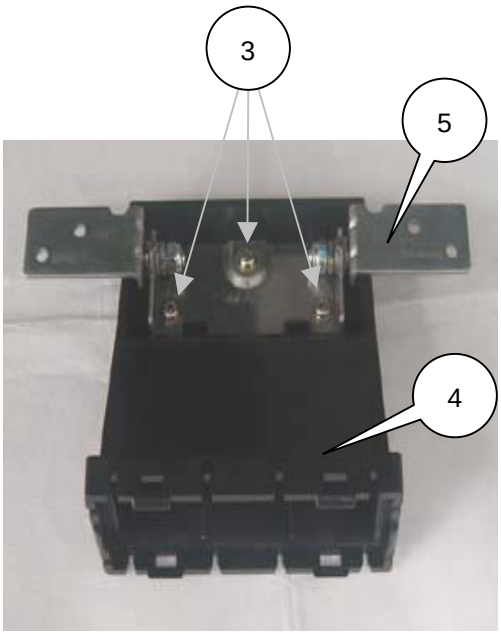
■ Use the proper screwdriver. If oversize or undersize screwdriver is used, screws may be damaged.

■ Assembly is the opposite process of disassembly.

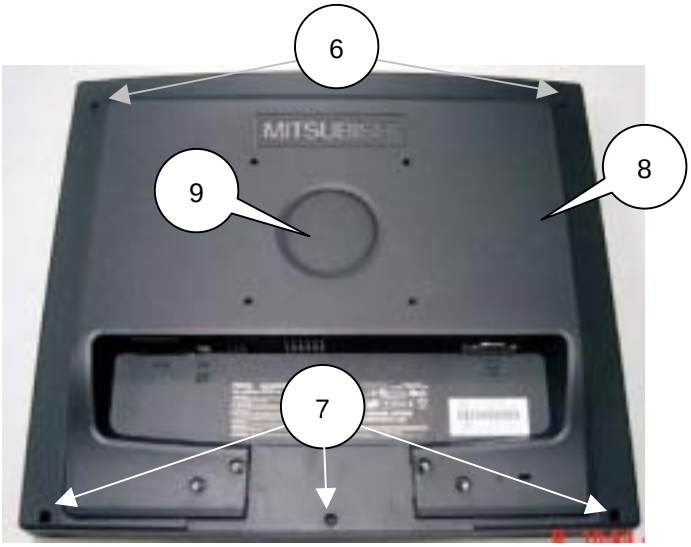
SYMBOL	For U.S./Europe (TPV Part Number)	DESCRIPTION	CABINET COLOR	Ver
1	34L1439 NA T	BASE	Black	A
1	34L1439 PL T	BASE	Black	B
2	AM1L1740-10-47	SCREW (M4*10)	Black	A/B
3	Q1L1040-10-128	SCREW (T4*10)	---	A/B
4	34L1435 NA T	STAND	Black	A
4	34L1435 PL T	STAND	Black	B
5	37L 509 1	HINGE	---	A/B



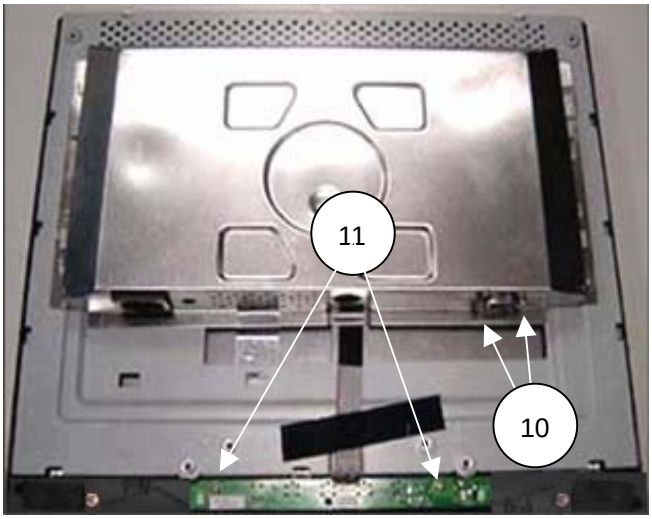




SYMBOL	For U.S./Europe (TPV Part Number)	DESCRIPTION	CABINET COLOR	Ver
6	M1L330-6-47	SCREW (M3*6)	Black	A/B
7	Q1L330-10-47	SCREW (T3*10)	Black	A/B
8	34L1438 NA 1T	REAR COVER	Black	A
8	34L1438 PL 1T	REAR COVER	Black	B
9	33L4778 NA T	INJECT COVER	Black	A
9	33L4778 PL T	INJECT COVER	Black	B

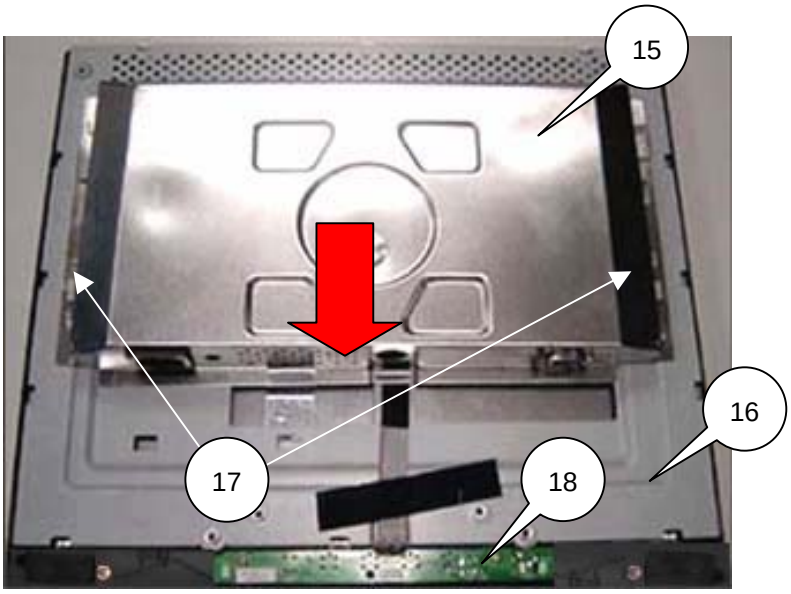


SYMBOL	For U.S./Europe (TPV Part Number)	DESCRIPTION	CABINET COLOR
10	2L6008-1	SCREW	----
11	Q1L330-8-120	SCREW (T3*8)	----



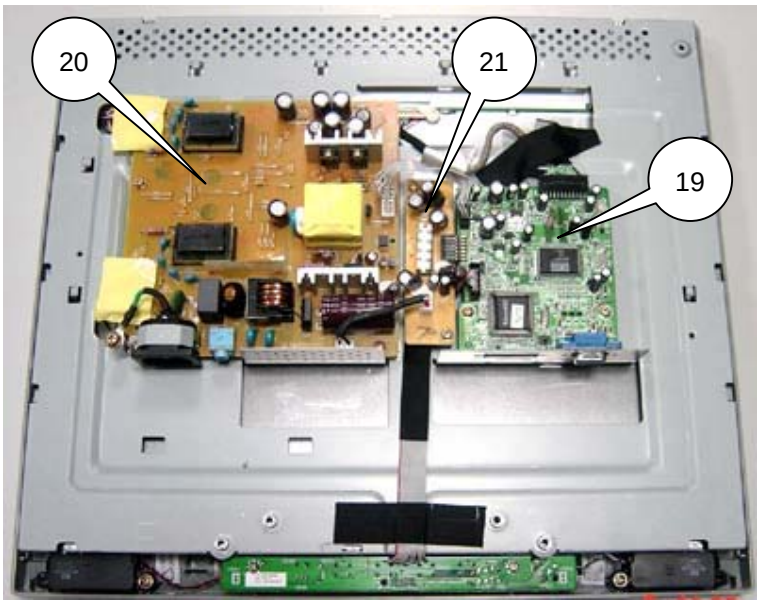
SYMBOL	For U.S./Europe (TPV Part Number)	DESCRIPTION	CABINET COLOR	Ver
12	34L1437-ANA-1T	FRONT PANEL	Black	A
12	34L1437-AGN 1T	FRONT PANEL	Black	B
13	33L4777 NA T	BUTTON FUNCTION	Black	A
13	33L4777 GN T	BUTTON FUNCTION	Black	B
14	33L4776 1 C	LENS	----	A/B

SYMBOL	For U.S./Europe (TPV Part Number)	DESCRIPTION	CABINET COLOR	Ver
15	85L682-1	SHIELD	---	---
16	15L8097-1	MAIN FRAME	---	---
17	M1L330-4-128	SCREW (M3*4)	---	---
18	KEPC780KDM	KEYBOARD	Black	A/B

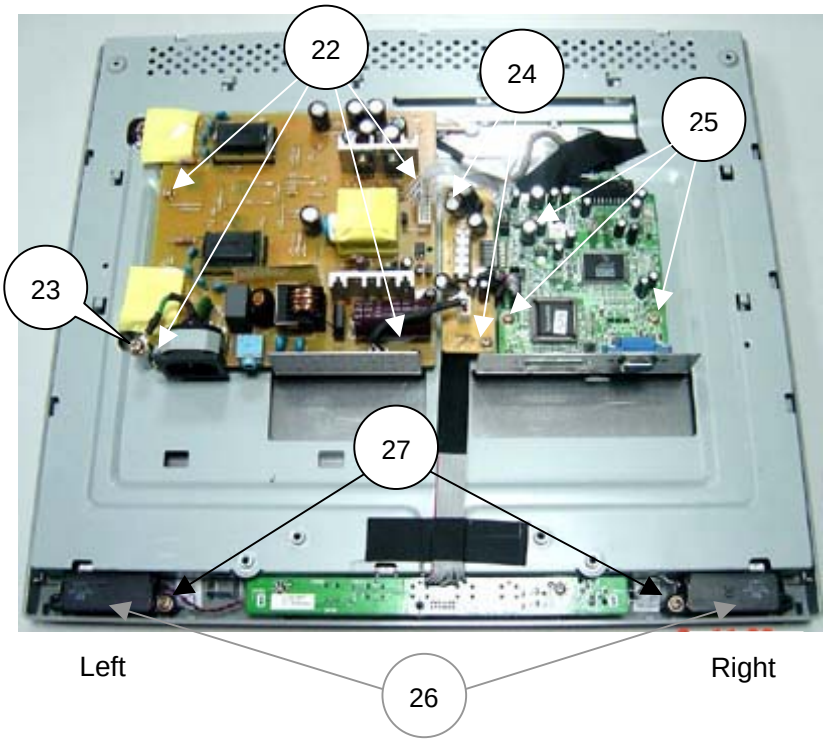


(QDI Panel)

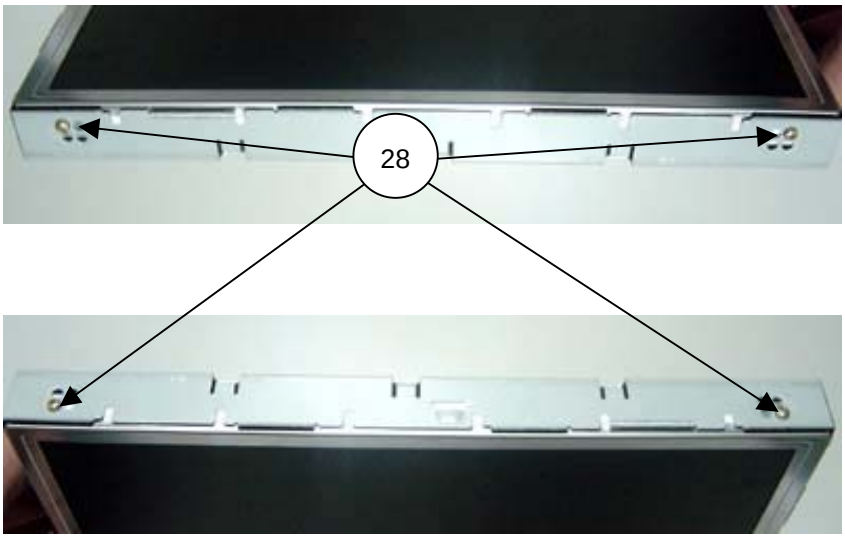
SYMBOL	For U.S./Europe (TPV Part Number)	DESCRIPTION
19	CBPC780KQLNV	MAIN BOARD
20	PWPC1742QDN1	POWER BOARD
21	AUPCK780B5	AUDIO BOARD

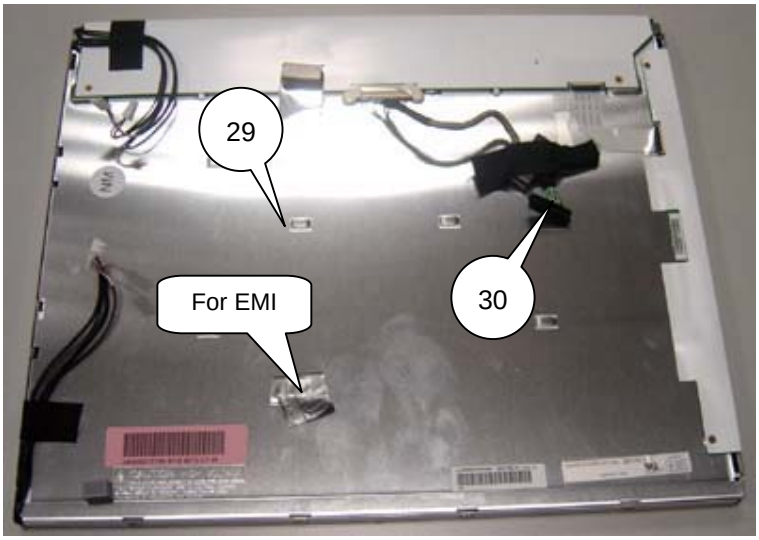


SYMBOL	For U.S./Europe (TPV Part Number)	DESCRIPTION
22	M1L1730-6-128	SCREW (M3*6)
23	M1L1740-6-128	SCREW (M4*6)
24	M1L1730-6-128	SCREW (M3*6)
25	M1L1130-6-128	SCREW (M3*6)
26	78L 322501 L	SPEAKER(LEFT)
26	78L 322501 R	SPEAKER(RIGHT)
27	Q1L1030 10128	SCREW

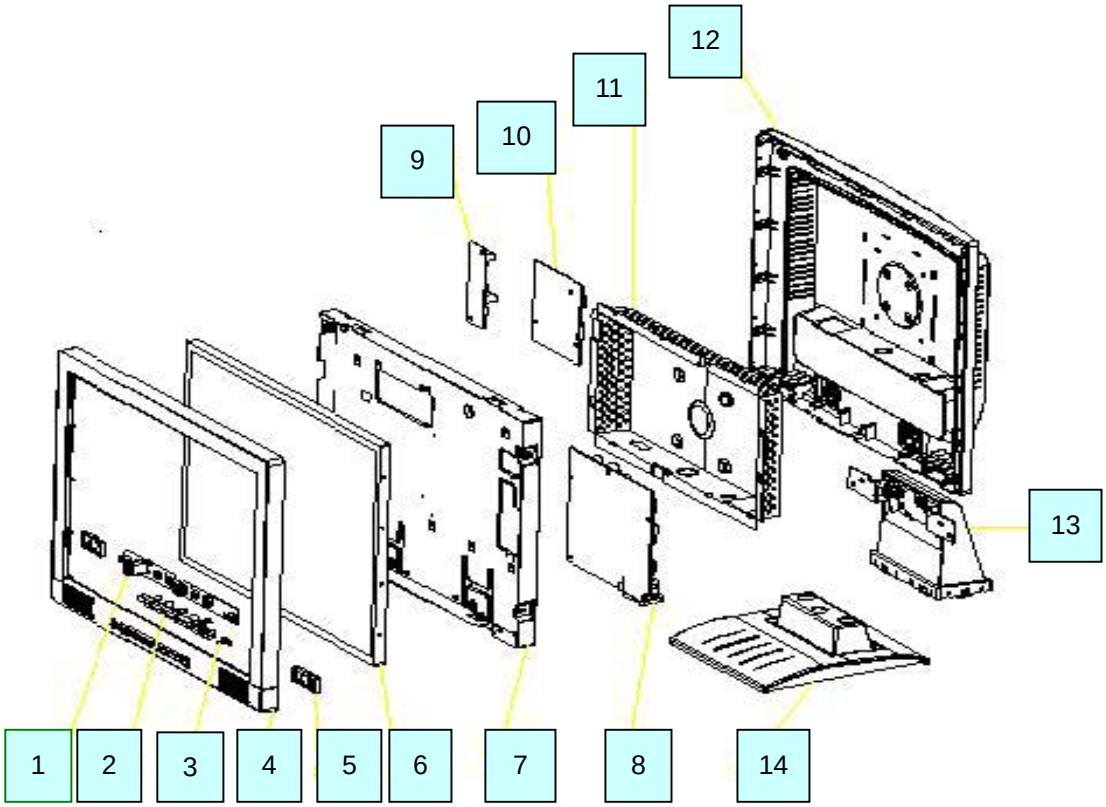


SYMBOL	For U.S./Europe (TPV Part Number)	DESCRIPTION
28	M1L330-4-128	SCREW (M3*4)
29	3A684063 (NMV Part Number)	LCD QD17EL0703 QDI
30	95G8018 30543	LVDS LINE





Explode Drawing



NO	DESCRIPTION	NO	DESCRIPTION
1	Key Board	8	Power Board
2	Key Pad	9	Main Board
3	Lens	10	Audio Board
4	Bezel	11	Shield
5	Speaker	12	Rear Cover
6	Panel	13	Stand and Hinge
7	Main Frame	14	Base

ADJUSTMENT PROCEDURES

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8.Color Temperature Check 4-36

1. Application

This adjustment specification should be applied to the LCD72VM / LCD72VM-BK.

2. Default Setting

Item		Condition
Power Supply		AC100V~240Vac
Input Freq.		1280×1024@75Hz
OSM SETTING	Volume	50%
	Mute	OFF
	Brightness	100%
	Contrast	50%
	Color Temp.	USER (R: 100%, G: 100%, B: 100%)
	OSM Time Off	45 sec.
	OSM Lock Out	NO
	Resolution notifier	ON
	OSD/OSM SETTING	OSM
	URL SETTING	WWW.NECMITSUBISHI.COM
	LANGUAGE	ENGLISH

3. Basic Operation

Power Button:

When pressed, the monitor enters the off mode, and the LED turns blank. Press again to restore normal status.

– / + Button:

The – / + Button is used to control the monitor functions. Press to switch functions or adjust settings.

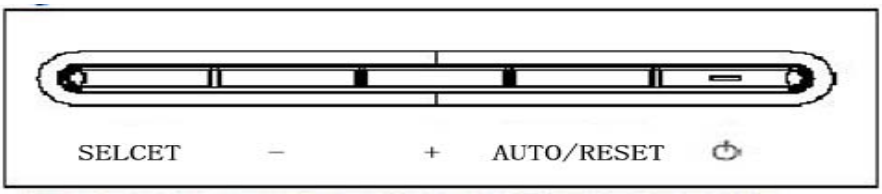
Auto / Reset adjust Key:

The Auto Adjust Key is used to automatically set the H Position, V Position, Clock and Phase.

Power Indicator:

Green— Power On mode. **Orange**— Power Saving mode. **Blank**— Power Off Mode.

Control Buttons



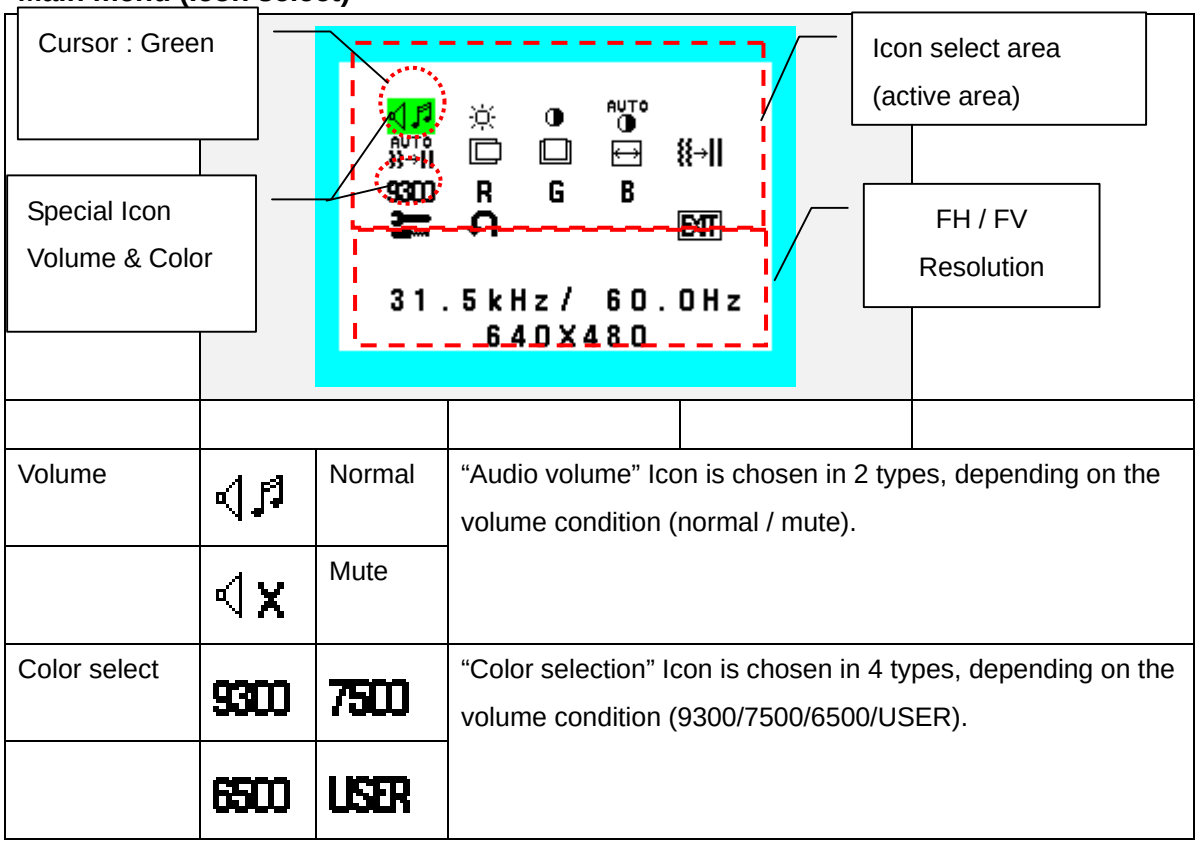
	Basic function at pressing each key			
KEY	Select	—	+	**Auto / Reset**
At No OSD showing	Showing OSD	Shortcut to Bright adjust window.	Shortcut to Volume adjust window.	"Auto adjust" operate
At OSD showing (Icon selection stage)	Go to Adjustment stage.	Cursor goes to left .	Cursor goes to right .	No operate for other icon.
At OSD showing (Adjustment stage)	Go to Icon selection stage.	Adjust value decrease OR Cursor for adjust goes to left.	Adjust value increase OR Cursor for adjust goes to right.	Reset operation. Mute off/on switch on Volume adjustment window.

4.General Adjustment

OSM Control

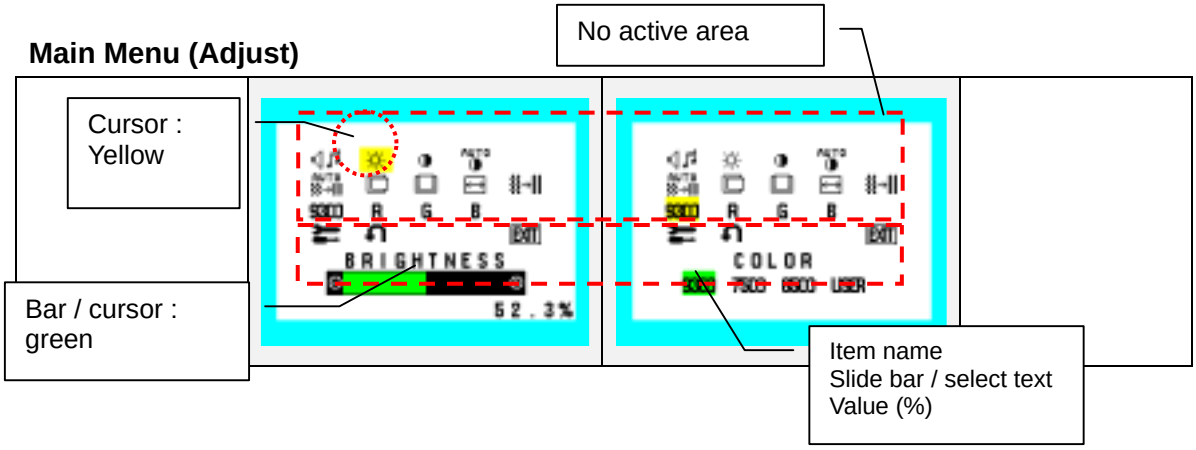
All functions are controllable by OSM using four buttons on the front bezel (excluding power button).

Main menu (Icon select)

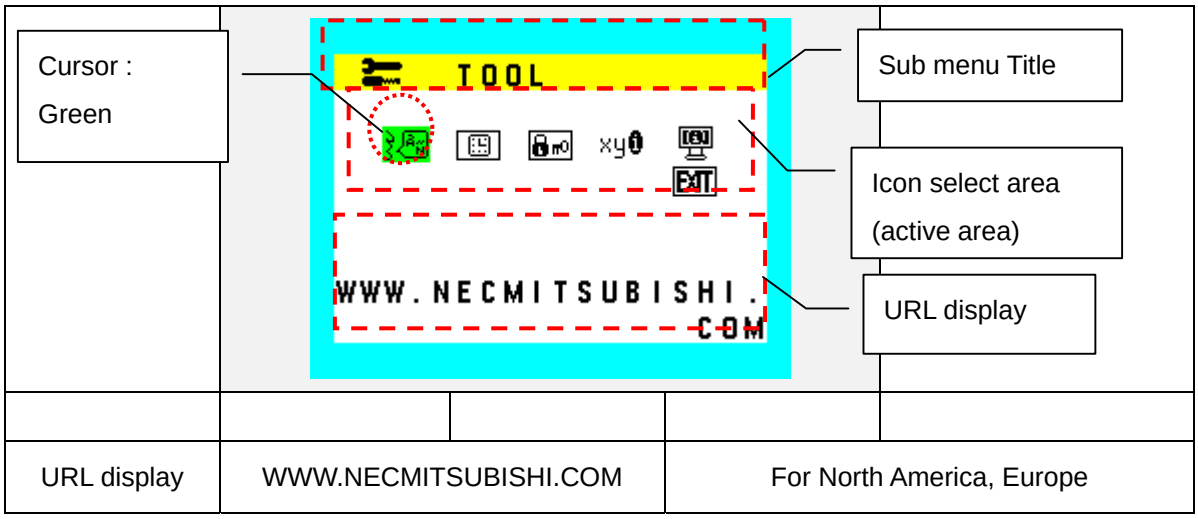


Volume		Normal	“Audio volume” Icon is chosen in 2 types, depending on the volume condition (normal / mute).
		Mute	
Color select	9300	7500	“Color selection” Icon is chosen in 4 types, depending on the volume condition (9300/7500/6500/USER).
	6500	USER	

Main Menu (Adjust)

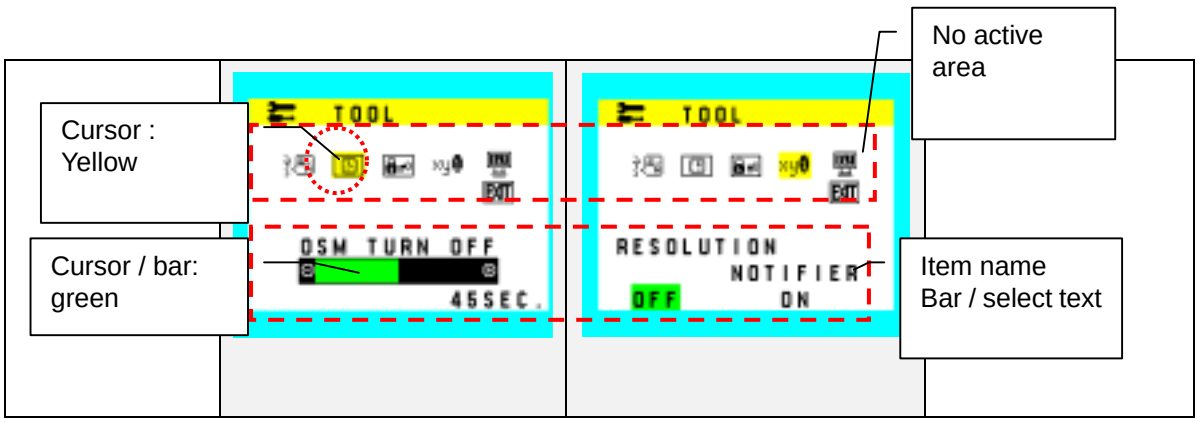


Sub Menu (Icon Select)



URL display	WWW.NECMITSUBISHI.COM	For North America, Europe

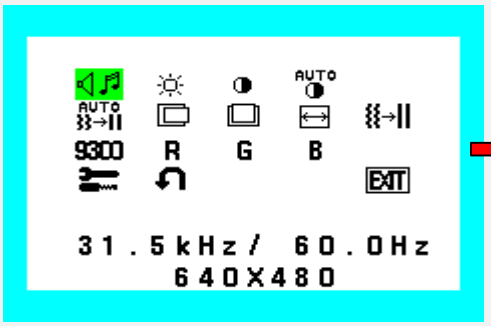
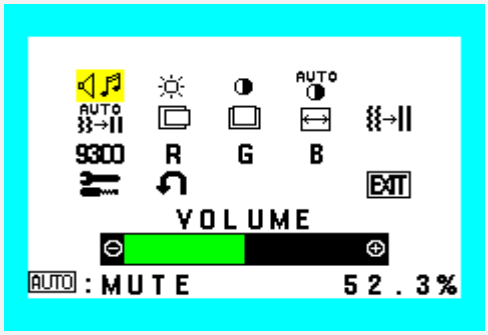
Sub Menu (Adjust)



4.1 USER Mode

Volume

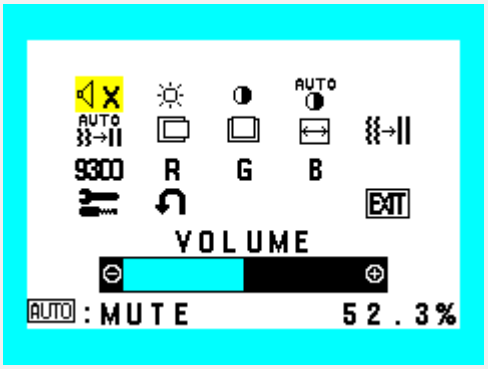
Control the sound volume of speakers and headphone.

Icon select	Audio adjust
	
1. During volume function operate, volume Icon and slide bar color is changed from Normal condition. 2. " + " Turn the volume up 3. " - " Turn down the volume 4. At exiting from this state, adjusted value is saved to EEPROM.	

Sound Mute

This function is the sound mute switch (toggle).

To call this function, press AUTO/RESET button when Volume menu is displayed.

Audio (Icon select)	Audio (Adjust: Mute)
	During mute function operate, mute Icon and slide bar color is changed from Normal condition.

Brightness

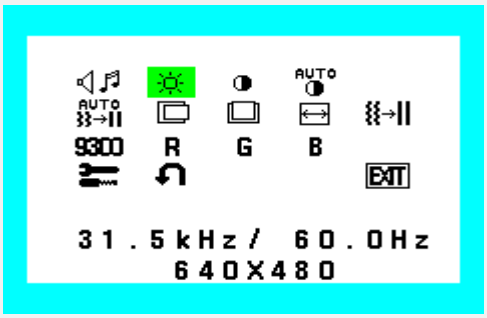
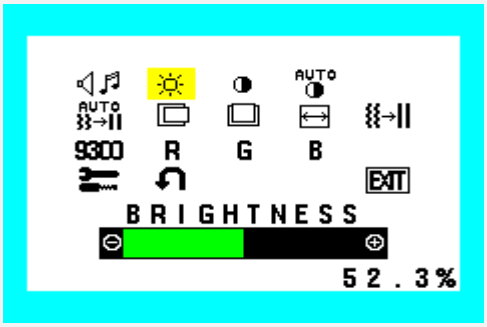
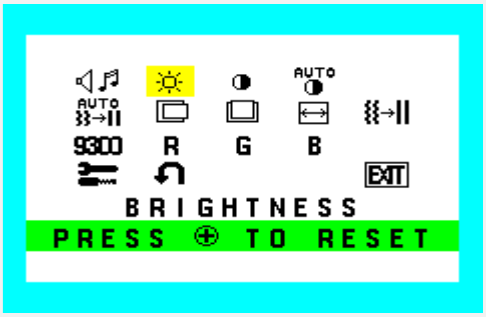
Adjust the background screen brightness by using backlight inverter.

Control range (BAR): 0.0% to 100.0%

Factory setting: 100%

Actual brightness control range: 30% to 100%

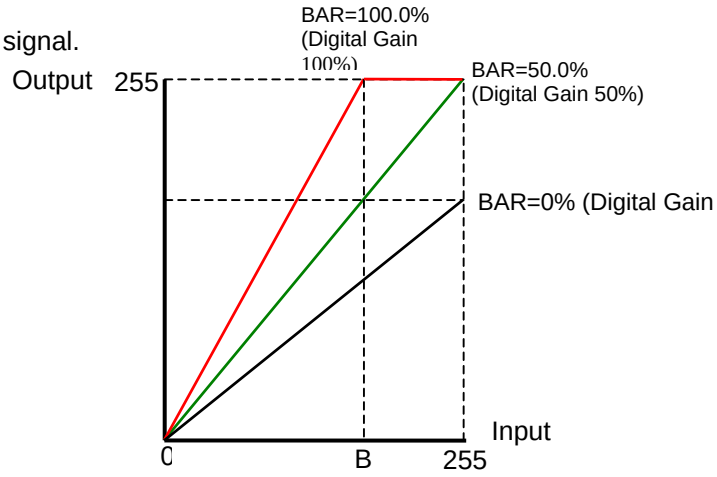
30% = (Brightness value [cd/m^2] when user controls Brightness Max) x 0.3

<table>
<tr><th>Brightness (Icon select)</th><th>Brightness (Adjust)</th></tr>
<tr><td> 
</td><td> 
</td></tr>
<tr><td colspan="2">1. During Brightness function operate, Brightness Icon and slide bar color is changed from Normal condition.
2. “+” Value increase (to bright)
3. “-” Value decrease (to dark)
4. At exiting from this state, adjusted value is saved to EEPROM.</td></tr>
<tr><td colspan="2">Brightness (Reset)</td></tr>
<tr><td> 
</td><td>Recall Brightness value to factory setting</td></tr>
</table>

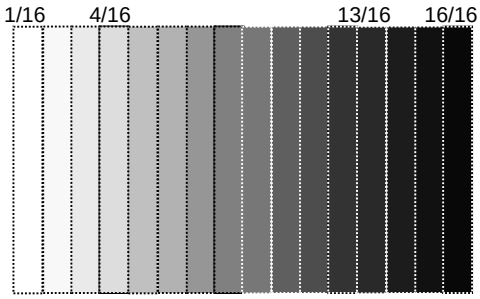
Contrast

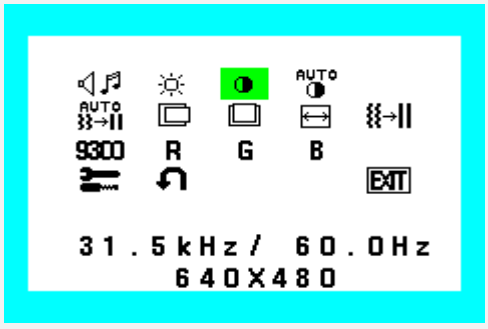
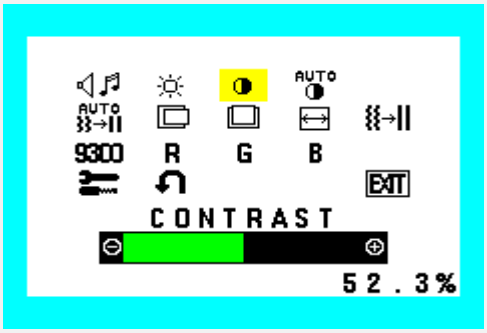
Adjust the image contrast by controlling input signal.

Control range: (BAR): 0.0% to 100.0%
Factory setting: 50%



B is around 205/255. It means about 4/16 gray will be white.



Contrast (Icon select)	Contrast (adjust)
	

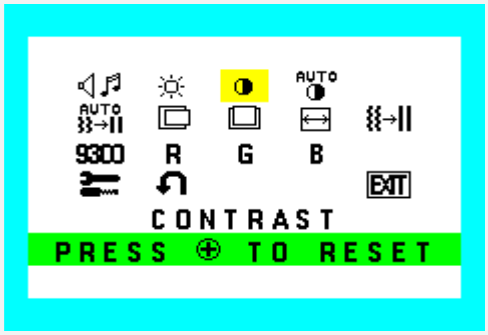
1.During Contrast function operate, Contrast Icon and slide bar color is changed from Normal condition.

2. “-” Value decrease (to dark)

3. “+” Value increase (to bright)

4. At exiting from this state, adjusted value is saved to EEPROM.

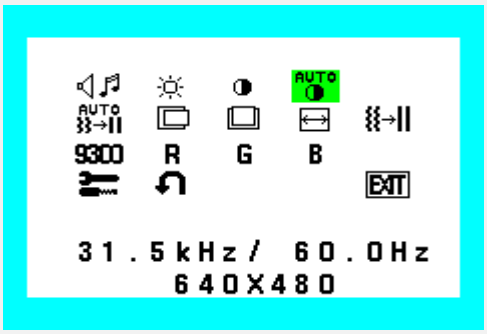
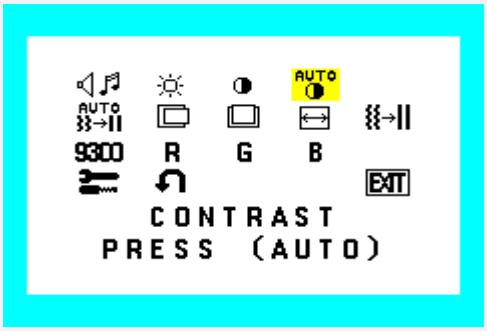
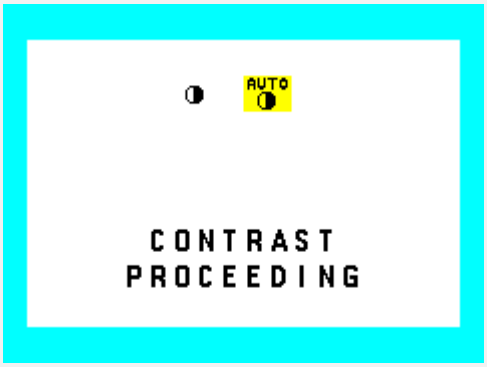
Contrast (reset)

	Recall Contrast value to factory setting

AUTO (Contrast)

Adjust the CONTRAST to the optimal value for the video-input level automatically. For example, when the amplitude of video input was larger/smaller than 0.7Vp-p, the value of contrast was automatically adjusted to the value, which will be in the same display condition as the video-input level was 0.7Vp-p.

