

# NEC

PART NO. 599910742

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# SERVICE MANUAL

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COLOR MONITOR  
**MultiSync<sup>®</sup> LCD1970NX**

**MODEL      LCD1970NX (B) / (C)  
                 LCD1970NX-BK (B) / (C)**

1st Edition

NEC-MITSUBISHI ELECTRIC VISUAL SYSTEMS CORPORATION

NOVEMBER 2004

200412  
08RJ1LBY    08RJ2LBY  
08RJ1LCY    08RJ2LCY



## 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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# User's Manual

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## *MultiSync LCD1970V* *MultiSync LCD1970NX*

User's Manual

# NEC

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|--|
| <b>WARNING</b>   |
| <div style="display: flex; justify-content: space-between;"> <div style="text-align: center;"> <p><b>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.</b></p> <p>REFRAIN FROM OPENING THE CABINET AS THERE ARE HIGH VOLTAGE COMPONENTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.</p> </div> </div> |

|   |
|---|
| <b>CAUTION</b>  |
| <div style="display: flex; justify-content: space-between;"> <div style="text-align: center;"> <p><b>CAUTION:</b> 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.</p> </div> </div> <p style="margin-top: 10px;">  This symbol warns user that uninsulated voltage within the unit may have sufficient magnitude to cause electric shock. Therefore, it is dangerous to make any kind of contact with any part inside this unit.         </p> <p style="margin-top: 10px;">  This symbol alerts the user that important literature concerning the operation and maintenance of this unit has been included. Therefore, it should be read carefully in order to avoid any problems.         </p> |

**Caution:**

When operating the MultiSync LCD1970V/MultiSync LCD1970NX 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.

When operating the MultiSync LCD1970V/MultiSync LCD1970NX with a 220-240V AC power source in Australia, use the power cord provided with the monitor. 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  |  |
|--|--|
| <p>We hereby certify that the colour monitor<br/>MultiSync LCD1970V (L194RK)/MultiSync<br/>LCD1970NX (L194RH) are in compliance with</p> <p>Council Directive 73/23/EEC:<br/>– EN 60950-1</p> <p>Council Directive 89/336/EEC:<br/>– EN 55022<br/>– EN 61000-3-2<br/>– EN 61000-3-3<br/>– EN 55024</p> | <p style="text-align: center;">and marked with</p> <div style="text-align: center; font-size: 2em; font-weight: bold; margin: 10px 0;">CE</div> <p style="text-align: center;">NEC-Mitsubishi Electric Visual<br/>Systems Corporation<br/>4-13-23, Shibaura,<br/>Minato-Ku<br/>Tokyo 108-0023, Japan</p> |



Windows is a registered trademark of Microsoft Corporation. NEC is a registered trademark of NEC Corporation. ENERGY STAR is a U.S. registered trademark.

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ErgoDesign is a registered trademark of NEC-Mitsubishi Electric Visual Systems Corporation in Austria, Benelux, Denmark, France, Germany, Italy, Norway, Spain, Sweden and U.K.

NaViSet is a trademark of NEC-Mitsubishi Electronics Display Europe GmbH in the countries of EU and Switzerland.

MultiSync is a registered trademark of NEC-Mitsubishi Electric Visual Systems Corporation in the countries of U.K., Italy, Austria, Netherlands, Switzerland, Sweden, Spain, Denmark, Germany, Norway and Finland.

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.

# Canadian Department of Communications Compliance Statement

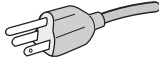
**DOC:** This Class B digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

**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 MultiSync LCD1970V (L194RK)/MultiSync LCD1970NX (L194RH) 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<br>Length<br>Plug shape | Non shield type, 3-conductor<br>2.0 m<br><br>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.

|                                |   |
|--------------------------------|---|
| <b>U.S. Responsible Party:</b> | <b>NEC-Mitsubishi Electronics Display of America, Inc.</b>  |
| <b>Address:</b>                | <b>500 Park Blvd, Suite 1100<br/>Itasca, Illinois 60143</b> |
| <b>Tel. No.:</b>               | <b>(630) 467-3000</b>                                       |

Type of Product: Display Monitor

Equipment Classification: Class B Peripheral

Model: MultiSync LCD1970V (L194RK)/MultiSync LCD1970NX (L194RH)



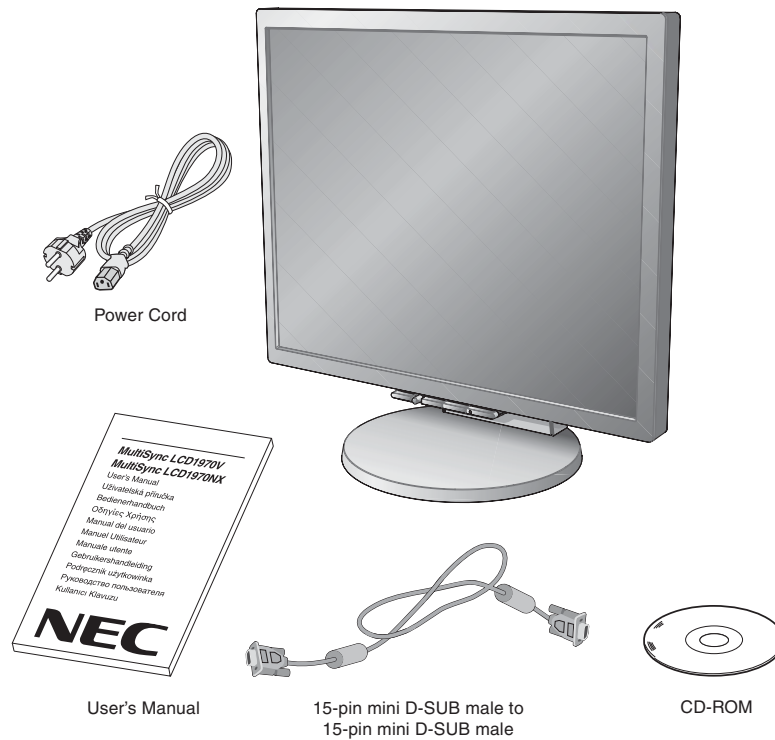
*We hereby declare that the equipment specified above conforms to the technical standards as specified in the FCC Rules.*

English-2

# Contents

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

- MultiSync LCD monitor with tilt/swivel/height adjust stand
- Power Cord
- Video Signal Cable (15-pin mini D-SUB male to 15-pin mini D-SUB male)
- User's Manual
- CD ROM (includes complete User's Manual in PDF format).  
To see the User's Manual, Acrobat Reader 4.0 or higher must be installed on your PC.



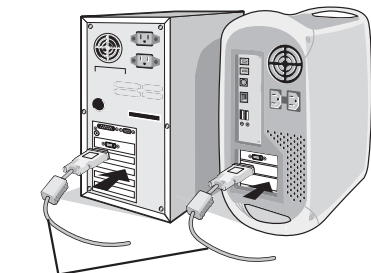
\* Remember to save your original box and packing material to transport or ship the monitor.



# Quick Start

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

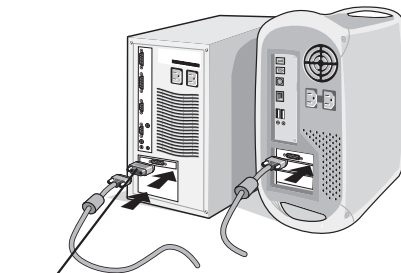
1. Turn off the power to your computer.
2. **For the PC or MAC with DVI digital output (NX only):** Connect the DVI signal cable (not included) to the connector of the display card in your system (**Figure A.1**). Tighten all screws.  
**For the PC with Analog output:** Connect the 15-pin mini D-SUB signal cable to the connector of the display card in your system (**Figure A.2**). Tighten all screws.  
**For the MAC:** Connect the Macintosh cable adapter to the computer, then attach the 15-pin mini D-SUB signal cable to the Macintosh cable adapter (**Figure B.1**). Tighten all screws.



DVI signal cable (not included) **Figure A.1**



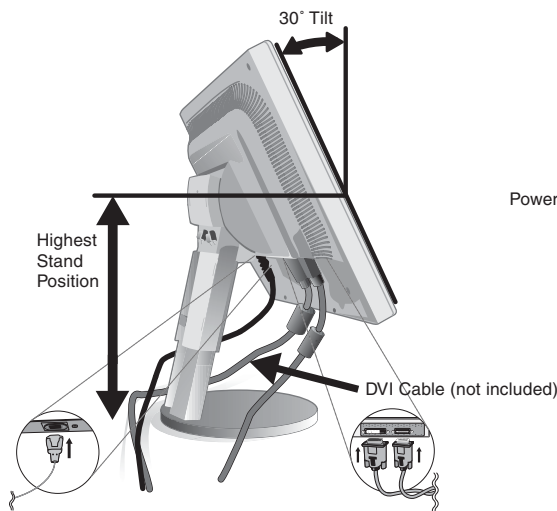
**Figure A.2**



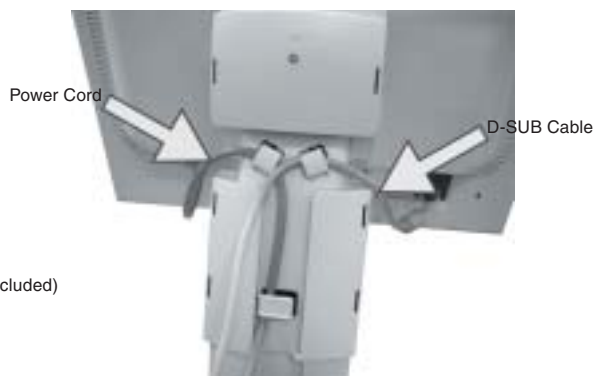
Macintosh Cable Adapter (not included) **Figure B.1**

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

3. Place hands on each side of the monitor to tilt the LCD panel 30-degree angle and lift up to the highest position (**Figure C.1**).
4. Connect all cables to the appropriate connectors (**Figure C.1**).
5. Place power cord into the specific hooks indicated in **Figure C.2**.
6. Place the D-Sub into the specific hooks indicated in **Figure C.2**.



**Figure C.1**



**Figure C.2**

- 7. Place the DVI cable into the specific hooks indicated in **Figure C.3**.
- 8. Make sure all cables are resting flat against the stand (**Figure C.3**).

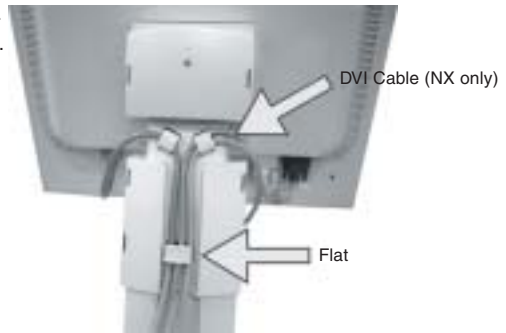


Figure C.3

- 9. Hold the all cables firmly and place the cable cover onto the stand (**Figure D.1**). To remove the cable cover, lift the cover off as shown in **Figure D.2**.

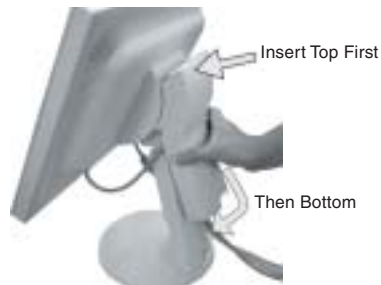


Figure D.1



Figure D.2

- 10. Connect the power cord to the power outlet (**Figure E.1**).

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

- 11. The vacation switch on the back side of the monitor must be turned on (**Figure E.1**). Turn on the monitor with the front power button and the computer.

**NOTE:** The vacation switch is a true on/off switch. If this switch is on the OFF position, the monitor cannot be turned on using the front button. DO NOT switch on/off repeatedly.

- 12. 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 (Analog input only)
- Auto Adjust (Analog input only)

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

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

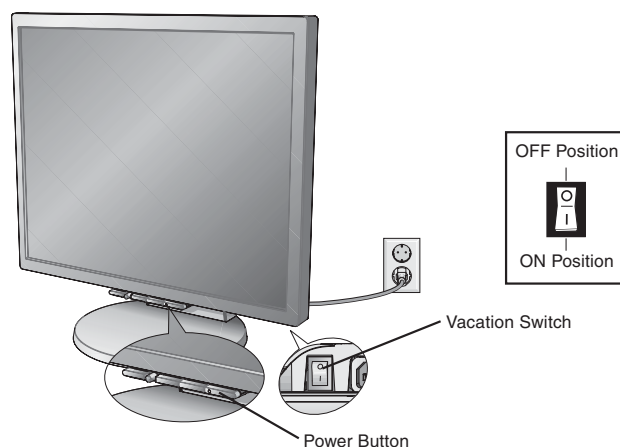
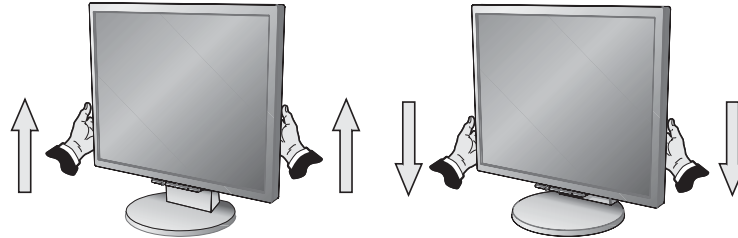


Figure E.1

## Raise and Lower Monitor Screen

The monitor may be raised or lowered. To raise or lower screen, place hands on each side of the monitor and lift or lower to the desired height (**Figure RL.1**).

**NOTE:** Handle with care when raising or lowering the monitor screen.

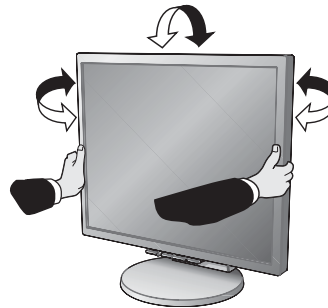


**Figure RL.1**

## Tilt and Swivel

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

**NOTE:** Handle with care when tilting and swivelling the monitor screen.



**Figure TS.1**

## Remove Monitor Stand for Mounting

To prepare the monitor for alternate mounting purposes:

1. Place hands on each side of the monitor and lift up to the highest position. Remove the cable cover (**Figure S.1**).
2. Disconnect all cables.
3. Place monitor face down on a non-abrasive surface (**Figure S.2**).

**NOTE:** Handle with care when monitor facing down, for avoiding the damage to the front buttons.

4. Remove the 2 screws connecting the stand to the monitor (**Figure S.2**).



**Figure S.1**



**Figure S.2**

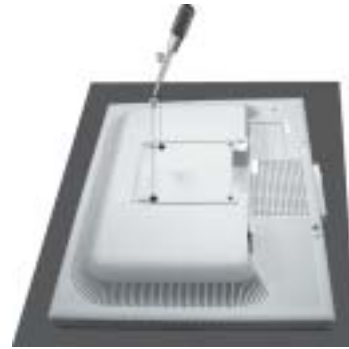
English-6

5. Lift up the stand to unlatch the upper hooks and remove the stand (**Figure S.3**).
6. Remove the 2 screws on the top of the monitor (**Figure S.4**). The monitor is now ready for mounting in an alternate manner.
7. Connect the cables to the back of the monitor.
8. Reverse this process to re-attach stand.

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



**Figure S.3**



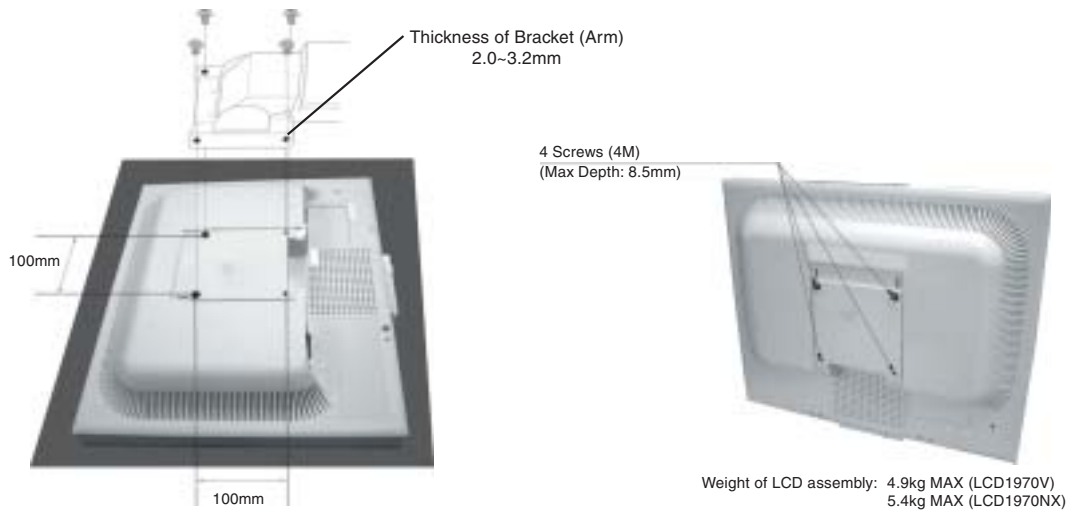
**Figure S.4**

## Flexible Arm Installation

This LCD monitor is designed for use with a flexible arm. To mount the monitor to a flexible arm:

1. Follow the instructions on how Remove Monitor Stand for Mounting to remove the stand.
2. Using the 4 screws from the stand removal and attach the arm to the monitor (**Figure F.1**).

**NOTE:** The LCD monitor should only be used with an approved arm (e.g. GS mark). 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.



**Figure F.1**

# Controls

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

To access OSM menu, press any of the control buttons (MENU/EXIT, Left, Right, Down, Up).

To change signal input, press the SELECT button (NX only).

To change DV MODE, press the RESET button (NX only).

**NOTE:** OSM must be closed in order to change signal input.



| Button     | Menu  |
|------------|---|
| MENU/EXIT  | Open OSM main menu. Exits the OSM controls. Exits to the OSM main menu.   |
| Left/Right | Moves the highlighted area left/right to select control menus. Moves the bar left/right to increase or decrease the adjustment. |
| Down/Up    | Moves the highlighted area down/up to select one of the controls.   |
| SELECT     | Active Auto Adjust function. Enter the OSM sub menu.  |
| RESET      | Resets the highlighted control menu to the factory setting.   |

**NOTE:** When **RESET** is pressed in the main and sub-menu, a warning window will appear allowing you to cancel the **RESET** function by pressing the MENU/EXIT button.



## Brightness/Contrast Controls

### BRIGHTNESS

Adjusts the overall image and background screen brightness.

### CONTRAST

Adjusts the image brightness in relation to the background.

### DV MODE (NX only)

Allows you to select the suitable setting for Movie, Picture and etc.

### AUTO CONTRAST (Analog input only)

Adjusts the image displayed to optimal settings.



## Auto Adjust (Analog input only)

Automatically adjusts the Image Position, H. Size and Fine settings.



## Image Controls (Analog input only)

### 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 System

**Colour Control System:** Six colour presets select the desired colour setting (sRGB and NATIVE colour presets are standard and cannot be changed).

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

**NATIVE:** Original colour presented by the LCD panel that is unadjustable.

**sRGB:** sRGB mode dramatically improves the colour fidelity in the desktop environment by a single standard RGB colour space. With this colour supported environment, the operator could easily and confidently communicate colour without further colour management overhead in the most common situations.



## Tools

**OFF TIMER:** Monitor will automatically power-down when the end user has selected a predetermined amount of time.

**HOT KEY:** You can adjust the brightness and contrast directly. When this function is set to ON, you can adjust the brightness with left or right control and contrast with up or down control while the OSM menu is off.

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



## Menu Tools

**LANGUAGE:** OSM control menus are available in eight languages.

**OSM LEFT/RIGHT:** You can choose where you would like the OSM control image to appear horizontally on your screen.

**OSM DOWN/UP:** You can choose where you would like the OSM control image to appear vertically on your screen.

**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.

**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 controls are locked out. To activate the OSM Lock Out function, press SELECT, then right control button and hold down simultaneously. To deactivate the OSM Lock Out, press SELECT, then left control button and hold down simultaneously while in the OSM menu.

**RESOLUTION NOTIFIER:** This optimal resolution is 1280 x 1024. If ON is selected, a message will appear on the screen after 30 seconds, notifying you that the resolution is not at 1280 x 1024.



## Information

The Information menu indicates the current input, display resolution, horizontal and vertical frequency, and polarity settings of the monitor. The model and serial numbers of your monitor are also indicated.

## OSM Warning

OSM Warning menus disappear with Exit button.

**NO SIGNAL:** This function gives a warning when there is no Horizontal or Vertical Sync. After power is turned on or when there is a change of input signal, 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 Menu Tools.

**OUT OF RANGE:** When input signal is non-supported timing or the video signal doesn't have proper timing, the **Out of Range** menu will appear.

# Recommended use

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## Safety Precautions and Maintenance




FOR OPTIMUM PERFORMANCE, PLEASE NOTE  
THE FOLLOWING WHEN SETTING UP AND USING  
THE MULTISYNC 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.
- 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:

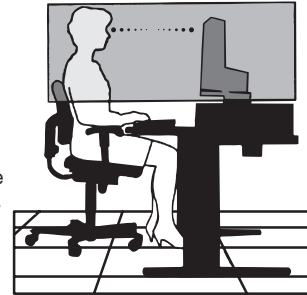
- When the power supply cord or plug is damaged.
  - If liquid has been spilled, or objects have fallen into the monitor.
  - If the monitor has been exposed to rain or water.
  - If the monitor has been dropped or the cabinet damaged.
  - If the monitor does not operate normally by following operating instructions.
  - If glass is broken, handle with care.
  - If monitor or glass 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:** Please be aware that LCD Technology may experience a phenomenon known as Image Persistence. Image Persistence occurs 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 displaying moving images and 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 20 feet away. Blink often.
- Position the monitor at a 90° angle to windows and other light sources to minimize glare and reflections. Adjust the monitor tilt so that ceiling lights do not reflect on your screen.
- If reflected light makes it hard for you to see your screen, use an anti-glare filter.
- 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:

- Adjust the Brightness until the background raster disappears.
- Do not position the Contrast control to its maximum setting.
- 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.

### Cleaning the LCD Panel

- When the liquid crystal panel is stained with dust or dirt, please wipe with soft cloth gently.
- Please do not rub the LCD panel with hard material.
- Please do not apply pressure to the LCD surface.
- Please do not use OA cleaner it will cause deterioration or discolor on the LCD surface.

### Cleaning the Cabinet

- Unplug the power supply
- Gently wipe the cabinet with a soft cloth
- To clean the cabinet, dampen the cloth with a neutral detergent and water, wipe the cabinet and follow with a dry cloth.

**NOTE:** Many plastics are used on the surface of the cabinet. DO NOT clean with benzene, thinner, alkaline detergent, alcoholic system detergent, glass cleaner, wax, polish cleaner, soap powder, or insecticide. Do not touch rubber or vinyl to the cabinet for a long time. These types of fluids and fabrics can cause the paint to deteriorate, crack or peel.



# Specifications for LCD1970V

| Monitor Specifications                         | MultiSync LCD1970V Monitor   | Notes   |
|--|--|---|
| LCD Module                                     | Diagonal: 48.2 cm/19.0 inches<br>Viewable Image Size: 48.2 cm/19.0 inches<br>Native Resolution (Pixel Count): 1280 x 1024  | Active matrix; thin film transistor (TFT) liquid crystal display (LCD); 0.294 mm dot pitch; 250 cd/m <sup>2</sup> white luminance; 450:1 contrast ratio, typical. |
| Input Signal                                   | Video: ANALOG 0.7 Vp-p/75 Ohms<br>Sync: Separate sync.TTL Level<br>Horizontal sync. Positive/Negative<br>Vertical sync. Positive/Negative<br>Composite sync. Positive/Negative* <sup>2</sup><br>Sync on Green (Video 0.7 Vp-p and Sync. 0.3 Vp-p)* <sup>2</sup>                      |   |
| Display Colours                                | 16,777,216   | Depends on display card used.   |
| Synchronization Range                          | Horizontal: 31.5 kHz to 81.1 kHz<br>Vertical: 56.0 Hz to 75.0 Hz   | Automatically<br>Automatically  |
| Viewing Angle                                  | Left/Right: 80°/80° (CR > 5)<br>Up/Down: 80°/80° (CR > 5)  |   |
| Resolutions Supported                          | 720 x 400* <sup>1</sup> : VGA-Text<br>640 x 480* <sup>1</sup> at 60 Hz to 75 Hz<br>800 x 600* <sup>1</sup> at 56 Hz to 75 Hz<br>832 x 624* <sup>1</sup> at 75 Hz<br>1024 x 768* <sup>1</sup> at 60 Hz to 75 Hz<br>1152 x 870* <sup>1</sup> at 75 Hz<br>1280 x 1024 at 60 Hz to 75 Hz | Some systems may not support all modes listed.<br><br>NEC-Mitsubishi Electronics Display cites recommended resolution at 60 Hz for optimal display performance.   |
| Active Display Area                            | Horizontal: 376.3 mm/14.8 inches<br>Vertical: 301.1 mm/11.9 inches   |   |
| Power Supply                                   | AC 100-240V ~ 50/60Hz  |   |
| Power Consumption (without optional Sound Bar) | 36W (typ)  |   |
| Current Rating                                 | 0.65-0.35A   |   |
| Dimensions                                     | 412.5 mm (W) x 386.5-496.5 mm (H) x 220.0 mm (D)<br>16.2 inches (W) x 15.2-19.5 inches (H) x 8.7 inches (D)  |   |
| Weight   | 7.0 kg (15.4 lbs)  |   |
| Environmental Considerations                   | Operating Temperature: 5°C to 35°C/41°F to 95°F<br>Humidity: 30% to 80%<br>Feet: 0 to 10,000 Feet<br>Storage Temperature: -10°C to 60°C/14°F to 140°F<br>Humidity: 10% to 85%<br>Feet: 0 to 30,000 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.

\*2 If your display is not showing a picture of the SOG and Composite Sync. Signal, please contact our hotline for further assistance.