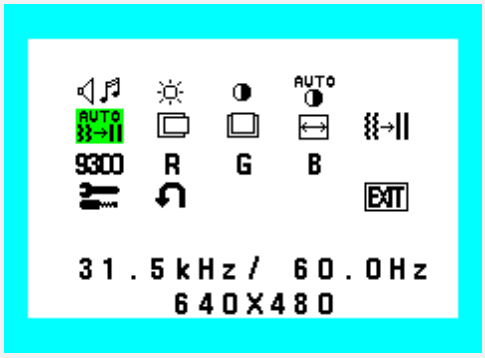
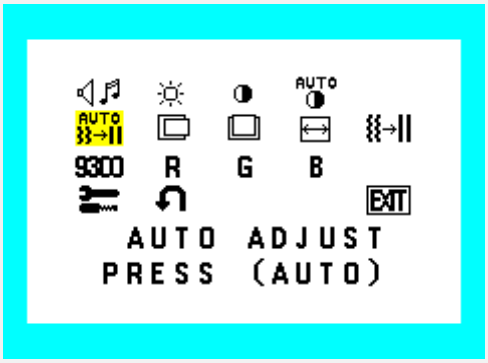
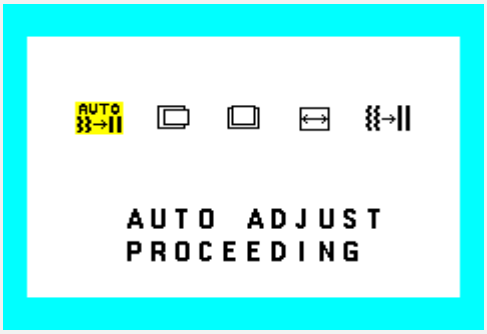
All other OSM operations shall be canceled in this adjustment term (probably during several seconds). After adjustment execute set to 50% of contrast value.

<table>
<tr><th>Auto Contrast (Icon select)</th><th>Auto Contrast (adjust)</th></tr>
<tr><td> 
</td><td> 
</td></tr>
<tr><td colspan="2">During Auto Contrast function operate, Auto Contrast Icon and slide bar color is changed from Normal condition.</td></tr>
<tr><td colspan="2">Auto Contrast (Proceeding)</td></tr>
<tr><td> 
</td><td>Operate “Auto Contrast Adjust” with showing this OSD.</td></tr>
</table>

AUTO (Geometry)

Adjust the H.POSITION, V.POSITION, H-SIZE and FINE to the optimal value automatically.

All other OSD operations shall be canceled in this adjustment term (probably during several seconds).

<table>
<tr><th>Auto adjust (Icon select)</th><th>Auto adjust (adjust)</th></tr>
<tr><td> 
</td><td> 
</td></tr>
<tr><td colspan="2">During AUTO function operate, AUTO Icon and slide bar color is changed from Normal condition.</td></tr>
<tr><th colspan="2">Auto Adjust (Proceeding)</th></tr>
<tr><td> 
</td><td>Operate “Auto Adjust” with showing this OSD.</td></tr>
</table>

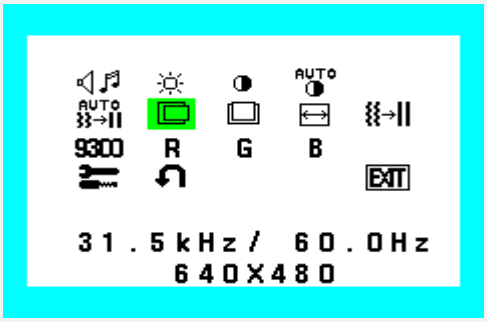
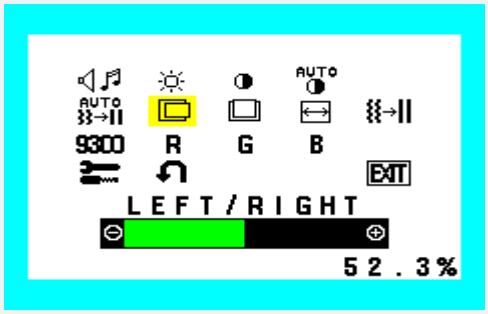
H. Position

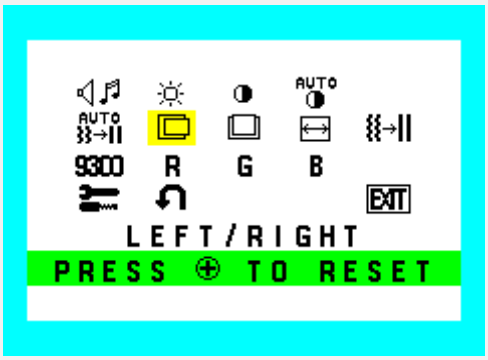
Adjust the horizontal image position.

Indicator Value and Bar of minimum position should be 0.0%

Indicator Value and Bar of maximum position should be 100.0%

Factory setting: Optimal value for the signals which is stated in the VESA standard..

Left/Right (H.Posi) (Icon select)	Left/Right (H.Posi) (adjust)
	
1. During H.Posi function operate, H. Posi Icon and slide bar color is changed from Normal condition. 2. “-” Value decrease (to left) 3. “+” Value increase (to right) 4. At exiting from this state, adjusted value is saved to EEPROM.	

Left/Right (H.Posi) (RESET)	
	Recall H. Posi value to factory setting

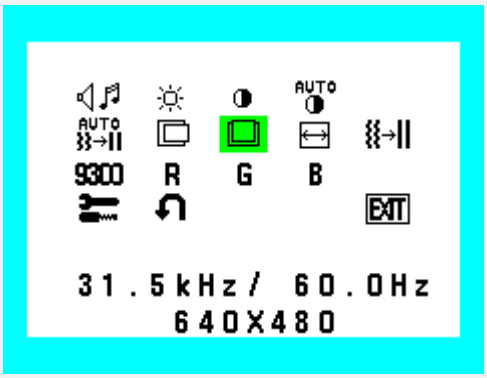
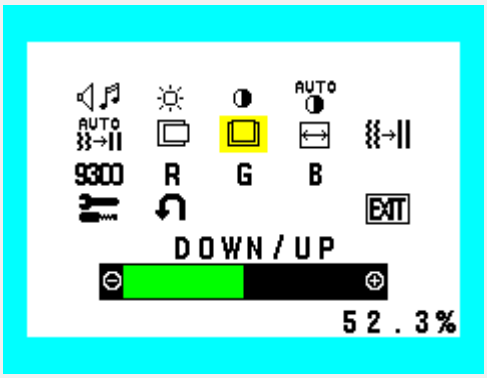
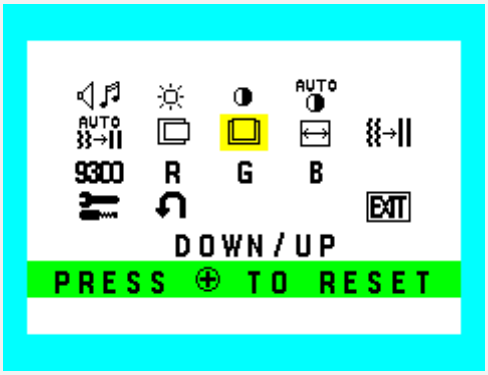
V. Position

Adjust the horizontal image position.

Indicator Value and Bar of minimum position should be 0.0%

Indicator Value and Bar of maximum position should be 100.0%

Factory setting: Optimal value for the signals which is stated in the VESA standard.

<table>
<tr><th>Down/Up (V.Posi) (Icon select)</th><th>Down/Up (V.Posi) (adjust)</th></tr>
<tr><td> 
</td><td> 
</td></tr>
<tr><td colspan="2">1. During V.Posi function operate, V. Posi Icon and slide bar color is changed from Normal condition.
2. “-” Value decrease (to down)
3. “+” Value increase (to up)
4. At exiting from this state, adjusted value is saved to EEPROM.</td></tr>
<tr><th colspan="2">Down/Up (V.Posi) (Reset)</th></tr>
<tr><td> 
</td><td>Recall V. Posi value to factory setting</td></tr>
</table>

H. Size

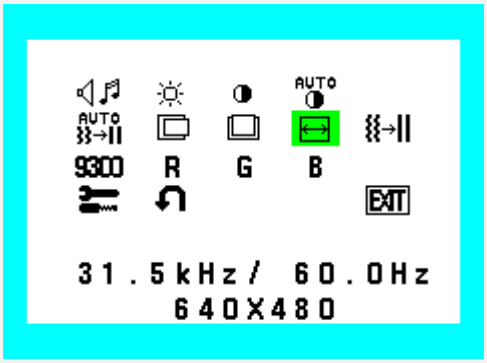
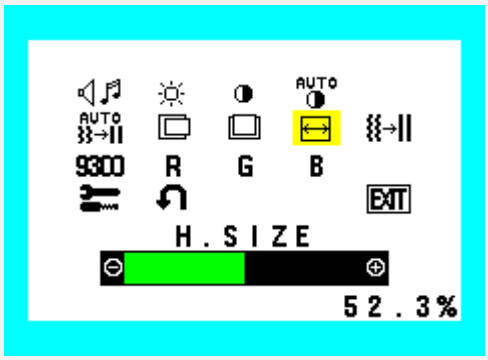
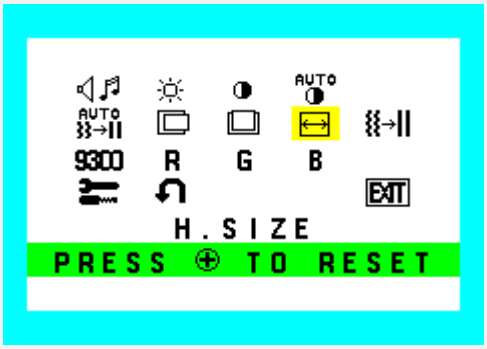
Adjust the frequency of internal pixel clock.

When increasing the value, the width of display image become wider, and when decreasing the value, the width becomes narrower. (Step 1pixel-clock .odd numbered, even numbered steps)

Indicator Value and Bar of minimum position should be 0.0%

Indicator Value and Bar of maximum position should be 100.0%

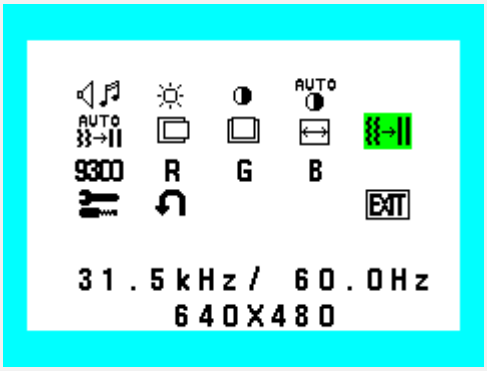
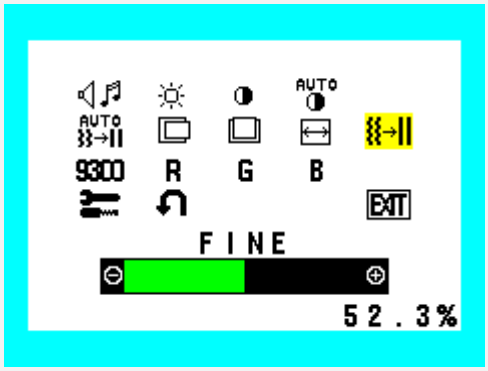
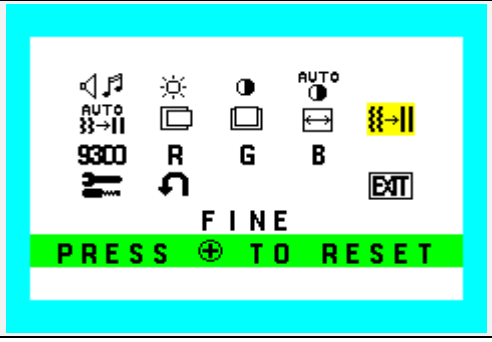
Factory setting: Optimal value for the signals, which is stated in the VESA standard.

<table>
<tr><th>H.Size(Clock) (Icon select)</th><th>H.Size(Clock) (Adjust)</th></tr>
<tr><td> 
</td><td> 
</td></tr>
<tr><td colspan="2">1. During H.Size function operate, H. Size Icon and slide bar color is changed from Normal condition.
2. “-” Value decrease (to narrow)
3. “+” Value increase (to wide)
4. At exiting from this state, adjusted value is saved to EEPROM.</td></tr>
<tr><td colspan="2">H.Size(Clock) (Reset)</td></tr>
<tr><td> 
</td><td>Recall H. Size value to factory setting</td></tr>
</table>

Fine

Adjust the delay of internal clock to control the display focus. Indicator Value and Bar of minimum position should be 0.0% Indicator Value and Bar of maximum position should be 100.0%

Factory setting: “0”

<table>
<tr><th>Fine (Phase) (Icon select)</th><th>Fine (Phase) (adjust)</th></tr>
<tr><td> 
</td><td> 
</td></tr>
<tr><td colspan="2">1. During Phase function operate, Phase Icon and slide bar color is changed from Normal condition.
2. “-” Value decrease
3. “+” Value increase
4. At exiting from this state, adjusted value is saved to EEPROM.</td></tr>
<tr><th colspan="2">Fine(Phase) (Reset)</th></tr>
<tr><td> 
</td><td>Recall Phase value to factory setting</td></tr>
</table>

Color

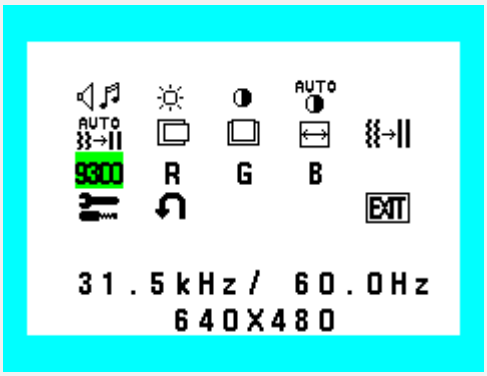
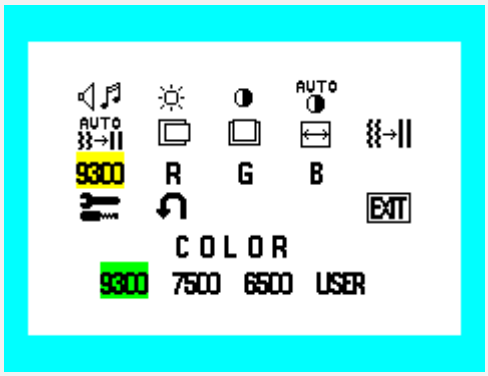
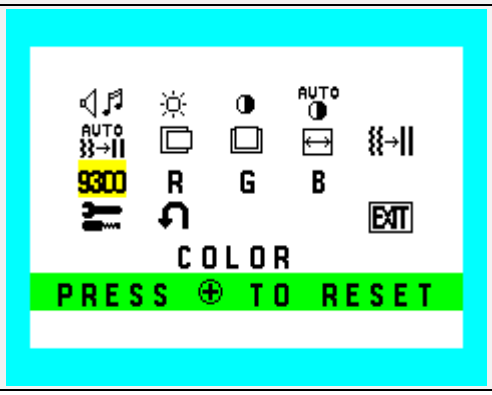
Selecting three preset color (9300, 7500, 6500) and one user customize.

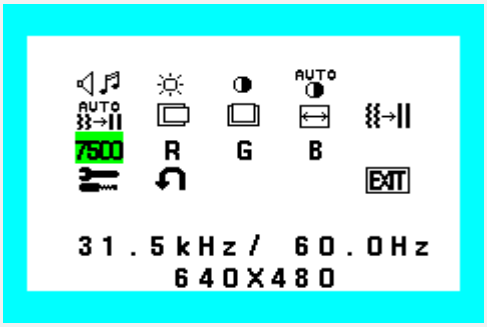
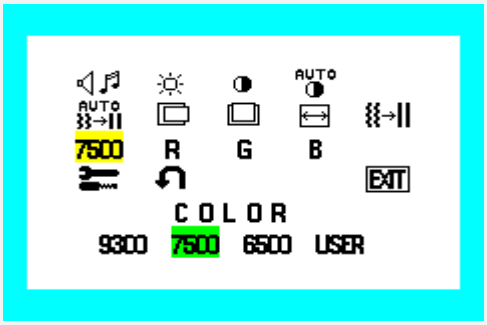
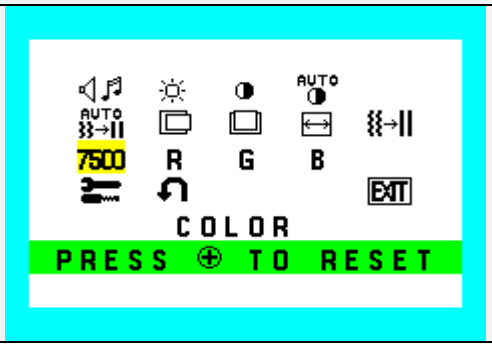
9300, 7500 and 6500 can't change RGB value in User Mode

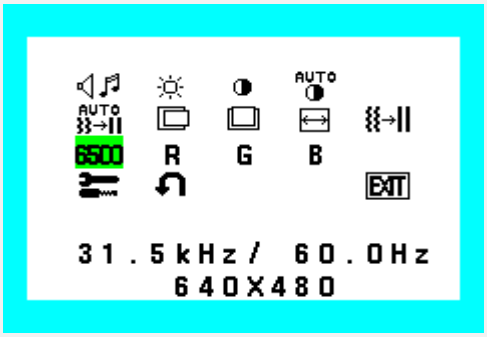
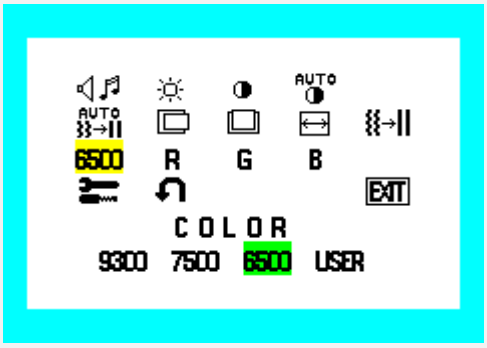
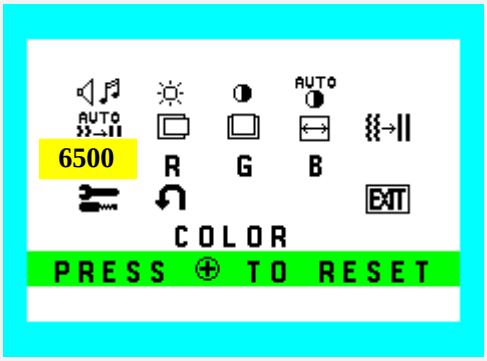
But, If open RGB menu when Selecting 9300, 7500 or 6500 then display each RGB color value (Don't change User value when only display)

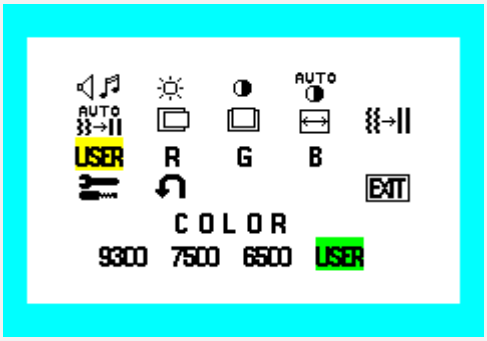
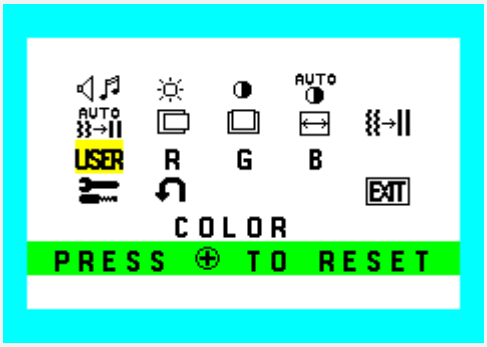
If change RGB menu when Selecting 9300, 7500 or 6500 then over write User value from each preset color value. And change user value.

"USER" can change RGB value.

<table>
<tr><th>9300 Color select (Icon select)</th><th>Color select (adjust)</th></tr>
<tr><td> 
</td><td> 
</td></tr>
<tr><td colspan="2">During Color select function operate, Color select Icon and slide bar color is changed from Normal condition.</td></tr>
<tr><th>Color select (Reset)</th><th></th></tr>
<tr><td> 
</td><td>Reset: Color select / User R, G, B</td></tr>
</table>

7500 Color select (Icon select)	Color select (adjust)
	
During Color select function operate, Color select Icon and slide bar color is changed from Normal condition.	
Color select (Reset)	
	Reset: Color select / User R, G, B

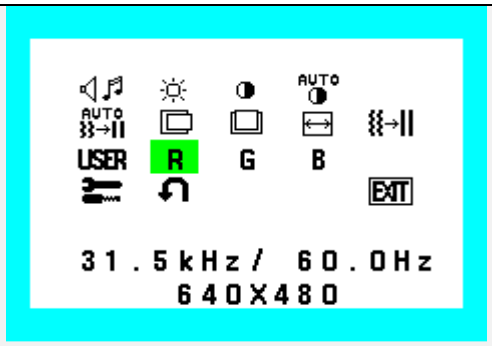
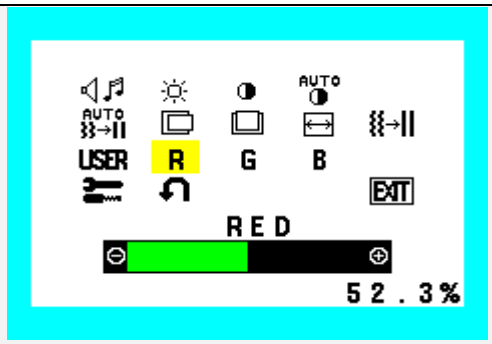
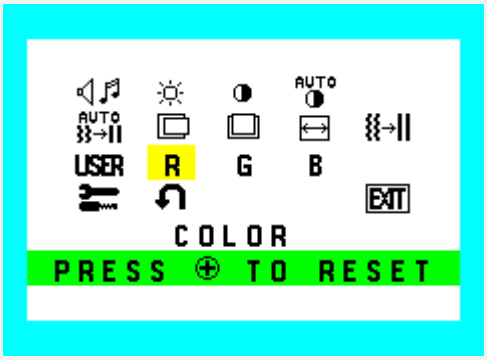
6500 Color select (Icon select)	Color select (adjust)
	
During Color select function operate, Color select Icon and slide bar color is changed from Normal condition.	
Color select (Reset)	
	Reset: Color select / User R, G, B

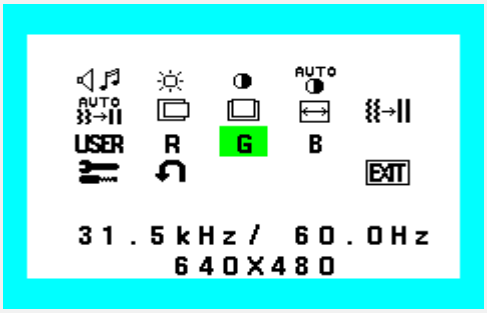
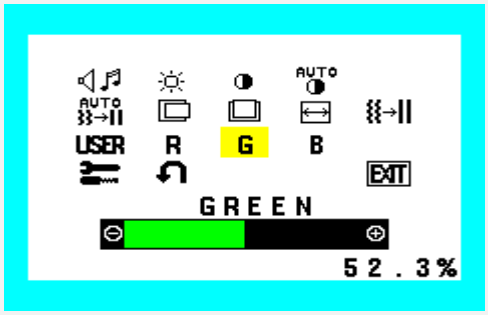
Color select (adjust)	Color select (Reset)
	
During USER function operate, USER Icon and slide bar color is changed from Normal condition.	
Reset: Color select / User R, G, B	

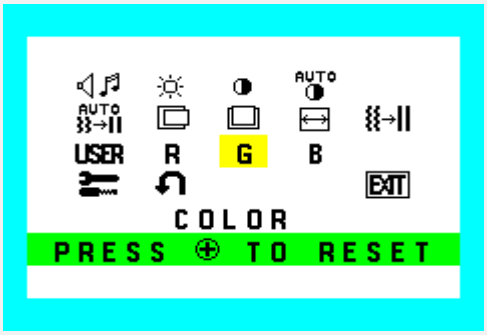
RGB Adjust

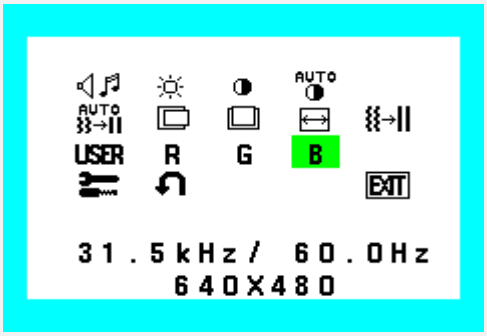
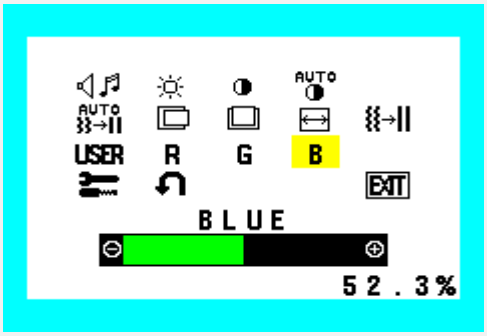
Adjust 3 colors (Red, Green, Blue) independently. Control range (BAR): 0% to 100% (each color) Default

Setting: 100%

Color Red(Icon select)	Color Red (adjust)
	
1. During Color Red function operate, Color Red Icon and slide bar color is changed from Normal condition. 2. “-”Value decrease (Red gain decrease) 3.”+” Value increase (Red gain increase) 4. At exiting from this state, adjusted value is saved to EEPROM.	
Color Red (Icon select)	
	Reset: Color select / User R, G, B

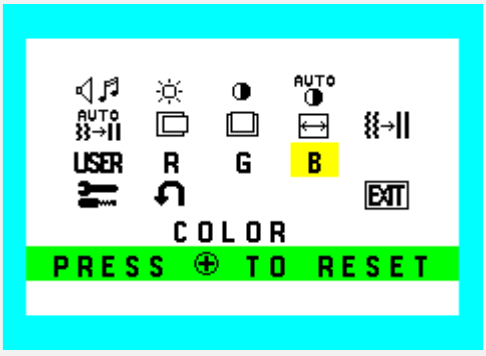
Color Green (Icon select)	Color Green (adjust)
	
1.During Color Green function operate, Color Green Icon and slide bar color is changed from Normal condition. 2. “-”Value decrease (Green gain decrease) 3. ”+” Value increase (Green gain increase)	

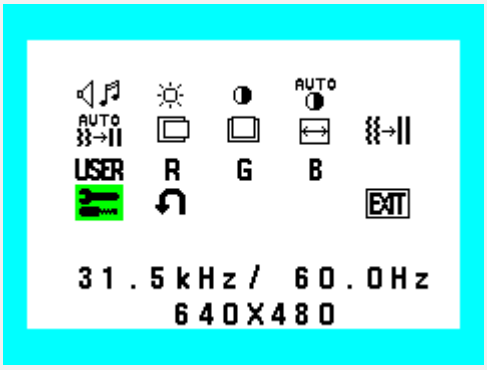
Color Red (Icon select)	
	Reset: Color select / User R, G, B

Color Blue (Icon select)	Color Blue (adjust)
	

1. During Color Blue function operate, Color Blue Icon and slide bar color is changed from Normal condition.

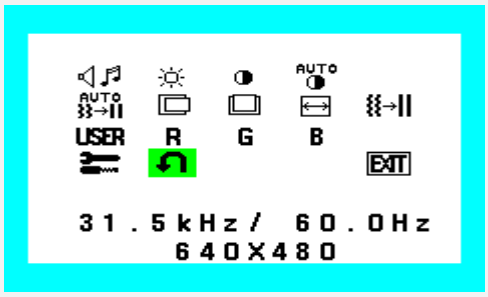
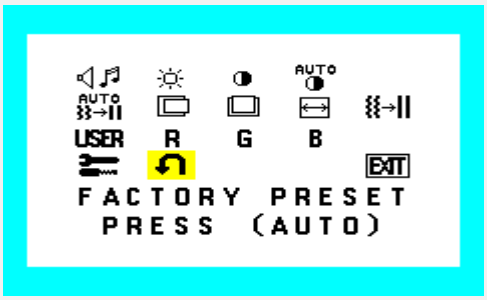
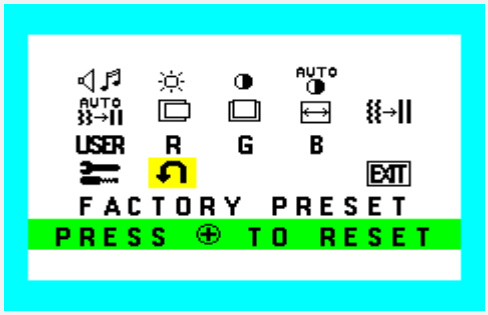
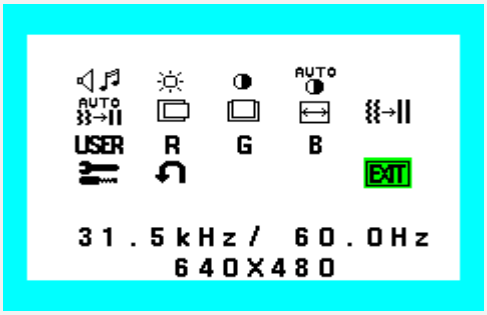
2. “-”Value decrease (Blue gain decrease) 3.”+” Value increase (Blue gain increase)

Color Blue (Icon select)	
	Reset: Color select / User R, G, B

Tool (Icon select)	
	

Factory Reset and OSD Close

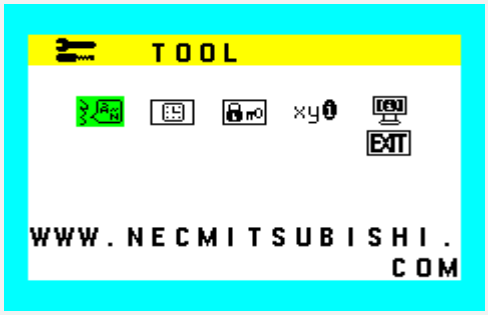
Reset all user settings to factory preset value except language selection.

Factory Preset (Icon select)	Factory Preset (adjust)
	
During Color Blue function operate, Color Blue Icon and slide bar color is changed from Normal condition.	
Factory Preset (confirmation)	**Exit (OSD Close)**
	

Language

Select one language for OSD. Seven languages are available for OSD menu.

The seven languages are English, Germany, French, Spanish, Italian, Swedish and Japanese.

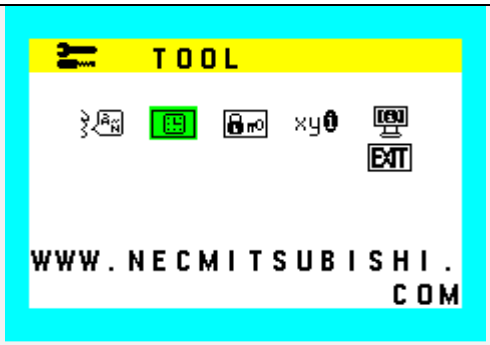
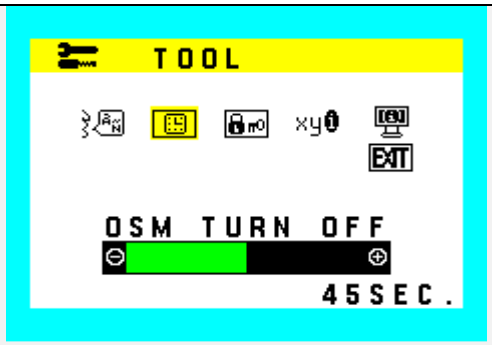
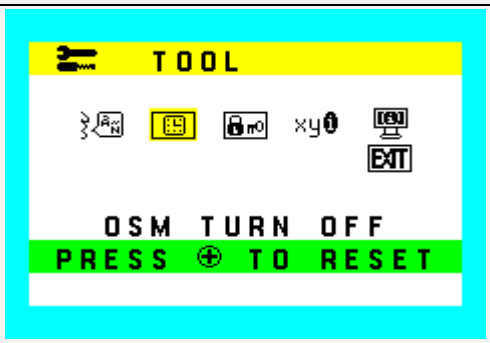
Language (Icon select)	Language (adjust)
	
Press SELECT key again you can exit it.	

OSD Turn off

Select OSD Menu turn off time.

10 - 120 seconds are available by 5 second step.

Factory setting: 45 seconds.

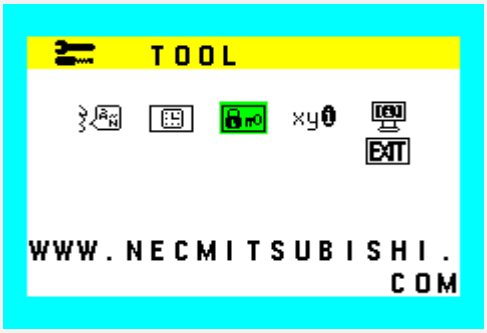
<table>
<tr><th>OSD Turn off (Icon select)</th><th>OSD Turn off (adjust)</th></tr>
<tr><td> 
</td><td> 
</td></tr>
<tr><td colspan="2">1. During OSD Turn off function operate, OSD Turn off Icon and slide bar color is changed from Normal condition.
2. "-“ Value decrease (to short)
3. "+” Value increase (to long)</td></tr>
<tr><th>OSD Turn off (Reset)</th><th></th></tr>
<tr><td> 
</td><td>Reset: OSD Turn Off</td></tr>
</table>

OSD Lock Out

This function locks out all access to OSD controls except volume, brightness and contrast control. When attempting to activate OSD controls while in the lock out mode, simple OSD menu of volume, brightness and contrast will appear.

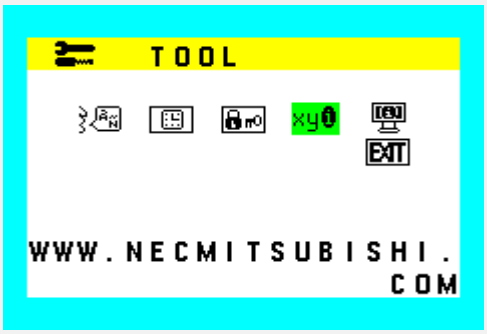
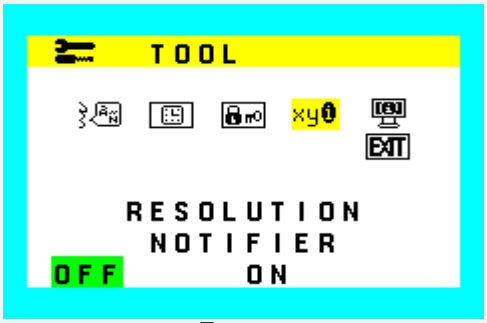
To activate the OSD Lock Out function, enter to OSD LOCK OUT menu, then press “+” key and AUTO key hold down simultaneously.

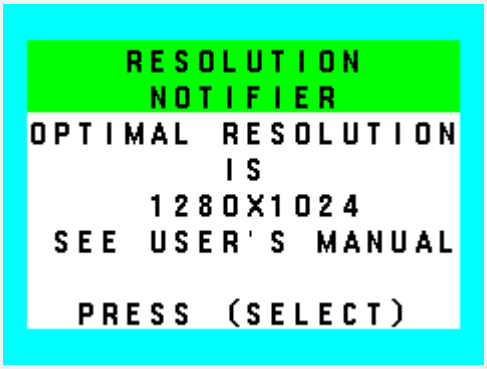
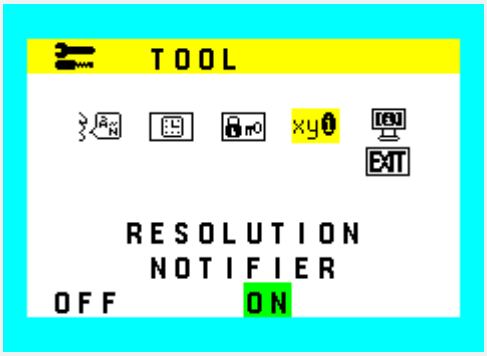
To de-activate the OSD Lock Out function, press “+” key and AUTO key hold down simultaneously.

OSD Lock Out (Icon Select)	OSD Lock Out (Adjust)
	

Resolution Notifier

Activate or de-activate Resolution Notifier function.

Resolution Notifier (Icon select)	Resolution Notifier (adjust)
	

Resolution Notifier (Message)	Resolution Notifier (adjust)
	

During Resolution Notifier function operate, Resolution Notifier Icon and slide bar color is changed from Normal condition.

This function gives warning about the display resolution.

This warning will appear in 30 seconds after the video signals except SXGA mode are input and the message shall turn off after OSD Turn Off time, or push “SELECT” key.

Resolution notifier OSD shall be shown under following conditions.

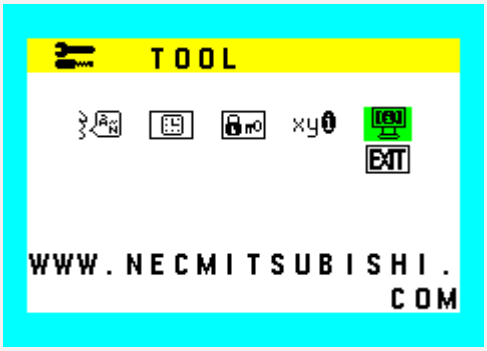
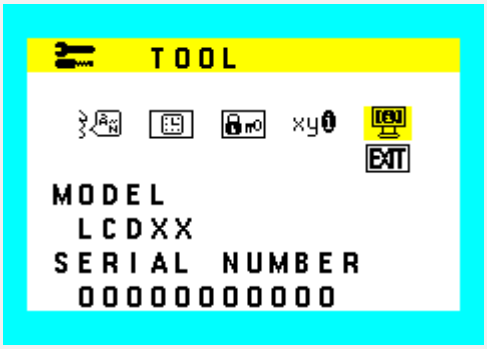
1. Resolution Notifier function is enabled.
2. CPU detects video signal is support mode (=not out of range mode) and not optimal resolution(1280x1024).
3. 30 seconds passed from the decision of video mode, and no OSD menu was shown at that time.