**NOTE:** Technical specifications are subject to change without notice.

# Specifications for LCD1970NX

| Monitor Specifications                         |  | MultiSync LCD1970NX Monitor  | Notes   |
|--|--|--|---|
| LCD Module                                     | Diagonal:<br>Viewable Image Size:<br>Native Resolution (Pixel Count):                      | 48.2 cm/19.0 inches<br>48.2 cm/19.0 inches<br>1280 x 1024  | Active matrix; thin film transistor (TFT) liquid crystal display (LCD); 0.294 mm dot pitch; 250 cd/m <sup>2</sup> white luminance; 500:1 contrast ratio, typical. |
| Input Signal                                   | Video:<br>Sync:  | ANALOG 0.7 Vp-p/75 Ohms<br>Separate sync.TTL Level<br>Horizontal sync. Positive/Negative<br>Vertical sync. Positive/Negative<br>Composite sync. Positive/Negative* <sup>2</sup><br>Sync on Green (Video 0.7 Vp-p and Sync. 0.3 Vp-p)* <sup>2</sup>                                   | Digital Input: DVI  |
| Display Colours                                |  | 16,777,216   | Depends on display card used.   |
| Synchronization Range                          | Horizontal:<br>Vertical:   | 31.5 kHz to 81.1 kHz (Analog)<br>31.5 kHz to 81.1 kHz (Digital)<br>56.0 Hz to 75.0 Hz  | Automatically<br>Automatically<br>Automatically   |
| Viewing Angle                                  | Left/Right:<br>Up/Down:  | 88°/88° (CR > 10)<br>88°/88° (CR > 10)   |   |
| Resolutions Supported                          |  | 720 x 400* <sup>1</sup> : VGA-Text<br>640 x 480* <sup>1</sup> at 60 Hz to 75 Hz<br>800 x 600* <sup>1</sup> at 56 Hz to 75 Hz<br>832 x 624* <sup>1</sup> at 75 Hz<br>1024 x 768* <sup>1</sup> at 60 Hz to 75 Hz<br>1152 x 870* <sup>1</sup> at 75 Hz<br>1280 x 1024 at 60 Hz to 75 Hz | Some systems may not support all modes listed.<br><br>NEC-Mitsubishi Electronics Display cites recommended resolution at 60 Hz for optimal display performance.   |
| Active Display Area                            | Horizontal:<br>Vertical:   | 376.3 mm/14.8 inches<br>301.1 mm/11.9 inches   |   |
| Power Supply                                   |  | AC 100-240V ~ 50/60Hz  |   |
| Power Consumption (without optional Sound Bar) |  | 38W (typ)  |   |
| Current Rating                                 |  | 1.2-0.6A   |   |
| Dimensions                                     |  | 412.5 mm (W) x 386.5-496.5 mm (H) x 220.0 mm (D)<br>16.2 inches (W) x 15.2-19.5 inches (H) x 8.7 inches (D)  |   |
| Weight   |  | 7.5 kg (16.5 lbs)  |   |
| Environmental Considerations                   | Operating Temperature:<br>Humidity:<br>Feet:<br>Storage Temperature:<br>Humidity:<br>Feet: | 5°C to 35°C/41°F to 95°F<br>30% to 80%<br>0 to 10,000 Feet<br>-10°C to 60°C/14°F to 140°F<br>10% to 85%<br>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.

\*2 If your display is not showing a picture of the SOG and Composite Sync. Signal, please contact our hotline for further assistance.

**NOTE:** Technical specifications are subject to change without notice.

# Features

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**Thin-frame design** creates more desktop space for you to work and play, while the flat screen's crisp, bright images and crystal-clear text deliver a comfortable viewing experience.

**No Touch Auto Adjust** automatically adjusts your optimal image settings upon initial power-on.

**Colour Control System** allows you to change between six colour settings on your display to match your personal preference.

**Redesigned OSM controls** allow you to quickly and easily adjust all elements of your screen image.

**NaViSet software** offers an expanded and intuitive graphical interface, allowing you to more easily adjust OSM display settings via mouse and keyboard.

**Height adjustable stand with tilt, swivel and cable management** adds flexibility to your viewing preferences.

**The flat screen's crisp, bright images and crystal-clear text** deliver a comfortable viewing experience.

**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 MultiSync 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

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## 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 the Vacation Switch should be in the ON position.
- 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.
- Check the Vacation Switch on the back side of the monitor.

## Image Persistence

- Please be aware that LCD Technology may experience a phenomenon known as Image Persistence. Image Persistence occurs 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 displaying moving images and 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 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 60Hz 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.
- Check the Vacation Switch should be in the ON position.

## 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 vacation switch off and on again.
- Make certain the computer is not in a power-saving mode (touch the keyboard or mouse).

# TCODevelopment



## Congratulations!

The display you have just purchased carries the TCO'03 Displays label. This means that your display is designed, manufactured and tested according to some of the strictest quality and environmental requirements in the world. This makes for a high performance product, designed with the user in focus that also minimizes the impact on our natural environment.

Some of the features of the TCO'03 Display requirements:

### **Ergonomics**

- Good visual ergonomics and image quality in order to improve the working environment for the user and to reduce sight and strain problems. Important parameters are luminance, contrast, resolution, reflectance, colour rendition and image stability.

### **Energy**

- Energy-saving mode after a certain time – beneficial both for the user and the environment
- Electrical safety

### **Emissions**

- Electromagnetic fields
- Noise emissions

### **Ecology**

- The product must be prepared for recycling and the manufacturer must have a certified environmental management system such as EMAS or ISO 14 001.
- Restrictions on:
  - chlorinated and brominated flame retardants and polymers
  - heavy metals such as cadmium, mercury and lead.

The requirements included in this label have been developed by TCO Development in co-operation with scientists, experts, users as well as manufacturers all over the world. Since the end of the 1980s TCO has been involved in influencing the development of IT equipment in a more user-friendly direction. Our labelling system started with displays in 1992 and is now requested by users and IT-manufacturers all over the world.

For more information, please visit  
**[www.tcodevelopment.com](http://www.tcodevelopment.com)**

English-16

## Manufacturer's Recycling and Energy Information

NEC-Mitsubishi Electric Visual Systems Corp. is strongly committed to environmental protection and sees recycling as one of the company's top priorities in trying to minimize the burden placed on the environment. We are engaged in developing environmentally-friendly products, and always strive to help define and comply with the latest independent standards from agencies such as ISO (International Organisation for Standardization) and TCO (Swedish Trades Union).

For more information, and for help in recycling your old NEC or Mitsubishi monitors, please visit our website at

<http://www.nec-mitsubishi.com> (in Europe) or

<http://www.nmv.co.jp/environment> (in Japan) or

<http://www.necmitsubishi.com/markets-solutions/totaltrade> (in USA).

Country-specific recycling programmes can also be found at:

Sweden - <http://www.el-retur.se>

Germany - <http://www.recyclingpartner.de/>

Holland - <http://www.mirec.nl/>

Japan - <http://www.diarcs.com/>

### Energy saving:

This monitor features an advanced energy saving capability. When a VESA Display Power Management Signaling (DPMS) Standard signal is sent to the monitor, the Energy Saving mode is activated. The monitor enters a single Energy Saving mode.

#### LCD1970V

| Mode               | Power consumption | LED colour |
|--------------------|-------------------|------------|
| Normal Operation   | Approx. 36W       | Green      |
| Energy Saving Mode | Less than 2W      | Amber      |
| Off Mode           | Less than 1W      | Unlit      |

#### LCD1970NX

| Mode               | Power consumption | LED colour |
|--------------------|-------------------|------------|
| Normal Operation   | Approx. 38W       | Green      |
| Energy Saving Mode | Less than 2W      | Amber      |
| Off Mode           | Less than 1W      | Unlit      |

# Serial Number Information

Refer to the serial number information shown below.

EX.) SERIAL NUMBER LABEL

|  |
|--|
| <p>Model Name : LCD1970NX<br/>         LCD1970NX-BK</p> <p>SERIAL NO. : <input style="width: 100px; height: 20px;" type="text"/></p> |
|--|

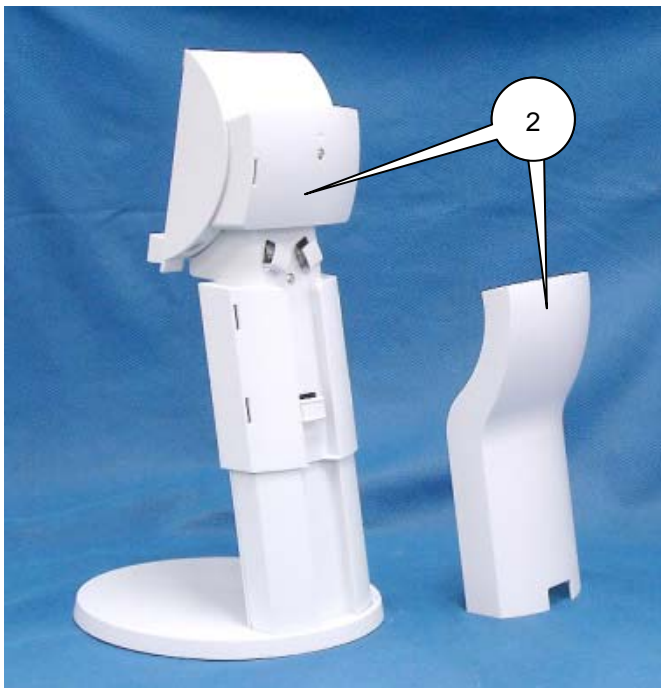


|   |  |
|---|--|
| <p><b>Manufactured Year :</b> _____<br/>         ( Last digit )</p> <p><b>Manufactured Month :</b> _____</p> <p>January to September    1 to    9<br/>         October                                  X<br/>         November                                Y<br/>         December                                Z</p> <p><b>Classification code :</b> _____</p> <p>Discriminate by cabinet color<br/>         White :                    0<br/>         Black :                    1</p> <p><b>Running number :</b> _____</p> <p>Note : This running number doesn't reset at each month.<br/>         (Example)<br/>         Jan.: 00001, 00002, 00003, ....., 01234,<br/>         Feb.: 01235, 01236, 01237, ....., 99999, 00001,<br/>         Mar.: 00002, 00003, 00004, .....</p> <p><b>Factory Code:</b> _____</p> <p>NPG China factory :    Y</p> <p><b>Control Code:</b> _____</p> <p>For B ver. (Europe) :    B<br/>         For C ver. (China) :    C</p> | <div style="border-bottom: 1px solid black; height: 20px; width: 100%;"></div> <div style="border-left: 1px solid black; border-right: 1px solid black; border-bottom: 1px solid black; height: 300px; width: 50%;"></div> <div style="border-left: 1px solid black; border-right: 1px solid black; border-bottom: 1px solid black; height: 300px; width: 50%;"></div> |
|---|--|

# DISASSEMBLY

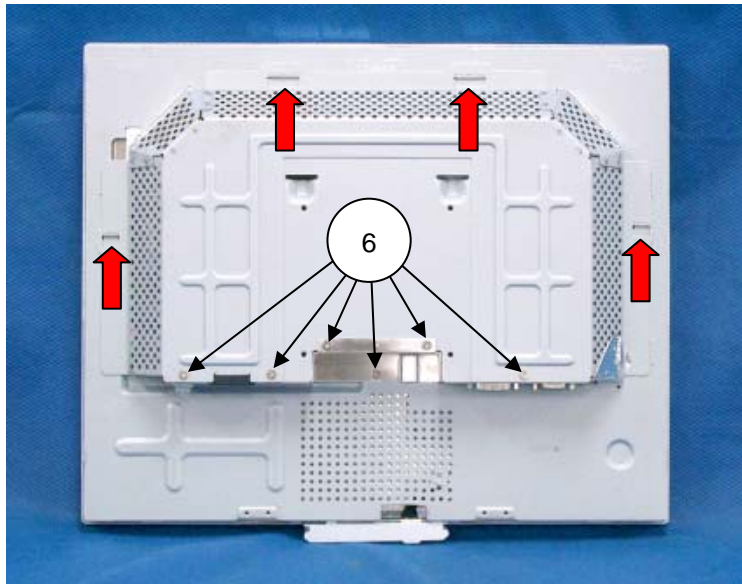
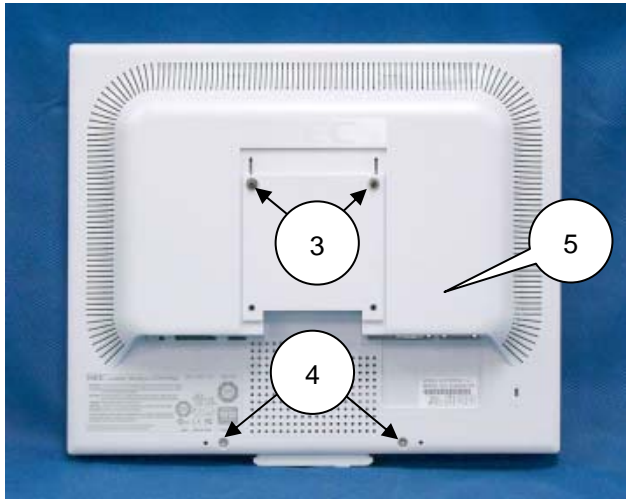
- Before you disassemble the set, turn off power and pull out the power plug.
- Use the proper screwdriver. If oversize or undersize screwdriver is used, screws may be damaged.
- Assembly is the opposite process of disassembly.

| Symbol | For Europe<br>(NPG Part Number) | For China<br>(NMV Part Number) | Description         | Cabinet<br>Color | Version |
|--------|---------------------------------|--------------------------------|---------------------|------------------|---------|
| 1      | 14300471                        | ---                            | SC,PL-CPIMS4*16*3K  | ---              | B / C   |
| 2      | 14900211                        | 79PQ7860                       | STAND UNIT L194R WH | White            | B / C   |
| 2      | 14900221                        | 79PQ7861                       | STAND UNIT L194R BK | Black            | B / C   |

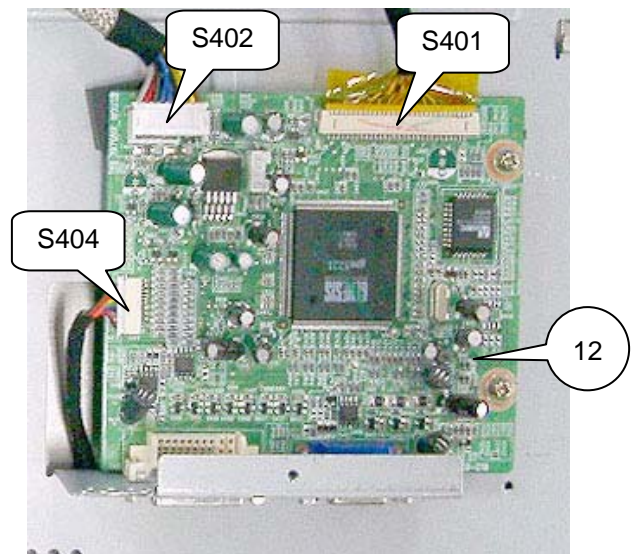
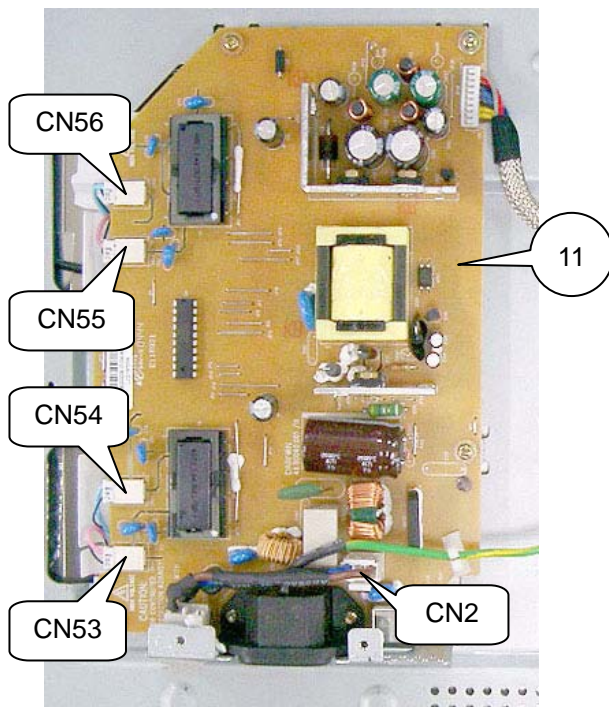
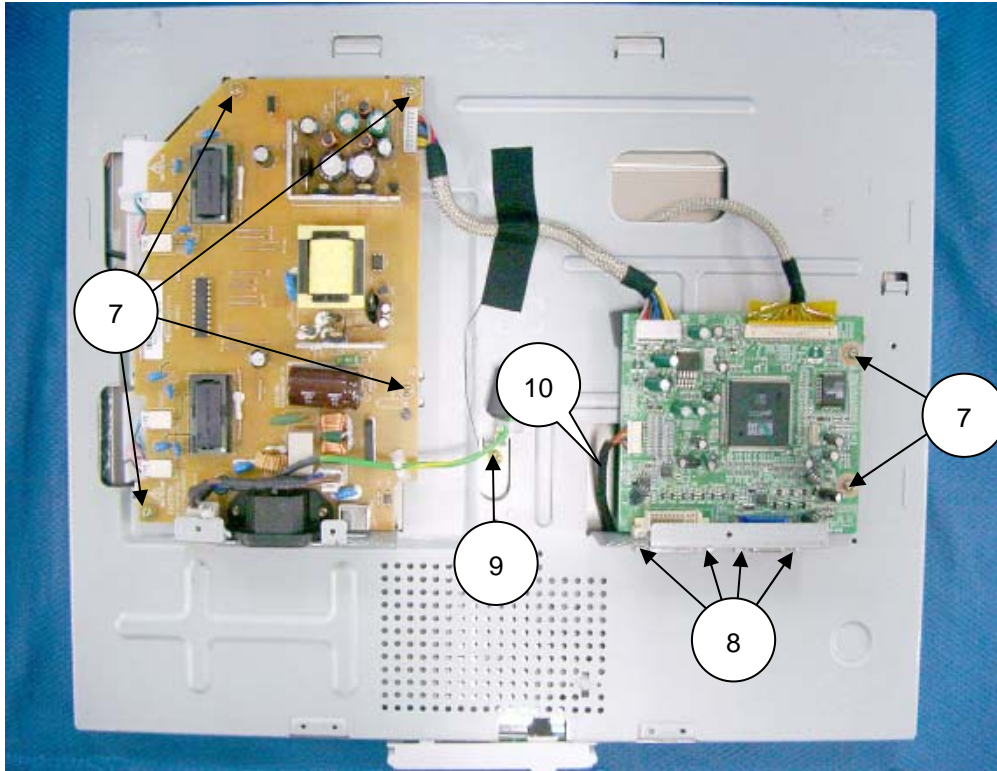




| Symbol | For Europe<br>(NPG Part Number) | For China<br>(NMV Part Number) | Description         | Cabinet<br>Color | Version |
|--------|---------------------------------|--------------------------------|---------------------|------------------|---------|
| 3      | 14300471                        | ---                            | SC,PL-CPIMS4*16*3K  | ---              | B / C   |
| 4      | 14300271                        | ---                            | P3X8 ML(IN)         | White            | B / C   |
| 4      | 14300311                        | ---                            | P3.0*8 MC(ZN)       | Black            | B / C   |
| 5      | 10107361                        | 79PQ7832                       | BACK L194RJ (N) WH  | White            | B / C   |
| 5      | 10107371                        | 79PQ7833                       | BACK L194RJ (N) BK  | Black            | B / C   |
| 6      | 14300801                        | ---                            | SC #3FSUSMS*3*6*15K | ---              | B / C   |

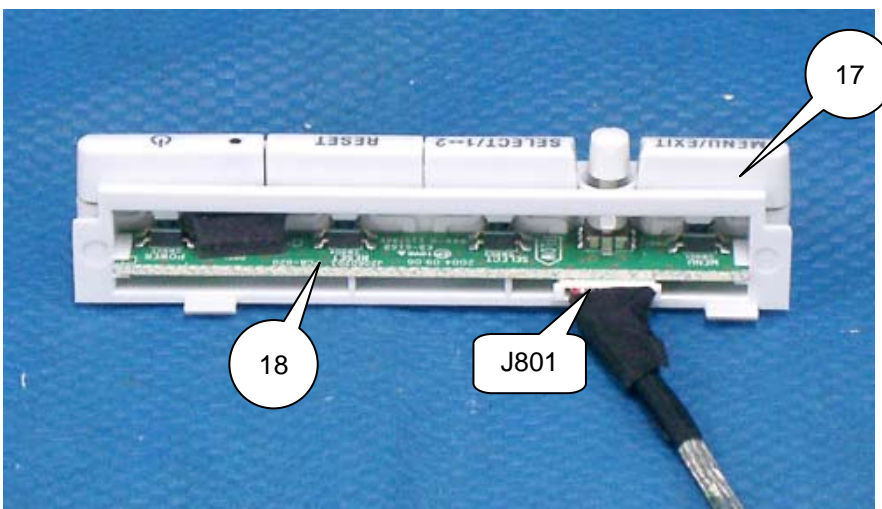
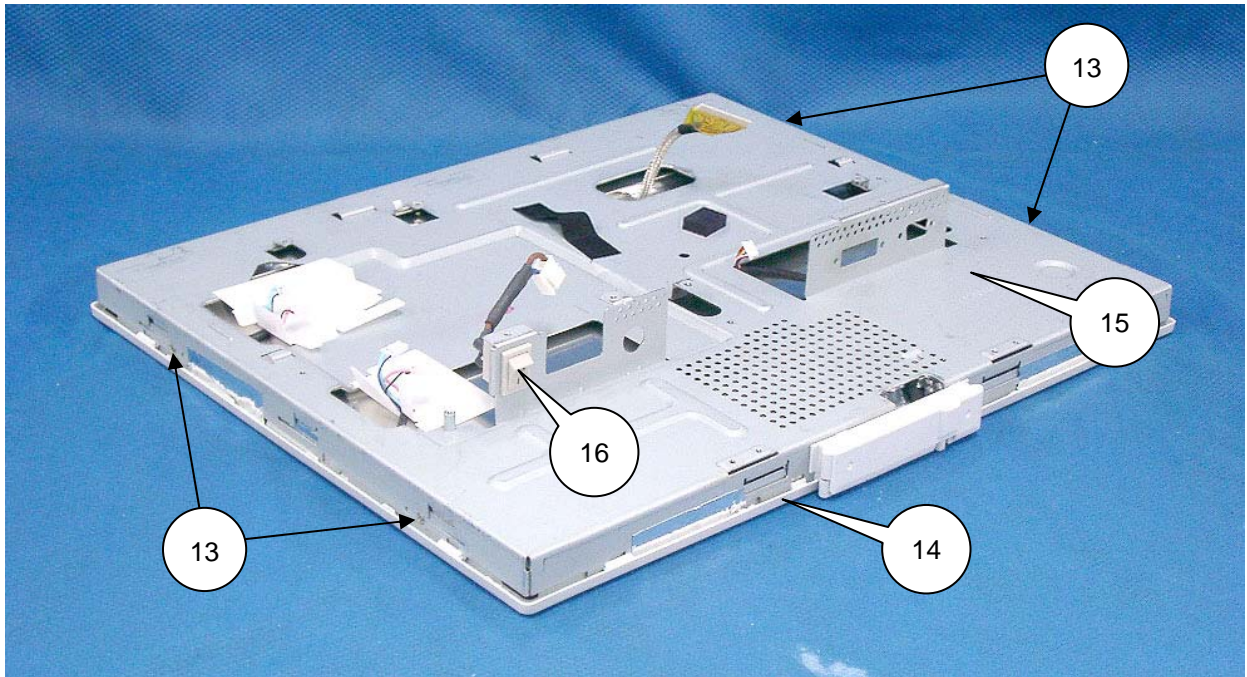


| Symbol | For Europe<br>(NPG Part Number) | For China<br>(NMV Part Number) | Description              | Cabinet<br>Color | Version |
|--------|---------------------------------|--------------------------------|--------------------------|------------------|---------|
| 7      | 14000121                        | ---                            | SCREW (CUP)3x8x15BF      | ---              | B / C   |
| 8      | 14300201                        | ---                            | SCREW 4#-40Tx4.8HLx4HLx5 | ---              | B / C   |
| 9      | 14000491                        | ---                            | SC,CBIPSx4x8x15B         | ---              | B / C   |
| 10     | R3201481                        | 79PQ7825                       | WIRE CC12P 1571#30L180   | ---              | B / C   |
| 11     | JM100401                        | 79PQ7815                       | U INVERT-POWER 1970V AU  | ---              | B / C   |
| 12     | AM0RJ1ML                        | 79PQ7808                       | MAIN INSERT ASSY         | ---              | B / C   |

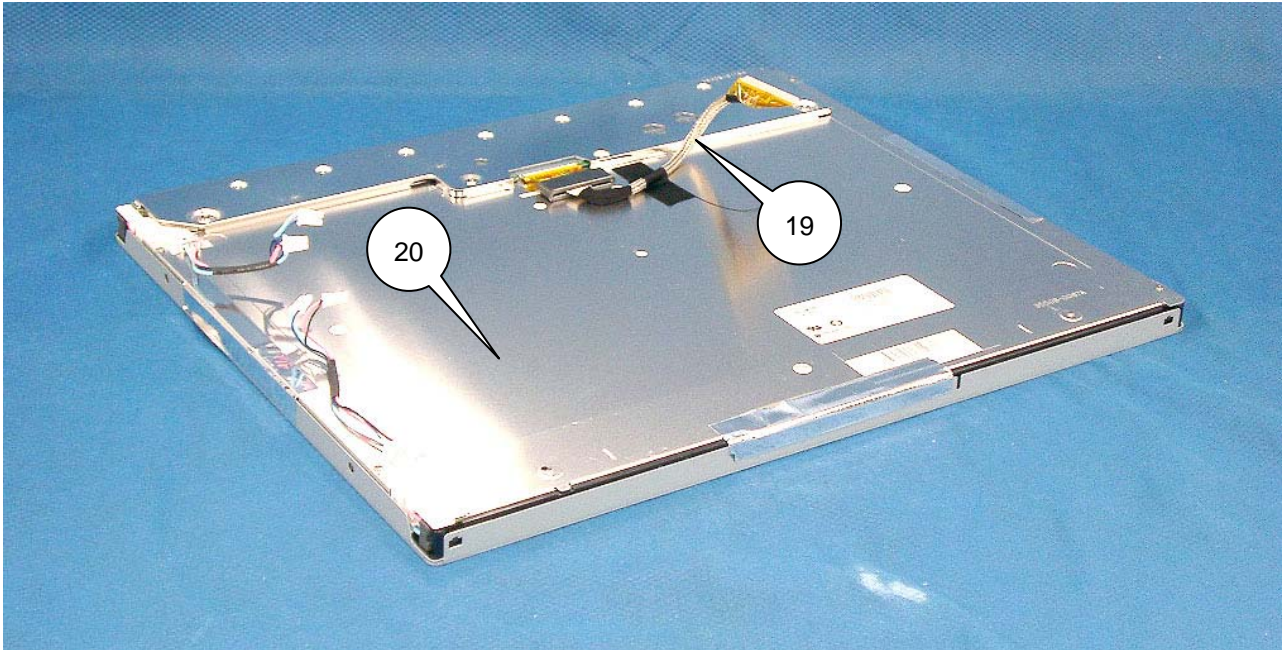




| Symbol | For Europe<br>(NPG Part Number) | For China<br>(NMV Part Number) | Description               | Cabinet<br>Color | Version |
|--------|---------------------------------|--------------------------------|---------------------------|------------------|---------|
| 13     | 14300801                        | ---                            | SC #3FSUSMS*3*6*15K       | ---              | B / C   |
| 14     | 10107611                        | 79PQ7840                       | BEZEL WH(N) BC L194RJ     | White            | B / C   |
| 14     | 10107611                        | ---                            | BEZEL WH(N) BC L194RJ     | Black            | B       |
| 14     | ---                             | 79PQ7842                       | BEZEL BK(N) C L194RJ      | Black            | C       |
| 15     | 12001211                        | 79PQ7855                       | CHASSIS BASE 1970NXH,(LPL | ---              | B / C   |
| 16     | R3900251                        | 79PQ7804                       | WIRE SW 1015#18L60 GRAY   | White            | B / C   |
| 16     | R3900241                        | 79PQ7803                       | WIRE SW 1015#18L60 BLK    | Black            | B / C   |
| 17     | 11700771                        | 79PQ7849                       | COVER UNIT WH L194RJ      | White            | B / C   |
| 17     | 11700781                        | 79PQ7850                       | COVER UNIT BK L194RJ      | Black            | B / C   |
| 18     | AS0RH1ML                        | 79PQ7812                       | SW INSERT ASSY            | ---              | B / C   |



| Symbol | For Europe<br>(NPG Part Number) | For China<br>(NMV Part Number) | Description            | Cabinet<br>Color | Version |
|--------|---------------------------------|--------------------------------|------------------------|------------------|---------|
| 19     | R3201471                        | 79PQ7824                       | WIRE CC30P 1589#30L220 | ---              | B / C   |
| 20     | 3A684091<br>(NMV Part Number)   | 3A684091                       | TFT LM190E02-A4K5      | ---              | B / C   |



# ADJUSTMENT PROCEDURES

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## **1. Application**

This adjustment specification should be applied to the adjustment of the LCD1970NX (L194RJ).