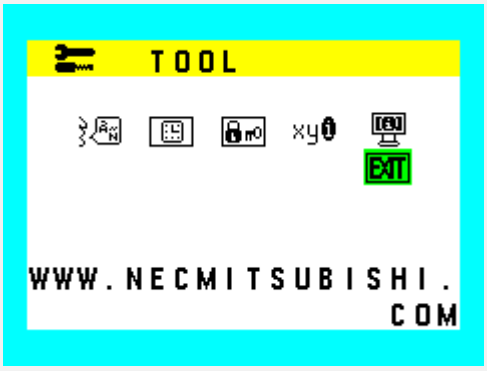
Resolution notifier OSD does NOT have priority over main OSD menu. If 30sec passed and if Main OSD menu is shown at that time, open Resolution notifier OSD "just after Main menu close".

Monitor Information (INFO)

Indicate the model and serial number of the unit.

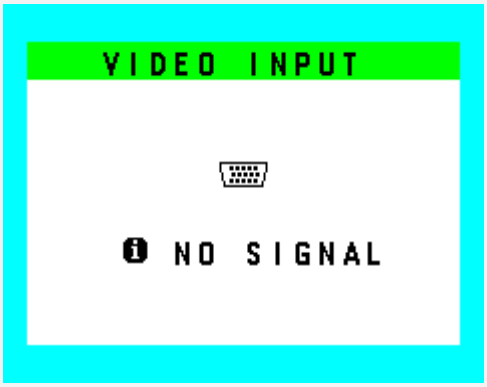
Model Name and serial number should be stored in EEPROM. And Model name should be programmed in factory. Number of characters for model name is max 9 and Number of characters for serial number is max 13.

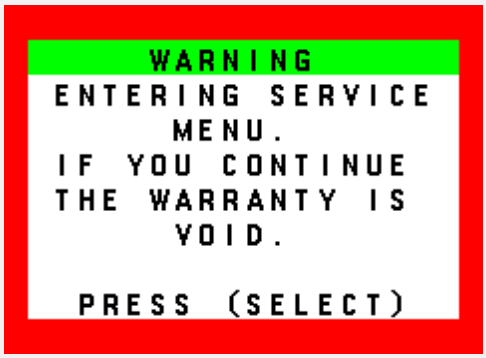
Monitor Info. (Icon select)	Monitor Info. (Information display)
	
Reserve memory area for Model name and serial number Model name: 9 characters max. Serial number: 13 character max. Model name indication: NEC Brand model: **LCD72VM /LCD72VM-BK**	

Exit (sub menu close)	
	

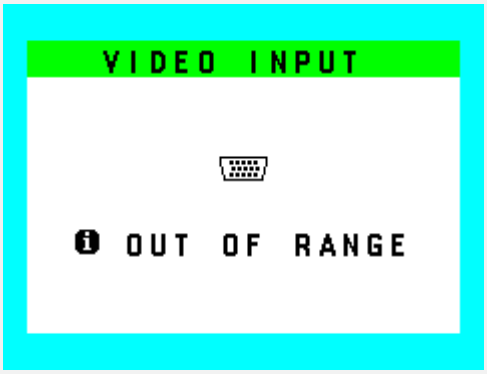
OSM Functions – Warnings

NO SIGNAL

Video Input: No Signal	
	This function gives a warning when input signal is not active. After power on or when input signal become inactive, this warning will appear. No signal OSD shall be shown after around 0.5sec from decision of video mode. This OSD shall be turned off after 5 seconds automatically. Then go to power saving mode. “No Signal” OSD Shall be displayed in the center of screen.

Warning for factory menu	
	This is right. Because this warning message is for user. We urge to no enter to service menu.

Out of Range

Video Input: Out of Range	
	This function gives warning about input resolution or refresh rate which the monitor cannot display. If video signal is not proper timing when monitor power on or input signal is changed.

When an out of range condition is formed, it displays OSD of the out of range mode.

Measured frequency is in the following case.

A. The out of range display of the screen non- display (The background screen is in the mute condition (The black background)).

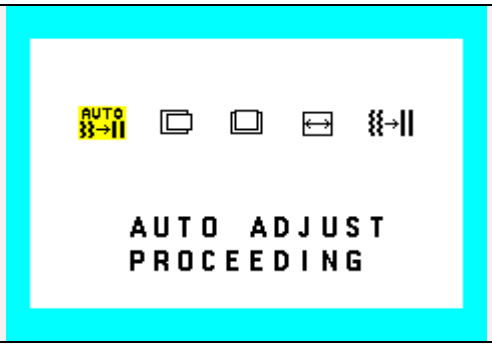
When the screen can not be displayed in the specification of the LCD panel by changing " H.size scaling rate and so on", *"Out Of Range" OSD Shall be displayed in the center of screen.*

B.The out of range display of the screen display(When the screen can be displayed in the specification of the LCD panel by changing " H.size, scaling rate and so on") *"Out Of Range" OSD Shall be displayed in the center of screen.*

Also, when judging case 2, Auto adjust function shall be proceeded. The Auto adjust function is described in section (Auto Adjust)

OSD Function –Short cut

Auto Adjust (Geometry)

Auto Adjust (proceeding)	
	1. Operate “Auto Adjust” with showing this OSD. 2. This function is adjust the H.POSITION, V.POSITION, H-SIZE and FINE to the optimal value automatically. To call this function, press “AUTO/RESET” button.

Other Functions

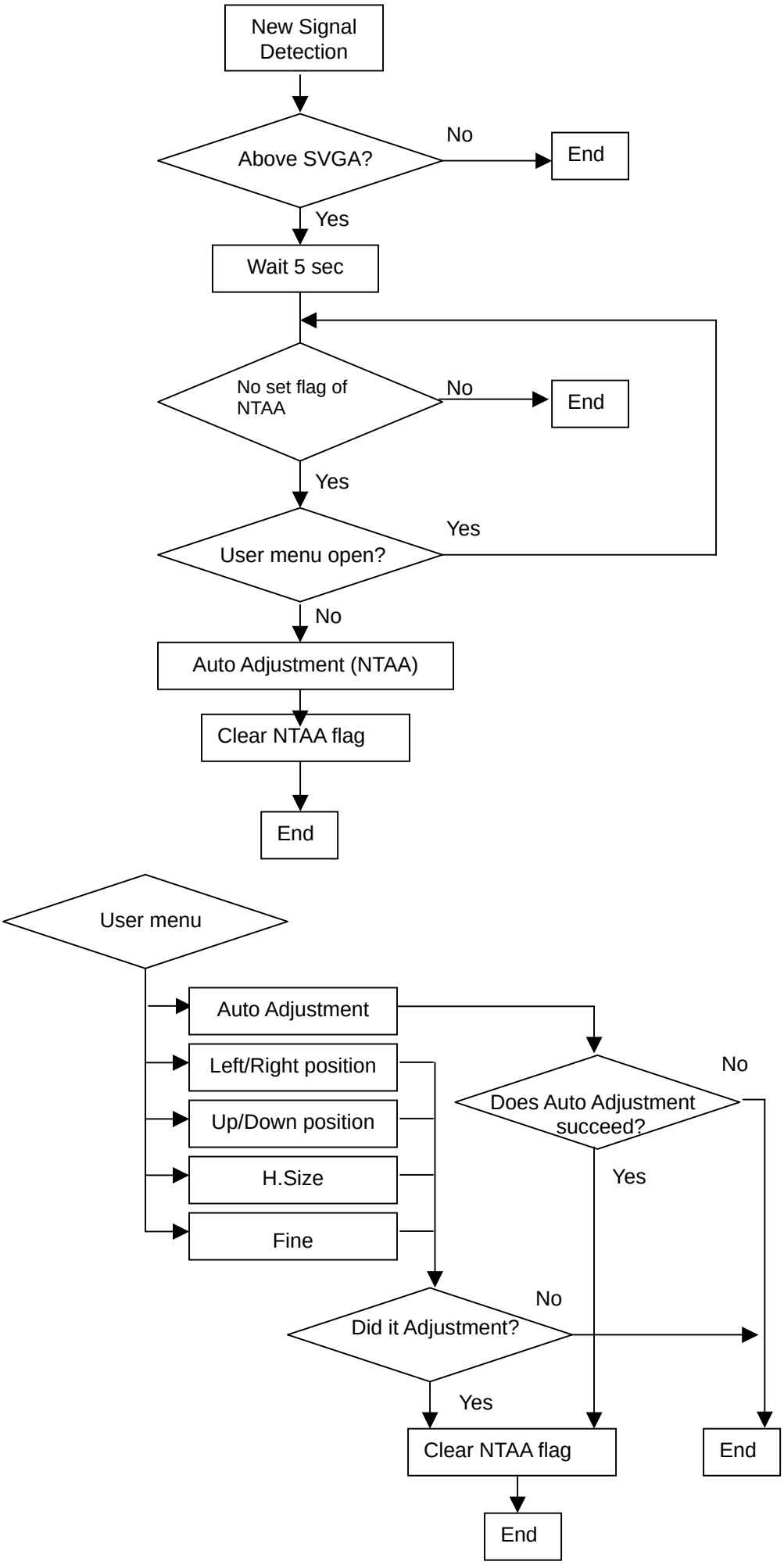
No Touch Auto Adjust

When monitor receive SVGA or higher video modes, Auto Adjust function shall execute automatically only once for each video modes. After proceeding NTAA function, set the NTAA flag, of that video mode, on. The NTAA flag shall be clear by only Factory preset in Factory/Service menu.

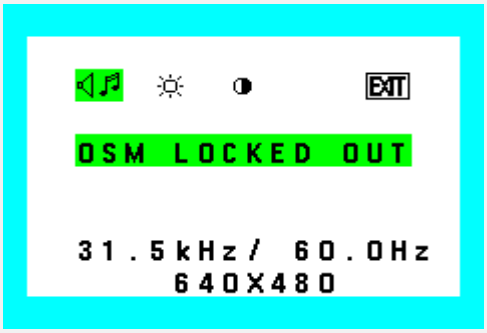
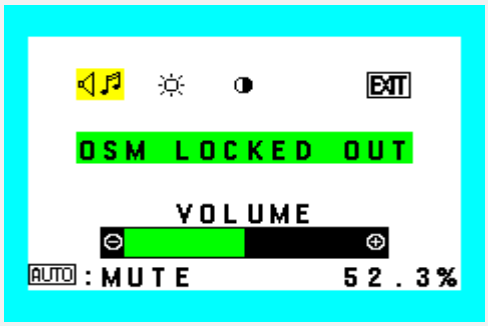
The character string "PROCEEDING...." shall be blinked during execution of automatic adjustment.

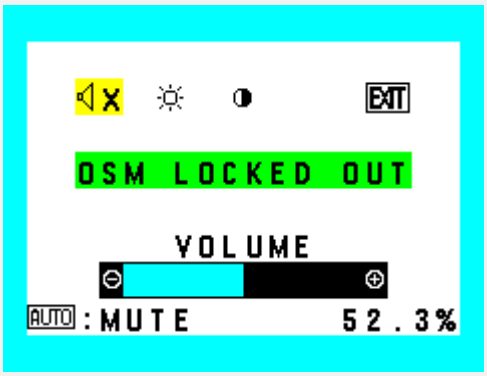
All key inputs, except power key, shall be canceled, during excursion.

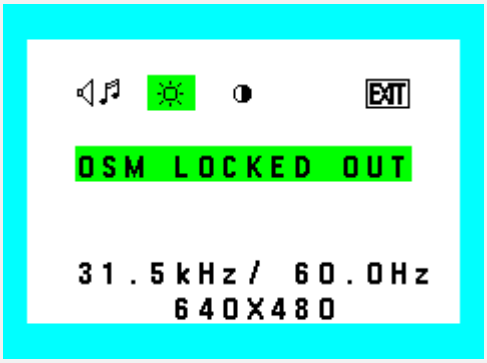
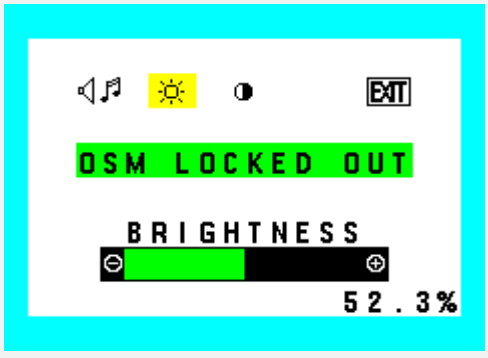
NTAA is executed frequency until auto adjustment succeeds.


New Signal Detection
Above SVGA?
No
End
Yes
Wait 5 sec
No set flag of NTAA
No
End
Yes
User menu open?
Yes
No
Auto Adjustment (NTAA)
Clear NTAA flag
End
User menu
Auto Adjustment
Left/Right position
Up/Down position
H.Size
Fine
Does Auto Adjustment succeed?
No
Yes
Did it Adjustment?
No
Yes
Clear NTAA flag
End
End

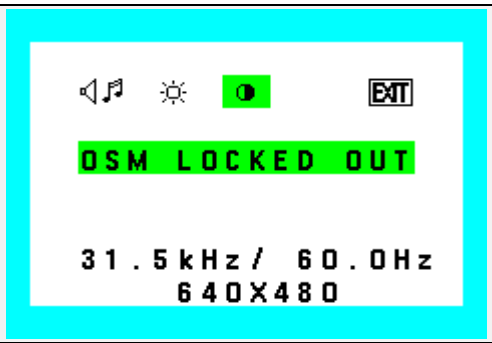
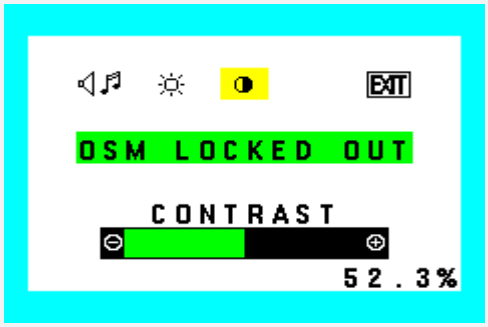
OSD Lockout

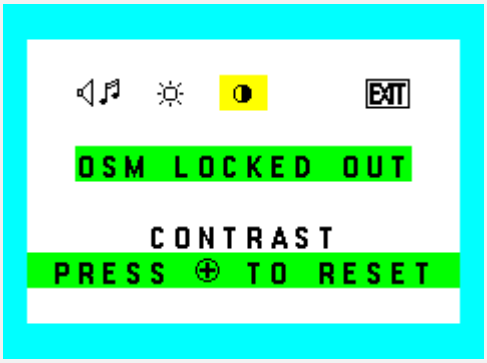
Audio (Icon select)	Audio (Adjust)
	
1. During **Audio** function operate, **Audio** Icon and slide bar color is changed from Normal condition. 2. “-” Turn down the volume 3. "+” Turn the volume up	

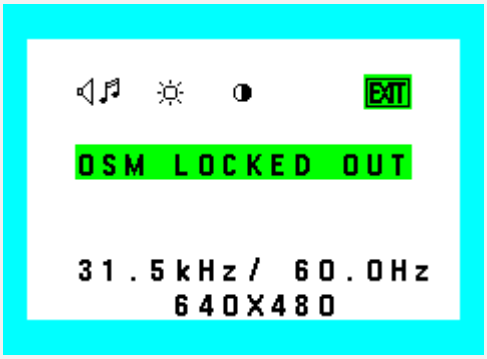
Audio (Adjust: Mute)	
	During mute function operate, Audio Icon and slide bar color is changed from Normal condition.

Brightness (Icon select)	Brightness (Adjust)
	
1. During **Brightness** function operate, **Brightness** Icon and slide bar color is changed from Normal condition. 2. “ - ” Value decrease (to dark) 3. “+ ” Value increase (to bright)	

Brightness (reset)	
	Reset: Brightness value

Contrast (Icon select)	Contrast (adjust)
	
1. During **Contrast** function operate, **Contrast** Icon and slide bar color is changed from Normal condition. 2. " - " Value decrease (to dark) 3. "+ " Value increase (to bright)	

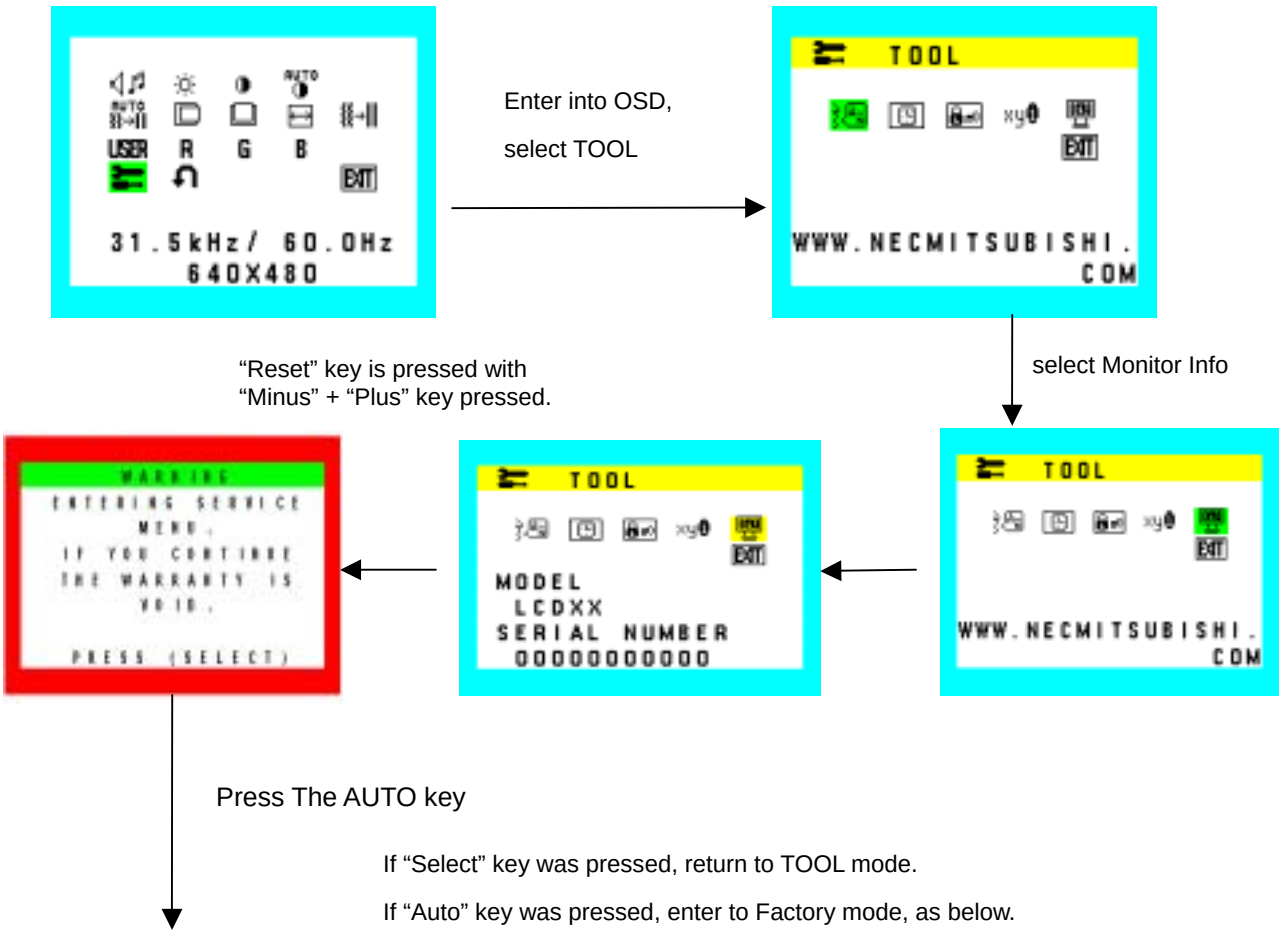
Contrast (reset)	
	Reset: Contrast value

Exit (Close OSM)	
	Lock Out "OFF" is saved.

4.2 Factory Mode

If there is specific key input, while displaying Display mode OSM, enter to the Factory menu.

When “Reset” + “Minus” + “Plus” key or “Reset” + “Left” + “Right” key was input during displaying Display mode OSM, open Waning OSM shows below.



Factory mode first page

Factory mode second page

Remark:

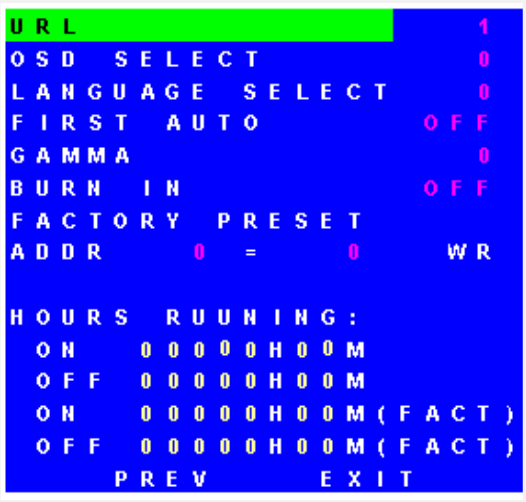
Adjust each R, G, B contrast (gain) and offset. Method of auto adjust is using ADC gain and offset. All value shall be adjustable manually.

Factory Mode First Page

Auto Level:	Press this icon, Software will find out the Gain, offset, offset1 value automatically.
Black Level:	Digital Offset (setting by software)
Offset1:	Analog RGB offset1 (scalar internal DC bias calibration data, setting by software)
Offset:	Analog RGB offset (Signal DC bias calibration data, setting by software)
Gain:	Analog RGB gain (setting by software)
9300:	Digital RGB gain (for setting white balance 9300)
7500:	Digital RGB gain (for setting white balance 7500)
6500:	Digital RGB gain (for setting white balance 6500)

URL (Factory Mode Second Page)

Select URL display



Select	Enter and withdraw from the changing area.
-	Value decrease
+	Value Increase
Auto/Reset	No Operate

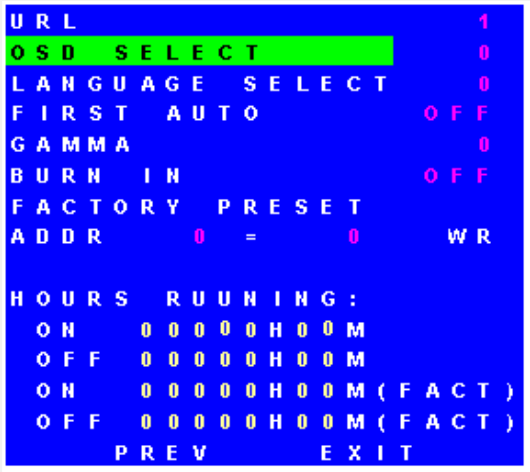
Value :

0: No URL display

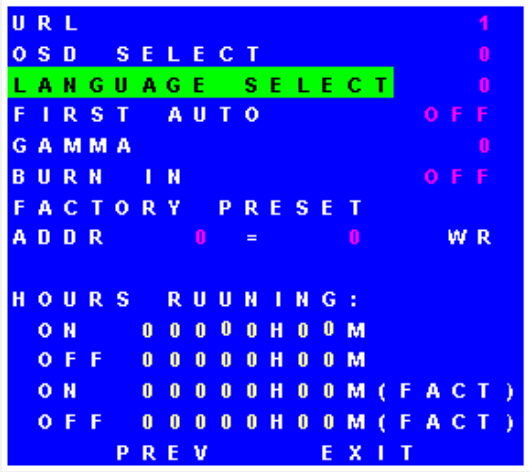
1: WWW.NECMITSUBISHI.COM

2: WWW.NMV.CO.JP

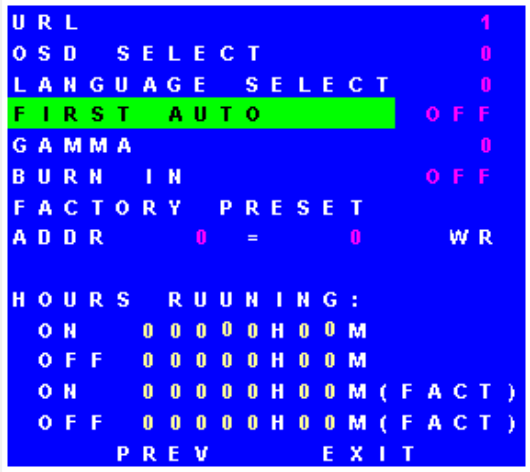
OSD SELECT (Factory Mode Second Page)

Select “OSM” or “OSD” for display.	
	Select: Enter and withdraw from the changing area. -: Value decrease +: Value Increase Auto/Reset: No Operate 0 OSM, Be careful the following menu: OSM turn off, OSM turn off reset, OSM lock out, OSM lock out submenu 1 OSD, Be careful the following menu: OSD turn off, OSD turn off reset, OSD lock out, OSD lock out submenu

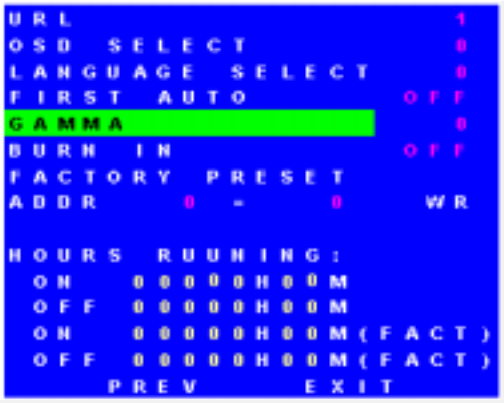
LANGUAGE SELECT (Factory Mode Second Page)

Select default of user mode language.	
	Select: Enter and withdraw from the changing area. -: Value decrease +: Value Increase Auto/Reset: No operate Select default of User mode language. 0: English 1: Japanese

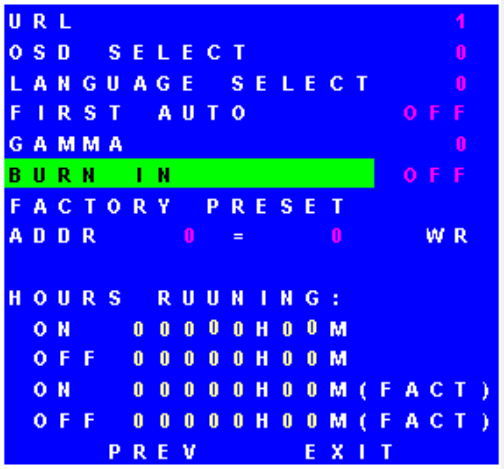
FIRST AUTO (Factory Mode Second Page)

First auto	
	Select: Enter and withdraw from the changing area -: Value decrease +: Value Increase Auto/Reset: No Operate Value : OFF: “Auto adjust ” function disable ON: “Auto adjust ” function enable

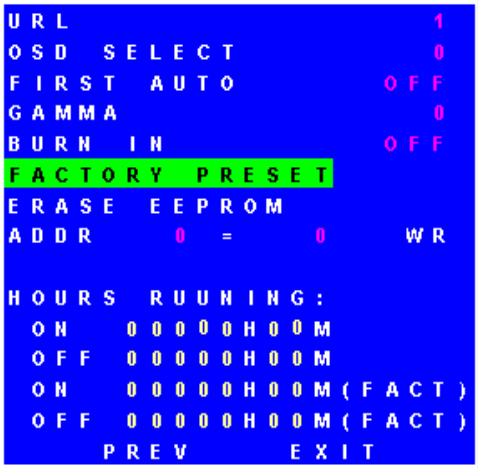
GAMMA (Factory Mode Second Page)

Select Gamma display		
	Select	Enter and withdraw from the changing area
	-	Value decrease
	+	Value Increase
	Auto/Reset	No Operate
	Value : 0: Selected QDI Gamma table 1: Selected LPL Gamma table	

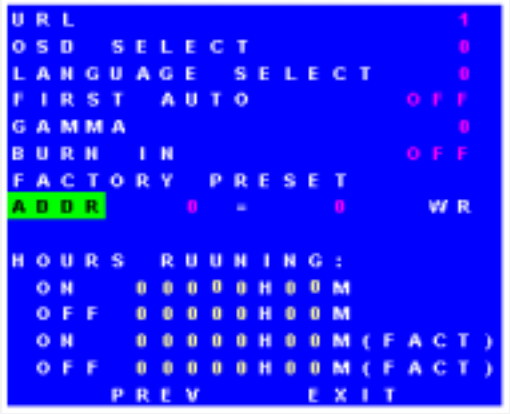
BURN IN mode (Factory Mode Second Page)

Burn in		
	Select	Enter and withdraw from the changing area
	-	Value decrease
	+	Value Increase
	Auto/Reset	No Operate
	1. Monitor can display some color Pattern with no signal-input. 2. Select ON or OFF to activate the Burn – in mode in factory mode, then turn on the monitor with no Signal input will activated the Burn in pattern 3. Burn In Pattern is cycling (FULL WHITE) ->(FULL BLACK) -> (FULL RED) -> (FULL GREEN) ->(FULL BLUE) 4. It will change the pattern once about 2 second.	

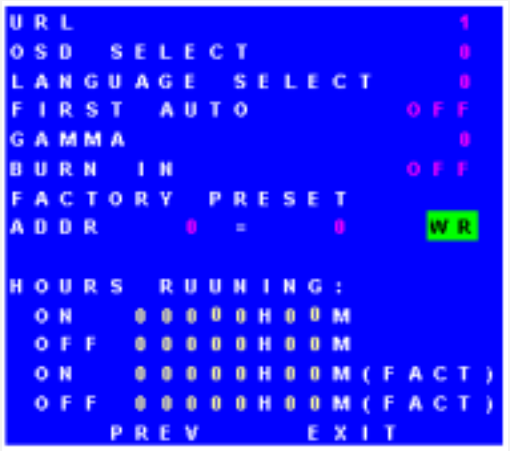
FACTORY PRESET (Factory Mode Second Page)

Factory Preset		
	Select	Operate Factory preset function
	-	Value decrease
	+	Value Increase
	Auto/Reset	No Operate
	While the cursor (Highlight) is on Factory Preset in Service menu, when “Auto/Reset” key was pushed, proceed the following procedure. 1. Reset all items of Factory preset in user mode. 2. Clear Reset table Hours Running 3. Clear First auto flag (NTAA). 4. OSD menu location back to center 5. Enable the Resolution Notifier message 6. OSD turn off time back to 45 sec\ 7. Operate Auto Adjust.	

ADDR (Factory mode second page)

ADDR	
	Select: Operate Factory preset function -: Value decrease +: Value Increase Auto/Reset: No Operate To specify the access address of the register index of ZAN3. (for DEBUG)

WR (Factory mode second page)

WR	
	Select: Operate Factory preset function -: Value decrease +: Value Increase Auto/Reset: No Operate To modify the content of the specify address of ZAN3. (for DEBUG)

HOURS RUNNING (Factory mode second page)

HOURS RUNNING	
	1. Indicate the “monitor power ON time” and “power save time” counted from factory shipment. 2. Hour Running function has four kinds of timer. a. Monitor power on time (Reset-able) b. Power save time (Reset-able) c. Monitor power on time (Un reset-able) d. Power save time (Un reset-able) Note1: Power save time = Stand by mode + Suspend mode + off mode

Note: “PREV”: Return to Factory mode first page.
“EXIT”: Exit the Factory mode.

5. Adjustment Mode Setting

AUTO LEVEL

1) Enter an input signal of VESA (1280×1024 @75Hz) input signal all white.
2) Enter the factory mode according to “4.2 Factory and Service mode”
3) Pressing the (-) or (+) button, adjust the high light to [AUTO LEVEL]. When the SELECT button is pressed, adjustment of the bias and the gain is carried out.

4) When adjustments have been finished, Pressing the (-) or (+) button, adjust the high light to [EXIT]. When the SELECT button is pressed, close the factory mode.

Note: Check whether RGB data is as follows in the case of Auto Color adjustment.

Auto Color R/G/B Data for QDI panel (QDI QD17EL07)

	R	G	B
9300	69	75	65
7500	78	76	53
6500	85	82	53

1) Select “R”, “G”, or “B” in the factory mode by pressing the “- (LEFT)” or “+ (RIGHT)” button.
2) When the MENU button is pressed, the high light moves to R/G/B data.
3) Press the “- (LEFT)” or “+ (RIGHT)” button to turn a numerical value is changed.
4) After the MENU button has been pressed, select “AUTO” and press the MENU button again. This causes the factory mode to be closed. (Try to display the OSD to confirm whether the service mode or the factory mode has been closed.)

6.Panel Brightness Check

1) Enter the input signal of 1280×1024 @75Hz, in Full white pattern.

2) Proceed “Factory Preset” function of miscellaneous menu.

3) OSM setting “BRIGHTNESS” to Max. (100%) and “CONTRAST” to 100%.

4) Color temperature setting to “USER” (R: 100%, G: 100%, B: 100%).

5) Check the center luminance should ≥ 250cd/m^2.

7. Panel Color Check

1) Enter an input signal of 1280×1024 @75Hz, in Full white pattern.

2) Proceed “Factory Preset” function. Brightness: 100%, Contrast:100%

3) Color temperature setting to “USER” (R: 100%, G: 100%, B: 100%).

4) Check the center color coordination. x = 313 ±10, y = 329 ±10,Y=190±10

8.Color Temperature Check

1) Enter an input signal of 1280×1024 @75Hz, in Full white pattern.

2) OSM “BRIGHTNESS” setting to Max. (100%) and “CONTRAST” setting to 50%.

3) Color temperature setting to each color.

4) Each color temperature setting as below:

9300K: x = 283 ±10 y = 297 ±10 Y=170±10
7500K: x = 299 ±10 y = 315 ±10 Y=170±10
6500K: x = 313 ±10 y = 329 ±10 Y=190±10

INSPECTION

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1. General Description

Product Specifications

LCD Module	Panel		QDI Panel: QD17EL07 REV.07
	Pixel Pitch		0.264mm
	Resolution		1280x1024 dots (XGA)
	Color		16.19 million colors (QDI Panel)
	Brightness		250cd/m^2 (Typical)
	Contrast Ratio		400:1 (Typical)
Viewing Angle	Horizontal	CR>=10(*2)	125 degrees (-60 to 65 degrees)
	Vertical	CR>=10(*2)	150 degrees (-75 to 75 degrees)
Frequency	Horizontal		31.5– 81.1 kHz
	Vertical		55.0 – 76.0 Hz
Pixel Clock			25.1 – 135.0MHz
Viewable Size			338 x 270.3 mm
Multi Pixel			Yes (with smoothing)
Digital Control			Yes
Color Control			Yes
On Screen Display			Yes
Power Management			Yes (1W x 2)
Plug and Play			Yes
USB Hub			No
Speaker			Yes
Headphone Jack			Yes
Microphone Jack			No
Auto Adjustment			Yes (Position / Focus / Clock)
Brightness control range			50% - 100% *
Controllable Function		Analog	Brightness, Contrast, Color Control, Position, Size, Phase, Clock, etc.
Input Signal (analog)		Signal Drive	Separated Direct Drive
		Video	RGB 0.7Vp-p Input Impedance 75 ohm
		Sync	Separate sync: TTL Level (Positive / Negative)
		Input	Mini D-sub 15pin
		DDC	DDC2B
		Signal Cable	Mini D-sub 15pin Signal Cable (L=1.8m)

*: When user setting is minimum,

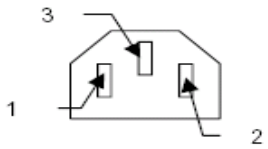
50% = (Brightness value [cd/m^2] when user controls Brightness Max) x 0.5

Power Supply		AC100-120V / 220-240V, 50 / 60Hz
Current Rating		(0.7A @ 100 - 120V, 0.4A @ 220 - 240V)
Operational Environment	Temp.	5 - 35°C
	Humid.	10 - 80%
Storage Environment	Temp.	-10 - 60°C
	Humid.	10 - 85%
Dimension	Net	374.0(W) x 383.6(H) x 196.0(D) mm
	Gross	480(W) x 515(H) x 226(D) mm
Weight	Net	5.8kg
	Gross	7.9 kg
Kensington compatible Security Lock		Yes
VESA compatible arm mounting interface		Yes, 75mm x 75mm
Tilt / Swivel / Rotation		Up 20° / Down 5°, No swivel, No rotation
Complied Regulatory and Guidelines		Safety: UL / C-UL, CE, GOST-R, TUV / GS, PCBC EMC: FCC Class B, Canadian DOC ClassB, CE Ergonomics: TUV-Ergo, Energy Star, ISO13406-2 Others: TCO'99, Windows XP Logo,
Accessories		User's manual, Utility Software. Set up sheet, Caution sheet, AC Power code (1.8m), Signal Cable (1.8m, mind-sub 15 pin)

2. Electrical Characteristics

2.1 Power Supply

AC Input	Input Voltage (Rating)	AC100 - 240V
	Input Voltage Range	AC90-264V
	Frequency (Rating)	50 / 60Hz
	Frequency Range	47 - 63Hz
	Power Consumption	34W (Max), Under 2W at Complete Off mode Under 2W at Stand-by and Suspend mode.
	Current	1.5mA (AC 240V)
	Inlet connector type	3 polarity, 10A 250V 65°C VDE, UL CSA approved CEE input connector. EN60320 Class I standard compliant



Pin	Name	I/O	Definition
1	L	I	Live
2	N	I	Neutral
3	FG	I	Frame GND

2.2 LCD without Acrylic Panel

2.2.1 For QDI Panel (QDI 17EL0707)

Item		Specifications	Remarks
LCD Module type		17.0” / 43.2 cm diagonal	
Display Type		Active matrix thin-film-transistor (TFT)	
Display Mode		TN, Normally White	
Resolution		1280(H) x 1024(V)	Aspect ratio 4:3
Active Display Area		337.92 (H) x 270.336 (V) mm	Unit: mm
Pixel Pitch		0.264(H) x 0.264(V)	Unit: mm
Color Depth		16.19 million color (6bit + FRC)	
Color Filter		RGB Stripe	
Surface Treatment		Anti-glare treatment of the front polarizer	
Viewing Angle (Typical)	Horizontal (Φ)	125 degrees (-60 to 65 degrees)	CR>=10(*2)
	Vertical (θ)	150 degrees (-75 to 75 degrees)	CR>=10(*2)
Contrast ratio		400:1 (typ)	
Luminance		250 (typ)	Unit: cd/m^2 (*1)
Response time	Rise time	4ms(typ.)	Unit: ms
	Fall time	12ms(typ.)	Unit: ms
Back Light	Type	CCFL (x 4 pcs)	
	Life time	40,000 (min), 50,000 (typ)	Unit: Hours

2.3 Full Scan Capacity

In case the input video mode is not 1280 x 1024, the image area should be expanded to 1024x768 smoothly with the function of scaling engine.