## **2. Adjustment Conditions**

### **2.1 Time for Adjustment**

Adjustments should be made only when the unit is fully assembled.

### **2.2 Measuring Instruments, Jigs, and Tools**

When adjusting the unit, use measurement instruments, jigs, and tools specified below.

- a. Use a signal generator that can produce an all white, or all black screens. Signal timing should be VG-819.

The amplitude of each signal (R, G, B) output should be maintained at  $0.7V_{p-p} \pm 0.05V$  when a load of  $75 \Omega$  is connected.

### **2.3 Power Supply Voltage**

INPUT: 100Vac ~ 240Vac  $\pm 10\%$ , 47~63Hz

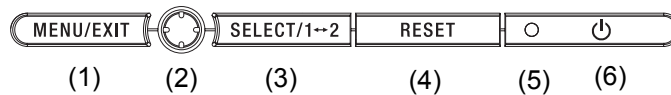
### **2.4 Aging**

Not required.

### 3. Default Setting

| Item         | Condition           |                       |
|--------------|---------------------|-----------------------|
| Power Supply | AC100V~240V         |                       |
| Input Freq.  | 1280×1024@75Hz      |                       |
| OSM Setting  | BRIGHTNESS          | 100%                  |
|              | CONTRAST            | 50%                   |
|              | Color Temp.         | NATIVE                |
|              | OSM TRUN OFF        | 45 sec.               |
|              | OSM LOOK OUT        | NO                    |
|              | Resolution notifier | ON                    |
|              | OFF TIMER           | OFF                   |
|              | OSD/OSM SETTING     | OSM                   |
|              | URL SETTING         | WWW.NECMITSUBISHI.COM |
|              | HOT KEY             | ON                    |
|              | LANGUAGE            | ENGLISH               |

### 4. Basic Operation (Front Control Panel Layouts)



|     | BUTTON                  | MENU   |
|-----|-------------------------|--|
| (1) | MENU/EXIT               | Open OSM main menu. Exits the OSM controls. Exits to the OSM main menu.  |
| (2) | 4 Direction Control Key | Left/Right<br>Moves the highlighted area left/right to select control menus.<br>Moves the bar left/right to increase or decrease the adjustment. |
|     |                         | Down/Up<br>Moves the highlighted area down/up to select one of the controls.   |
| (3) | SELECT/1 ↔ 2            | Active Auto Adjust function. Enter the OSM sub menu.   |
| (4) | RESET                   | Resets the highlighted control menu to the factory setting.  |
| (5) | Power LED               | Power LED, is green when monitor is on; amber when in power saving mode.   |
| (6) | POWER                   | Switch on/off monitor power.   |

## 5. Set Adjustments

### 5.1 Power On

1) Plug the AC power cable into the wall outlet. Then press the POWER key. Confirm that the status LED is amber, and that the OSM [NO SIGNAL] is displayed.

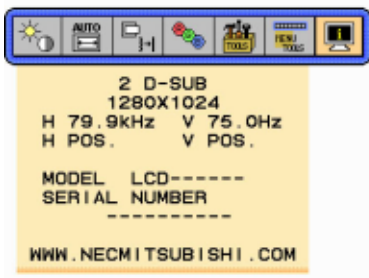
**NOTE:** If the status LED is not amber after the POWER key is pressed check that the power cable is properly connected. If the power cable is properly connected, the POWER key is pressed, and the status LED does not show amber, the unit will require further troubleshooting.

2) Input a signal of 1280 x 1024@75Hz. Confirm that the status LED changes from amber to green.

**NOTE:** If the status LED did not change from amber to green, the unit will require further troubleshooting.

3) Press the "MENU/EXIT" key. Confirm that the OSM is shown on the LCD screen.

#### Information



Indicate the Input signal-timing mode.

Resolution /Frequency

- ▶: Moves the right group icon
- ◀: Moves the left group icon
- ▲: No function
- ▼: No function
- SELECT: No function
- RESET: No function
- EXIT: OSM is close

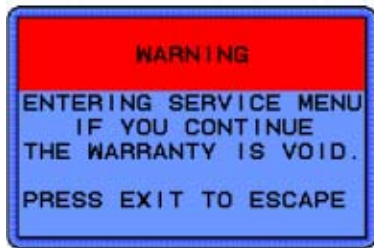
Press, "RESET" + "SELECT" at the same time under the condition of the above OSM to enter Factory mode.



## 5.2 Factory Mode

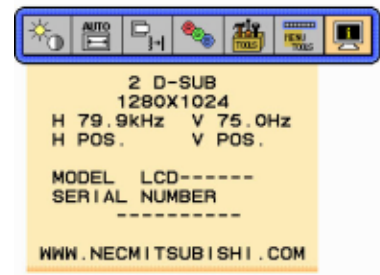
The following pages comprise the Service Menu.

### The Warning Message



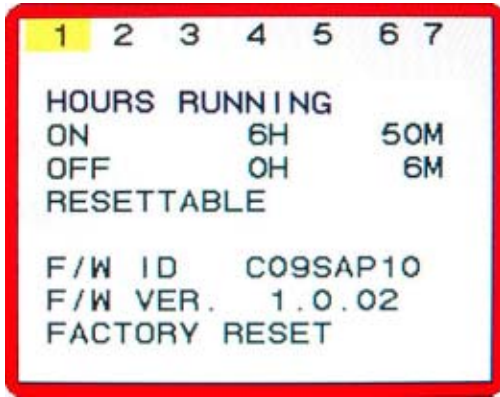
### 5.2.1 How to Enter Service Mode

1. Open Information menu (Signal information).
2. Press "SELECT"+"RESET".
3. The Warning Message will be shown.
4. Then press "Select" to enter the Service Mode.
5. Press, "EXIT" to close OSM menu.



Information Menu

## 5.2.2 How to Use Service Mode



**Page1:** This page is used to check user's HOURS RUNNING and system's total HOURS RUNNING.

1. Press "SELECT" to move cursor on HOURS RUNNING.
2. Press "◀ (LEFT)" + "RESET" at the same time to check HOURS RUNNING.
3. Press "▼ (DOWN)" or "▲ (UP)" to move cursor to FACTORY PRESET.
4. Press, "SELECT" to reset all function to initial status (include user's HOURS RUNNING and AUTO INFORMATION).

### HOURS RUNNING

This Indicates On time and Off mode (power save) time (hours, minutes). There are two timers.

**RESETTABLE:** Display Reset-able timers.

**UNRESETTABLE:** Display Un reset-able timers.

The following key operation changes the timer indication.

Select "HOURS RUNNING".

|  |                               |
|--|-------------------------------|
| Press, "▶ (RIGHT)" + "RESET":              | Display Un reset-able timers. |
| Press, "◀ (LEFT)" + "RESET":               | Display Reset-able timers.    |
| Press, "◀ (LEFT)" + "▶ (RIGHT)" + "RESET": | Timer is cleared              |

The indicated number will change every 5minutes.

|                |          |
|----------------|----------|
| On mode time:  | xxxH xxM |
| Off Mode time: | xxxH xxM |

### F/W ID and F/W VER.

Indicate Firmware ID and Firmware version.

F/W ID (LCD1970NX): C59SLP10

### FACTORY RESET

When the proceed key is pushed during Factory reset, Hours Running and Auto Count is cleared.

|               |     |     |     |   |   |   |
|---------------|-----|-----|-----|---|---|---|
| 1             | 2   | 3   | 4   | 5 | 6 | 7 |
| AUTO CONTRAST |     |     |     |   |   |   |
|               | R   | G   | B   |   |   |   |
| GAIN          | 253 | 255 | 252 |   |   |   |
|               | R   | G   | B   |   |   |   |
| OFFSET1       | 33  | 32  | 28  |   |   |   |
|               | R   | G   | B   |   |   |   |
| OFFSET2       | 52  | 44  | 49  |   |   |   |
|               | R   | G   | B   |   |   |   |
| OFST2CO       | 4   | 4   | 4   |   |   |   |

**Page2:** This page is used to adjust RGB offset, and gain.

### AUTO CONTRAST

A gain, offset1 and offset2 are auto adjusted.

Input frequency: Analog signal, white frame and gray pattern.

1. Press “▼ (DOWN)” or “▲ (UP)” to move cursor to AUTO CONTRAST.
2. Press, “SELECT“ for auto balance.

**GAIN:** The manual adjustment of the gain of analog input each color can be carried out.

**OFFSET1:** The manual adjustment of the preceding stage offset of analog input each color can be carried out.

**OFFSET2:** The manual adjustment of the latter stage offset of analog input each color can be carried out.

**OFST2CO:** Only this value is lowered from OFFSET2 after performing AUTO CONTRAST. (Initial: 4)

|               |   |   |   |   |   |     |
|---------------|---|---|---|---|---|-----|
| 1             | 2 | 3 | 4 | 5 | 6 | 7   |
| AUTO CONTRAST |   |   |   |   |   | 13  |
| AUTO ADJUST   |   |   |   |   |   | 4   |
| BRIGHT MAX    |   |   |   |   |   | 255 |
| BRIGHT MIN    |   |   |   |   |   | 52  |
| PWM0 FRQ      |   |   |   |   |   | 35  |

**Page3:**

**AUTO CONTRAST:** No. of auto-contrast control trials conducted by the user.  
\* This value can be reset by factory preset in the service menu.

**AUTO ADJUST:** No. of auto-adjustment trials conducted by the user.  
\* This value can be reset by factory preset in the service menu.

**BRIGHT MAX:** Brightness control Max. (Initial: 255)

**BRIGHT MIN:** Brightness control Min. (Initial: 52)

**PWM0 FRQ:** Backlight brightness control frequency it decides by the multiple of this figure and a vertical synchronization signal. (Initial: 35 = 3.5 times)

| 1          | 2 | 3 | 4 | 5 | 6 | 7 |
|------------|---|---|---|---|---|---|
| OSD DESIGN |   |   |   |   |   | 0 |
| OSD SELECT |   |   |   |   |   | 0 |
| URL        |   |   |   |   |   | 1 |
| EDID WP    |   |   |   |   |   | 0 |

**Page4:**

**OSD DESIGN:** It does not operate.

**OSD SELECT:** The OSD/OSM display is modified for the OSD user menu.

0: OSD: (Japanese destination)

1: OSM: Setting for shipment (overseas destination) (setting for shipment)

**URL:** Display/non-display of the Internet address is modified for MONITOR INFO.

0: No displayed

1: Display: WWW.NECMITSUBISHI.COM (overseas destination) (setting for shipment)

2: Display: WWW.NMV.CO.JP (Japanese destination)

**EDID WP:** EDID write-protected function is changed.

0: Enable

1: Disable (Setting for shipment)

|    |        |      |   |   |   |   |
|----|--------|------|---|---|---|---|
| 1  | 2      | 3    | 4 | 5 | 6 | 7 |
| CS | SAMPLE | COMP |   |   |   | 3 |
| CS | SAMPLE | SOG  |   |   |   | 3 |

**Page5:**

**CS SAMPLE COMP:** The position that detects the synchronized signal of a composite signal is adjusted.

0: A synchronized signal is detected in a 2/8 level synchronous position.

1: A synchronized signal is detected in a 3/8 level synchronous position.

2: A synchronized signal is detected in a 4/8 level synchronous position.

3: A synchronized signal is detected in a 5/8 level synchronous position. (Setting for shipment)

**CS SAMPLE SOG:** The position that detects the synchronized signal of sync on green signal is adjusted.

0: A synchronized signal is detected in a 2/8 level synchronous position.

1: A synchronized signal is detected in a 3/8 level synchronous position.

2: A synchronized signal is detected in a 4/8 level synchronous position.

3: A synchronized signal is detected in a 5/8 level synchronous position. (Setting for shipment)

|   |      |          |       |   |   |   |
|---|------|----------|-------|---|---|---|
| 1 | 2    | 3        | 4     | 5 | 6 | 7 |
| H | FREQ | STABLE   |       |   |   | 2 |
| V | FREQ | STABLE   |       |   |   | 1 |
|   |      | STABLE   | COUNT |   |   | 4 |
| H | FREQ | UNSTABLE |       |   |   | 2 |
| V | FREQ | UNSTABLE |       |   |   | 1 |
|   |      | UNSTABLE | COUNT |   |   | 1 |

**Page6:** It does not operate.

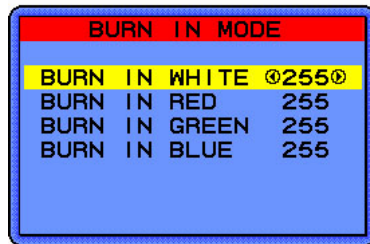
### 5.2.3 How to Exit Service Mode

Press the "EXIT" key to close OSM menu (Service mode).  
If you turn off (power off) the monitor in the Service mode, it will exit the Service mode.  
Likewise, if you unplug the power cord while in the Service mode, it will exit the Service mode.