Standard resolution: 1280 x 1024

Expand method: Full expand mode with smoothing as follows

Down scaling: Down scaling at over 1280 x 1024 mode

Table 2.3 Picture Size (In Full-Screen mode)

Multi-pixel mode	Input display	Expanded Rate		Expanded Resolution
	Resolution	Horizontal	Vertical	
Expansion	720x350	1.78	2.56	1280x896
Expansion	640x350	2.0	2.56	1280x896
Expansion	640x400	2.0	2.56	1280x1024
Expansion	720x400	1.78	2.56	1280x1024
Expansion	640x480	2.0	2.13	1280x1024
Expansion	800x600	1.6	1.71	1280x1024
Expansion	832x624	1.54	1.64	1280x1024
Expansion	1024x768	1.25	1.33	1280x1024
Expansion	1152x864	1.11	1.19	1280x1024
Expansion	1152x870	1.11	1.18	1280x1024
Expansion	1152x900	1.11	1.14	1280x1024
Expansion	1280x960	1.0	1.07	1280x1024
Standard	1280x1024	1.0	1.0	1280x1024
Down scale	1600x1200	0.8	0.85	1280x1024

2.4 85Hz Refresh Rate Support

Monitor should display 85Hz refresh rate mode as emergency mode.

Monitor should display “Input not Supported” warning menu at this mode.

2.5 White Color Temperature (T146 48K/60HZ, 1280 x 1024, Full Scan)

White color temperature is 4 preset as 9300,7500, 6500, user (Native)

Target of color setting

Color Temp.	Color Coordinate		Tolerance	Color Coordinate		Tolerance
	x	y		u’	v’	
9300K	0.283	0.297	±0.03	0.189	0.446	$\Delta u'v' \leq 0.01$*
7500K	0.299	0.315	±0.03	0.193	0.459	$\Delta u'v' \leq 0.01$*
6500K	0.3127	0.3291	±0.03	0.198	0.468	$\Delta u'v' \leq 0.01$*

2.6 Check Power Manage Function

Monitor should enter to power saving mode if the following condition occurs.

Mode	Horizontal	Vertical	Power Supply	Input Timing	Power Consumption
On	ON	ON	240Vac	VESA 1024X768 (75Hz)	34W
Stand-by	OFF	ON	240Vac	VESA 1024X768 (75Hz)	2W
Suspend	ON	OFF	240Vac	VESA 1024X768 (75Hz)	2W
Off	OFF	OFF	240Vac	VESA 1024X768 (75Hz)	2W

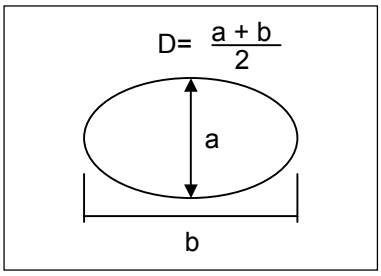
3. External Inspection on the LCD Module

3.1 For QDI Panel (QDI 17EL0707 Rev.02)

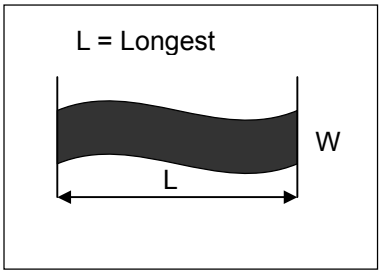
External Inspection

Inspection item	Criteria	Reject count (N)
Black spot, White spot, Foreign circular Material Dent &bubble	D > 0.5mm	N = 0
	0.5mm ≥ D ≥ 0.15mm	N ≤ 3
	D < 0.15mm	Don't care
	Minimum distance between defects: 10mm	
Scratches, lint L: length; W: width (mm)	L > 4.0mm; W > 0.1mm	N ≤ 0
	4mm ≥ L ≥ 2.0mm, 0.1mm ≥ W ≥ 0.01mm	N ≤ 3
	L < 2.0mm, W< 0.01mm	Don't care

Average Diameter: D



Length: L



The external visual inspection: The inspection shall be conducted by using a single 20W fluorescent lamp for illumination and the distance between the MODULE and the eyes of the inspector shall be 35 cm or more.

* The area for external inspection is active area plus 1.0mm width. (Upper, Lower, Left and Right)

Dot Defect

(1) Definition

a) Bright dot

The sub-pixel can be seen when using the 5% ND-Filter.

b) Scratches on the color filter (Bright dot count)

Count: defect area > 1/4 dot

No count: defect area < 1/4 dot

(2) Bright dot (Acceptable)

Green/Red/Blue dots: When the MODULE lights, dots appear bright in display at black picture. (V0)

Check pattern	Total Quantity
Black picture	≤ 3

2 adjacent ….. 1 pair MAX

Green Bright dots 2 adjacent ….. Nothing

Defect distance ….. more than 10mm

(3) Black dots (Acceptable)

Black dots: When the MODULE lights, dots appear black in display at Green + Blue + Red picture.

Check pattern	Total
Green + Blue + Red Picture	Three picture position total 5 MAX

Two adjacent dots ….2 pair MAX

Defect distance ….. more than 5mm

Three joined bright dots must be nil

(4) Total dot defect (Black & Bright)

Check pattern	Total Quantity
N/A	5 MAX

Display non-uniformity / Mura

There should be no distinct non-uniformity/ Mura visible through 5% transparency of filter.

Note: To make the special standard for the high percentage mura. Specification as the following list

Mura Type	Inspection criteria	Inspection method
Edge mura	ND filter 8%	Per Gray scale 32 pattern (not limited in each Gray scale pattern)
Spot mura	ND filter 8%	Per Each Gray scale pattern

4. Safety Test

- Destination: All over the world
- Applicable standards: UL/C-UL
- Unit class: Class I units (the units protected against electric shocks by protective earthing, or those equipped with 3-core power cords)
- Ratings: AC100 - 240V 50/60Hz 0.6A/0.3A

4.1 Input Current Measurements

Under the measuring conditions specified below, an input current should be measured while the 50Hz input voltage is maintained at 220V AC (+0 to -5V). The input currents measured should all confirm so they satisfy the judgment standard.

(1) Measuring conditions

- Condition of the set : ON mode
- Measuring conditions: The inspection signal is set at “1024X768 (75Hz)” and “white” is displayed throughout the screen. At that time, the brightness and contrast should be kept under the brightest condition.

(2) Judgment standard

- The input current should be kept below 0.35A +10%.

4.2 Power Source/Earth Connections

a. Checks on the power source/earth connections

The earth side of the cord or the earth wire of the inlet filter for the cord set should be visually checked to see that it is connected to the chassis block of the unit as specified below.

1) The earth wire color should be spiral of green and yellow. Units applicable to UL or C-UL

2) The earth wire should be firmly connected to the chassis block by the use of a screw (See Note) of 3.5mm∅ in diameter.

Note: Spring washers or star washers should be used, without fail.

b. Earth resistance testing

This testing should be carried out prior to the dielectric strength test.

The earth resistance should be 0.1Ω or less when a current of 25A AC is carried between the earth side of the cord (the plug block or the section closest to the plug where no plug is provided) and the metallic block (the DVI connector) that is used as a safety earth for the unit.

Where the earth resistance exceeds 0.1Ω, the condition should be still acceptable if the earth resistance is 0.1Ω or less when the resistance of the power cord is excepted.

4.3 Dielectric Strength Test

To confirm the freedom from insulation breakdown, testing should be carried out under the conditions specified below.

1) Measuring conditions

- Measuring instrument: Dielectric strength tester (The specified voltage should be maintained in the state that a current of 10mA is carried.)
- Testing point: Between the electrical circuit block and the exposed metallic block (D-SUB connector)

Note: The electrical circuit block should mean the power input block (primary side). Testing should be carried out under the condition that both poles of the power plug are short-circuited. (Where a 3-core cord is used, the two poles other than the earth terminal should be short-circuited.)

2) Judgment standard

The freedom from insulation breakdown should be confirmed under the condition that the applied voltage is maintained at 1500V AC (+0 to 50V) for one minute.

Even though the result of this testing is OK, such a condition should be regarded as unacceptable if there is a leakage (flashing) around the section where the test voltage has been applied.

If the result of insulation resistance test is found unacceptable, to be carried out after this testing, such a condition should be regarded as that an insulation breakdown has occurred.

4.4 Leakage Current Test

A leakage current should be measured under the conditions specified below, in order to confirm that the requirements of the judgment standard are met.

1) Measuring conditions

- Measuring instrument: Leakage current meter (A 1500Ω resistor should be incorporated, together with a bypass capacitor of 0.15μF.)
- Testing point: Between the exposed metallic block (D-SUB connector) and Phases A and B of the power source.
- Condition of the set: A power cable should be connected without connecting a signal generator. The see-saw switch on the set side should be turned ON and OFF.

2) Judgment standard

The leakage current measured should be 1.5mA or less with an input of 240V AC × 1.06 +5/-0V (60Hz).

4.5 Insulation Resistance Test

An insulation resistance should be measured under the conditions specified below, in order to confirm that the requirements of the judgment standard are met.

1) Measuring conditions

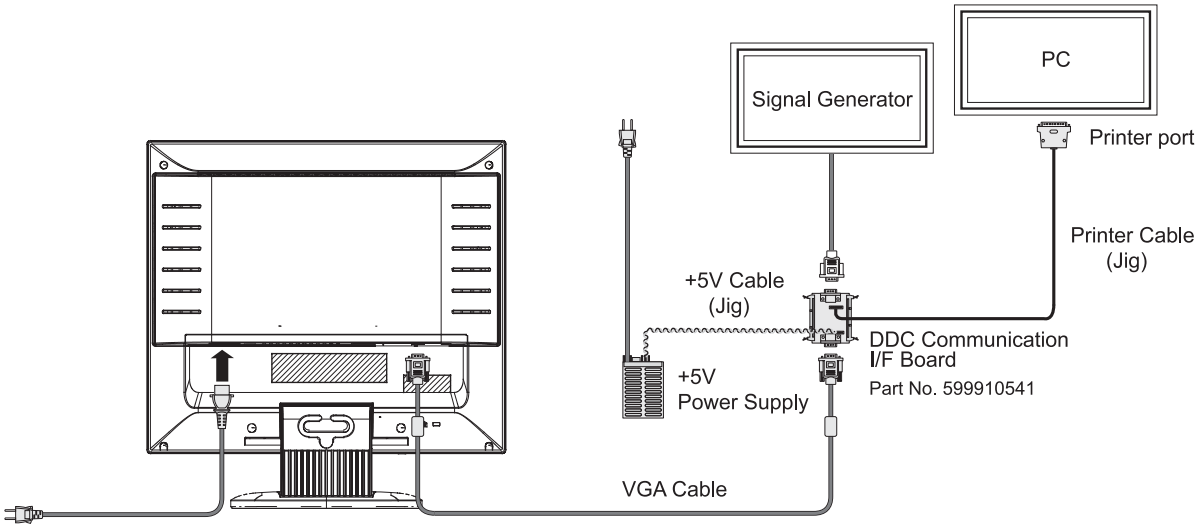
- Measuring instrument: 500V DC MEGOHM Meter
- Testing point: Between the power circuit block and the exposed metallic block (D-SUB connector)
- Measured value readout: A test voltage should be applied for one minute and the resistance value should be read out thereafter.

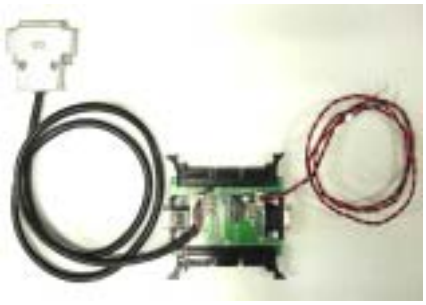
2) Judgment standard: 10MΩ or more

5. Inspection of PLUG & PLAY Communication and OSM "MONITOR INFORMATION" for Model Name / Serial Number

5.1 System Connection

This system should be connected as shown below.





DDC Communication I/F BOARD

5.2 Input Signal

Horizontal synchronization frequency: Not specified.

Vertical synchronization frequency: Not specified.

5.3 Program

Service tool: Service tool Ver. W3.22

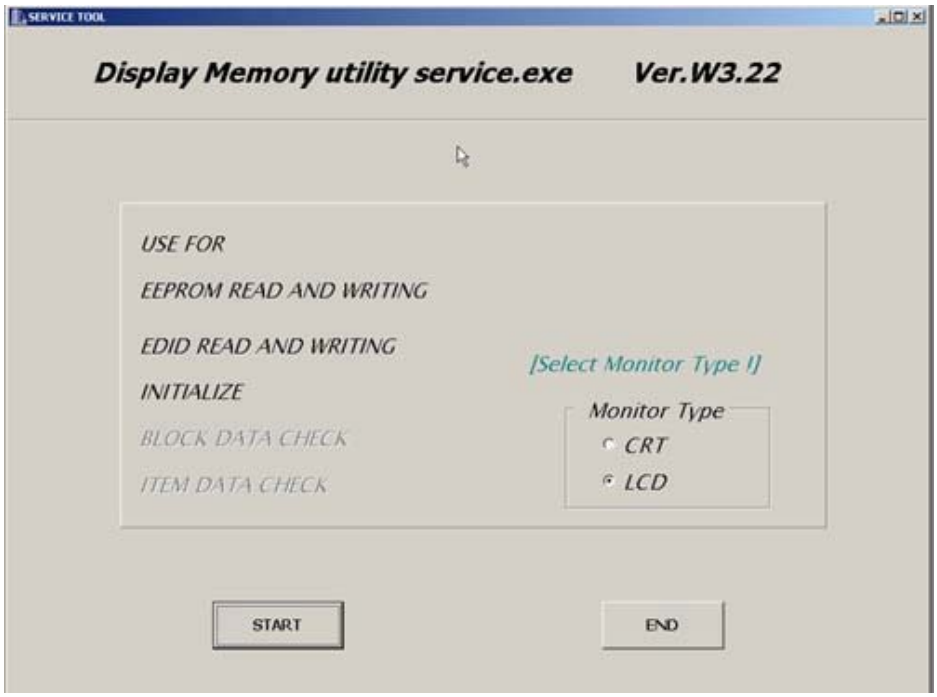
5.4 Operation

1) Connect the EDID data writing unit with jigs, etc.

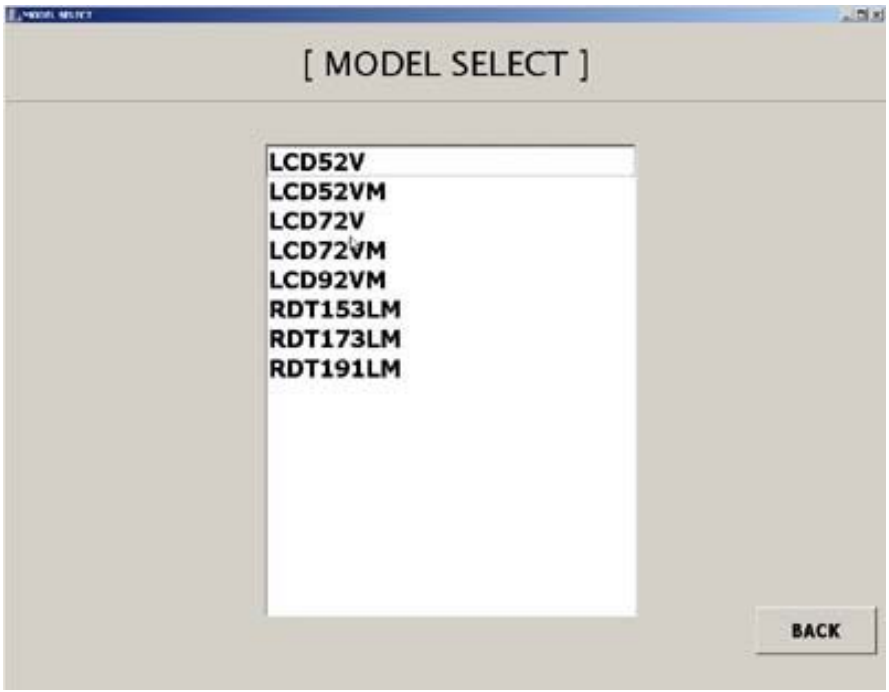
2) Copy all the files of the service tool Ver. W3.22 in a proper directory.

3) Start [Service2.EXE] of the service tool Ver. W3.22

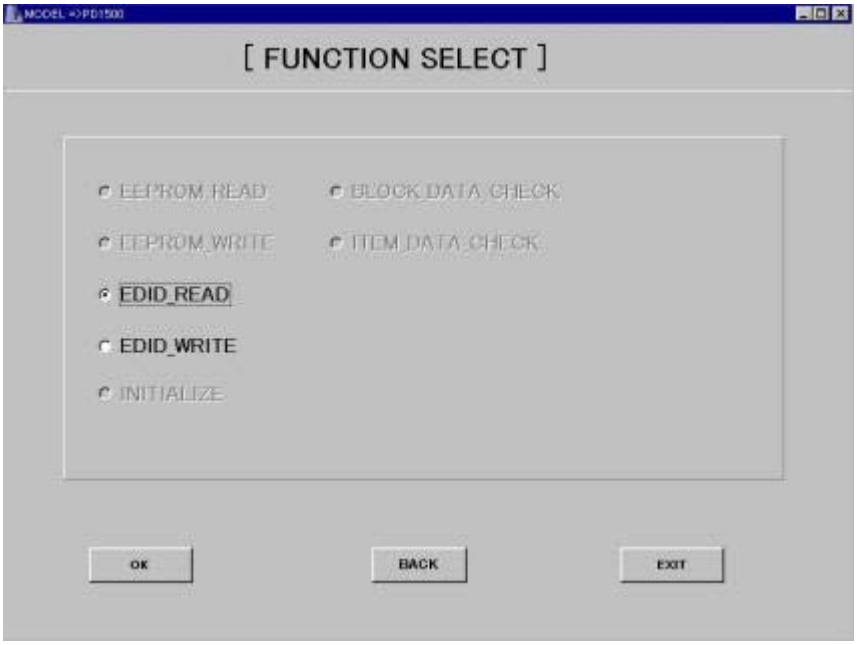
4) When the screen as shown below appears, check to [LCD] of [Monitor Type] and press the [START] button.



5) When the screen as shown below appears, adjust the cursor to [LCD72VM] and make a double click.

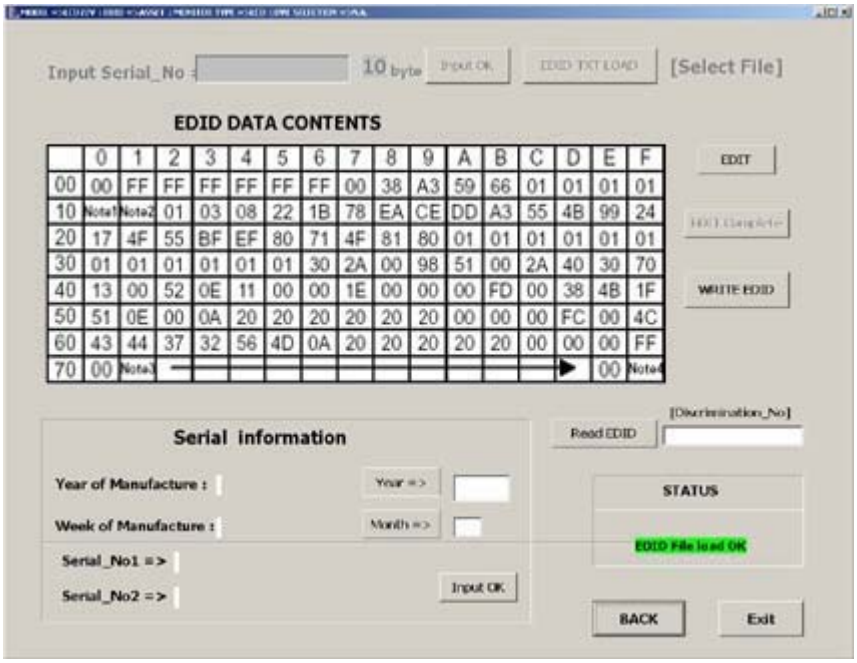


6) When the screen as shown below appears, check to [EDID_READ] and press the [OK] button.



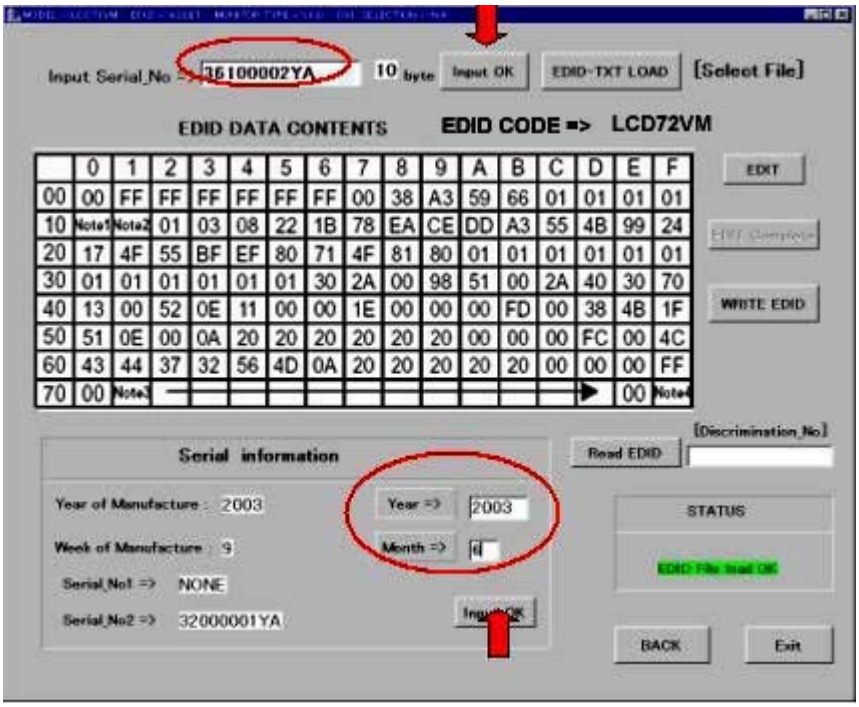
7) When the screen as shown below appears, confirm that the correct data are displayed in the columns of EDID DATA CONTENTS and Serial information.

If all the displayed data are [FF] or the like, or if the serial number is different from that of the corresponding unit, then EDID data writing should be carried out.

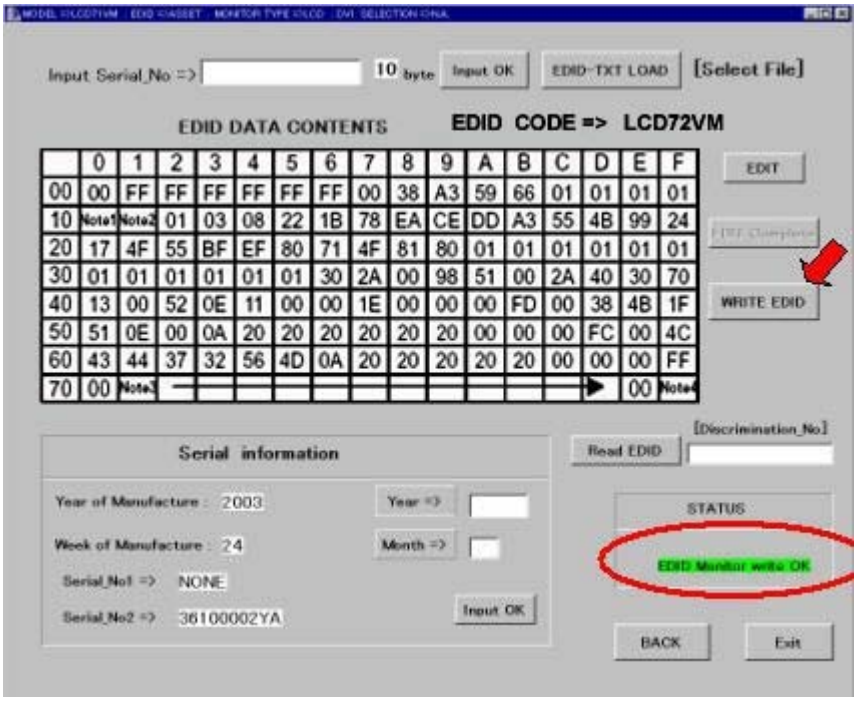


8) When a screen of Item 6 is displayed by pressing the [BACK] button, check to [EDID_WRITE] and press the [OK] button.

9) When the screen as shown below appears, examine the serial number of the unit, enter an input in the column of [Input Serial No.] through the keyboard, and press the [Input OK] button. Enter an input in the column of [.Year=>] in manufactured year(A.D. four digits) and [Month=>] in manufactured month through the keyboard, and press the [Input OK] button.



10) When the [WRITE EDID] button is pressed, writing of the EDID data only is carried out. Upon the completion of correct writing, a display of [EDID Monitor Write OK] is presented in the column of [STATUS].



11) Upon the normal completion of EDID data writing, press the [Exit] button to close the program.

5.5 EDID Data File

content of DDC process

EDID DATA FOR MultiSync LCD72VM

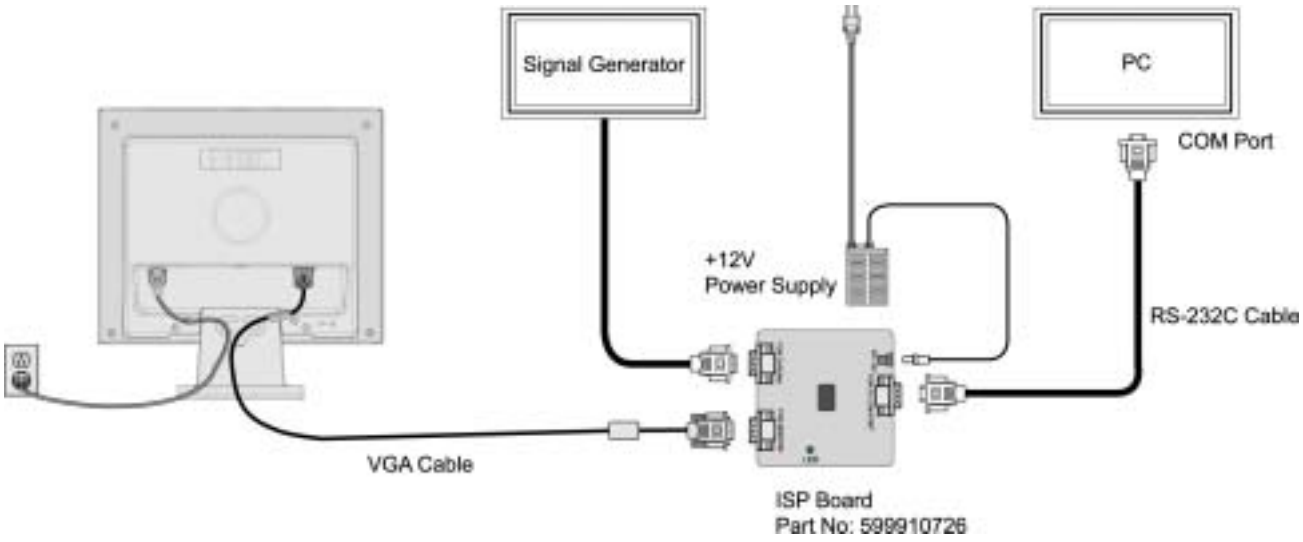
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00	00	FF	FF	FF	FF	FF	FF	00	38	A3	59	66	01	01	01	01
10	Note1	Note2	01	03	08	22	1B	78	EA	CE	DD	A3	55	4B	99	24
20	17	4F	55	BF	EF	80	71	4F	81	80	01	01	01	01	01	01
30	01	01	01	01	01	01	30	2A	00	98	51	00	2A	40	30	70
40	13	00	52	0E	11	00	00	1E	00	00	00	FD	00	38	4B	1F
50	51	0E	00	0A	20	20	20	20	20	20	00	00	00	FC	00	4C
60	43	44	37	32	56	4D	0A	20	20	20	20	20	00	00	00	FF
70	00	Note3	Note3	Note3	Note3	Note3	Note3	Note3	Note3	Note3	Note3	Note3	Note3	Note3	00	Note4

Note 1: address 10h — Week of manufacture = Month of manufacture × 4
Note 2: address 11h — Year of manufacture - 1990
Note 3: address 71h ~ 7Dh — Serial Number (ASCII coded)
If less than 13 char, terminate with 0Ah and fill the rests with 20h.
Note 4: address 7Fh — Checksum
The sum of entire 128 byte shall be equal to 00h.

5.6 OSM "Monitor Information" for Model Name / Serial Number

a). System Connection

This system should be connected as shown below.



ISP Board
(Part No: 599910726)

b). Input Signal

Horizontal synchronization frequency:Not specified.

Vertical synchronization frequency: Not specified.

c). Preparation

1. Turn on the PC, Chroma2226, and Chroma setting: Timng116/Pattern48 (640x480), and then connect the S/N recorder to PC and Chroma.
2. Ensure the date in PC is currently.

d). Program

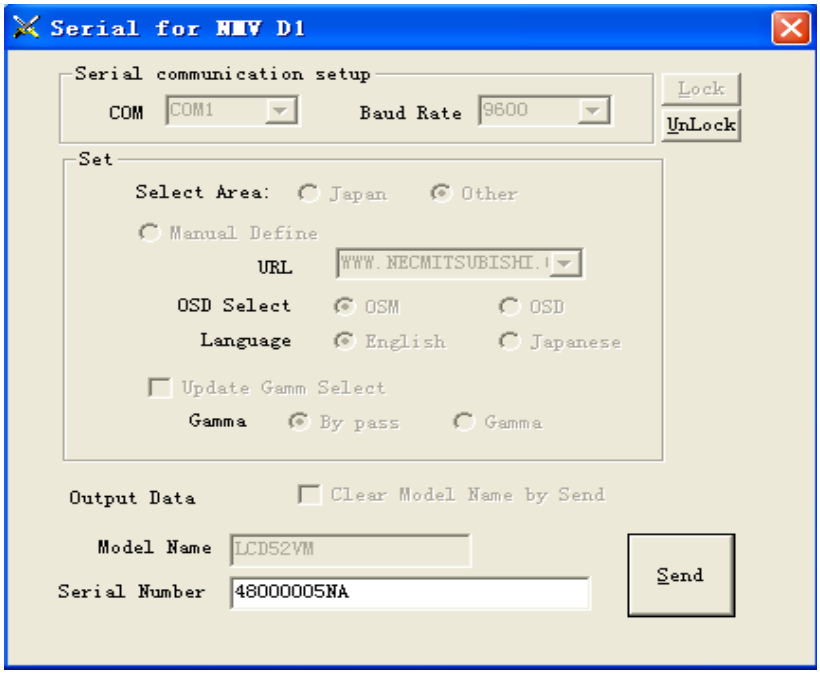
S/N Record Program (Part No: 599910727)

e). Operation Steps

S/N Record:

1. Connect the signal cable and S/N record. Select and run the right S/N record program, and the dialog box appear (shown as follows), and the options setting should accord with the figure shown as follow:

   (COM: COM1; Baud Rate: 9600)



2. According to different sell region the contents is vary, there is a reference as follow Table shown:

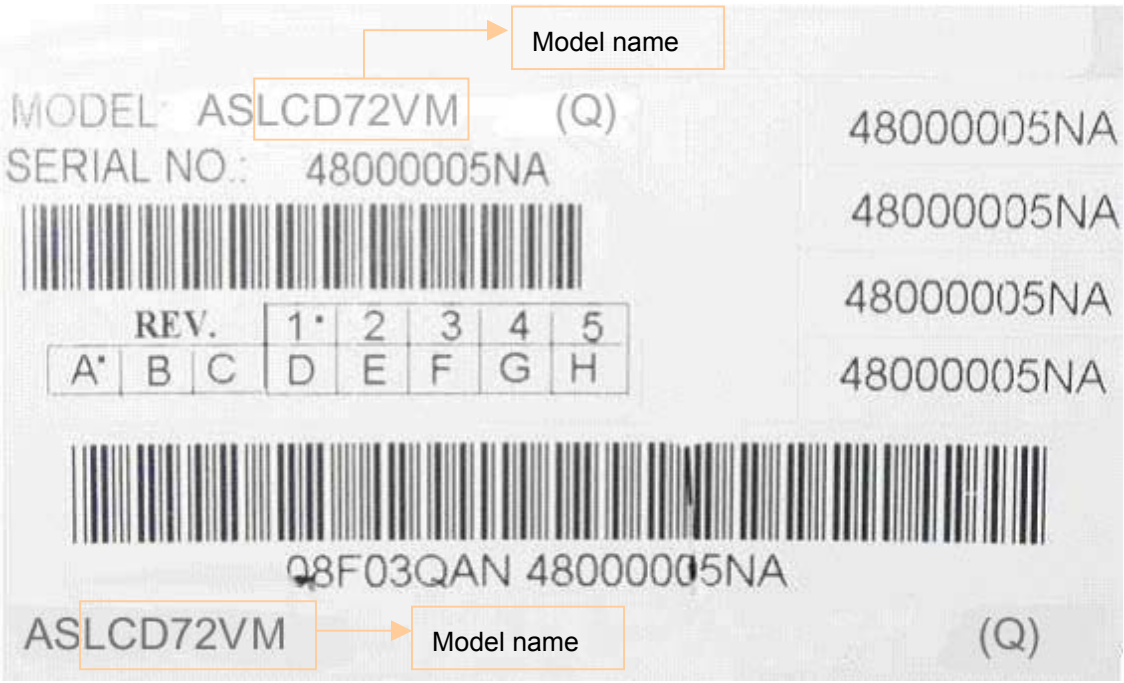
   S/N contents

Sell region	The shown web address (URL)	OSD select	Default language
Japan	WWW.NMV.CO.JP	OSD	Japanese
Other	WWW.NECMITSUBISHI.COM	OSM	English

3. Key in MODEL NAME and select the right options of the dialog box. After checked ok, the foreman or the charge should kick the “LOCK” button, the items mentioned above will be locked.

4. Scan 10 emics Barcode, kick the Enter or Send button, if shown: “Send Complete! “, means record successfully, kick Enter or kick Send button again, then press select key make the OSD on, select the Tool item, check the Model name, Web address (URL), OSD select and SN contents, if one of them doesn’t tally with factual content, connect the lines compactly, record again.

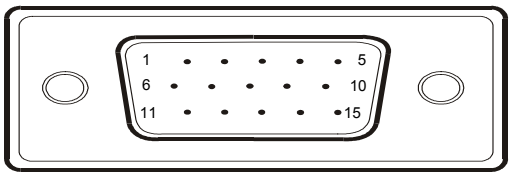
Attached 1: Barcode sample



Sign: 1. Make sure the foreman or the charge should check the SN contents of the first set of each schedule OK and lock.

2. If the model name is unconformity with the fact code, please inform the MK and RD-LCD to affirm.

6. Analog D-SUB Connector



Pin	Meaning	Pin	Meaning
1	Video input red	**9**	+5V (DDC)
2	Video input green	**10**	Sync. ground
3	Video input blue	**11**	Ground
4	Ground	**12**	DDC-Data
5	Ground	**13**	H. sync
6	Red video ground	**14**	V. sync
7	Green video ground	**15**	DDC Clock
8	Blue video ground		

7. Factory Preset Display Modes

The following are the most frequently used of the preset operating modes:

Mode	Horizontal frequency	Refresh rate	Screen resolution
Dos*	31.5kHz	70Hz	720x400
VGA	31.5kHz	60Hz	640x480
VGA	35.0kHz	67Hz	640x480
VGA	37.9kHz	73Hz	640x480
VGA	37.5kHz	75Hz	640x480
SVGA	35.1kHz	56Hz	800x600
SVGA	37.9kHz	60Hz	800x600
SVGA	48.1kHz	72Hz	800x600
SVGA	46.9kHz	75Hz	800x600
SVGA	49.7kHz	75Hz	832x624
XGA	48.4kHz	60Hz	1024x768
XGA	56.5kHz	70Hz	1024x768
XGA	60.0kHz	75Hz	1024x768
XGA	53.7kHz	66Hz	1024x768
	68.8kHz	75Hz	1152x870
	75.0kHz	75Hz	1280x960
	60.0kHz	60Hz	1152x960
	64.0kHz	60Hz	1152x1024
	80.0kHz	75Hz	1152x1024

8. Audio System

8.1 Audio Input

Connector type:	Φ3.5 stereo mini jack@ back side of monitor
Color of Connector:	Pantone284C (Light Blue)
Input level:	500mVrms
Input impedance:	47kΩ

8.2 Headphone Output

Output power:	1.0 W rms/CH @ 1KHz
Total harmonic distortion(@ 1W):	<1%
S/N ratio:	50db
Connector type:	Φ3.5 stereo mini jack@ front side of monitor
Output power:	1W + 1W
Output level:	Same loudness level of sound as build-in speaker. (headphone impedance: 32Ω)
Color:	Gray (For white model)
	Black (For black model)

8.3 Built-in speakers

Type:	Micro Speaker (8Ω, 1W + 1W) without box
Nominal Impedance:	8 Ohm
Maximum Input Power:	1 W/CH
Resonance Frequency:	less than 450Hz
Speaker Size:	40 x 20 mm

When headphone connected to headphone jack, speaker outputs should be disabled.

8.4 Characteristic

Frequency band:	250Hz to 20kHz
Total harmonic distortion:	3% (condition: 1W, all black)
	2% (condition: 50mW,all black)
Remaining behind hum:	5mVp-p (max)

(Any noise shall not be heard from the point of 30cm distance from the monitor.)

Remaining behind buzz:	5mVp-p (max)

(Any noise shall not be heard from the point of 30cm distance from the monitor.)

S/N ratio:	40dB (condition: all black)
S/buzz ratio:	40dB (condition: all white, contrast max)
Channel separation:	30dB
Right/left output deviation:	±1%

Sound noise by vibration of cabinet should not be heard at condition of 70% volume, 1kHz 500 mVrms input, 250Hz to 20kHz range.

8.5 Audio Control

Following functions must be controlled by OSM.

Volume Control

Mute function

Speaker Output Power at 1kHz, 500mVrms, volume max 1 + 0.5W

Volume control characteristic is similar as gamma 2.2 curve.

8.6 Audio Test

a. During Volume function operate, Volume Icon and slide bar color is changed from Normal condition.
b. Can you hear the sound increasing or decreasing, During Volume function operate.
c. Can you hear the sound by the earphone.
d. Can you hear the sound without the earphone when earphone is connected.

TROUBLE SHOOTING

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5. PWPC Board 6-6

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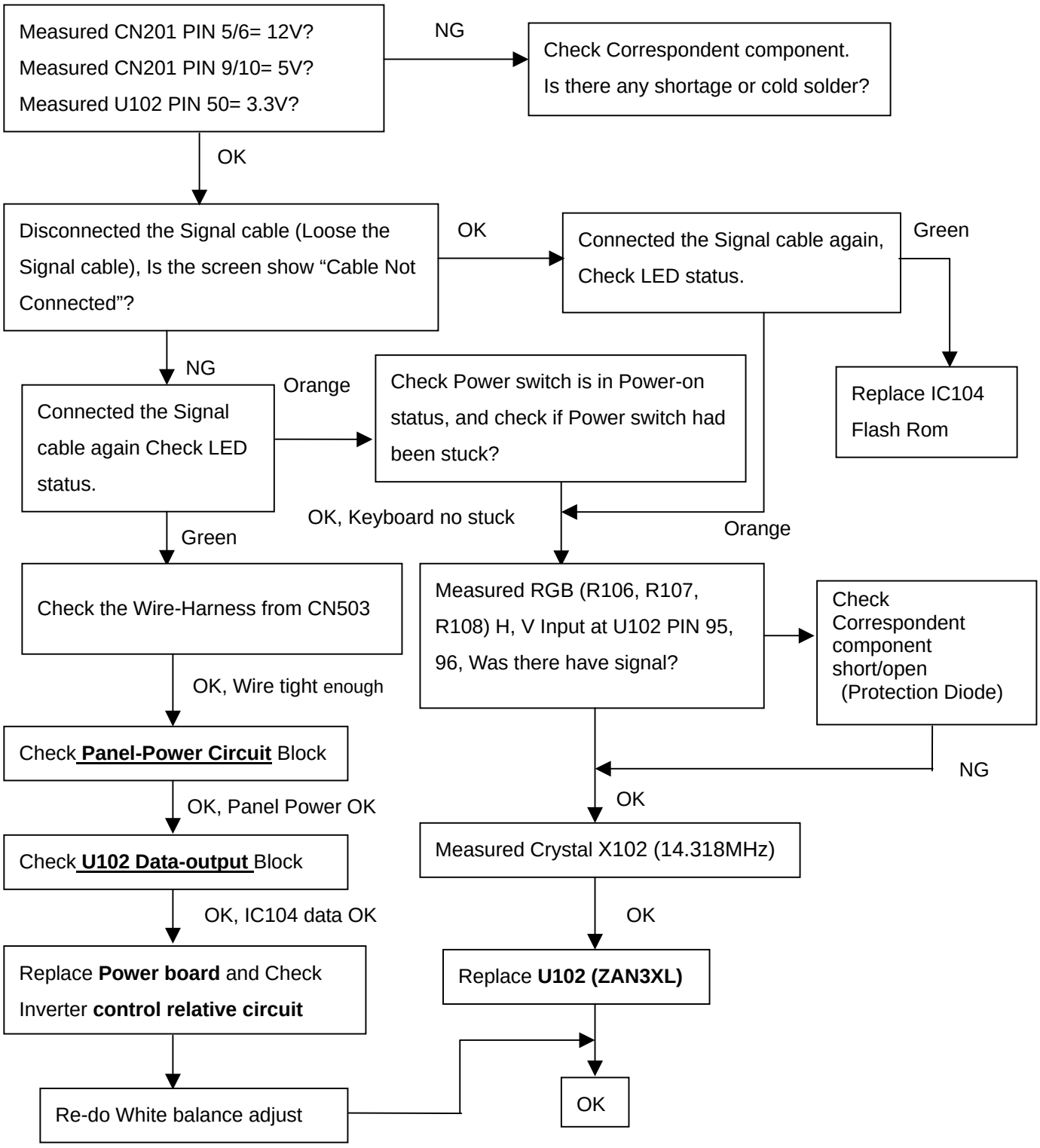
5.2 No Backlight 6-7

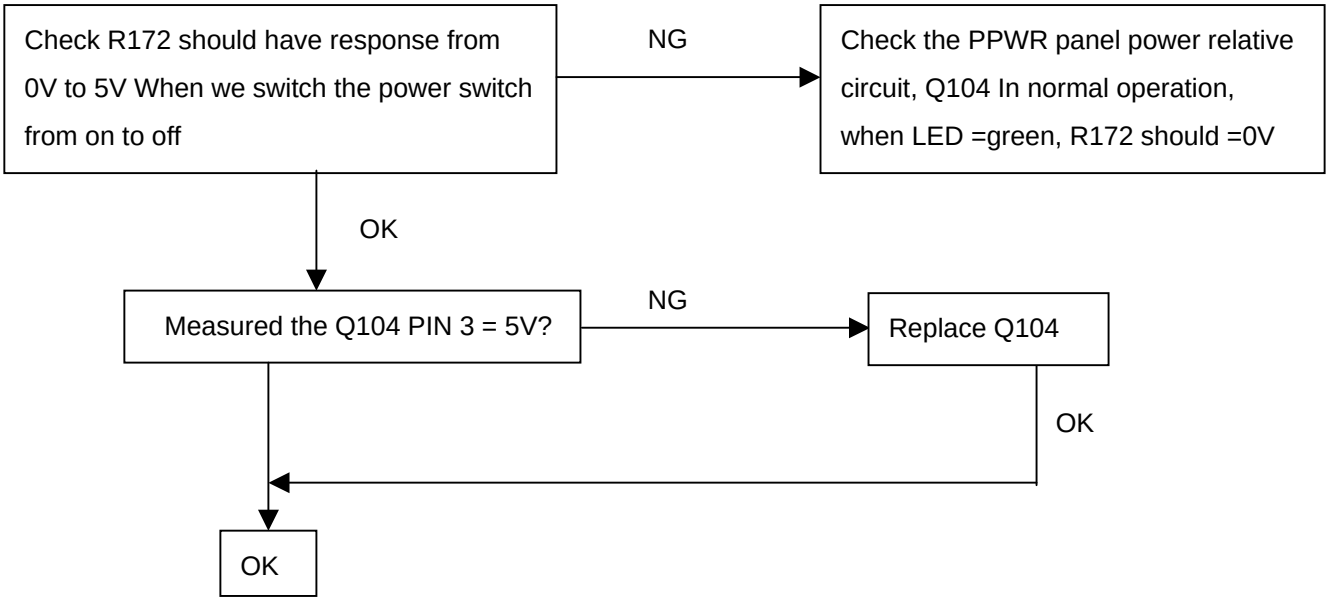
1. No Display On Screen



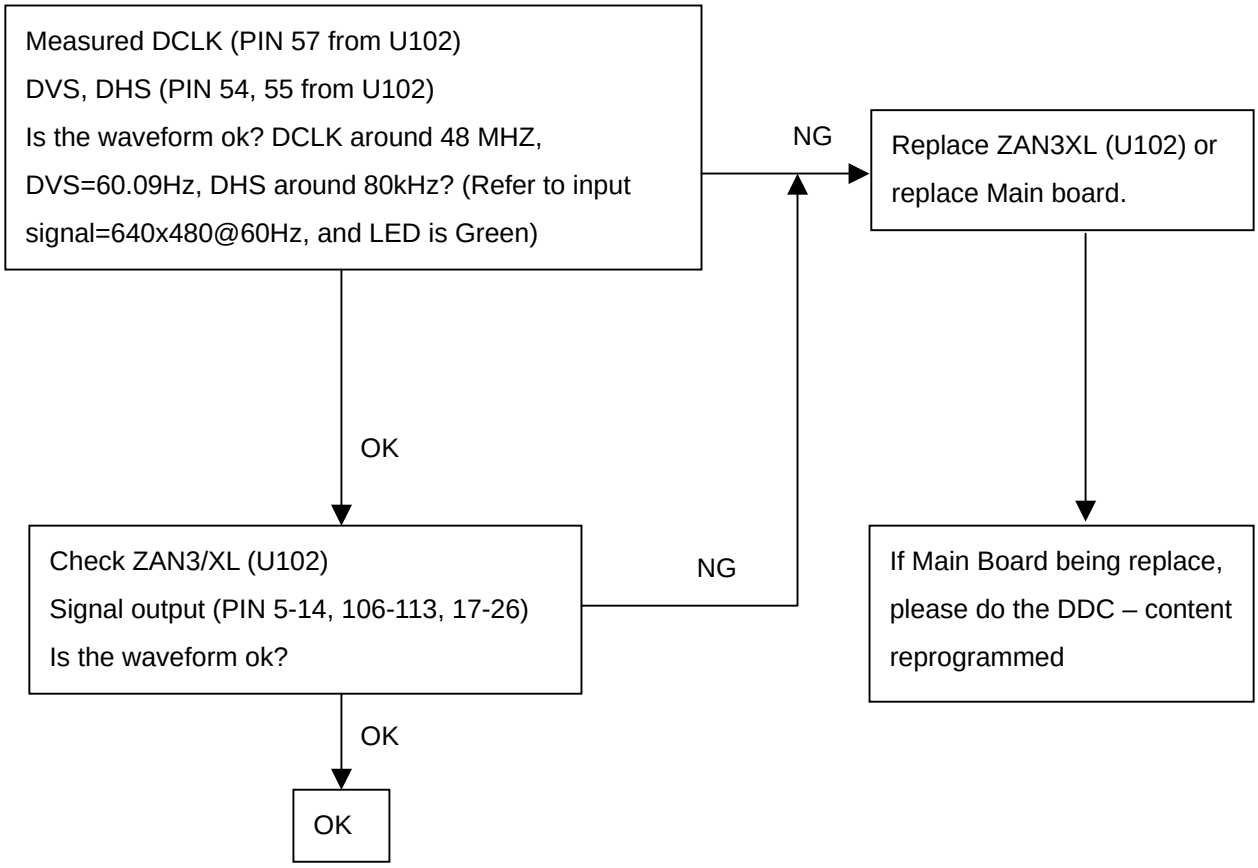
Note: 1. If replace “**Main-Board**”, Please re-do “DDC-content” programmed & “White-Balance”.

2. If replace “**Power Board**” only, Please re-do “ WHITE-Balance”

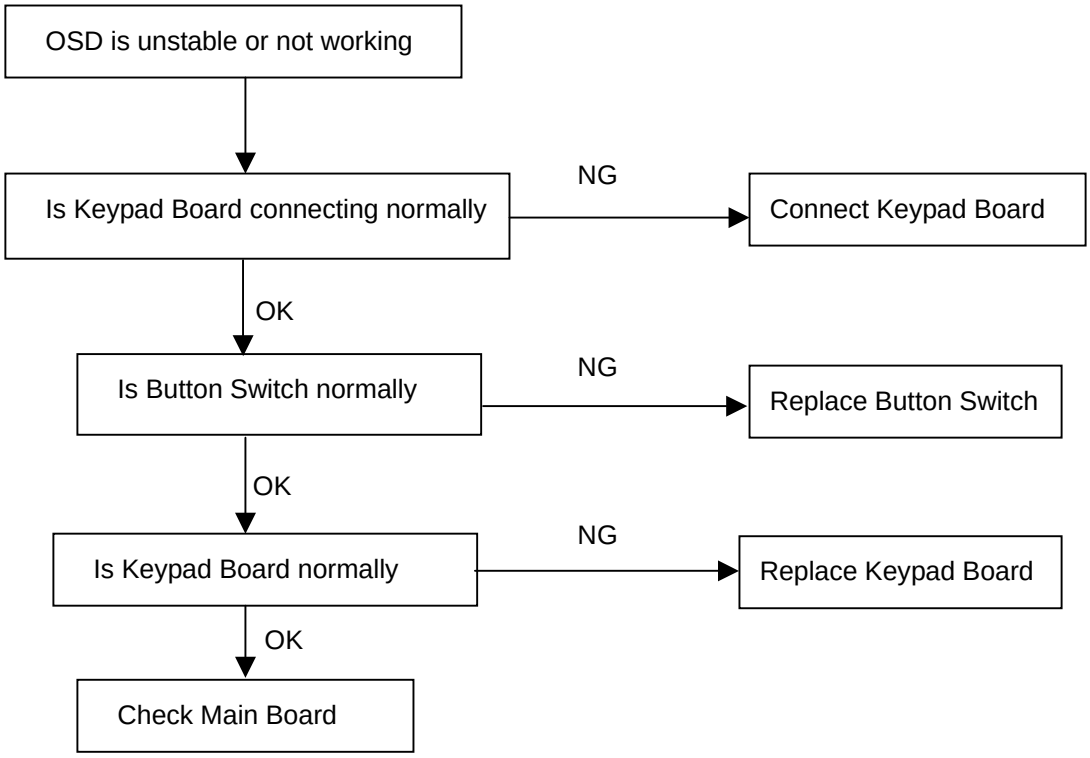
2. Panel Power Circuit



3. U102-Data Output

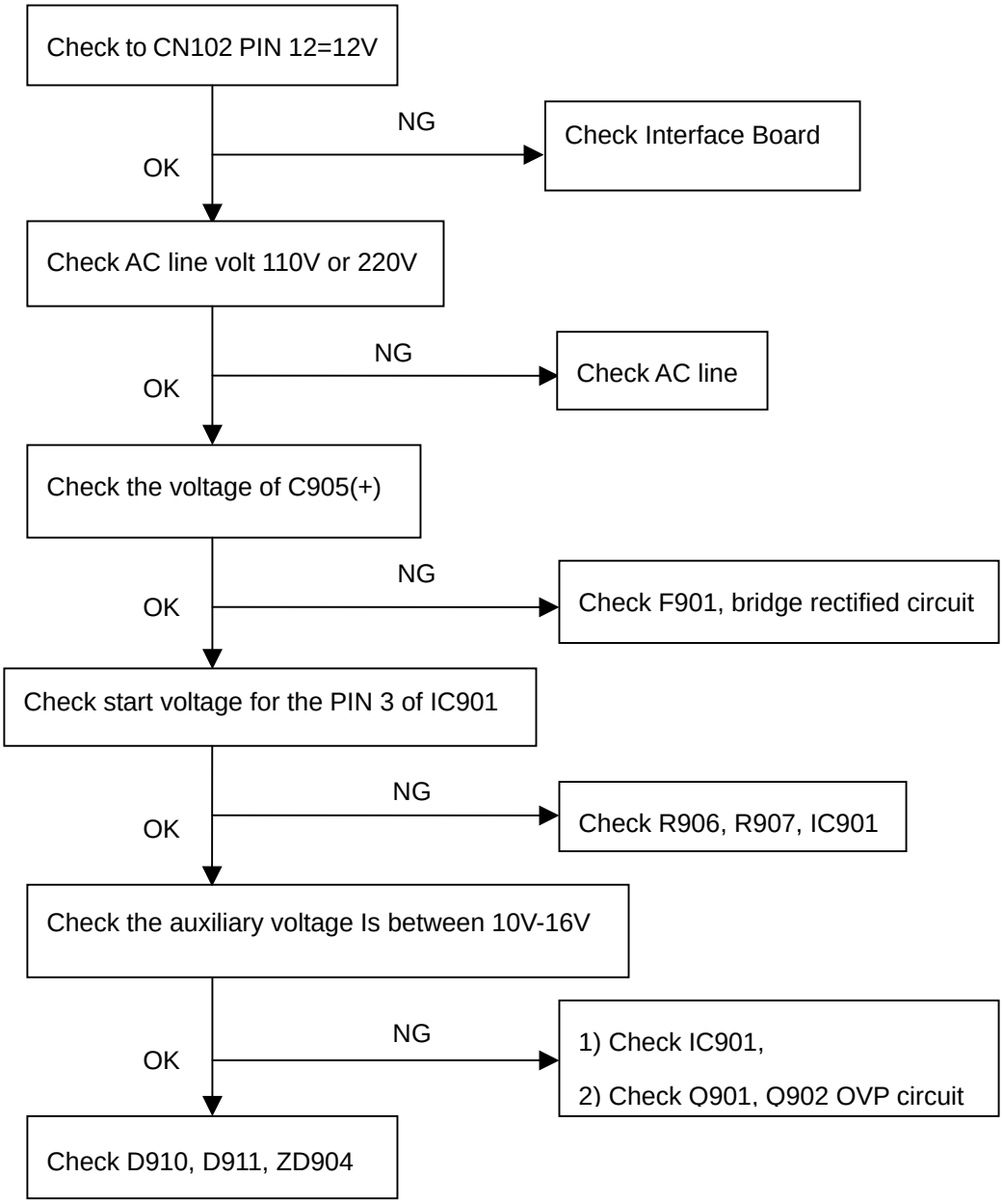


4. Keypad Board

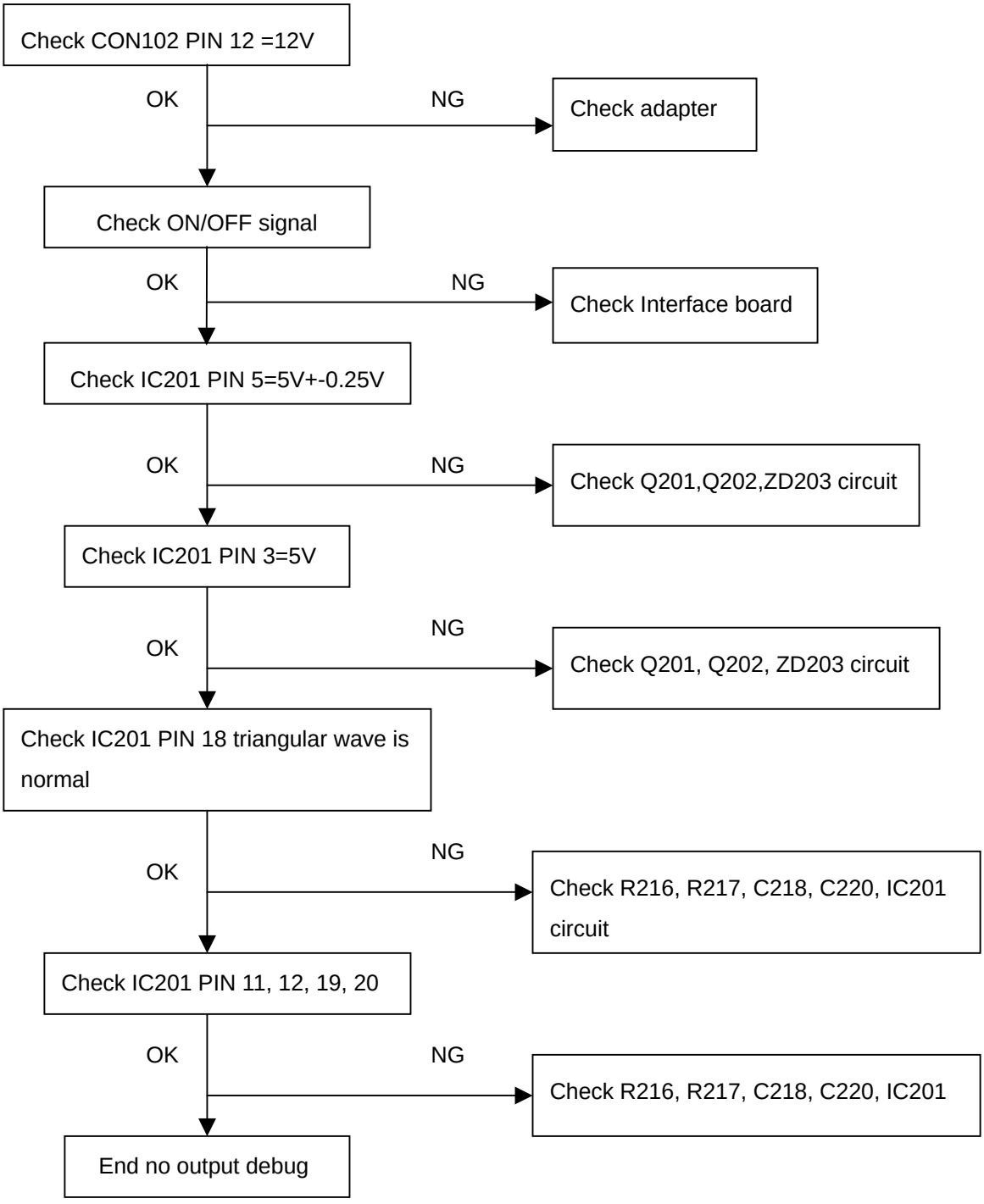


5. PWPC

5.1 No Power



5.2 No Backlight



CIRCUIT DESCRIPTION

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2.5 Panel Control Circuit 7-4

2.6 On/Off /Brightness Control Circuit 7-4

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3.2 Inverter 7-11

1. General Description

The LCD MONITOR contains a panel, a main board, an inverter/power board, audio board and keyboard.

2. Main Board

The main board contains panel control logic, brightness control logic, DDC and DC convert DC circuit etc.

2.1 Description of Main Chips

MCU: 8051 SCM, main function is power control, OSD control, frequency calculation, RS232 communication and etc.

GMZAN3XL: integrate ADC, OSD, SCALER, convert analog RGB into digital and zoom and shrink scaling output to timing control circuit of LCD panel.

AIC1084: DC power converter, used to convert 5v to 3.3v.

AIC1777A: DC power converter, used to convert 3.3v to 1.8v.

24C02: 1K EEPROM, is used to save DDC date which contains the basic parameter of production facility, supplier, product name, maximum H-frequency, support resolution and so on.

24C16: 4K EEPROM, is used to save Auto configuration data, white balance data, the state of power key and power on time counting data.

2.2 MCU

Oscillator: Provides clock frequency of 14.318MHZ for U101, C147, C148 is used for compensating frequency. Capacitance for both is 33PF/50V.

Reset: Consists of R122, R188, active low.

Communication: Contains AD0-AD3 (DATA), ALE (HCLK), AD4 (HFS), INT0 (INTERRUPT REQUEST) in the series communication between MCU and GMZAN3XL, because of some TIMING input condition, the GMZAN3XL causes interruption and then it exports INT0 to MCU.

OSD control: PIN 25-29 is keyboard OSD function control.

White-balance adjust control: PIN 11 (RXD) and PIN 13 (TXD) are used for adjusting white-balance while in the factory mode.

VGA-CON: PIN 24 is no signal test pin, it is high level at no signal, and low when connected to signal.

Power supply, Ground: PIN 44, PIN 35 are the power supply pins, PIN 22 connects ground.

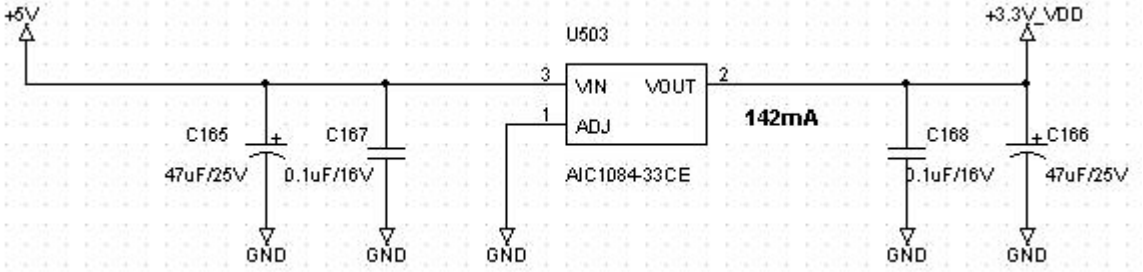
2.3 GMZAN3XL

The GMZAN3XL is a graphics display processor and provides all the key display functions required good quality image on a LCD panel. The integrated functions include a high-speed triple-ADC and PLL, a high quality zoom and shrink scaling engine, an on-screen display (OSD) controller, digital color controls and LVDS Transmitters. The GMZAN3XL provides a front-end analog interface with standard VGA compliance and an output at industry standard LVDS interface for speed up to XGA and SXGA respectively.

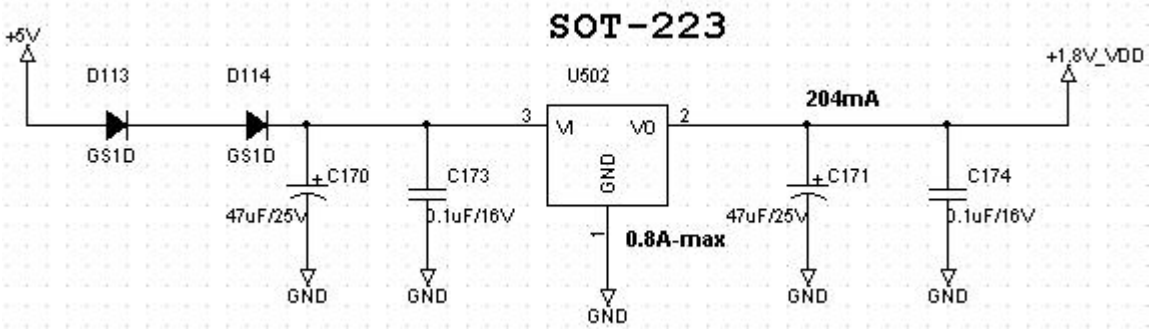
Pin name	I/O	NO	Describe
RED+	I	77	Positive analog input for RED channel
RED-	I	78	Negative analog input for RED channel
GREEN+	I	74	Positive analog input for GREEN channel
GREEN-	I	75	Negative analog input for GREEN channel
BLUE+	I	70	Positive analog input for BLUE channel
BLUE-	I	71	Negative analog input for BLUE channel
HSYNC	I	95	ADC input horizontal sync
VSYNC	I	96	ADC input vertical sync
TCLK	I	88	Reference clock from the crystal oscillator or external MCU source
XTAL	O	87	Crystal oscillator output
RESETn	I	90	Hardware Reset signal I/O is active low output (120ms) provided for other system components
PBIAS	O	29	Panel Bias Control (backlight enable)
PPWR	O	30	Panel Power Control
GPIO1/PWM1	O	53	Volume Control
GPIO1/PWM1	O	52	Panel Backlight Control
CLKP_LV_E	O	7	LVDS Clock+
CLKP_LV_E	O	8	LVDS Clock-
AVDD_RPLL_33	I	89	Analog power (3.3v) for the reference DDS PLL
VDD_RPLL_18	I	84	Digital power (1.8v) for RCLD and clock generator
VDDA_ADC_33	I	69/79	Analog power (3.3v) for the ADC
VDD_ADC_18	I	82	Digital power (1.8v) for ADC encoding logic
AVDD_LV_33	I	1	Analog 3.3v supply for LVDS PLL and Band gap
AVDD_OUT_LV_33	I	4/16/28	Digital 3.3v supply for LVDS outputs
RVDD_33	I	33/51/94	Ring VDD (3.3V)
CVDD_18	I	31/47/65/67/92/99	Core VDD (1.8V)

2.4 DC to DC

The required power supply is different for each chip, and the voltage of 12v, and 5v offered by PWPC can't reach the requirement, so we deal with this problem by means of two pieces of DC TO DC chips(AIC1084, BS1834). The circuit diagrams are as follows:



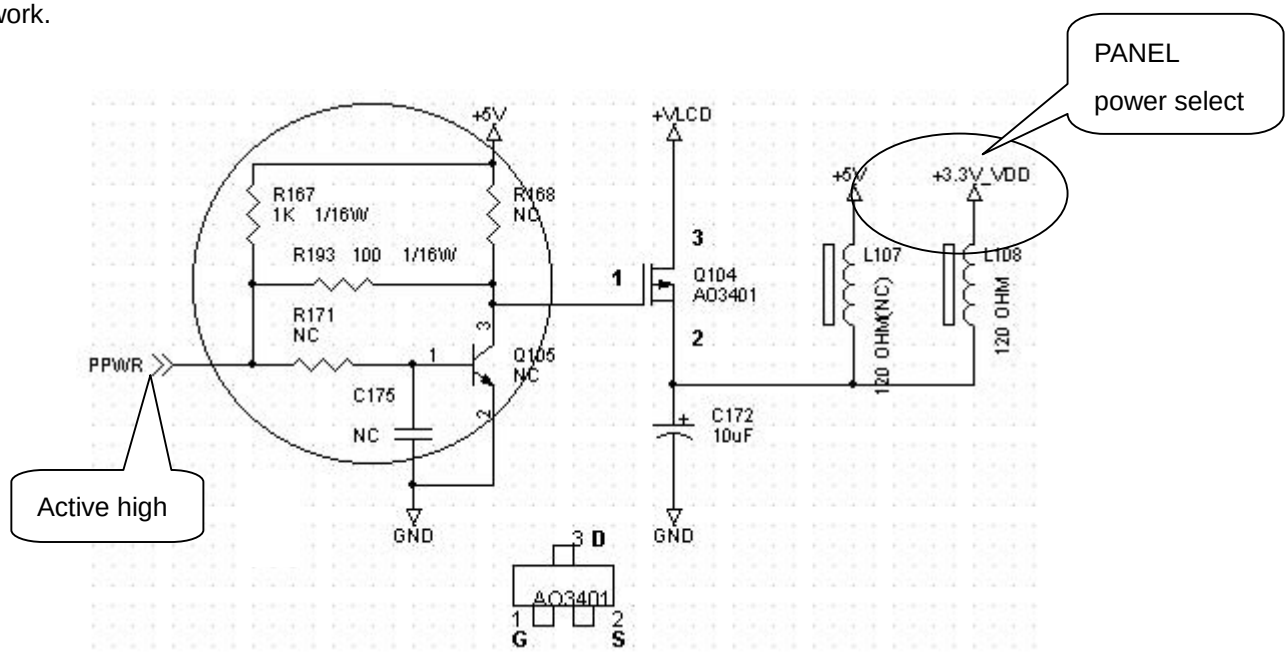
5V TO 3.3V



5V TO 1.8V

2.5 Panel Control Circuit

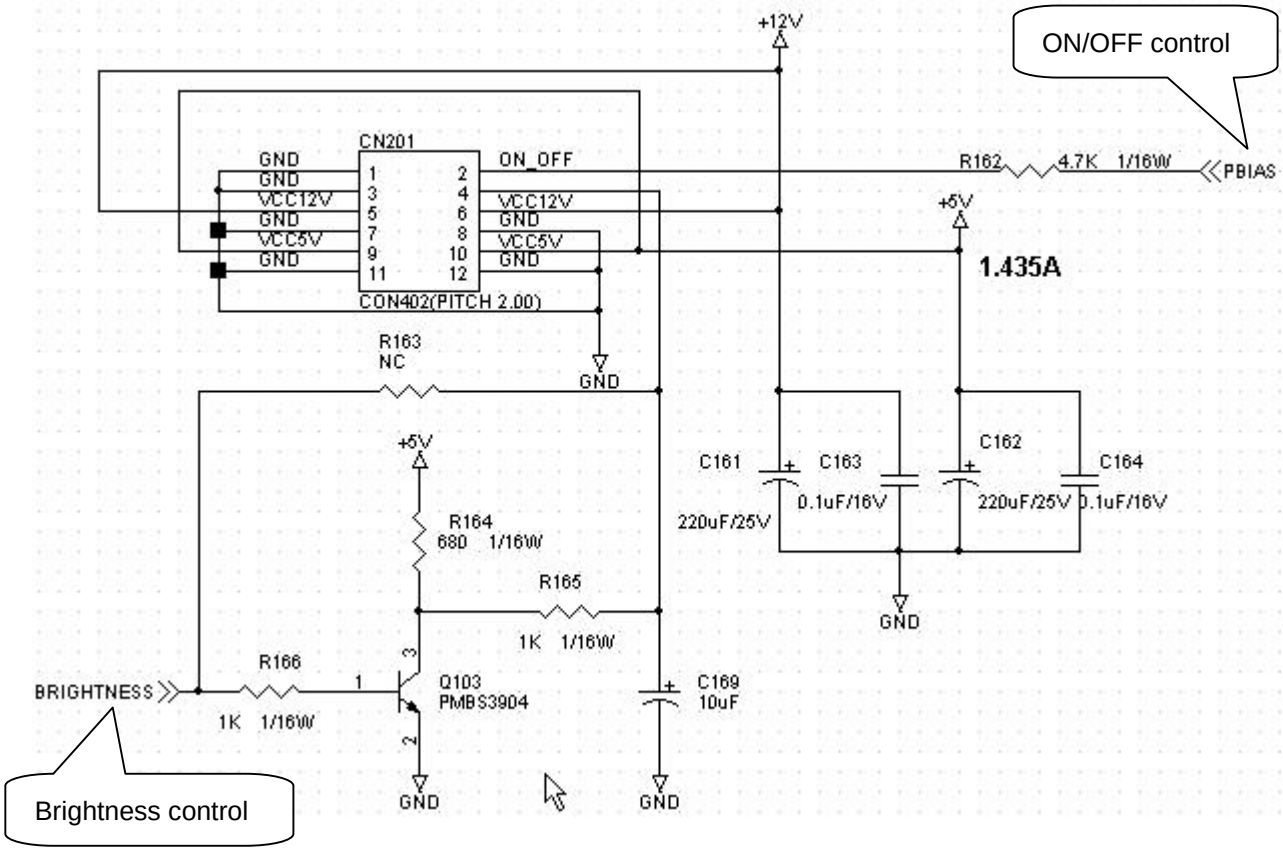
The high level output from PIN 30 of U101 makes Q105, Q104 break through, and offer 3.3V to panel when work well. The output is low level when it's saving energy state and Q105, Q104 break off, so the panel doesn't work.



2.6 On/Off /Brightness control circuit

ON/OFF control: When engaged, the outputs are high level, and low in saving energy state.

Brightness control: When engaged, the output PWM pulse from PIN 52 of U101 adjusts the brightness, the smaller the duty cycle, the higher the brightness.



3. PWPC

PWPC board combines an adapter and inverter.

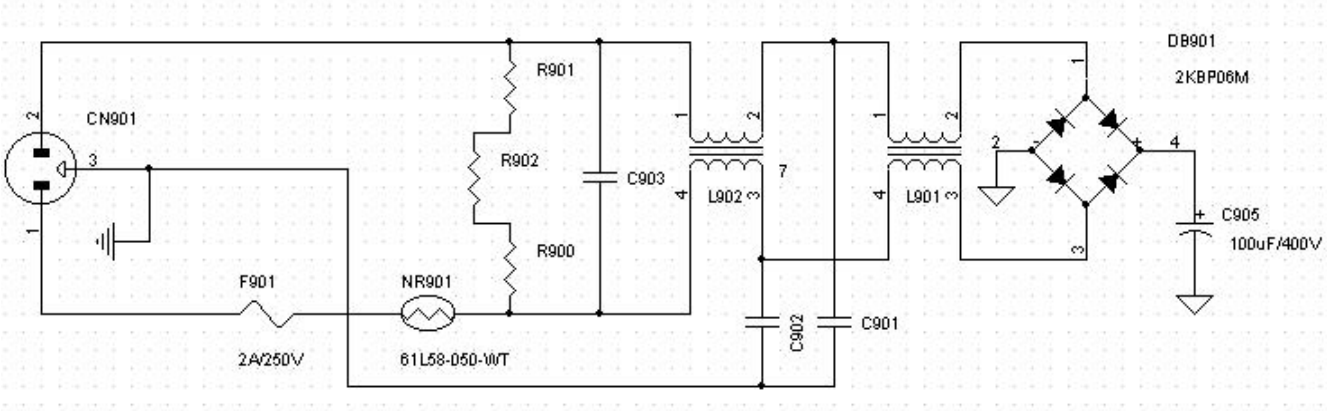
The adapter consists of bridge rectifier, filter, start circuit, PWM control circuit (SG6841D), and protection circuits. It provides 12V, and 5V DC voltage from input of 90V-240V AC voltage. It provide power supply for each chips in the main board and inverter.

The inverter is DC TO AC circuit. It changes the 12v DC of power supply to about 600-800v AC which drives the backlight. It consists of starting circuit, PWM controller, DC changing circuit, LC surging circuit, output circuit and protection circuit.

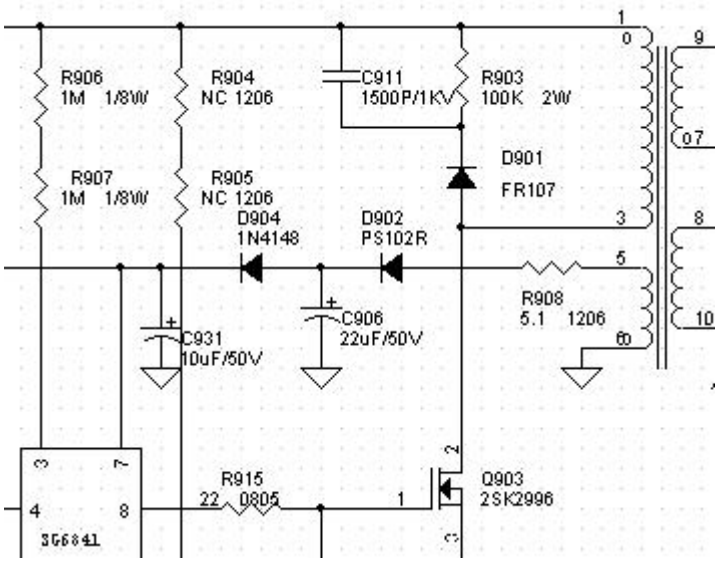
3.1 Adapter

EMI filter circuit: It is used to get rid of the disturbance existing in the electric network or spuriously coming from outside. L902 is used to reduce the symmetry disturbance and filter high frequency noise. C901, and C902 can control the symmetry, and filter the low frequency noise. R901, and R902 is used for discharging the capacitance when the power is off. NR901 is used to prevent the pulse of surge current at start-up.

Rectifier and filter circuit: The AC input is changed to a high DC voltage. The magnitude is a product of 1.414 to AC after it is converted by a bridge rectifier (BD901) and filtered by the capacitor (C905).