### 5.2.4 Burn in Mode

The monitor can display color image without signal for aging.

Enter "Burn in mode" if Press "RESET" and "SELECT" key simultaneously when "No signal" OSM is shown.



Display Color can be changed by "Burn in mode" menu.

Exit "Burn in mode" by pressing "MENU/EXIT" or turning on video signal input or turning off "Monitor power" that is hardware off or software off.

Default setting: White, Red, Green, Blue = 255

## 6. Auto Contrast Adjustment

### 6.1 ADC Bias and Gain Control

- a: Enter the input signal of VESA 640x480 (75Hz) in 8Grayscale+Window+Frame pattern.  
Input signal level: 0.7Vp-p
- b: OSM into factory mode
- c: OSM select to "auto contrast" then press "Left" or "Right" button, then push down key.
- d: Press "SELECT" key to auto BIAS and GAIN execute.

|                      | 1 | 2   | 3   | 4   | 5 | 6 | 7 |
|----------------------|---|-----|-----|-----|---|---|---|
| <b>AUTO CONTRAST</b> |   |     |     |     |   |   |   |
|                      |   | R   | G   | B   |   |   |   |
| GAIN                 |   | 253 | 255 | 252 |   |   |   |
|                      |   | R   | G   | B   |   |   |   |
| OFFSET1              |   | 33  | 32  | 28  |   |   |   |
|                      |   | R   | G   | B   |   |   |   |
| OFFSET2              |   | 52  | 44  | 49  |   |   |   |
|                      |   | R   | G   | B   |   |   |   |
| OFST2CO              |   | 4   | 4   | 4   |   |   |   |

### 6.2 Panel Brightness Check

- a: Enter the input signal of VESA 1280x1024 (75Hz) in full white pattern.  
Input signal level: 0.7Vp-p
- b: OSM setting "brightness" to Max. and "contrast" to 50%.
- c: Color temperature setting to "NATIVE" mode.
- d: Check the center luminance: 200 cd/m<sup>2</sup>

### 6.3 Panel Color Check

- a: Enter the input signal of VESA 1280x1024 (75Hz) in full white pattern.  
Input signal level: 0.7Vp-p.
- b: Color temperature setting to "NATIVE" mode.
- c: Check the center color coordination.  
x=313 ±30  
y=329 ±30

### 6.4 Color Temperature Check

- a: Enter the input signal of VESA 1280x1024 (75Hz) in full white pattern.  
Input signal level: 0.7Vp-p.
- b: OSM "brightness" setting to MAX (100) and "contrast" setting to 50%.
- c: OSM into factory mode, and adjust R, G, B GAIN to meet below color temperature table.
- d: Each color temperature SPEC. as below:  
Control the color temperature according to the correlation data as follows.  
Measurement of correlation data is available only for preset white color 9300K~5000K.

| Color Temp.  | True value                 |       | Product check Tolerance | Auto-alignment adjust Tolerance |
|--------------|----------------------------|-------|-------------------------|---------------------------------|
|              | x                          | y     |                         |                                 |
| 9300K        | 0.283                      | 0.297 | ± 0.011                 | ± 0.005                         |
| 8200K        | 0.292                      | 0.307 | ± 0.011                 | ± 0.005                         |
| 7500K        | 0.299                      | 0.315 | ± 0.011                 | ± 0.005                         |
| 6500K (sRGB) | 0.313                      | 0.329 | ± 0.011                 | (1) ± 0.005<br>(2) Δ E94 < 15   |
| 5000K        | 0.346                      | 0.359 | ± 0.011                 | ± 0.005                         |
| Native       | Native color of LCD panel. |       |                         |                                 |

## 6.5 Reference Signal Timing

| Item                      | Abbreviation | VESA 1280x1024 75Hz |         | VESA 640x480 75Hz |        |
|---------------------------|--------------|---------------------|---------|-------------------|--------|
| Pixel frequency           | fc           | 135.00MHz           |         | 31.500MHz         |        |
| Horizontal frequency      | fh           | 79.98kHz            |         | 37.50kHz          |        |
| Line Time total           | Th           | 12.50us             | 1688CLK | 26.67us           | 840CLK |
| Horizontal active display | Thd          | 9.48us              | 1280CLK | 20.32us           | 640CLK |
| Horizontal sync pulse     | Thp          | 1.07us              | 144CLK  | 2.03us            | 64CLK  |
| Horizontal back porch     | Thb          | 1.84us              | 248CLK  | 3.81us            | 120CLK |
| Horizontal front porch    | Thf          | 0.12us              | 16CLK   | 0.51us            | 16CLK  |
| Horizontal sync polarity  |              | POS                 |         | NEG               |        |
| Vertical Frequency        | fv           | 75.03Hz             |         | 75.00Hz           |        |
| Frame time total          | Tv           | 13.33ms             | 1066H   | 13.33ms           | 500H   |
| Vertical active display   | Tvd          | 12.80ms             | 1024H   | 12.80ms           | 480H   |
| Vertical sync pulse       | Tvp          | 0.04ms              | 3H      | 0.08ms            | 3H     |
| Vertical back porch       | Tvb          | 0.48us              | 38H     | 0.43ms            | 16H    |
| Vertical front porch      | Tvf          | 0.01ms              | 1H      | 0.03ms            | 1H     |
| Vertical sync polarity    |              | POS                 |         | NEG               |        |



# INSPECTION

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# 1. General Description

## Product Specifications

|                                 |                | LG.Philips LM190E02-A4K5  |                  |
|---------------------------------|----------------|---|------------------|
|                                 |                | Analog Input  | Digital Input    |
| <b>LCD Module</b>               | Pixel Pitch    | 0.294mm   |                  |
|                                 | Resolution     | 1280x1024 dots (SXGA)   |                  |
|                                 | Color          | 16.7 million colors (8 bit)   |                  |
|                                 | Brightness *1) | 250cd/m <sup>2</sup> (Typical)  |                  |
|                                 | Contrast Ratio | 500:1 (Typical)   |                  |
|                                 | Viewing Angle  | 88/88(L/R), 88/88(U/D) (CR>10: Typical)   |                  |
| <b>Frequency</b>                | Horizontal     | 31.5 – 81.1 kHz   | 31.5 – 81.1 kHz  |
|                                 | Vertical       | 56.0 – 76.0 Hz  | 56.0 – 76.0 Hz   |
| <b>Pixel Clock</b>              |                | 25.1 – 135.0 MHz  | 25.1 – 135.0 MHz |
| <b>Viewable Size</b>            |                | 376.32 x 301.056 mm   |                  |
| <b>Multi Pixel</b>              |                | Yes (with smoothing)  |                  |
| <b>Digital Control</b>          |                | Yes   |                  |
| <b>Color Control</b>            |                | Yes   |                  |
| <b>On Screen Display</b>        |                | Yes   |                  |
| <b>Power Management</b>         |                | Yes (VESA DPMS, EPA, GEEA level)  |                  |
| <b>Plug and Play</b>            |                | Yes (VESA DDC2B)  |                  |
| <b>USB Hub</b>                  |                | Yes (USB Version 2.0 Self Powered Hub<br>1 up-stream / 4 down-stream)   |                  |
| <b>Speaker</b>                  |                | No  |                  |
| <b>Headphone Jack</b>           |                | No  |                  |
| <b>Microphone Jack</b>          |                | No  |                  |
| <b>Auto Adjustment</b>          |                | Yes (Position / Size / Phase)   |                  |
| <b>Brightness control range</b> |                | 50% - 100%  |                  |
| <b>Controllable Function</b>    | OSM            | Brightness, Contrast, Auto contrast, DV mode, Auto adjust, H. Position, V. Position, Fine, Color control, Resolution notifier, Hot key, Factory preset, Language, OSM position, Off timer, OSM turn off, OSM lock out, Monitor inf. |                  |
| <b>Input Signal</b>             | Video          | RGB 0.7Vp-p<br>Input Impedance 75 ohm   |                  |
|                                 | Sync           | Separate sync: TTL Level<br>Composite, Sync on Green<br>Video   | TMDS             |
|                                 | Input          | Mini D-sub 15pin  | DVI-D            |
|                                 | DDC            | DDC2B   |                  |
|                                 | Signal Cable   | Mini D-sub 15pin to Mini D-sub 15pin (L=2.0m)<br>DVI-D to DVI-D (L=2.0m)  |                  |

\*1): You should satisfy this value for products of 60% and more.

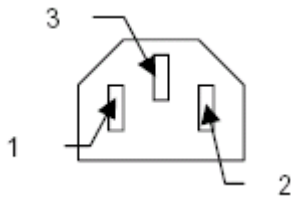
\*2): Soft off mode

|   |        |   |
|---|--------|---|
| <b>Power Supply</b>                           |        | Universal AC100 – 240V  |
| <b>Current Rating</b>                         |        | 1.2A (AC100V) / 0.6A (AC240V)   |
| <b>Operational Environment</b>                | Temp.  | 5 – 35°C  |
|   | Humid. | 30 – 80% (without condensation)   |
| <b>Dimension</b>                              | Net    | 367.0(W) x 362.0 – 472.0(H) x 198(D) mm   |
|   | Gross  | 426.0(W) x 446.0(H) x 252.0(D) mm   |
| <b>Weight</b>                                 | Net    | 7.5kg   |
|   | Gross  | 9.8kg   |
| <b>VESA compatible arm mounting interface</b> |        | Yes, 100mm x 100mm  |
| <b>Tilt / Swivel / Rotation</b>               |        | Up & Down 30° to -5° / Yes ±170° / NA   |
| <b>Complied Regulatory and Guidelines</b>     |        | Safety: UL / c-UL, TuV GS<br>EMC: FCC-B<br>VLF / ELF: MPR-II, TCO'03<br>Others: CE, Ctick, PSB, AS, TCO'03(AN),<br>TCO'99(ANBK), GOST, PCBC, BSMI |
| <b>Accessories</b>                            |        | User's manual, AC Power code (2.0m), Analog Cable (2.0m, mind-sub 15 pin), Digital Cable (2.0m, DVI-D), USB Cable (2.0m)                          |

## 2. Electrical Characteristics

### 2.1 Power Supply

|          |                             |  |
|----------|-----------------------------|--|
| AC Input | Input Voltage (Rating)      | 100 – 240VAC   |
|          | Input Voltage Range         | 90 – 264VAC  |
|          | Frequency (Rating)          | 50 / 60Hz  |
|          | Frequency Range             | 47 – 63Hz  |
|          | Power Consumption           | 38W (Typ.)   |
|          | AC Leakage Current          | < 0.25 mA @AC 100V, < 3.5mA @AC230V  |
|          | Inrush Current (Cold Start) | < 30A <sub>0-P</sub> @AC110V, < 50A <sub>0-P</sub> @AC220V   |
|          | KK+Inlet connector type     | 3 polarity, 10A 250V 65°C<br>VDE, UL CSA approved CEE input connector.<br>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 Panel

|                             |   |
|-----------------------------|---|
| LCD                         | Active matrix thin-film-transistor (TFT)              |
| Effective display size      | 376.32(H) x 301.056(V) mm                             |
| Pixel number                | 1280 x 1024 pixels                                    |
| Color filter arrangement    | RGB vertical stripes                                  |
| Display method              | IPS, Normally black                                   |
| Drive method                | Active matrix thin-film-transistor (TFT)              |
| Pixel pitch                 | 0.294(H) x 0.294(V) mm                                |
| Dot number                  | 1280 x 1024 dots                                      |
| Back-light                  | CCFL x 4pcs.  |
| Luminance                   | 250 cd/m <sup>2</sup>                                 |
| Contrast ratio              | 500:1 (typical)                                       |
| Display color               | 16.7 million colors (8 bit)                           |
| Viewing angle               | 88/88(L/R), 88/88(U/D) (CR>10: Typical)               |
| Response time               | Rising: 12msec (Typical)<br>Falling: 13msec (Typical) |
| Back-light Life Time        | 40,000 hours (Min.)                                   |
| Brightness adjustment range | 50% to 100%   |

## 2.3 85Hz Refresh Rate Support

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

Monitor should display “Out of Range” warning menu at this mode.

## 2.4 White Color Temperature

White color temperature is 6 presets as 9300, 8200, 7500, sRGB (6500), 5000 and Native.

Default value of user color should be Native that is maximum setting for panel.

Target of color setting

| Color Temp.  | True value                 |       | Product check Tolerance | Auto-alignment adjust Tolerance |
|--------------|----------------------------|-------|-------------------------|---------------------------------|
|              | x                          | y     |                         |                                 |
| 9300K        | 0.283                      | 0.297 | ± 0.011                 | ± 0.005                         |
| 8200K        | 0.292                      | 0.307 | ± 0.011                 | ± 0.005                         |
| 7500K        | 0.299                      | 0.315 | ± 0.011                 | ± 0.005                         |
| 6500K (sRGB) | 0.313                      | 0.329 | ± 0.011                 | (1) ± 0.005<br>(2) Δ E94 < 15   |
| 5000K        | 0.346                      | 0.359 | ± 0.011                 | ± 0.005                         |
| Native       | Native color of LCD panel. |       |                         |                                 |

## 2.5 Check Power Manage Function

This function conform DPMS of VESA, and International Energy Star Office Equipment program.