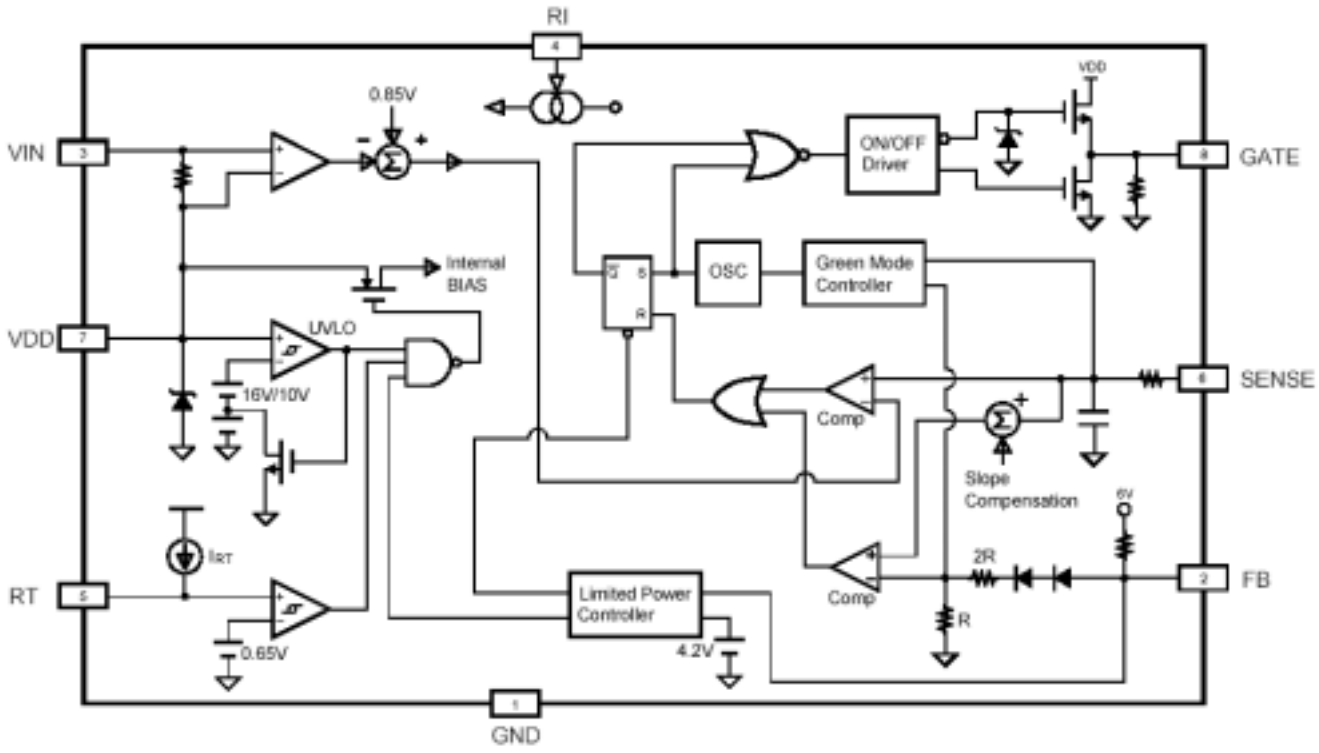


Start-up circuit: After being converted and filtered, the high DC voltage travels through R906, R907 as they dissipate a portion of the voltage. Start-up begins when the lowered voltage is supplied at a current of 30uA to IC901 (SG6841D). The output pulse makes the switch-power circuit work. The voltage produced at the two terminals of T901 is sent to PIN 7 of IC901 after being commuted by D902 and filtered by C907. The start-up process is ended.



SG6841: PWM. It requires low start-up current (30uA) and low working current (3mA). It contains functions such as low-voltage protection, over-current protection, over-voltage protection, Temperature protection, etc. The function of each pin and the inside circuit diagram are as follows:

Pin	NAME	FUNCTION	Pin	NAME	FUNCTION
1	GND	Ground	5	RT	Temperature protection
2	FB	Feedback voltage input	6	SENSE	Current test pin
3	VIN	Start-up current input	7	VDD	Power supply
4	RI	Reference setting	8	GATE	PWM drive output


RI
4
0.85V
VIN
3
VDD
7
RT
5
GND
1
Internal
BIAS
UVLO
16V/10V
IRT
0.65V
ON/OFF
Driver
VDD
GATE
8
OSC
Green Mode
Controller
S
R
Comp
SENSE
6
Slope
Compensation
6V
2R
R
Comp
FB
2
Limited Power
Controller
4.2V

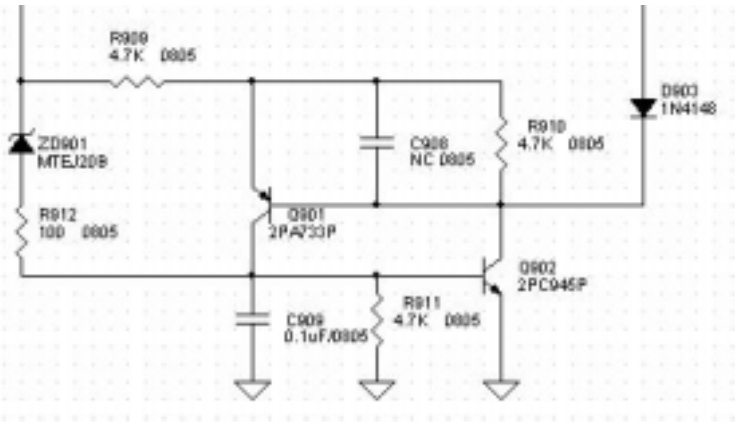
Protection circuit: over-voltage protection:

1. The voltage output across terminals 5-6 of T901 increases when the voltage of electric net exceeds its maximum. When the output exceeds 20V, ZD901 will conduct , and voltage will be applied across R912. Q902 will turn on when the voltage across R911 reaches 0.6V, and the voltage of the Base of Q901 will be pulled down, Q901 gets through. 15V benchmark voltage of PIN7 connects to grounding through R909, R910, Q902. So it cuts off the supply to IC and acts as over-voltage protection.

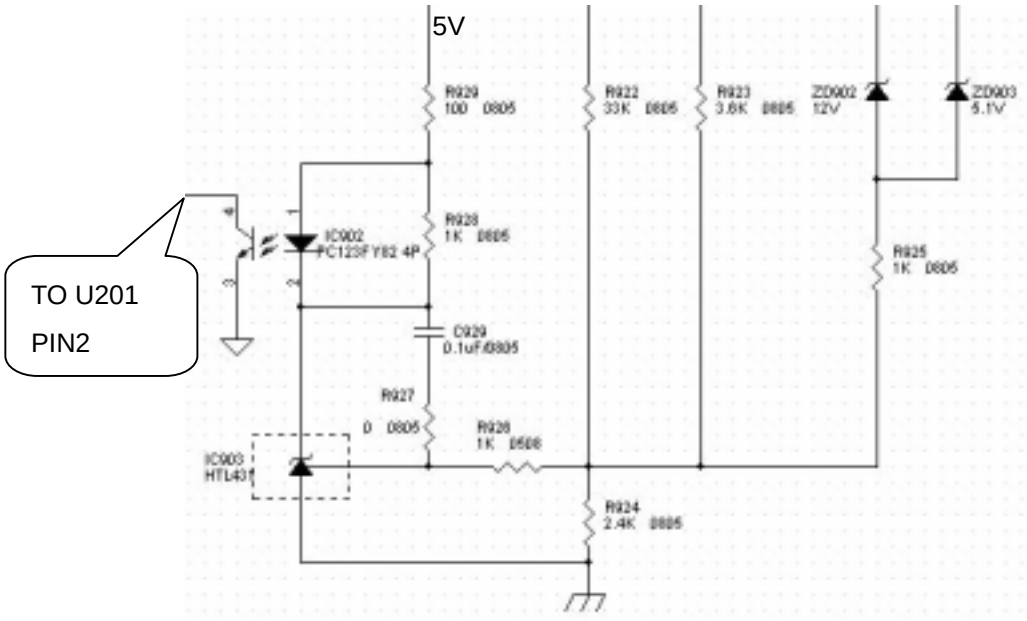
2. ZD902 or ZD903 will break down when 12V or 5V DC voltage increases, which leads to the light inside the photo electricity coupling component gets brighter abnormally, PIN 2 connects to grounding through photosensitive transistor, then it cuts off the pulse output. That is also effective way for over-voltage protection.

Temperature protection: When the working temperatures of components in the circuit exceeds a particular temperature, the temperature-protection component inside the IC connects a resistor from PIN 5 to ground to test the temperature. The pulse output is cut off instantly when the voltage of PIN 5 is lower than 0.65V. Completing over-temperature protection.

Over-current protection: The voltage across R917 which is a current test resistor will be applied to the in-phase output port of over-current test comparison unit in SG6841D. As long as the voltage exceeds 1V, the current protection circuit inside SG6841D will start up; Then PIN 8 is closed, completing over-current protection.



Over-voltage protection circuit 1

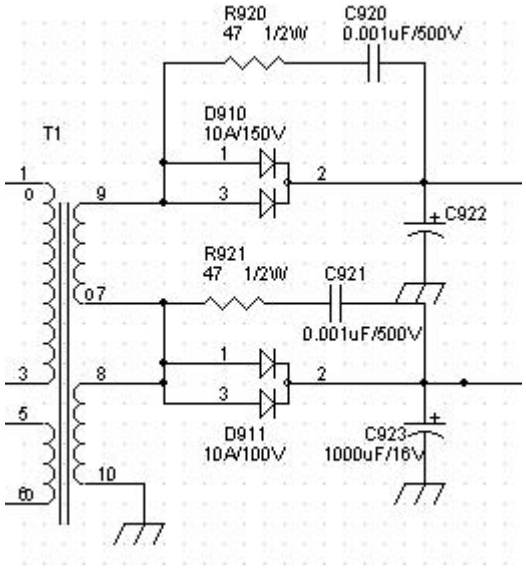


Over-voltage protection circuit 2

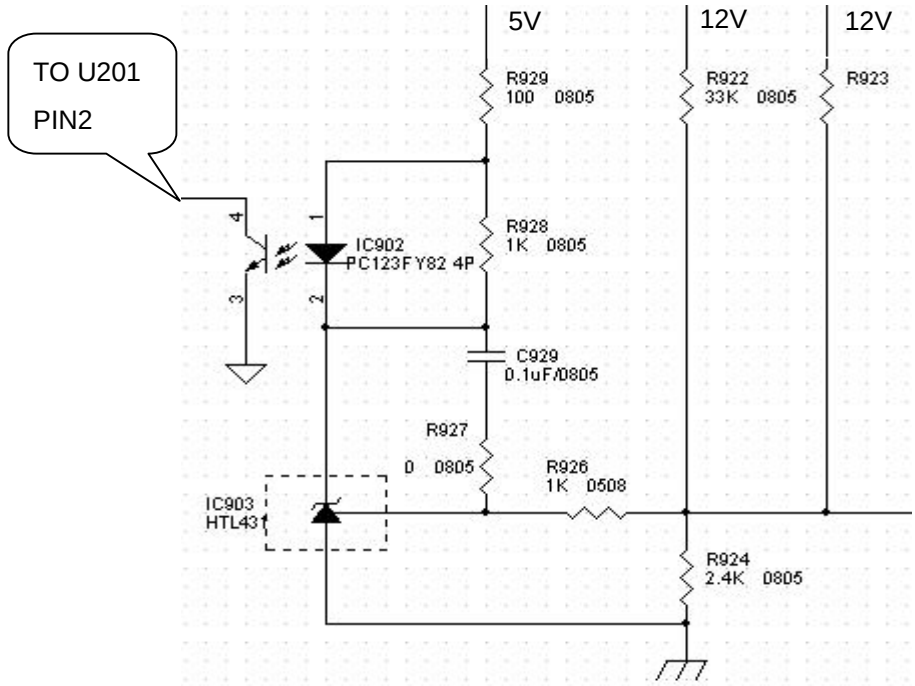
Commute and filter output circuit:

When PIN 8 of IC901 sends a high pulse, current passes through Q903 and produces a current in the primary coil of T901 (pin 1 +, pin 3 -). This produces a reverse electromotive force (EMF) in the secondary coil. Energy is stored in the secondary coil because D910, and D912 are closed. When PIN 8 of IC901 sends a low pulse, Q903 is closed.

When the primary coil produces a reverse current EMF, the secondary coil will produce a reverse EMF. At that time D910, D911 conducts with a voltage output of 12V is filtered through C922, C923. The RC circuit R920, C920 will absorb the surge voltage produced by D910, and R921 and C921 will absorb the surge voltage produced by D911.



Circuit for steadying voltage: The rising of electric supply voltage can result in the increase of output voltage. This leads to the increase of the current that flows through photoelectric coupling unit. The brighter the light produced inside the photoelectric coupling unit, the more easily the current can get through the photosensitive side, due to it lower resistance. That's the reason for the decrease of voltage at PIN 2. When the voltage is applied to the reverse-phase terminal of error amplifier inside SG6841D, It controls the duty of pulse output and reduces the voltage output. This process stabilizes the output. As the voltage decreases, the same principle is applied to steady the output.



3.2 Inverter

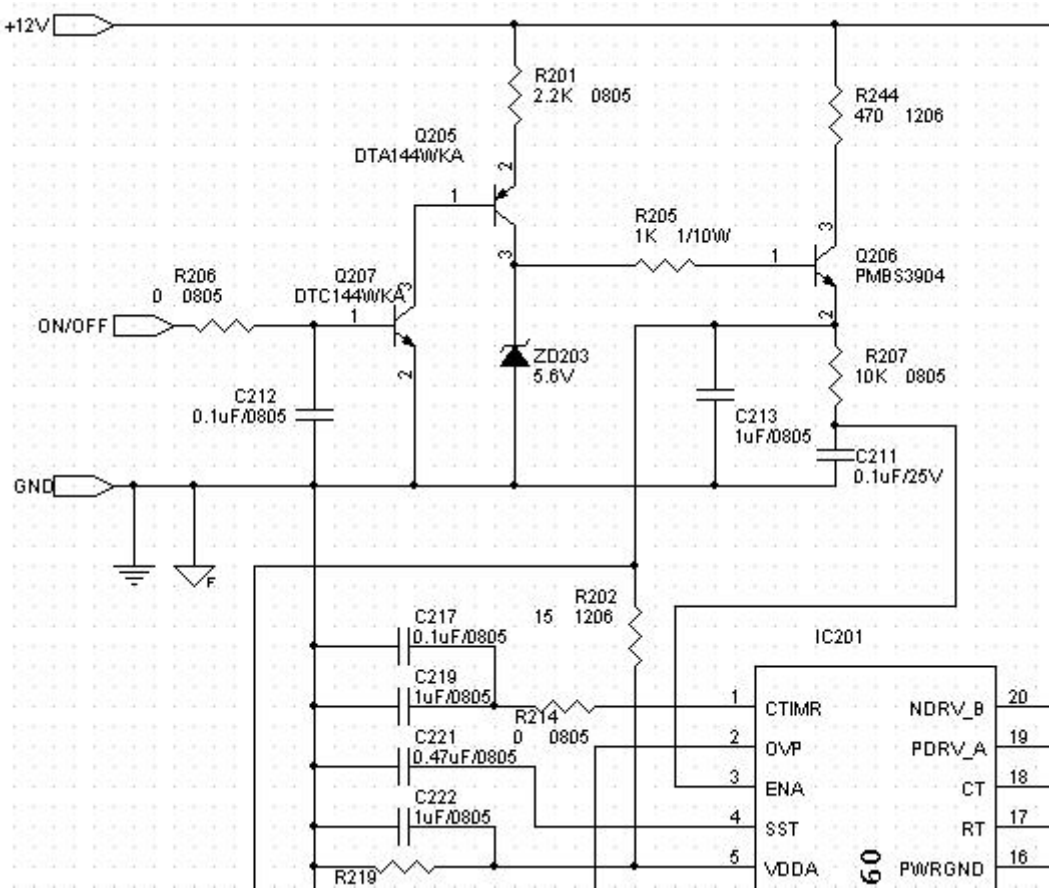
Input interface section:

1. 12V DC input, , provided by power section;

2. ON/OFF enable signal, , provided by GMZAN3SL from the main board with value of 0Vor 3V. When OFF=0V, the inverter doesn't work, while OFF=3V, it works under normal situation.

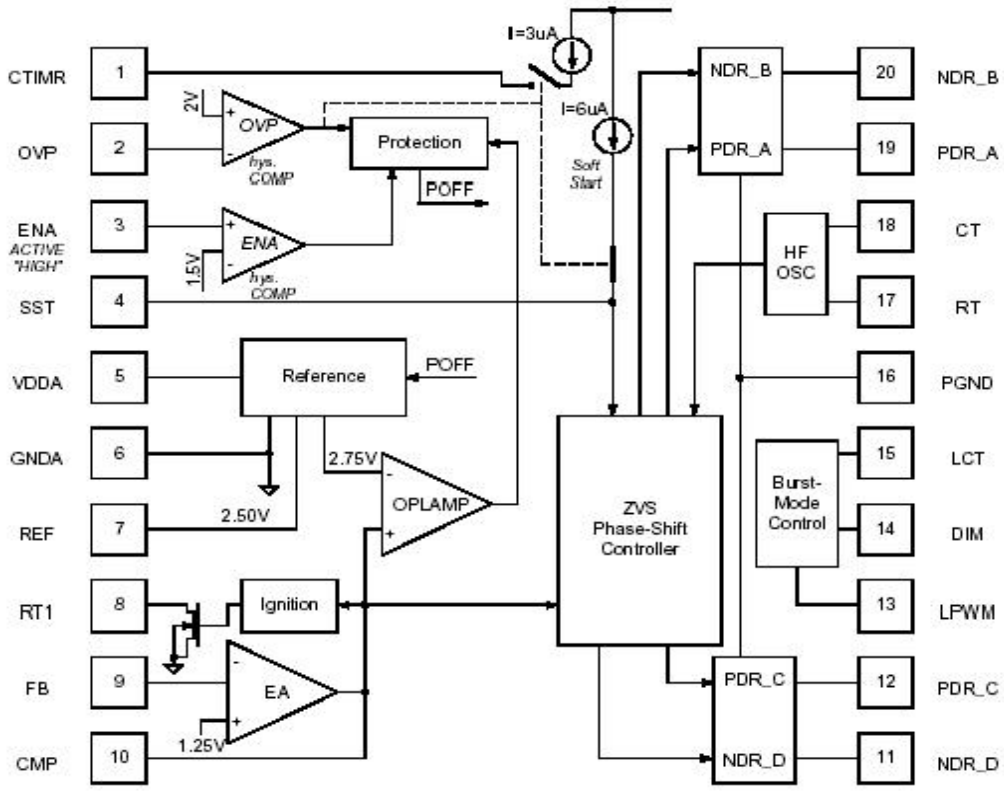
3. DIM signal for luminance modulation, offered by GMZAN3SL in the main board with its range of 0~5V. The Inverter offers different currents to the loads because of the different feedback of voltage to the feedback-terminal of PWM. The smaller the value of DIM, the smaller the current output of Inverter, the darker the brightness.

Voltage start-up circuit: It consists of a PNP, and two NPN transistors with two working stages. The first stage: When the ON/OFF enable voltage is 0V, Q207, Q205 and Q206 are closed. So the DC voltage at the emitter of Q206 can't be applied to PIN 3 and PIN 5 of IC201. The inverter will not work because there are no pulse output at PIN 11, PIN 12, PIN 19 and PIN 20. . The second stage: When the ON/OFF enable voltage is high, Q207, Q205 and Q206 get through. Then 12V voltage is applied to PIN 3 and PIN 5 of IC201 resulting in the operation of the IC. IC201 produces a pulse output to the control switch transistor, and the Inverter work applying high voltage to the backlight.

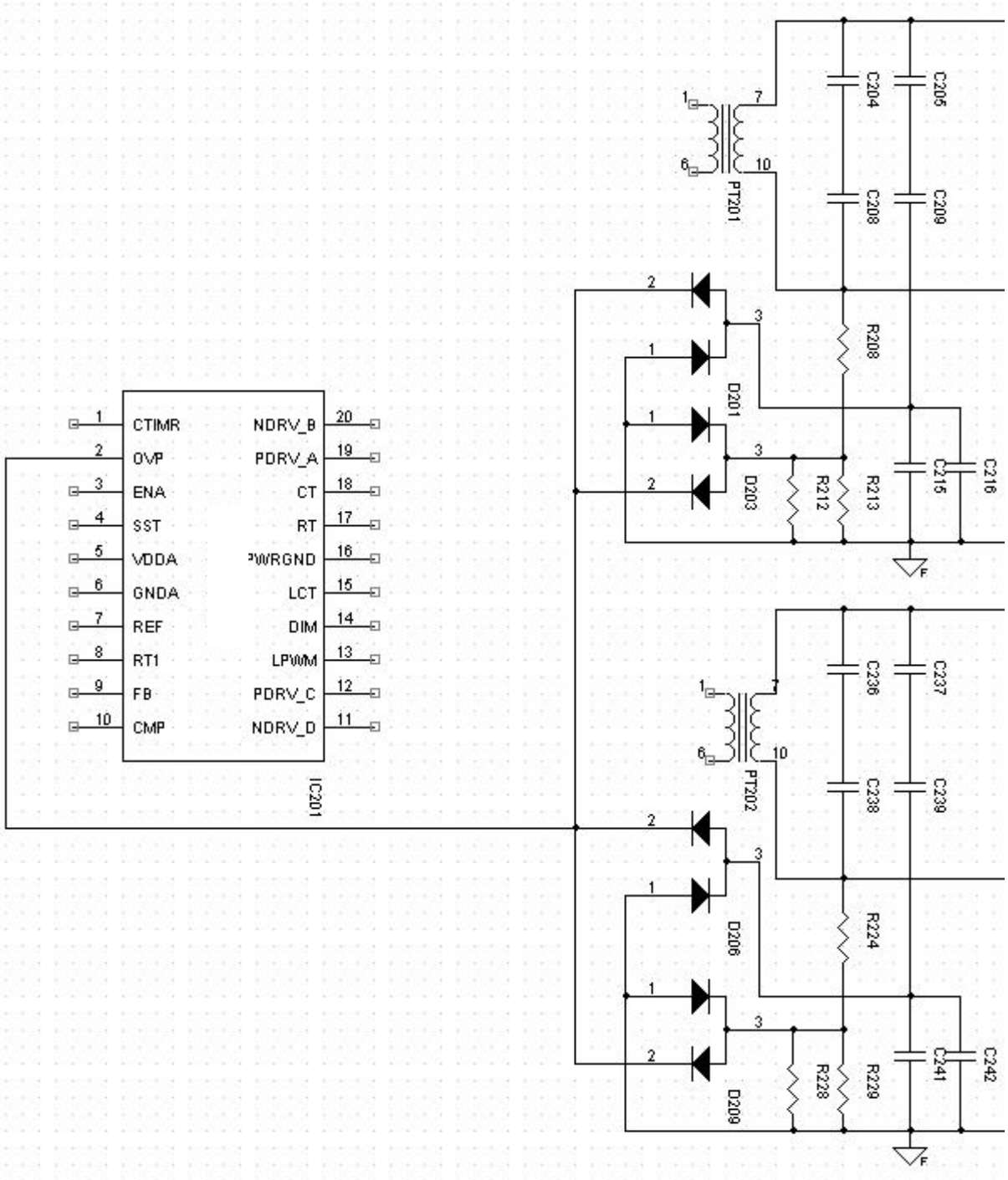


OZT1060: It is a unique, high-efficiency, Cold Cathode Fluorescent Lamp (CCFL) backlight inverter controller that is designed for wide input voltage inverter applications. Additionally, the 0Z1060 performs the lamp dimming function with an analog voltage or low frequency Pulse Width Modulation (PWM) control. The OZ1060 operates at a single, constant frequency in a phase-shift PWM mode. Intelligent open-lamp and over-voltage protections provide design flexibility so various transformer models/manufactures may be used. The built-in burst mode control provides a wide dimming range and simplifies the application circuit designs. Both operating and burst-mode frequencies are user-programmable parameters. The function of each pin and the circuit diagram inside are as follows:

Names	Pin No.	I/O	Description
CTIMR	1	I	Capacitor for CCFL ignition duration
OVP	2	I	Over Voltage Protection Input Vth=2.0V
ENA	3	I	Enable input, TTL signal is applicable
SST	4	I	Soft-start capacitor
VDDA	5	I	Voltage source for the IC
GNDA	6	I	Analog signal ground reference
REF	7	O	Reference voltage output
RT1	8	I	Resistor for programming ignition frequency
FB	9	I	CCFL current feedback signal
CMP	10	O	Compensation output of the current error amplifier
NDRV_D	11	O	NMOSFET drive output
PDRV_C	12	O	PMOSFET drive output
LPWM	13	O	Low-frequency PWM signal for burst-mode dimming control
DIM	14	I	Input analog signal for burst-mode dimming control
LCT	15	I	Triangular wave for burst-mode dimming frequency
PGND	16	I	Power ground reference
RT	17	I	Timing resistor set operating frequency
CT	18	I	Timing capacitor set operating frequency
PDRV_A	19	O	PMOSFET drive output
NDRV_B	20	O	NMOSFET drive output


CTIMR
1
OVP
2
ENA
ACTIVE
"HIGH"
3
SST
4
VDDA
5
GNDA
6
REF
7
RT1
8
FB
9
CMP
10
2V
OVP
hys.
COMP
Protection
POFF
ENA
1.5V
hys.
COMP
Reference
POFF
2.50V
2.75V
OPLAMP
Ignition
EA
1.25V
I=3uA
I=6uA
Soft
Start
ZVS
Phase-Shift
Controller
NDR_B
PDR_A
HF
OSC
Burst-
Mode
Control
PDR_C
NDR_D
20
NDR_B
19
PDR_A
18
CT
17
RT
16
PGND
15
LCT
14
DIM
13
LPWM
12
PDR_C
11
NDR_D

Protection circuit: Over-voltage protection: The rising of output voltage can result in the increase of D201, D203, D206 and D209 commute output voltage, and When OVP (PIN 2 of IC201) reaches the 2.0V threshold, PIN 1 (CTIMR) of IC201 charges the capacitor with a 3.0uA current. When CTIMR voltage reaches 3.0V, the IC201 shuts down (latch). Open-lamp protection: when the CCFL is suddenly removed or gets damaged/open during operation, the lamp current is lost and thus FB (PIN 9 of IC201) drops. This causes CMP (PIN 10 of IC201) to rise and when it reaches the 2.75V threshold, the IC201 shuts down (latch); additionally when SST (PIN 4 of IC201) reaches a threshold about 1V below the VDDA (PIN 5 of IC201) voltage. For a nominal VDDA of 5.0V, the threshold is 4.0V. then IC201 shuts down (latch) as well.



Replacement Parts List
(For U.S./Europe)

Parts List for Models LCD72VM-BK (A) / LCD72VM-BK (B)

For U.S/Europe (TPV Part Number)	Description	Version	Cabinet Color
AUPC780KB5	AUDIO BOARD		
CBPC780KQLNV	CONVERSION BOARD		
KEPC780KDM	KEY BOARD	A/B	Black
PWPC1742QDN1	POWER BOARD		
11L6061 1	SPACER SUPPORT		
12L6039500	RUBBER PAD		
12L6039501	RUBBER PAD		
15L5908 1	BRACKET		
15L8096 1	BRACKET VESA		
15L8097 1	MAIN FRAME		
40L 190842 4A	ID LABEL	A/B	Black
40L 457842 1A	CARTON LABEL	A/B	Black
40L 58162435A	LABEL		
41L7800842 8A	CAUTION SHEET	B	
41L780084218A	SALES OFFICES LIST	B	
41L780084225A	FLYER NAVISET	A/B	
41L780084221B	MANUAL	A	
41L780084222A	PROTETION BROUCHER FOR	A	
41L780084234A	MANUAL	B	
41L780084232A	SETUP SHEET	A	
41L780084248A	SETUP SHEET	B	
44L3743 1	EPS(L)	A/B	
44L3743 2	EPS(R)	A/B	
44L3743842 7A	CARTON	B	Black
44L3743842 3B	CARTON	A	Black
44LH600 1	handke2		
45L 76 28 V6	PE BAG FOR CLAMP		
45L 76 28 V9	PE BAG FOR MAUUAL		
45L 76 28DE2	PE BAG FOR BASE		
45L 77500	BARCODE RIBBON		
45L 88607DE2	PE PAG		
45L 88609 B	EPE COVER	B	
50L 600 4	HANDLE 1		

For U.S/Europe (TPV Part Number)	Description	Version	Cabinet Color
52L 1185	MIDDLE TAPE FOR CARTON		
52L 1186	SMALL TAPE		
52L 1207 A	ALUMINIUM TAPE		
52L 1211519	ALUMINIUM TAPE		
52L6025 11704	MYLAR		
52L6025 11753	MYLAR		
70G2000508NMV	CD-ROM	B	
85L 682 1	SHIELDING COVER		
89L 173 56 27	AUDIO HARM:GOLD FULL	A/B	Black
89L1738GAA16N	SIGNAL CABLE	A/B	Black
89L404A18NISN	POWER CORD	B	Black
89L402A18NISN	POWER CORD	A	Black
95G8014 16533	WIRE HARNESS		
95G8018 30 51	HARNESS		
M1L 330 4128	SCREW M3X4		
M1L 330 6 47	3MMX6 STEEL	A/B	Black
M1L1140 6128	SCREW 4X6		
M1L1730 6128	SCREW M3x6		
Q1L 330 10120	SCREW FOR FP/RC		
Q1L 330 12 47	SCREW	A/B	Black
3A684063 (NMV Part Number)	LCD QD17EL0703 QDI		
AM1L1740 10 47	SCREW	A/B	Black
33L4695 1 C	CLAMP		
12L 394 3	FOOT-PORON 20*1.7MM		
33L4776 1 C	LENS		
33L4777 GN T	BUTTON FUNCTION	B	Black
33L4777 NA T	BUTTON FUNCTION	A	Black
33L4778 PL T	INJECT COVER	B	Black
33L4778 NA T	INJECT COVER	A	Black
34L1435 PL T	STAND	B	Black
34L1435 NA T	STAND	A	Black
34L1437AGN 1T	BEZEL	B	Black
34L1437ANA 1T	BEZEL	A	Black
34L1438 PL 1T	REAR COVER	B	Black
34L1438 NA 1T	REAR COVER	A	Black
34L1439 PL T	BASE	B	Black
34L1439 NA T	BASE	A	Black
37L 509 1	HINGE		

For U.S/Europe (TPV Part Number)	Description	Version	Cabinet Color
78L 322501 L	SPEAKER		
78L 322501 R	SPEAKER		
Q1L1030 10128	SCREW		
Q1L1040 10128	TAP 4X8 FOR SP		

Replacement Parts List of Main Board

CBPC780KQLNV (MAIN BOARD)		
Symbol	**For U.S./Europe (TPV Part Number)**	**Description**
C122	67L215Y2207NV	105°C 22UF +-20% 50V
C129	67L215Y2207NV	105°C 22UF +-20% 50V
C136	67L215Y2207NV	105°C 22UF +-20% 50V
C140	67L215Y2207NV	105°C 22UF +-20% 50V
C143	67L215Y100 7N	LOW ESREC 10UF 50V NCC
C158	67L215Y100 7N	LOW ESREC 10UF 50V NCC
C161	67L215V221 4N	LOW ESR EC 220UF 25V NC
C162	67L215V221 4N	LOW ESR EC 220UF 25V NC
C165	67L215V470 4N	LOW ESR EC 47UF 25V NCC
C166	67L215V470 4N	LOW ESR EC 47UF 25V NCC
C169	67L215Y100 7N	LOW ESREC 10UF 50V NCC
C170	67L215V470 4N	LOW ESR EC 47UF 25V NCC
C171	67L215V470 4N	LOW ESR EC 47UF 25V NCC
C172	67L215Y100 7N	LOW ESREC 10UF 50V NCC
C182	67L215V470 4N	LOW ESR EC 47UF 25V NCC
CN201	33L8027 12	WAFER 2*6P 2.0MM R/A
CN301	88L 35315F H	D-SUB 15PIN
CN501	33L3802 2	WAFER EH-2
CN503	33L802724B H	PIN HEADER 24P 2.0mm
CN601	33L801714A H	PIN HEADER 2*7 R/A
CN602	33L8027 16	WAFER 16PIN 2.0mm DIP
U101	56L1125522QM3	SM 5964C40J
X101	93L 22 53	CRYSTAL 14.318MHzHC-49U
X102	93L 22 53	CRYSTAL 14.318MHzHC-49U
C102	65L0603560 31	CHIP 56PF 50V NPO
C103	65L0603560 31	CHIP 56PF 50V NPO
C104	65L0603473 32	CHIP 0.047UF 50V X7R
C106	65L0603473 32	CHIP 0.047UF 50V X7R
C108	65L0603473 32	CHIP 0.047UF 50V X7R
C112	65L0603473 32	CHIP 0.047UF 50V X7R
C113	65L0603473 32	CHIP 0.047UF 50V X7R
C114	65L0603473 32	CHIP 0.047UF 50V X7R
C115	65L0603104 12	0.1UF +-10% 16V X7R
C116	65L0603104 12	0.1UF +-10% 16V X7R
C117	65L0603330 31	33PF+-5% 50V NPO
C118	65L0603221 31	CAP:CER 220PF 5% 50V SM

Symbol	For U.S./Europe (TPV Part Number)	Description
C119	65L0603104 12	0.1UF +-10% 16V X7R
C120	65L0603221 31	CAP:CER 220PF 5% 50V SM
C121	65L0603221 31	CAP:CER 220PF 5% 50V SM
C123	65L0603104 12	0.1UF +-10% 16V X7R
C124	65L0603104 12	0.1UF +-10% 16V X7R
C125	65L0603104 12	0.1UF +-10% 16V X7R
C126	65L0603104 12	0.1UF +-10% 16V X7R
C127	65L0603104 12	0.1UF +-10% 16V X7R
C128	65L0603104 12	0.1UF +-10% 16V X7R
C130	65L0603104 12	0.1UF +-10% 16V X7R
C131	65L0603104 12	0.1UF +-10% 16V X7R
C132	65L0603104 12	0.1UF +-10% 16V X7R
C133	65L0603104 12	0.1UF +-10% 16V X7R
C134	65L0603104 12	0.1UF +-10% 16V X7R
C135	65L0603104 12	0.1UF +-10% 16V X7R
C137	65L0603104 12	0.1UF +-10% 16V X7R
C138	65L0603104 12	0.1UF +-10% 16V X7R
C139	65L0603104 12	0.1UF +-10% 16V X7R
C141	65L0603104 12	0.1UF +-10% 16V X7R
C142	65L0603104 12	0.1UF +-10% 16V X7R
C144	65L0603104 12	0.1UF +-10% 16V X7R
C145	65L0603104 12	0.1UF +-10% 16V X7R
C146	65L0603104 12	0.1UF +-10% 16V X7R
C147	65L0603330 31	33PF+-5% 50V NPO
C148	65L0603330 31	33PF+-5% 50V NPO
C149	65L0603104 12	0.1UF +-10% 16V X7R
C150	65L0603104 12	0.1UF +-10% 16V X7R
C154	65L0603102 32	1000PF +-10% 50V X7R
C155	65L0603102 32	1000PF +-10% 50V X7R
C156	65L0603102 32	1000PF +-10% 50V X7R
C157	65L0603102 32	1000PF +-10% 50V X7R
C159	65L0603104 12	0.1UF +-10% 16V X7R
C163	65L0603104 12	0.1UF +-10% 16V X7R
C164	65L0603104 12	0.1UF +-10% 16V X7R
C167	65L0603104 12	0.1UF +-10% 16V X7R
C168	65L0603104 12	0.1UF +-10% 16V X7R
C173	65L0603104 12	0.1UF +-10% 16V X7R
C174	65L0603104 12	0.1UF +-10% 16V X7R
C176	65L0603330 31	33PF+-5% 50V NPO

Symbol	For U.S./Europe (TPV Part Number)	Description
C177	65L0603470 31	CHIP 47PF 50V NPO
C180	65L0805105 22	CHIP 1UF 25V X7R 0805
C181	65L0603101 32	100PF +-10% 50V X7R
C183	65L0603104 12	0.1UF +-10% 16V X7R
C184	65L0603104 12	0.1UF +-10% 16V X7R
D101	93L 6433P	BAV99
D102	93L 39147	TZMC5V6-GS08
D103	93L 39147	TZMC5V6-GS08
D104	93L 39S 39 T	MLL5232B 6.2V
D105	93L 6433P	BAV99
D106	93L 6433P	BAV99
D107	93L 39147	TZMC5V6-GS08
D108	93L 39147	TZMC5V6-GS08
D109	93L 39147	TZMC5V6-GS08
D110	93L 64 42 P	BAV70 SOT-23
D111	93L 39147	TZMC5V6-GS08
D112	93L 39147	TZMC5V6-GS08
D113	93L1020 1 S	GS1D
D114	93L1020 1 S	GS1D
FB101	61L0603000	CHIPR 0OHM +-5% 1/10W
FB102	61L0603000	CHIPR 0OHM +-5% 1/10W
FB103	61L0603000	CHIPR 0OHM +-5% 1/10W
FB104	71G 59B431	BK1608 HW 431
FB105	71L 56Z601	CHIP BEAD 600 OHM 0805
IC103	56L1133 34	M24C02-WMN6T SMT
IC104	56L1133 56	M24C16-WMN6T/W SO-8
L101	71L 56K121	CHIP BEAD 120OHM 6A
L102	71L 56K121	CHIP BEAD 120OHM 6A
L103	71L 56K121	CHIP BEAD 120OHM 6A
L104	71L 56K121	CHIP BEAD 120OHM 6A
L105	71L 56K121	CHIP BEAD 120OHM 6A
L106	71L 56K121	CHIP BEAD 120OHM 6A
L107	71L 56K121	CHIP BEAD 120OHM 6A
Q101	57L 417 6	PMBS3906/PHILIPS-SMT(06
Q102	57L 417 6	PMBS3906/PHILIPS-SMT(06
Q103	57L 417 4	PMBS3904/PHILIPS-SMT(04
Q104	57L 763 1	A03401 SOT23 BY AOS(A1)
Q106	57L 417 4	PMBS3904/PHILIPS-SMT(04
Q107	57L 417 4	PMBS3904/PHILIPS-SMT(04

Symbol	For U.S./Europe (TPV Part Number)	Description
R101	61L0603100 0F	CHIP 100OHM 1/10W 1%
R102	61L0603470	CHIPR 47 OHM +-5% 1/10W
R103	61L0603470	CHIPR 47 OHM +-5% 1/10W
R104	61L0603100 0F	CHIP 100OHM 1/10W 1%
R105	61L0603100 0F	CHIP 100OHM 1/10W 1%
R106	61L0603750 9F	75OHM 1% 1/10W
R107	61L0603750 9F	75OHM 1% 1/10W
R108	61L0603750 9F	75OHM 1% 1/10W
R109	61L0603100 0F	CHIP 100OHM 1/10W 1%
R110	61L0603100 0F	CHIP 100OHM 1/10W 1%
R111	61L0603100 0F	CHIP 100OHM 1/10W 1%
R112	61L0603101	CHIPR 100 OHM +-5% 1/10
R113	61L0603680	CHIPR 68OHM +-5% 1/10W
R114	61L0603470	CHIPR 47 OHM +-5% 1/10W
R115	61L0603222	CHIPR 2.2K OHM+-5% 1/10
R116	61L0603222	CHIPR 2.2K OHM+-5% 1/10
R117	61L0603103	CHIPR 10K OHM +-5% 1/10
R118	61L0603103	CHIPR 10K OHM +-5% 1/10
R119	61L0603101	CHIPR 100 OHM +-5% 1/10
R120	61L0603101	CHIPR 100 OHM +-5% 1/10
R122	61L0603472	CHIPR 4.7K OHM +-5% 1/1
R123	61L0603472	CHIPR 4.7K OHM +-5% 1/1
R125	61L0603101	CHIPR 100 OHM +-5% 1/10
R126	61L0603101	CHIPR 100 OHM +-5% 1/10
R127	61L0603472	CHIPR 4.7K OHM +-5% 1/1
R133	61L0603472	CHIPR 4.7K OHM +-5% 1/1
R134	61L0603472	CHIPR 4.7K OHM +-5% 1/1
R135	61L0603472	CHIPR 4.7K OHM +-5% 1/1
R137	61L0603101	CHIPR 100 OHM +-5% 1/10
R139	61L0603101	CHIPR 100 OHM +-5% 1/10
R141	61L0603101	CHIPR 100 OHM +-5% 1/10
R142	61L0603330	CHIPR 33 OHM +-5% 1/10W
R143	61L0603103	CHIPR 10K OHM +-5% 1/10
R144	61L0603103	CHIPR 10K OHM +-5% 1/10
R146	61L0603330	CHIPR 33 OHM +-5% 1/10W
R147	61L0603472	CHIPR 4.7K OHM +-5% 1/1
R148	61L0603472	CHIPR 4.7K OHM +-5% 1/1
R149	61L0603472	CHIPR 4.7K OHM +-5% 1/1
R150	61L0603102	CHIPR 1K OHM +-5% 1/10W

Symbol	For U.S./Europe (TPV Part Number)	Description
R152	61L0603101	CHIPR 100 OHM +-5% 1/10
R153	61L0603101	CHIPR 100 OHM +-5% 1/10
R154	61L0603102	CHIPR 1K OHM +-5% 1/10W
R155	61L0603102	CHIPR 1K OHM +-5% 1/10W
R157	61L0603221	CHIPR 220 OHM+-5% 1/10W
R158	61L0603221	CHIPR 220 OHM+-5% 1/10W
R159	61L0603221	CHIPR 220 OHM+-5% 1/10W
R160	61L0603221	CHIPR 220 OHM+-5% 1/10W
R162	61L0603472	CHIPR 4.7K OHM +-5% 1/1
R164	61L0603681	CHIP 680 OHM 1/10W
R165	61L0603102	CHIPR 1K OHM +-5% 1/10W
R166	61L0603102	CHIPR 1K OHM +-5% 1/10W
R167	61L0603102	CHIPR 1K OHM +-5% 1/10W
R172	61L1206331	CHIP 330OHM 5% 1/4W
R173	61L0603103	CHIPR 10K OHM +-5% 1/10
R174	61L0603103	CHIPR 10K OHM +-5% 1/10
R175	61L0603103	CHIPR 10K OHM +-5% 1/10
R177	61L0603272	CHIP 2.7K OHM 1/10W
R178	61L0603272	CHIP 2.7K OHM 1/10W
R179	61L0603472	CHIPR 4.7K OHM +-5% 1/1
R180	61L0603221	CHIPR 220 OHM+-5% 1/10W
R181	61L0603102	CHIPR 1K OHM +-5% 1/10W
R183	61L0603472	CHIPR 4.7K OHM +-5% 1/1
R184	61L0603102	CHIPR 1K OHM +-5% 1/10W
R185	61L0603330	CHIPR 33 OHM +-5% 1/10W
R186	61L0603330	CHIPR 33 OHM +-5% 1/10W
R187	61L0603472	CHIPR 4.7K OHM +-5% 1/1
R188	61L0603101	CHIPR 100 OHM +-5% 1/10
R189	61L0603471	CHIPR 470 OHM+-5% 1/10W
R190	61L0603472	CHIPR 4.7K OHM +-5% 1/1
R191	61L0603472	CHIPR 4.7K OHM +-5% 1/1
R192	61L0603472	CHIPR 4.7K OHM +-5% 1/1
R193	61L0603101	CHIPR 100 OHM +-5% 1/10
R194	61L0603103	CHIPR 10K OHM +-5% 1/10
RP101	61L 125330 8	CHIP AR 894R 33OHM +-5%
RP102	61L 125330 8	CHIP AR 894R 33OHM +-5%
RP103	61L 125472 8	CHIP AR 8P4R 4.7K OHM+-
U101	87L 202 44	PLCC SMT CONN PD41C-441
U102	56L 562 72	GMZAN3/SL (BD) PQFB-100

Symbol	For U.S./Europe (TPV Part Number)	Description
U502	56L 563 27	AIC1117A-18CY SOT-223
U503	56L 585 4	AIC1117-33CY
	715L1350 1 GM	PCB

Replacement Parts List of Key Board

KEPC780KDM/3 (KEY BOARD)		
Symbol	**For U.S./Europe Part No for TPV**	**Description**
CN101	33L801712A H	PIN HEADER 2*6 R/A
CN102	88L 30221T	PHONE JAC(DARK ROOF GRA
CN103	33L3802 2H	WAFER 2P RIGHT ANGLE
CN104	33L3802 2H	WAFER 2P RIGHT ANGLE
DP101	81L 12 1A GP	LED
SW101	77L 600 1GHJ	KEY SWITCH
SW102	77L 600 1GHJ	KEY SWITCH
SW103	77L 603 2 HJ	TACT SWITCH
SW104	77L 600 1GHJ	KEY SWITCH
SW105	77L 600 1GHJ	KEY SWITCH
R101	61L 60239152T	390 OHM 5% 1/6W
R102	61L 60239152T	390 OHM 5% 1/6W
ZD100	93L 3973B52T	HZ6B2
	715L1351 1A 17	PCB

Replacement Parts List of Power Board

PWPC1742QDN (POWER BOARD)		
Symbol	**For U.S./Europe (TPV Part number)**	**Description**
C201	67L215L102 3N	105°C 100UF +-20% 16
C204	65L 3J2206ET	22PF 5% 3KV TDK
C205	65L 3J5096ET	5PF 5% SL 3KV
C208	65L 3J2206ET	22PF 5% 3KV TDK
C209	65L 3J5096ET	5PF 5% SL 3KV
C225	67L215L102 3N	105°C 100UF +-20% 16
C236	65L 3J2206ET	22PF 5% 3KV TDK
C237	65L 3J5096ET	5PF 5% SL 3KV
C238	65L 3J2206ET	22PF 5% 3KV TDK
C239	65L 3J5096ET	5PF 5% SL 3KV
C263	95L 90 23	TIN COATED
C901	65L305M2222B2	2200PF 400VAC/250VAC
C902	65L305M2222B2	2200PF 400VAC/250VAC
C904	63L 107474 HS	0.47UF +-10% 250VAC
C905	67L215S10115N	100UF+-20% 450V
C912	65L306M2222B2	2200PF +-20% 250VAC
C922	67L215L102 3N	105°C 100UF +-20% 16
C923	67L215L102 3N	105°C 100UF +-20% 16
C924	67L215L102 3N	105°C 100UF +-20% 16
C925	67L215L102 3N	105°C 100UF +-20% 16
CN102	95L8021 12520	HARNESS
CN201	33L8021 2D U	CONN.2P DIP R/A LM401-0
CN202	33L8021 2D U	CONN.2P DIP R/A LM401-0
CN204	33L8021 2D U	CONN.2P DIP R/A LM401-0
CN205	33L8021 2D U	CONN.2P DIP R/A LM401-0
CN301	88L 30220K	AUDIO IN JACK
CN302	95G8013 3 31	WIRE HARNESS
D901	93L 6026W52T	FR107
D902	93L 6038P52T	PS102R
D902	93L 60 38	
DB901	93L 50460 8	BRIDGE 2KBP06M2A600V
H1	85L6106 1	SHILD
IC902	56L 139 3A	PC123Y22
L901	73L 174 26 LS	COMMON CHOKE
L902	73L 174 53 L GP	CHOKE
L903	73L 253 91 LS	CHOKE BY LI SHIN

Symbol	For U.S./Europe (TPV Part number)	Description
L904	73L 253 91 LS	CHOKE BY LI SHIN
NR901	61L 58050 WT	NTC 5 OHM 5A
PT201	80LL17T 23 DN	XFMR
PT202	80LL17T 23 DN	XFMR
R903	61L152M10458F	100K OHM 5% 2W
R917	61L152M398 64	0.39 OHM 2W
R920	61L175L47052T	47OHM +-5% 1/2W
R921	61L175L47052T	47OHM +-5% 1/2W
T901	80LL17T 2 T	X'FMR
C202	65L0805104 32	CHIP 0.1UF 50V X7R
C203	65L1206225 22	2.2UF 25V X7R 1206
C206	65L1206225 22	2.2UF 25V X7R 1206
C207	65L1206225 22	2.2UF 25V X7R 1206
C210	65L0805104 32	CHIP 0.1UF 50V X7R
C211	65L0805104 32	CHIP 0.1UF 50V X7R
C212	65L0805104 32	CHIP 0.1UF 50V X7R
C213	65L0805105 22	CHIP 1UF 25V X7R 0805
C214	65L0805473 32	CHIP 0.047UF 50V X7R
C216	65L0805392 32	3900PF/50V
C217	65L0805104 32	CHIP 0.1UF 50V X7R
C219	65L0805105 22	CHIP 1UF 25V X7R 0805
C220	65L0603221 31	CAP:CER 220PF 5% 50V SM
C221	65L0805474 22	CHIP 0.47UF 25V X7R 080
C222	65L0805105 22	CHIP 1UF 25V X7R 0805
C224	65L0805682 32	CHIP 6.8UF 50V X7R 0805
C226	65L0805104 32	CHIP 0.1UF 50V X7R
C227	65L0805104 32	CHIP 0.1UF 50V X7R
C228	65L0805472 31	CHIP 4700PF 50V X7R 080
C229	65L0805104 32	CHIP 0.1UF 50V X7R
C230	65L0805473 32	CHIP 0.047UF 50V X7R
C231	65L1206225 22	2.2UF 25V X7R 1206
C232	61L0603303	CHIP 30K OHM 5% 1/10W
C233	65L1206225 22	2.2UF 25V X7R 1206
C234	65L1206225 22	2.2UF 25V X7R 1206
C235	65L0805104 32	CHIP 0.1UF 50V X7R
C240	65L0805104 32	CHIP 0.1UF 50V X7R
C242	65L0805392 32	3900PF/50V
C243	65L0805104 32	CHIP 0.1UF 50V X7R
C245	65L0805104 32	CHIP 0.1UF 50V X7R

Symbol	For U.S./Europe (TPV Part number)	Description
C246	65L0805104 32	CHIP 0.1UF 50V X7R
C247	65L0805104 32	CHIP 0.1UF 50V X7R
C265	65L1206105 32	CHIP 1UF 50V X7R 1206
C266	65L1206105 32	CHIP 1UF 50V X7R 1206
C267	65L1206105 32	CHIP 1UF 50V X7R 1206
C268	65L1206105 32	CHIP 1UF 50V X7R 1206
C907	65L0805104 32	CHIP 0.1UF 50V X7R
C909	65L0805104 32	CHIP 0.1UF 50V X7R
C910	65L0805102 32	CHIP 1000P 50VX7R 0805
C926	65L0805104 32	CHIP 0.1UF 50V X7R
C927	65L0805104 32	CHIP 0.1UF 50V X7R
C929	65L0805104 32	CHIP 0.1UF 50V X7R
C930	65L0805471 21	CHIP 470PF 25V NPO
D201	93L 6433P	BAV99
D202	93L 6433P	BAV99
D203	93L 6433P	BAV99
D204	93L 6433P	BAV99
D206	93L 6433P	BAV99
D207	93L 6433P	BAV99
D208	93L 6432V	LL4148-GS08
D209	93L 6433P	BAV99
D210	93L 6433P	BAV99
D211	93L 6432V	LL4148-GS08
D212	93L 6432V	LL4148-GS08
D213	93L 6432V	LL4148-GS08
D214	93L 6432V	LL4148-GS08
D903	93L 6432V	LL4148-GS08
D904	93L 6432V	LL4148-GS08
F902	84L 52 2	SMD FUSE 4A 32V GET-HAN
IC201	56L 608 7	OZT1060G
IC901	56L 379 33	SG6841S
Q204	57L 60040A	AM4512C
Q205	57L 760 4	DTA144WKA BY ROHM SMT(7
Q206	57L 417 4	PMBS3904/PHILIPS-SMT(04
Q207	57L 760 5	DTC144WKA BY ROHM SMT(8
Q208	57L 60040A	AM4512C
Q209	57L 60040A	AM4512C
Q210	57L 60040A	AM4512C
Q211	57L 759 2	RK7002 SOT-23

Symbol	For U.S./Europe (TPV Part number)	Description
Q212	57L 759 2	RK7002 SOT-23
Q213	57L 759 2	RK7002 SOT-23
Q214	57L 759 2	RK7002 SOT-23
Q215	57L 759 2	RK7002 SOT-23
R201	61L0805102	CHIPR 1K OHM +-5% 1/8W
R202	61L1206150	CHIP 15 OHM 5% 1206 1/4
R203	61L0805103	CHIPR 10K OHM +-5% 1/8W
R204	61L0805103	CHIPR 10K OHM +-5% 1/8W
R205	61L0805102	CHIPR 1K OHM +-5% 1/8W
R206	61L0805102	CHIPR 1K OHM +-5% 1/8W
R207	61L0805103	CHIPR 10K OHM +-5% 1/8W
R210	61L0805361	CHIPR 360OHM +-5% 1/8W
R212	61L0805622	CHIP 6.2K OHM 1/8W
R213	61L0805273	CHIP 27KOHM 5% 0805 1/8
R215	61L0805361	CHIPR 360OHM +-5% 1/8W
R216	61L0805105	CHIP 1M OHM 5% 1/8W
R217	61L0805623	CHIPR 62K OHM +-5% 1/8W
R218	61L0805102	CHIPR 1K OHM +-5% 1/8W
R219	61L0805912	CHIP 9.1KOHM 5% 0805 1/
R220	61L0805220	CHIP 22 OHM 5% 0805 1/8
R222	61L0805513	CHIP 51KOHM 1/8W
R223	61L0805105	CHIP 1M OHM 5% 1/8W
R225	61L0805205	CHIP 2M OHM 5% 1/8W
R226	61L0805474	CHIP 470K OH 1% 0805
R227	61L0805361	CHIPR 360OHM +-5% 1/8W
R228	61L0805622	CHIP 6.2K OHM 1/8W
R229	61L0805824	CHIP 820K OHM 5% 0805 1
R231	61L0805105	CHIP 1M OHM 5% 1/8W
R234	61L0805361	CHIPR 360OHM +-5% 1/8W
R236	61L0805304	300K OM 1/8W
R237	61L0805154	CHIP 150KOHM 5% 1/8W
R238	61L0805105	CHIP 1M OHM 5% 1/8W
R239	61L0805102	CHIPR 1K OHM +-5% 1/8W
R241	61L0805105	CHIP 1M OHM 5% 1/8W
R243	61L0805105	CHIP 1M OHM 5% 1/8W
R244	61L1206471	CHIPR 470 OHM+-5% 1/4W
R245	61L0805224	CHIPR 220K OHM +-5% 1/8
R900	61L1206394	CHIPR 390KOHM+-5% 1/4W
R901	61L1206394	CHIPR 390KOHM+-5% 1/4W

Symbol	For U.S./Europe (TPV Part number)	Description
R902	61L1206394	CHIPR 390KOHM+-5% 1/4W
R906	61L1206105	CHIP 1MOHM 5% 1/4W
R907	61L1206105	CHIP 1MOHM 5% 1/4W
R908	61L1206519	CHIPR 510OHM +-5% 1/4W
R909	61L1206472	CHIP 4.7KOHM 5% 1/4W
R910	61L0805472	CHIRP 4.7K OHM +-5% 1/8
R911	61L0805472	CHIRP 4.7K OHM +-5% 1/8
R912	61L0805101	CHIPR 100 OHM +-5% 1/8W
R913	61L0805103	CHIPR 10K OHM +-5% 1/8W
R914	61L0805243	SMD 24KOHM/0805/+-5% 1/
R915	61L0805220	CHIP 22 OHM 5% 0805 1/8
R916	61L0805103	CHIPR 10K OHM +-5% 1/8W
R924	61L0805242	CHIP 2.4KOHM 1% 1/8W
R925	61L0805102	CHIPR 1K OHM +-5% 1/8W
R926	61L0805102	CHIPR 1K OHM +-5% 1/8W
R927	61L0805000	CHIP O OHM 1/8W
R928	61L0805102	CHIPR 1K OHM +-5% 1/8W
R929	61L1206101	CHIP 100 OHM 5% 1/4W
R932	61L0805221	CHIPR 220 OHM +-5% 1/8W
ZD201	93L 39S 24 T	RLZTE-115.6B ROHM
ZD202	93L 39S 24 T	RLZTE-115.6B ROHM
ZD203	93L 39S 24 T	RLZTE-115.6B ROHM
ZD901	93L 39S 20 T	RLZ22B BY ROHM
ZD904	93L 39S 19 T	PTZ7.5B
C905	6L 31502	1.5MM RIVET
C906	67L 3052207NT GP	EC 105 22UF 50V KME50VB
C911	65L 1K222 2T	0.0022UF 1KV +-10%
C920	65L517K102 5T	1000PF 10% Y5P 500V
C921	65L517K102 5T	1000PF 10% Y5P 500V
C931	67L 3051007NT GP	EC105 10UF 50V KME50V
CN902	6L 31500	EYELET
F901	84L 56 1	FUSE 2A 250V WICKMANN
IC903	56L 158 10 T	AZ431AZ-A TO-92
L901	6L 31502	1.5MM RIVET
NR901	6L 31502	1.5MM RIVET
PT201	6L 31502	1.5MM RIVET
PT202	6L 31502	1.5MM RIVET
Q901	57L 420 PP T	2PA733P
Q902	57L 419 PP T	2PC945P

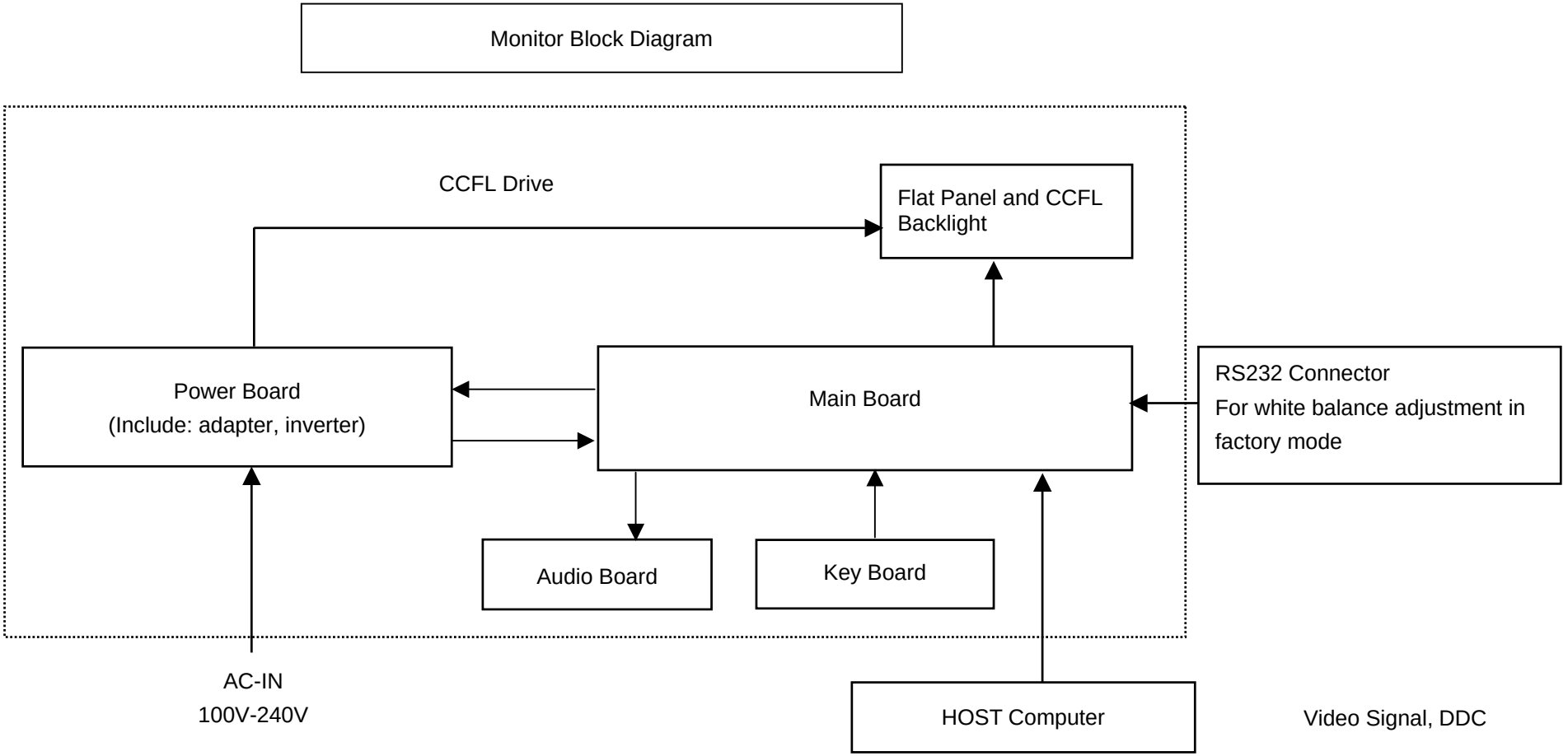
Symbol	For U.S./Europe (TPV Part number)	Description
R208	61L212Y625 KT	6.2M 3KV KAMAYA
R221	61L 60233352T	33KOHM 1% 1/6W
R224	61L212Y625 KT	6.2M 3KV KAMAYA
R292	61L 60222052T	CFR 22 OHM+-5% 1/6W
R922	61L 21033352T	33K 1/6W 1%
R923	61L 21036252T	3.6K 1/6W 1%
T901	6L 31502	1.5MM RIVET
ZD902	93L 39 5452T	ZENER HZ12B2
ZD903	93L 39 7752T	ZENER HZ5C1
	95L 900568	HARNESS
	96L 29 6	SHRINK TUBE UL/CSA
CN902	87L 501 12 CJ	AC SOCKET
	90L6064 1	HEAT SINK
	M1L1730 8128	SCREW M3x8
Q903	57L 667 20	AP2761I-A TO-220CFM
	96L 29 1	SHRINK TUBE UL/CSA
FB901	71L 55 29	FERRITE BEAD
	90L6064 1	HEAT SINK
	M1L1730 8128	SCREW M3x8
D910	93L 60245	SP10150
D911	93L 60237	SRF20100C
	715L1236 1 AS	PCB

Replacement Parts List of Audio Board

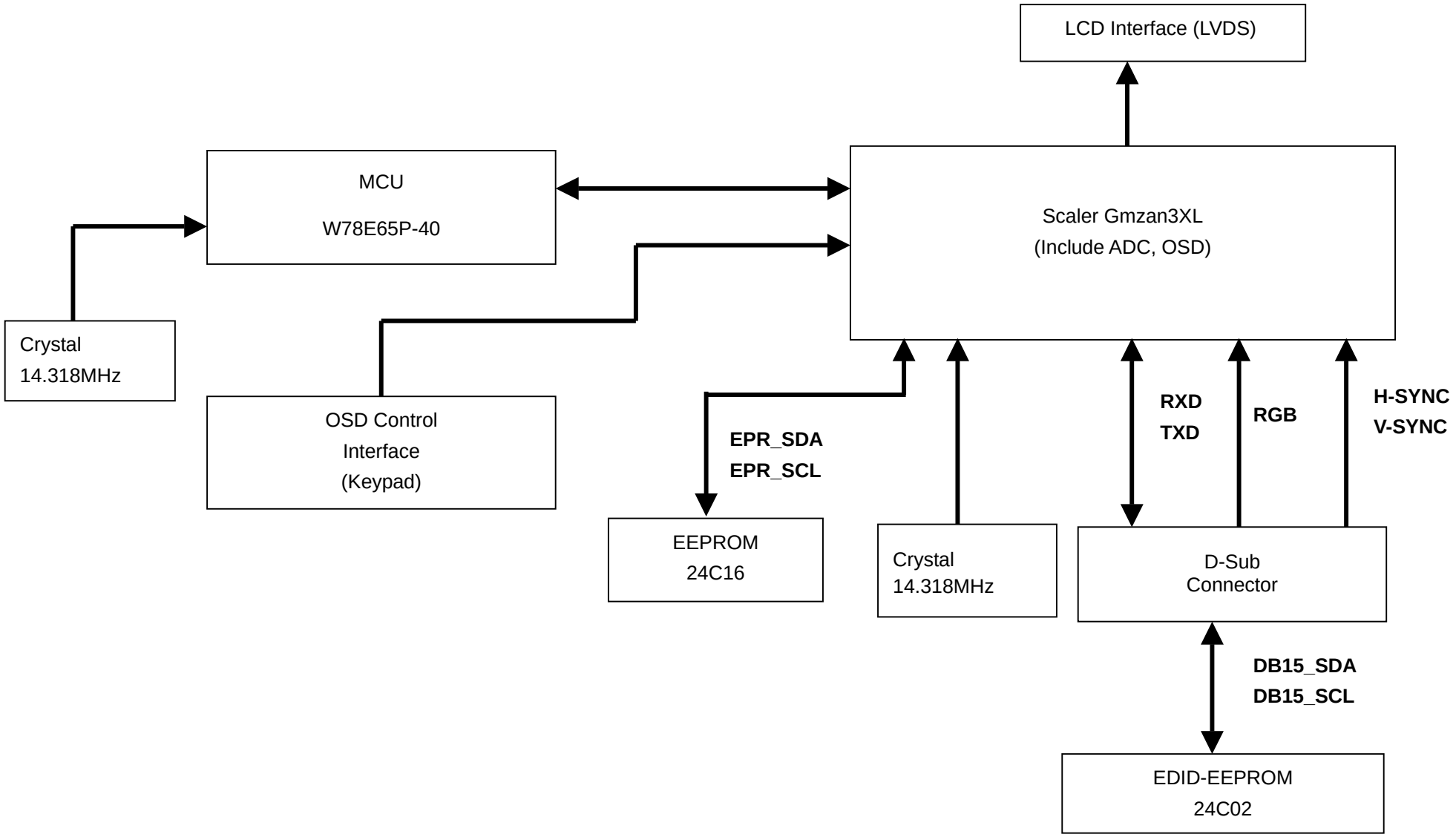
AUPC780KB5 (AUDIO BOARD)		
Symbol	**For U.S./Europe Part No for TPV**	**Description**
CN202	33L802414C H	2*7PIN DUAL ROW RIGHT A
CN204	33L3278 3	3P PLUG B3B-XHA/JST
U201	56L 616 1	TDA7496L BY ST
C203	65L0805104 32	CHIP 0.1UF 50V X7R
C204	65L0805474 22	CHIP 0.47UF 25V X7R 080
C206	65L0805474 22	CHIP 0.47UF 25V X7R 080
C211	65L0805101 31	CHIP 100PF 50V NPD 0805
C212	65L0805101 31	CHIP 100PF 50V NPD 0805
C213	65L0805104 32	CHIP 0.1UF 50V X7R
R201	61L0603183	CHIP 18K OHM 1/10W
R203	61L0603183	CHIP 18K OHM 1/10W
R207	61L0603102	CHIPR 1K OHM +-5% 1/10W
R208	61L0603102	CHIPR 1K OHM +-5% 1/10W
R210	61L0603203	CHIPR 20K OHM+-5% 1/10W
R211	61L0603203	CHIPR 20K OHM+-5% 1/10W
C201	67L 2154713NT GP	KY16VB 470M-TP58*15
C202	67L 2154713NT GP	KY16VB 470M-TP58*15
C205	67L 2154713NT GP	KY16VB 470M-TP58*15
C207	67L 2154713NT GP	KY16VB 470M-TP58*15
C208	67L 2154713NT GP	KY16VB 470M-TP58*15
C209	67L 2151007NT	10UF +-20% 50V NCC
C210	67L 2151007NT	10UF +-20% 50V NCC
R212	61L 60220152T	CFR 200 OHM +-5% 1/6W
	715L1144 2NMV	PCB

BLOCK DIAGRAM

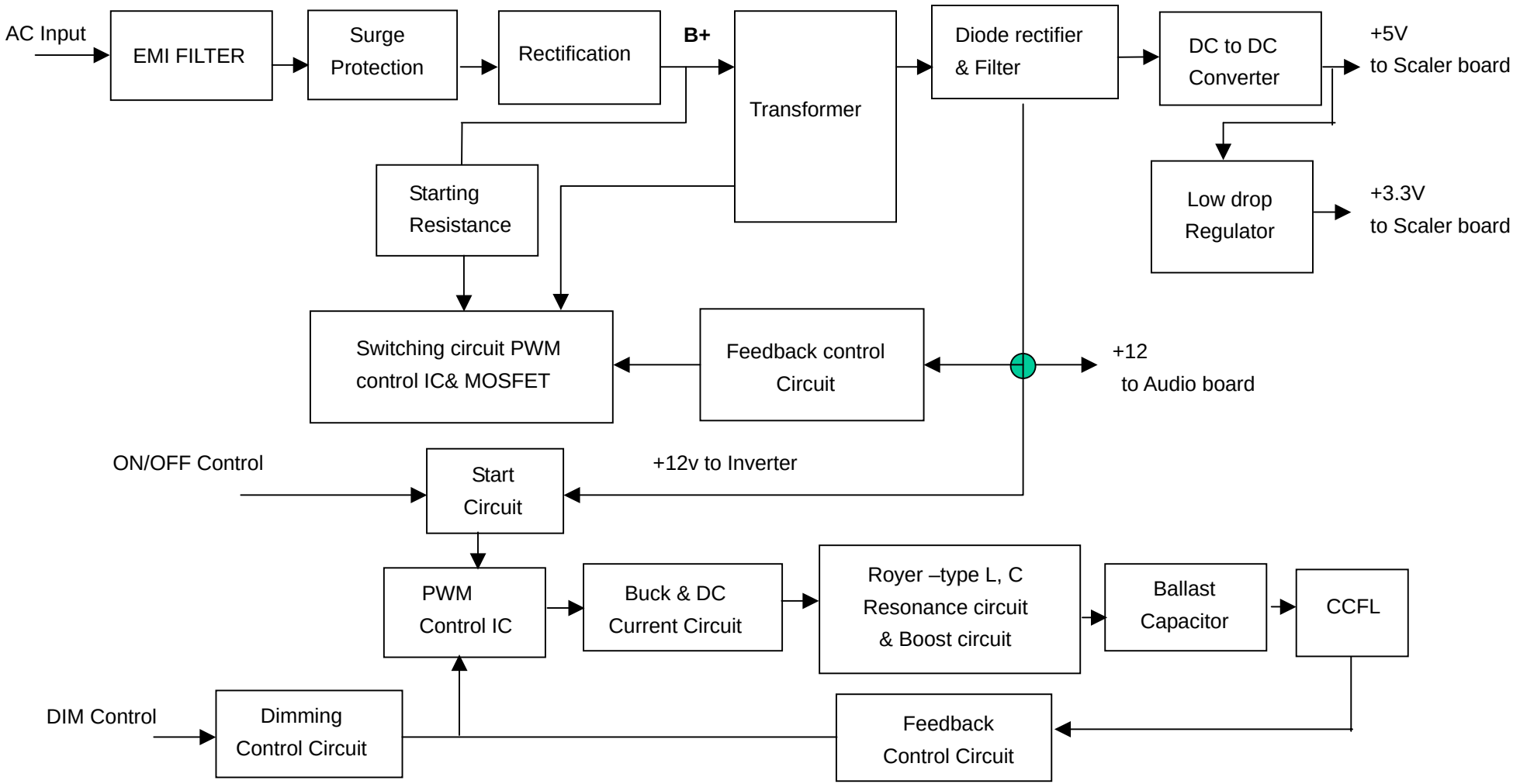
1. THE MONITOR BLOCK DIAGRAM (MODEL: LCD72VM)



2. SCALER BOARD BLOCK DIAGRAM (MODEL: LCD72VM)



3. POWER BOARD BLOCK DIAGRAM (MODEL: LCD72VM)



4. AUDIO BOARD BLOCK DIAGRAM (MODEL: LCD72VM)

SCHEMATIC DIAGRAM

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AUDIO BOARD ---------- 10-7
KEYPAD BOARD ---------- 10-8
POWER BOARD ---------- 10-9

MODEL LCD72VM SCHEMATIC DIAGRAM MAIN BOARD (TITLE PAGE) (1/9)

REVISION HISTORY

Date	Author	Ver	Comments
4/20/'04	SCAR	A	Preliminary
5/12/'04	SCAR	B	R128,R128,R145 BOM Change to NC CN601 BOM Change to 33L8017-14A-H R165 BOM Change to 1K ohm U501 Change From SOT-223 to TO-252 5/11 D104 Change from 5.6V to 6.2V 5/11 R130 Change from key-off to key-Left 5/11 Add H/W ISP R130 to 0 Ohm 5/11 Change R152,R153 to 150 Ohm 5/11 Change Q101,Q102 from 3904 to 3906 5/11 Change R154,R155 from 4.7K to 1K Ohm 5/11 Add R191,R192 4.7K Ohm 5/12 Add R193 Option 5/12 C122,129,136,140 Change vendor to NCC 5/13 Change from 2.2uF to 10uF(NCC) 5/13 Add USB power circuit
6/25/'04 6/29/'04	SCAR Cheng Lung	C	6/25 Modify EDID-WP control Circuit -Page3 6/29 Modify EDID-WP control Circuit -Page3 6/29 Modify D101,D105,D106 from +3.3_VDD to +5V
6/30/'04	SCAR	D	6/30 MOV D111,D112 NEAR D SUB 6/30 MODIFY RESET TRACE

CONTENTS

SCHEMATIC	SHEET
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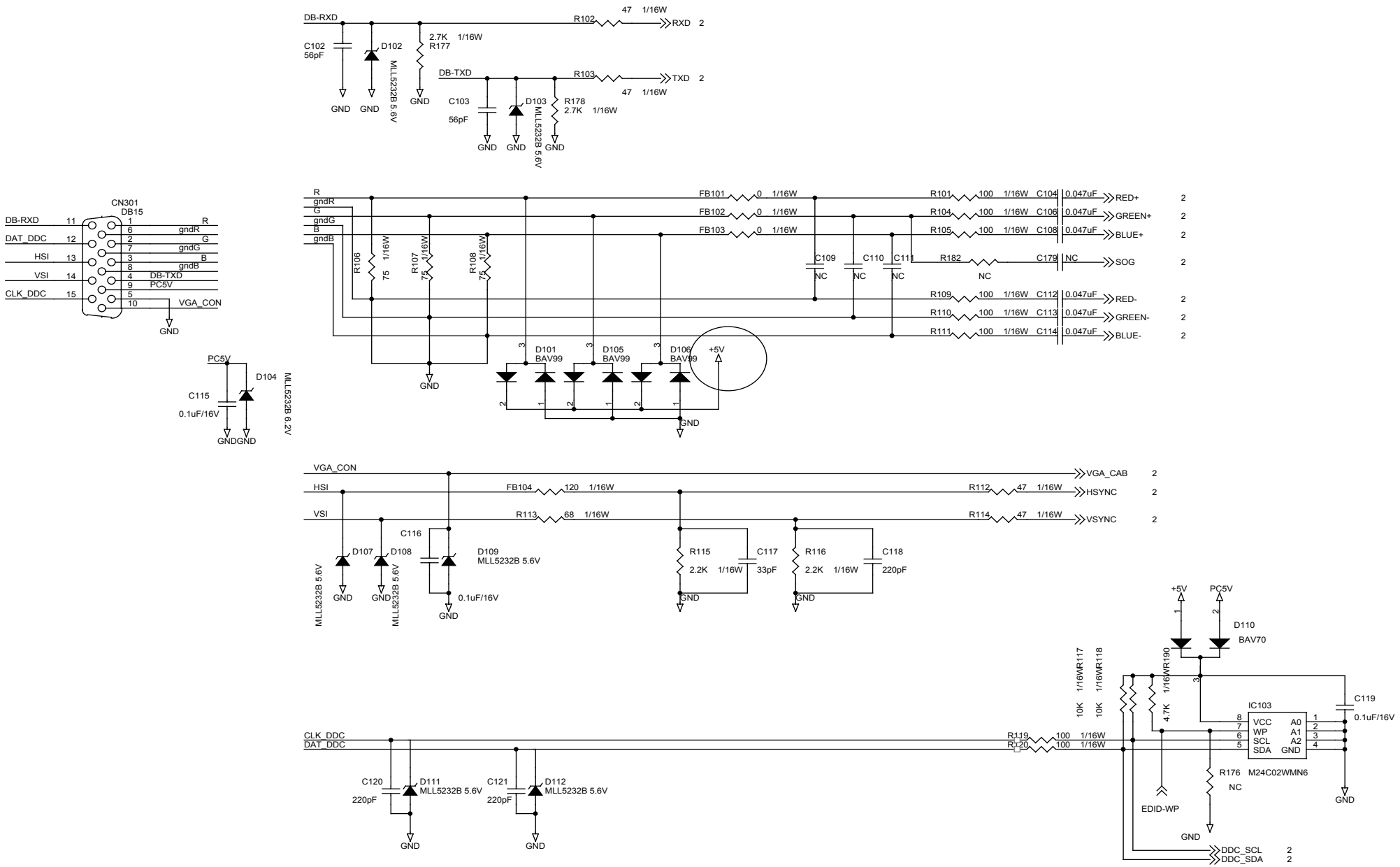
SCALER AND MCU	3/9
POWER	4/9
PANEL INTERFACE	5/9
AUDIO BOARD	6/9
KEYBOARD	7/9
INVERTER	8/9
PWPC1742QDN1	9/9