Power Management condition and status for ANALOG Input mode.

| Mode     | Horizontal | Vertical | Power Supply | Input Timing          | Power Consumption |
|----------|------------|----------|--------------|-----------------------|-------------------|
| On       | On         | On       | 240Vac       | VESA 1280x1024 (75Hz) | 38W +20%          |
| Stand-by | Off        | On       | 240Vac       | VESA 1280x1024 (75Hz) | 2W                |
| Suspend  | On         | Off      | 240Vac       | VESA 1280x1024 (75Hz) | 2W                |
| Off      | Off        | Off      | 240Vac       | VESA 1280x1024 (75Hz) | 2W                |

Recovery Time from power saving mode: less than 3sec.,

Power Management condition and status for DIGITAL Input mode.

| Mode       | DE        | Horizontal | Vertical | Power Supply | Input Timing          | Power Consumption |
|------------|-----------|------------|----------|--------------|-----------------------|-------------------|
| On         | Pulses    | On         | ON       | 240Vac       | VESA 1280x1024 (75Hz) | 38W +20%          |
| Active off | No Pulses | N/A        | N/A      | 240Vac       | VESA 1280x1024 (75Hz) | 2W                |

Recovery Time from power saving mode: less than 3sec.,

### 3. External Inspection on The LCD Module

#### 3.1 Inspection Conditions

1. Room temperature: 20-25°C
2. Humidity: 65 ±5%RH
3. Illumination: Single 20W fluorescent lamp non-directive (Appearance 300 ~ 700 Lux, Display 180 ~ 200Lux)
4. To be a distance about 35 cm in front of LCD unit, viewing line should be perpendicular to the surface of the module judge the visual appearance with human's eyes.
5. Take off the protector of polarizer while judging the display area.
6. If there is any question while judging, check the panel again while operating

#### 3.2 Electrical Inspection Specification

| Item   |   | Criteria  |  | Remar                 |        |
|--|---|---|--|-----------------------|--------|
| Adjacent Dots  | (1)   | Bright dots   | Horizontally adjacent 2 dots (R+G, G+B)  | Max. 3                | Note 1 |
|  | (2)   | Dark dots   |  | Max. 3                | Note 2 |
|  | (3)   | Bright dots   | Horizontally, vertically or combined adjacent 3 dots<br>(Separately bright dots and dark dots) | Not Allowed           | Note 3 |
|  | (4)   | Dark dots   |  | Not Allowed           |        |
| Dot Defect   | (5)   | Dot defects except (1) and (2)                                    | R or G or B (Bright Dot + Dark Dot)  | Max. 7                | Note 4 |
| Min. Distance between bright dots  | (6)   | Distance between bright dots                                      | Distance between bright dots (R - R): less than 5.9mm  | Max. 2 for each color | Note 5 |
|  | (7)   | Distance between (6)'s  | Distance between (6) s: less than 9mm  | Not Allowed           | Note 6 |
|  | (8)   | Fault cluster   | Two or more pixels or sub-pixels with more than one fault of (5).                              | Max. 3                | Note 7 |
|  |   |   | Two or more pixels or sub-pixels with more than one fault of (1).                              | Not Allowed           | Note 8 |
|  |   | Two or more pixels or sub-pixels with more than one fault of (2). |  |                       |        |
| Total amount of Dot Defects  | Total amount of Bright Dot (R, G, B) and Dark Dot (R, G, B) |   |  | Max. 13               | -      |
|  | Total amount of Bright Dot (G)                              |   |  | Max. 4                | -      |
| Note 9. Every dot herein means sub-pixel (each Red, Green or Blue color)   |   |   |  |                       |        |
| Note 10. Bright & Dark Dots are larger than one third of sub-pixel. (Dots smaller than one third of sub-pixel are not counted as a defect dots.) |   |   |  |                       |        |
| Note 11. Do not use the [ND] filter in counting a bright dot.  |   |   |  |                       |        |

 :Bright Dot   
  :Dark Dot

Note 1. Horizontally adjacent 2 dots (R+G, G+B)

| Count as horizontally adjacent 2 dots |     |  |     |     |      |
|---------------------------------------|-----|--|-----|-----|------|
| R G                                   | G B | R G  | G B |     |      |
|                                       |     |  |     |     |      |
| Do not count as adjacent 2 dots       |     |  |     |     |      |
| R G                                   | R G | R G  | R G | R G | R G  |
|                                       |     |  |     |     |      |
|                                       |     |  |     |     | etc. |
| Combination with Bright & Dark Dot    |     | Combination except horizontally adjacent 2 dots. |     |     |      |

Note 2. 1) + 2) : Max. 3

Note 3. Horizontally, vertically or combined adjacent 3 dots (separately bright dots and dark dots)

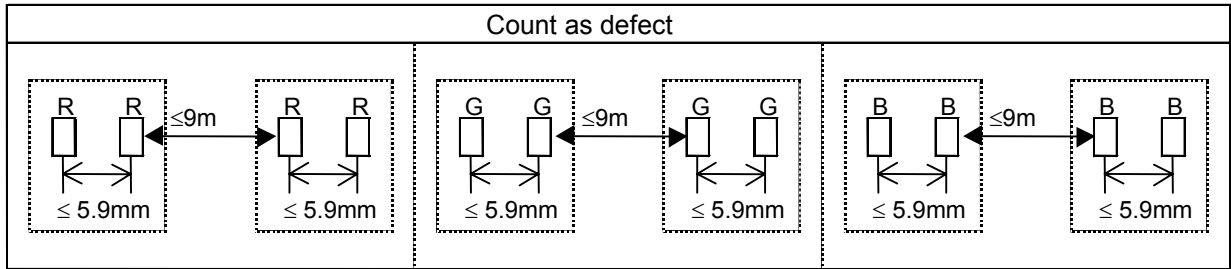
| Count as adjacent 3 dots        |  |  |  |  |  |  |  |
|---------------------------------|--|--|--|--|--|--|--|
|                                 |  |  |  |  |  |  |  |
|                                 |  |  |  |  |  |  |  |
|                                 |  |  |  |  |  |  |  |
| Do not count as adjacent 3 dots |  |  |  |  |  |  |  |
|                                 |  |  |  |  |  |  |  |

Note 4. Do not count the horizontally adjacent 2 dots (R-G, G-B)

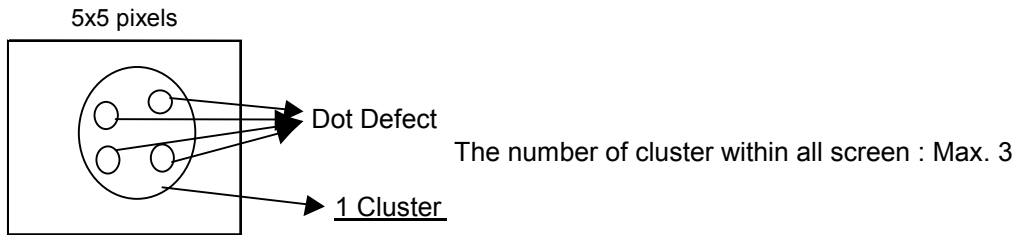
Note 5. Distance between bright dots

| Count as defect   | Do not count as defect  |
|---|---|
| <p> <math>\leq 5.9\text{mm}</math>    <math>\leq 5.9\text{mm}</math>    <math>\leq 5.9\text{mm}</math> </p> | <p> <math>\leq 5.9\text{mm}</math>    <math>\leq 5.9\text{mm}</math>    <math>\leq 5.9\text{mm}</math>    <math>\leq 5.9\text{mm}</math>    <math>\leq 5.9\text{mm}</math>    <math>\leq 5.9\text{mm}</math> </p> |
| Distance between the same colors  | Combination with Bright Dot & Dark Dot<br>Combination with the different color  |

Note 6. Distance between the group of (6)'s.



Note 7. Two or more pixels or sub-pixels with more than one fault of 5) within 5x5 pixels



Note 8. Two or more pixels or sub-pixels with more than one fault of 1) or 2) within 5x5 pixels

| Count as defect                 | Do not count as defect |
|---------------------------------|------------------------|
| <p>5x5 pixels    5x5 pixels</p> | <p>5x5 pixels</p>      |



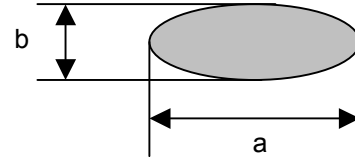
### 3.3 Polarizer Defects

| Items   |          | Criteria  |
|---------|----------|---|
| Scratch | Linear   | $0.01 \leq W \leq 0.05, 1.0 \leq L \leq 10.0, N \leq 4$ |
| Dent    | Circular | $0.2 \leq D \leq 0.8, N \leq 4$                         |

NOTE: D: Average Diameter  $D=(a+b)/2$

W: Width, L: Length, N: Quantity

Linear:  $a > 2b$ , Circular:  $a \leq 2b$



- a. Extraneous substances, which can be wiped out, like Finger Print, Particles are not considered as a defect.
- b. Defects which are on the Black Matrix (outside of Active Area) are not considered as a defect.

### 3.4 Foreign Material

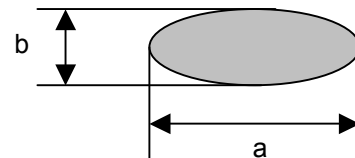
| Items            |          | Criteria   |
|------------------|----------|--|
| Foreign Material | Linear   | $0.03 \leq W \leq 0.10, 0.3 \leq L \leq 3.0, N \leq 4$ |
|                  | Circular | $0.25 \leq L \leq 0.8, N \leq 5$                       |

NOTE: D: Average Diameter  $D=(a+b)/2$

W: Width, L: Length, N: Quantity

Linear:  $a > 2b$ , Circular:  $a < 2b$

Length: The line of apsides (Long distance)



### 3.5 Line Defect

All kinds of line defects such as vertical, horizontal, or cross marks are not allowed.

### 3.6 Bezel Appearance

Scratches, minor dents, stains, dust particles on the Bezel frame are not considered a defect.

## 4. Safety Test

- Destination : All over the world
- Applicable standards : UL60950/C-UL/EN60950
- 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 1.5A/0.8A

### 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. (The rear rating plates are the same as those for North America and Europe. Therefore, measurements should also be based on this setting.)

#### (1) Measuring conditions

- Condition of the set : ON mode
- Measuring conditions : The inspection signal is set at "19" 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 0.8A +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 UL60950 or IEC60950 (EN60950)]

2) The earth wire should be firmly connected to the chassis block by the use of a screw (See Note) of 3.5mm $\varnothing$  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 0.1 $\Omega$  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 D-SUB connector) that is used as a safety earth for the unit.

Where the earth resistance exceeds 0.1 $\Omega$ , the condition should be still acceptable if the earth resistance is 0.1 $\Omega$  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 means 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 toggle 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: 10M $\Omega$  or more

## 5. PLUG & PLAY Communication Inspection

### 5.1 System Connection

This system should be connected as shown below.