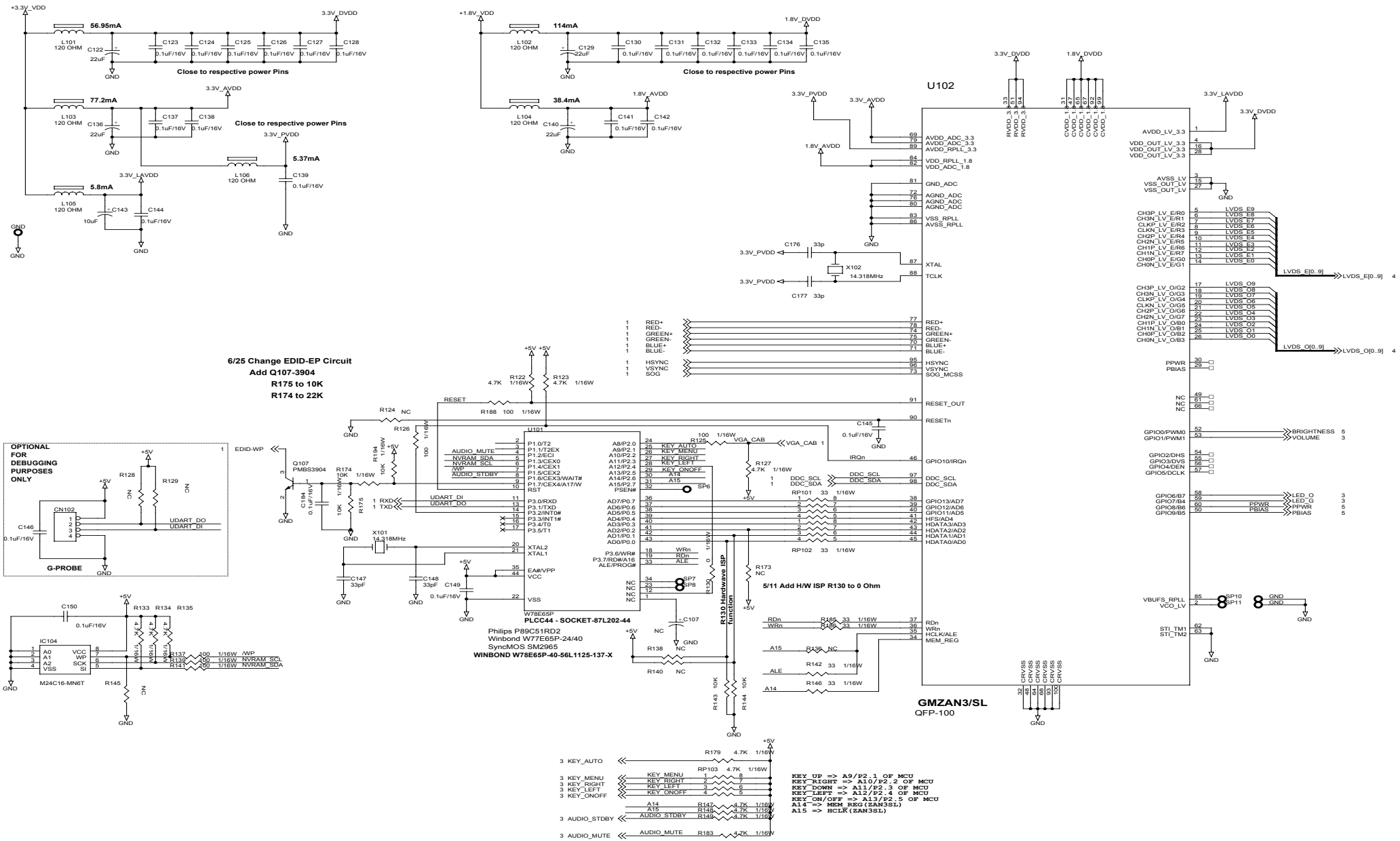
GMZAN3 X/SL NMV Control Board Rev.D

NMV-AS Series LCD

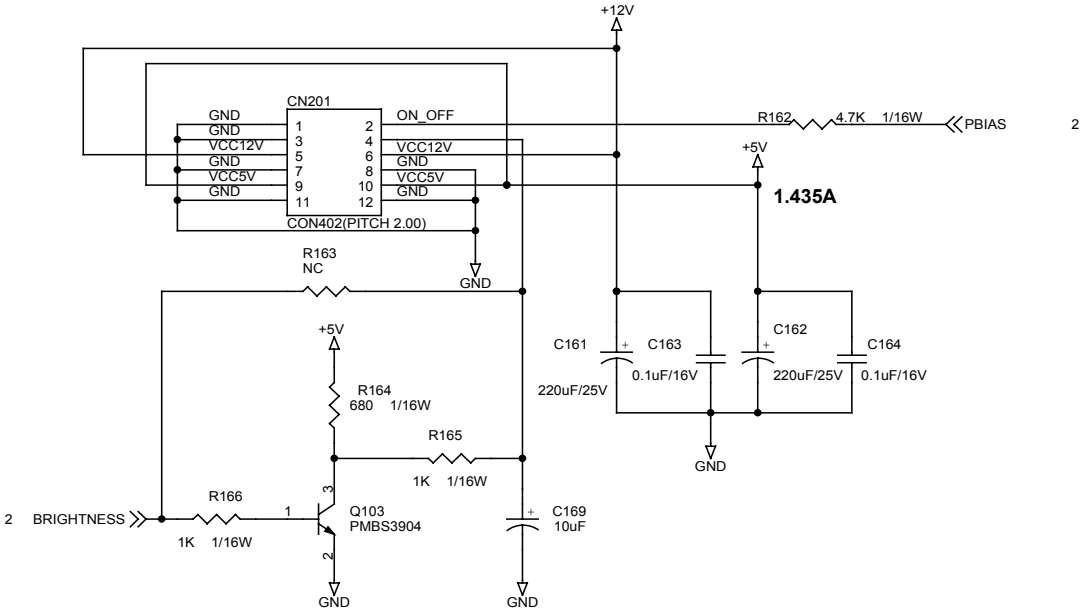
MODEL LCD72VM SCHEMATIC DIAGRAM MAIN BOARD (ANALOG INPUT) (2/9)

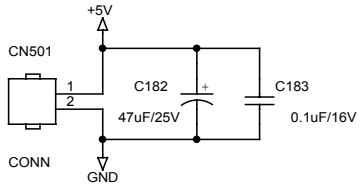


MODEL LCD72VM SCHEMATIC DIAGRAM MAIN BOARD (SCALER AND MUC) (3/9)



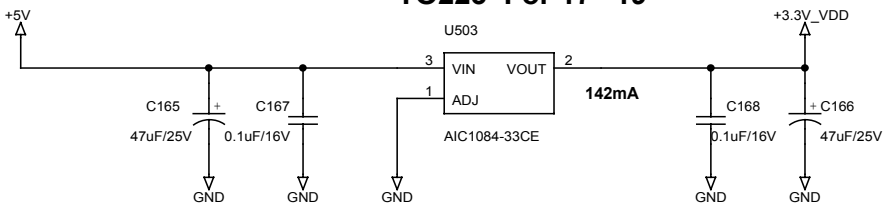
MODEL LCD72VM SCHEMATIC DIAGRAM MAIN BOARD (POWER) (4/9)





TO-263 For 15"

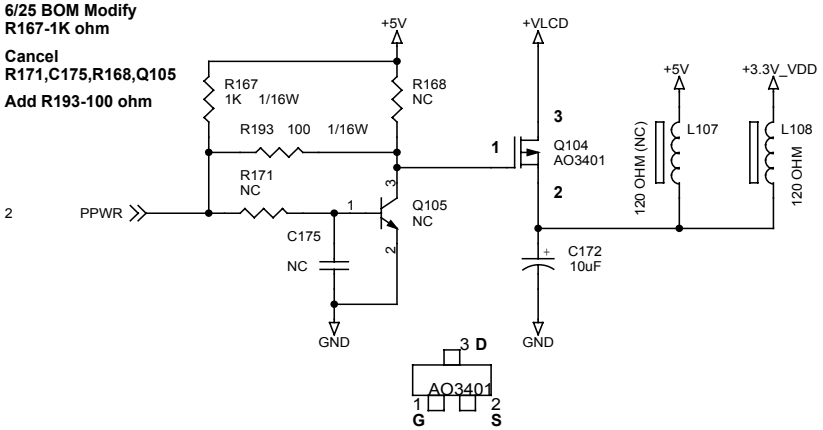
TO223 For 17" 19"



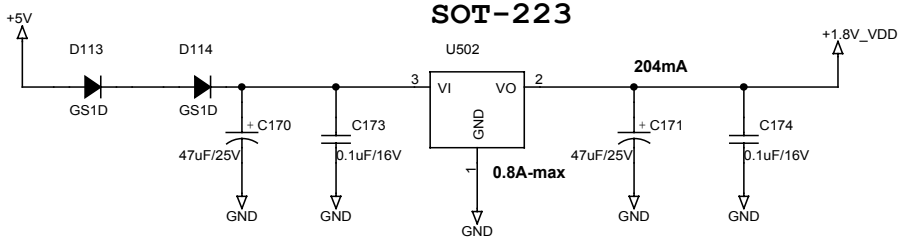
6/25 BOM Modify
R167-1K ohm

Cancel
R171,C175,R168,Q105

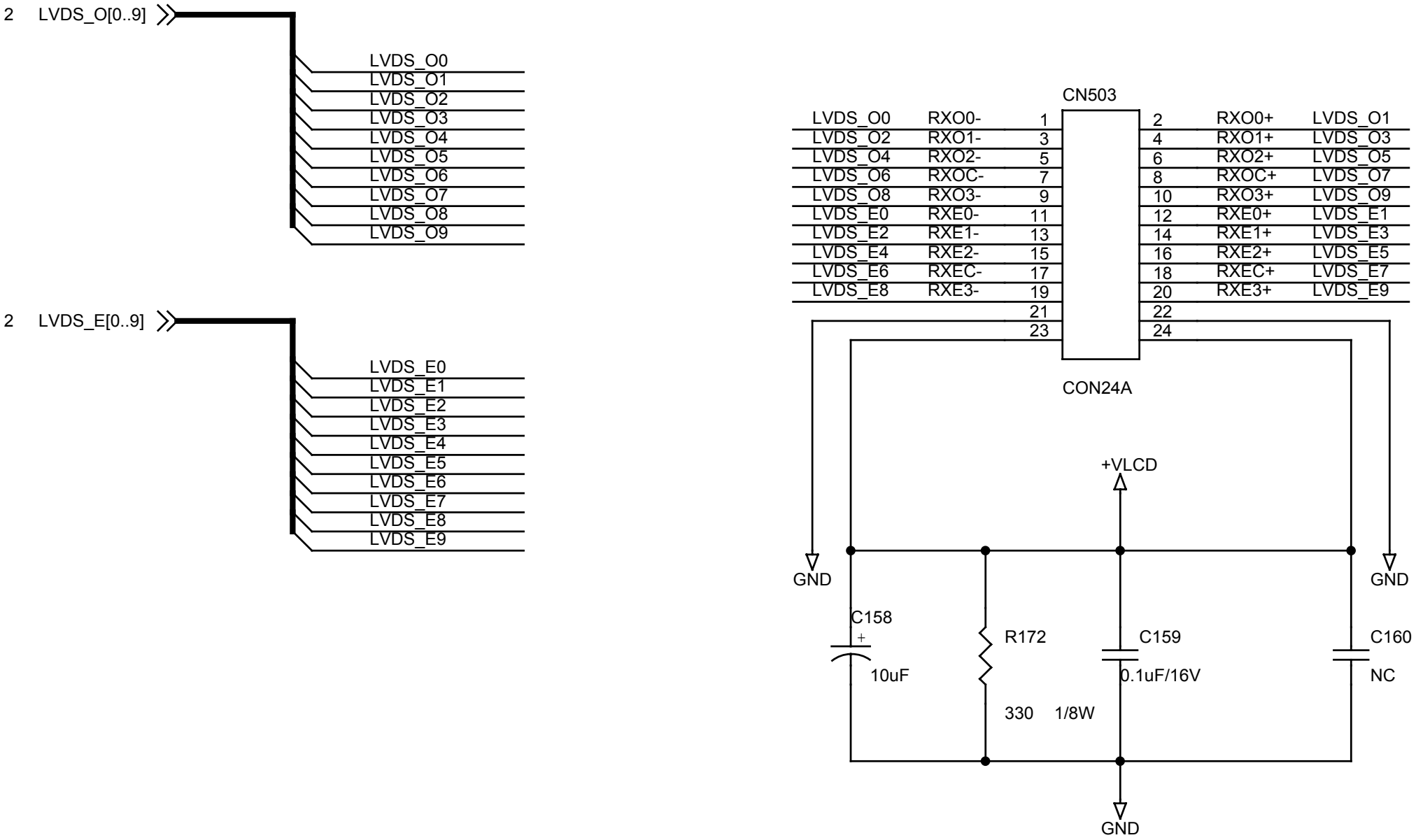
Add R193-100 ohm



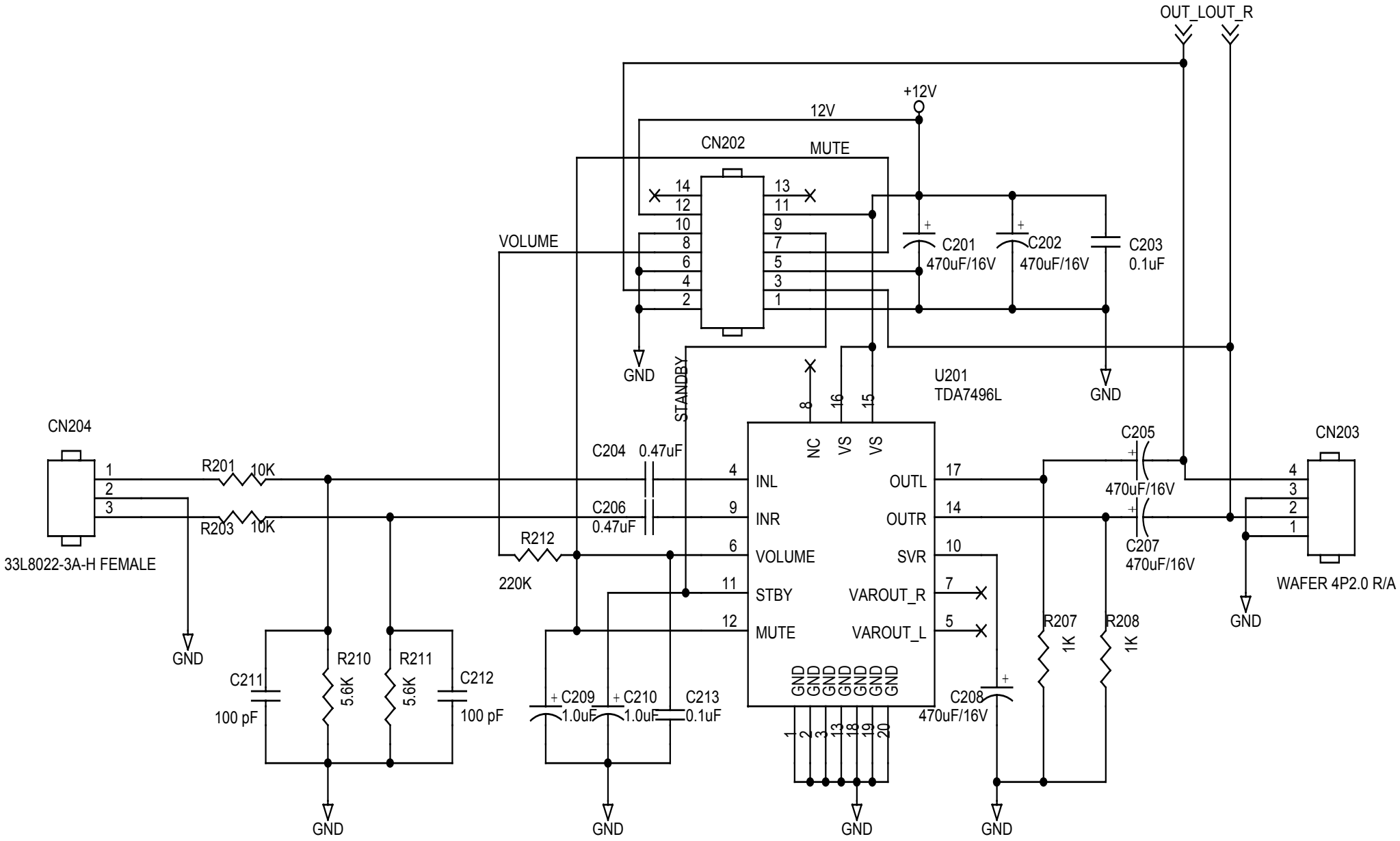
SOT-223



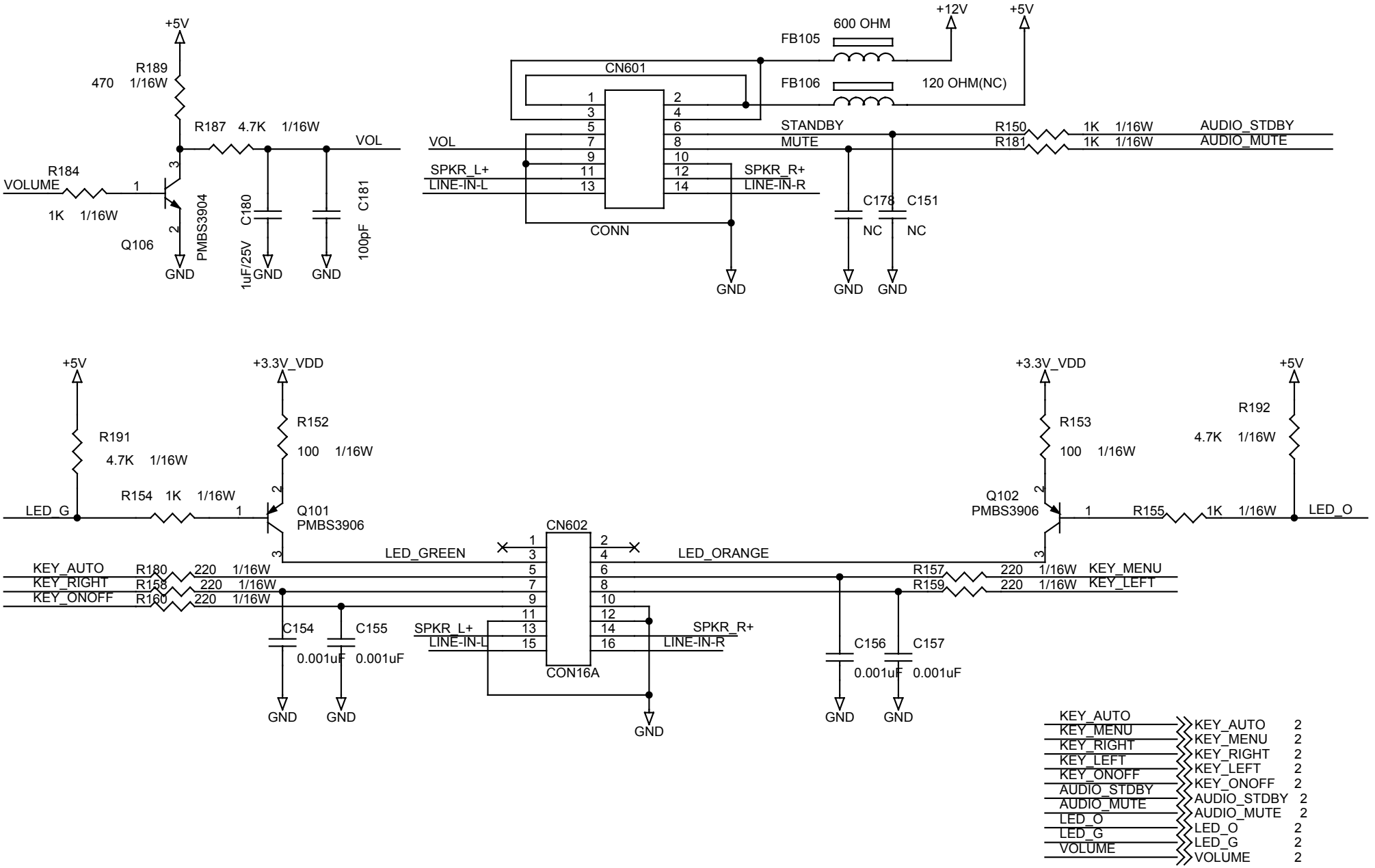
MODEL LCD72VM SCHEMATIC DIAGRAM MAIN BOARD (PANEL INTERFACE) (5/9)



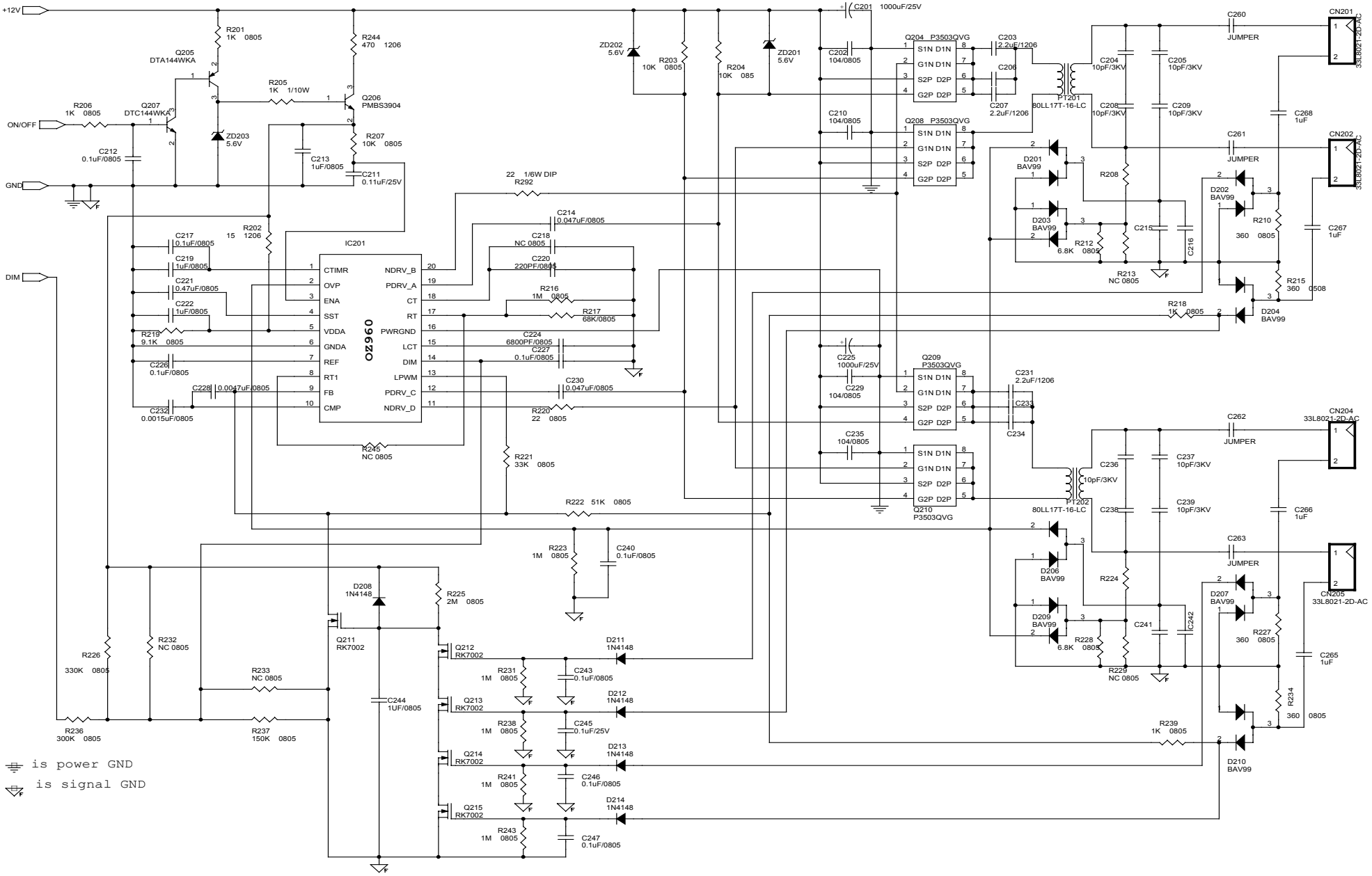
MODEL LCD72VM SCHEMATIC DIAGRAM AUDIO BAORD (6/9)



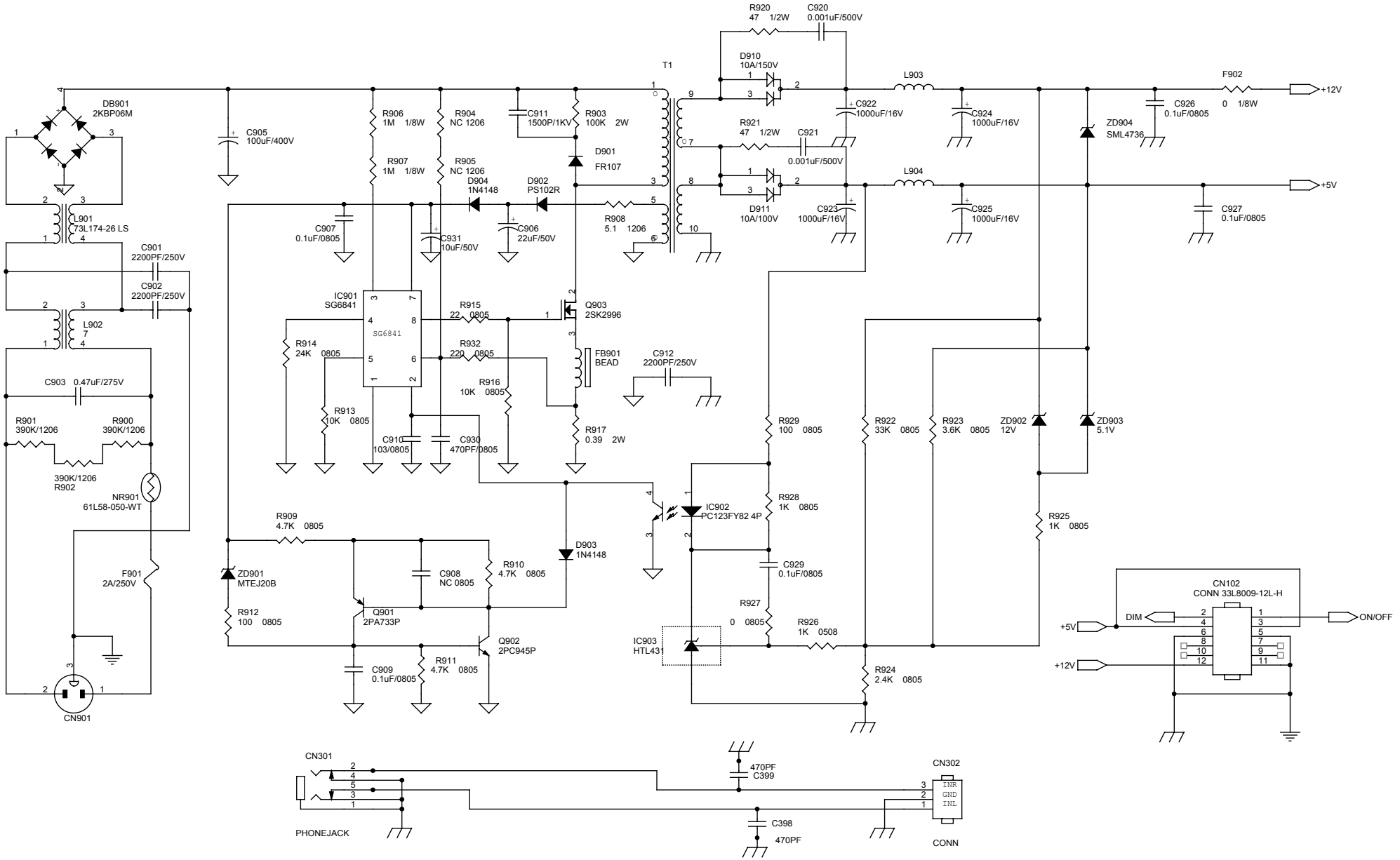
MODEL LCD72VM SCHEMATIC DIAGRAM KEYPAD BAORD (7/9)



MODEL LCD72VM SCHEMATIC DIAGRAM POWER BAORD (INVERTER) (8/9)

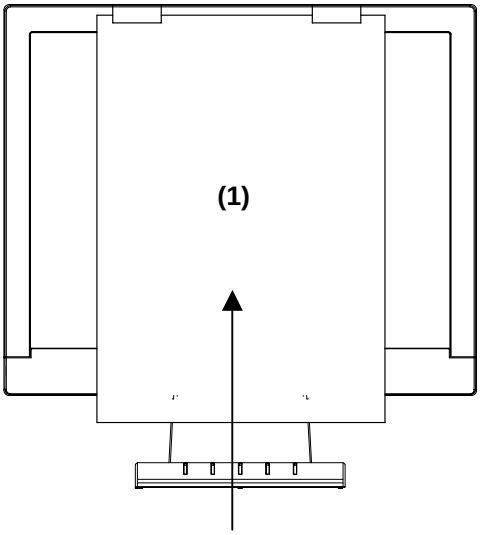


MODEL LCD72VM SCHEMATIC DIAGRAM POWER BAORD (PWPC1742QDN1) (9/9)



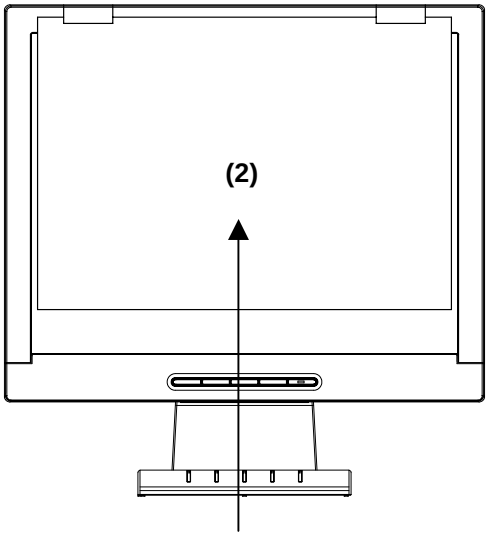
Packing Specification

A Version



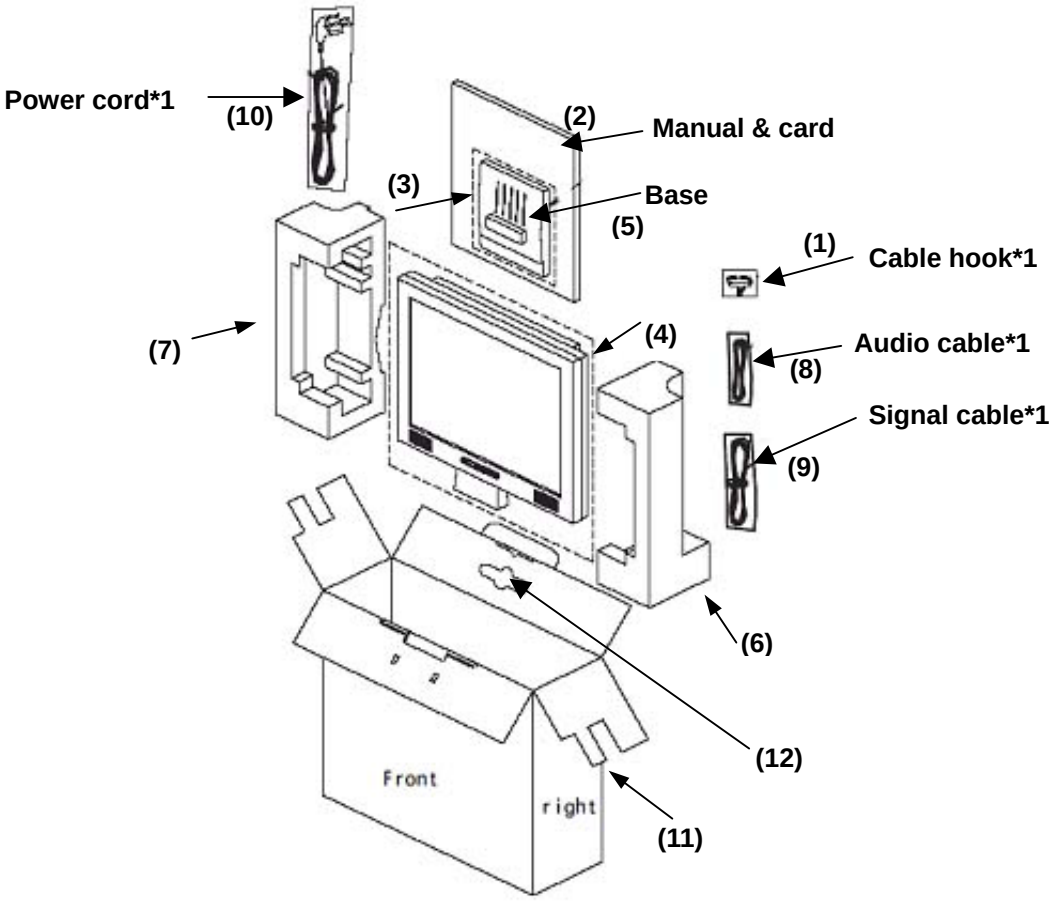
Set Up Sheet
This page printed in English

B Version



Set Up Sheet
Out side is English Ver

Item	Description	For U.S/Europe (TPV Part Number)	Ver	Cabinet Color
1	SETUP SHEET	41L780084232A	A	Black
2	SETUP SHEET	41L780084248A	B	Black



B Ver Only

Add tape
(Don't cover the contents of the Caution Sheet.

Put Caution sheet on cushion like above drawing.
(Fold by 2 pcs (Letter is out))

Item	Description	For U.S./Europe (TPV Part Number)	Ver	Cabinet Color
1	PE BAG for clamp	45L 76 28 V6	---	---
1	CLAMP	33L4695 1 C	---	---
2	PE BAG FOR MAUUAL	45L 76 28 V9	---	---
2	Sheet, Protection	41L780084222A	A	----
2	FLYER NAVISET	41L780084225A	---	---
2	MANUAL	41L780084221B	A	---
2	MANUAL	41L780084234A	B	---
2	CD ROM	70G2000508NMV	B	---
2	OFFICE LIST	41L780084218A	B	---
3	PE BAG FOR BASE	45L 76 28DE2	---	---
4	PE PAG	45L 88607DE2	---	---
4	EPE COVER	45L 88609 B	B	---
5	BASE	34L1439 NA T	A	Black
5	BASE	34L1439 PL T	B	Black
6	EPS (right)	44L3743 2	---	---
7	EPS (left)	44L3743 1	---	---
8	AUDIO HARM:GOLD FULL	89L 173 56 27	A/B	Black
9	SIGNAL CABLE	89L1738GAA16N	A/B	Black
10	POWER CORD	89L404A18NISN	B	Black
10	POWER CORD	89L402A18NISN	A	Black
11	CARTON	44L3743842 7A	B	Black
11	CARTON	44L3743842 3B	A	Black
12	HANDLE KEYWAY	44LH600 1	---	---
12	HANDLE 1	50L 600 4	---	---
13	CAUTION SHEET	41L7800842 8A	B	---

REVISION HISTORY

Revision	Revision
New Issue (1st Edition) 2004/10/20	

PRINTING THE ELECTRONIC DOCUMENT

The PDF of this service manual is not designed to be printed from cover to cover. The pages vary in size, and must therefore be printed in sections based on page dimensions.

NON-SCHEMATIC PAGES

Data that does NOT INCLUDE schematic diagrams are formatted to 8.5 x 11 inches and can be printed on standard letter-size and/or A4-sized paper.

SCHEMATIC DIAGRAMS

The schematic diagram pages are provided in two ways, full size and tiled. The full-sized schematic diagrams are formatted on paper sizes between 8.5" x 11" and 18" x 30" depending upon each individual diagram size. Those diagrams that are LARGER than 11" x 17" in full-size mode have been tiled for your convience and can be printed on standard 11" x 17" (tabloid-size) paper, and reassembled.

TO PRINT FULL SIZE SCHEMATIC DIAGRAMS

If you have access to a large paper plotter or printer capable of outputting the full-sized diagrams, output as follows:

1) Note the page size(s) of the schematics you want to output as indicated in the middle window at the bottom of the viewing screen.

2) Go to the File menu and select Print Set-up. Choose the printer name and driver for your large format printer. Confirm that the printer settings are set to output the indicated page size or larger.

3) Close the Print Set Up screen and return to the File menu. Select "Print..." Input the page number of the schematic(s) you want to print in the print range window. Choose OK.

TO PRINT TILED VERSION OF SCHEMATICS

Schematic pages that are larger than 11" x 17" full-size are provided in a 11" x 17" printable tiled format near the end of the document. These can be printed to tabloid-sized paper and assembled to full-size for easy viewing.

If you have access to a printer capable of outputting the tabloid size (11" x 17") paper, then output the tiled version of the diagram as follows:

1) Note the page number(s) of the schematics you want to output as indicated in the middle window at the bottom of the viewing screen.

2) Go to the File menu and select Print Set-up. Choose the printer name and driver for your printer. Confirm that the plotter settings are set to output 11" x 17", or tabloid size paper in landscape ( ) mode.

3) Close the Print Set Up screen and return to the File menu. Select "Print..." Input the page number of the schematic(s) you want to print in the print range window. Choose OK.

TO PRINT SPECIFIC SECTIONS OF A SCHEMATIC

To print just a particular section of a PDF, rather than a full page, access the Graphics Select tool in the Acrobat Reader tool bar.

1) To view the Graphics Select Tool, press and HOLD the mouse button over the Text Select Tool which looks like:
This tool will expand to reveal to additional tools.
Choose the Graphics Select tool by placing the cursor over the button on of the far right that looks like:

2) After selecting the Graphics Select Tool, place your cursor in the document window and the cursor will change to a plus (+) symbol. Click and drag the cursor over the area you want to print. When you release the mouse button, a marquee (or dotted lined box) will be displayed outlining the area you selected.

3) With the marquee in place, go to the file menu and select the "Print..." option. When the print window appears, choose the option under the section called "Print Range" which says "Selected Graphic".

Select OK and the output will print only the area that you outlined with the marquee.