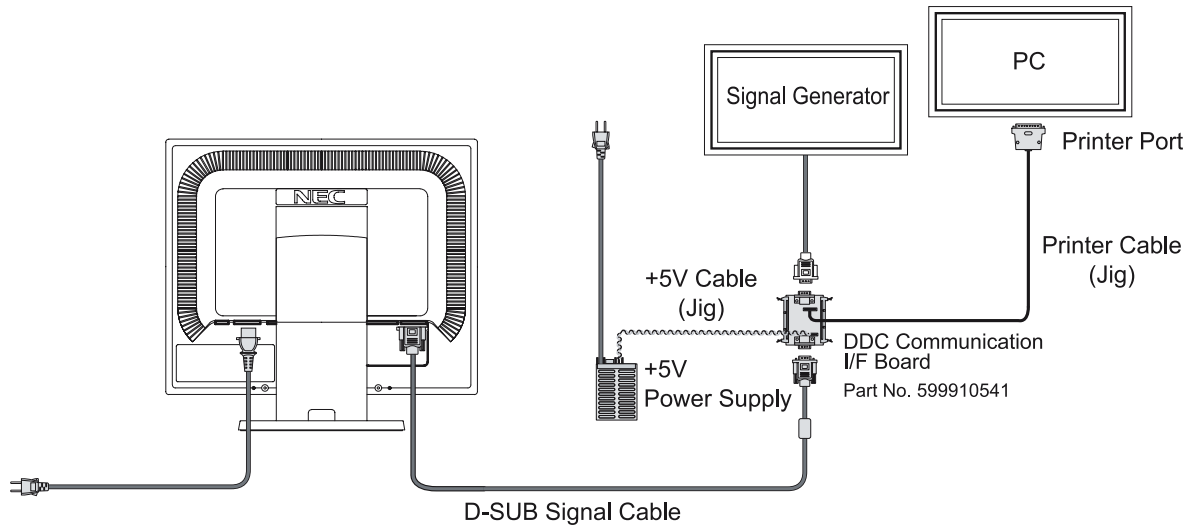


Fig.5.1.1 D-SUB connector connection

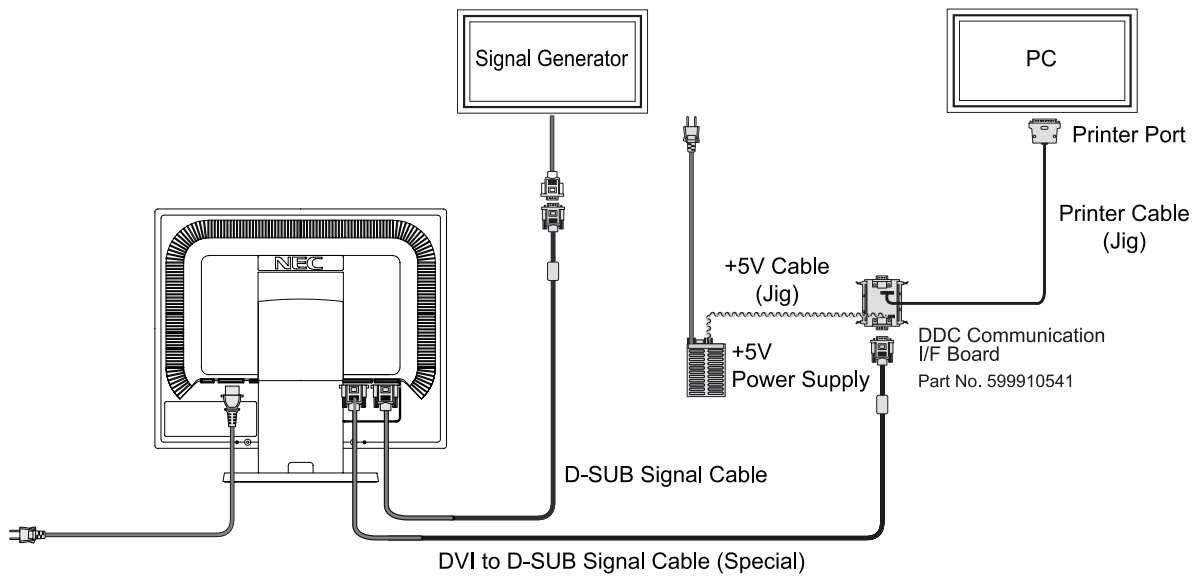


Fig 5.1.2 DVI-D connector connection

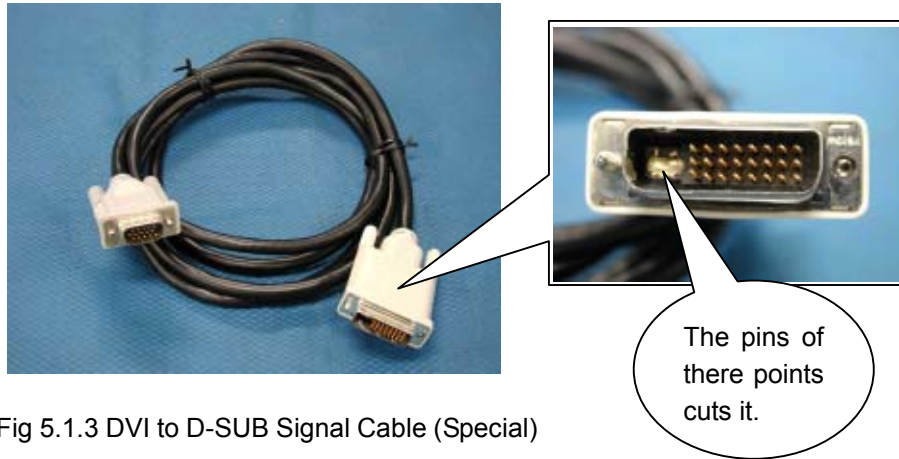


Fig 5.1.3 DVI to D-SUB Signal Cable (Special)

The pins of these points cuts it.

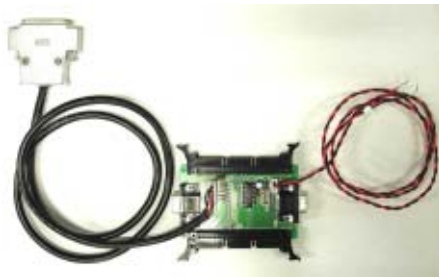


Fig 5.1.4 DDC Communication I/F BOARD

## 5.2 Input Signal

Horizontal synchronization frequency: Not specified.

Vertical synchronization frequency: Not specified.

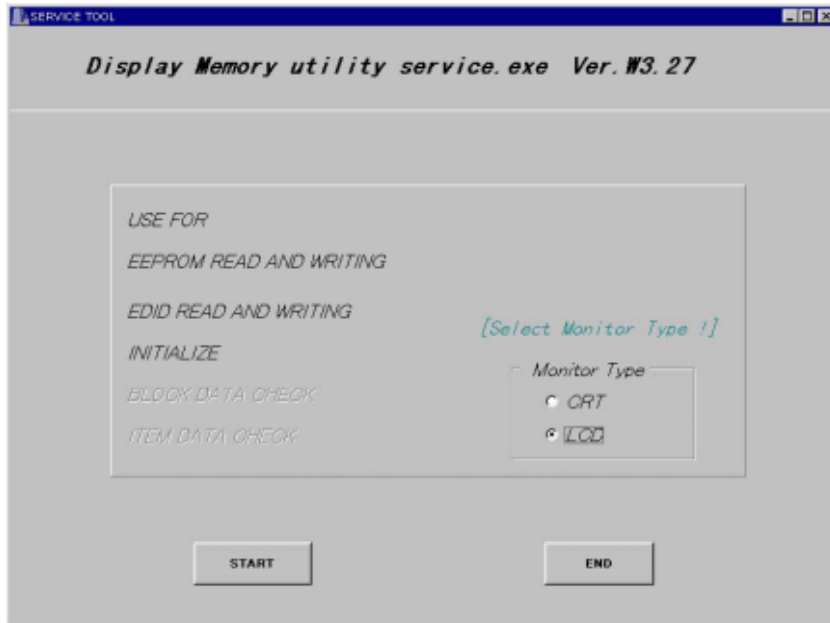
## 5.3 Program

Service tool Ver. 3.27 (Part No. 599910735)

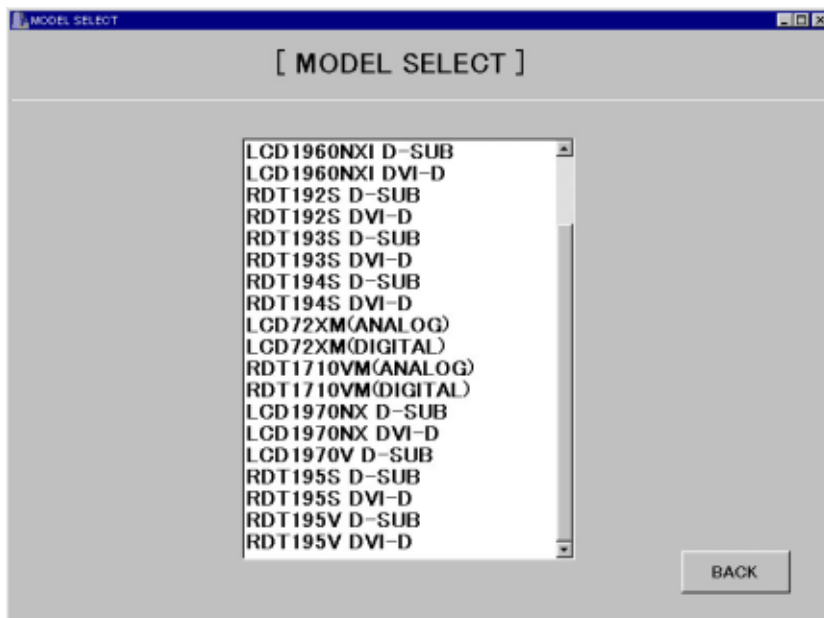
## 5.4 Operation

### 5.4.1 EDID Data Inspection and Writing to the D-SUB Connector (Analog)

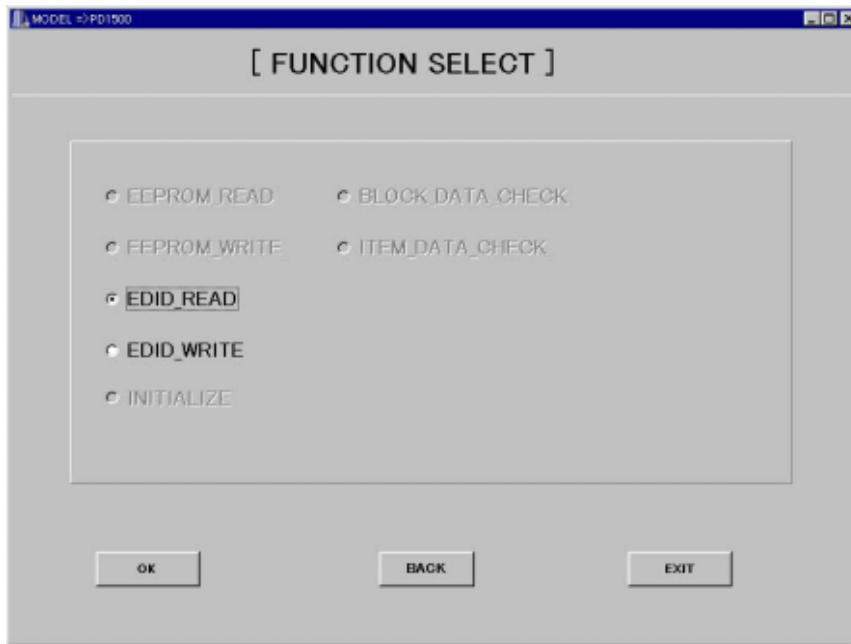
- 1) Connect the EDID data-writing unit with jigs, etc.
- 2) Copy all the files of the service tool Ver. 3.27 in a proper directory.
- 3) Start [Service2.EXE] of the service tool Ver. 3.27.
- 4) When the screen as shown below appears, check to [LCD] of [Monitor Type] and press the [START] button.



- 5) When the screen as shown below appears, adjust the cursor to [LCD1970NX D-SUB] and double click.

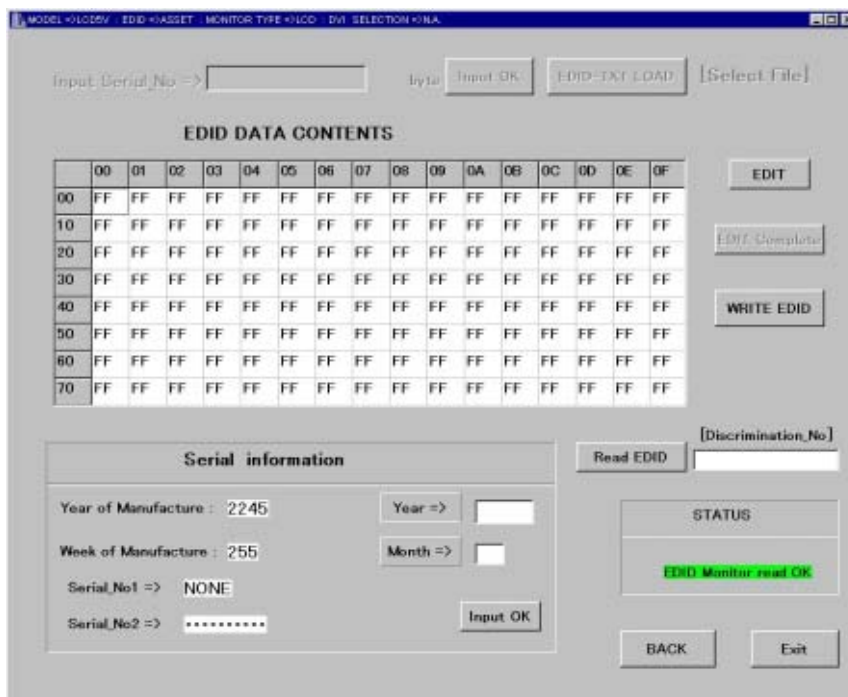


- 6) Enter Factory mode, a tag 4 is select by the "▼ (DOWN)" or "▲ (UP)" key move cursor to EDID WP (EDID write-protection).
- 7) A numerical value is set to "0" (OFF) and EDID write-protection is canceled.
- 8) When the screen as shown below appears, check to [EDID\_READ] and press the [OK] button.



- 9) 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.

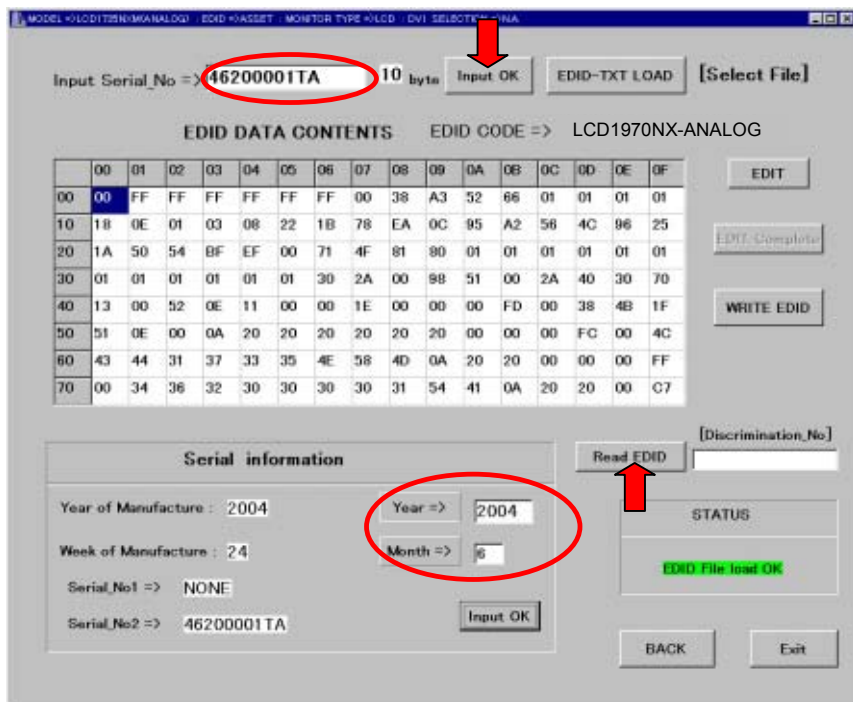


- 10) When a screen of Item 6 is displayed by pressing the [BACK] button, check to [EDID\_WRITE] and press the [OK] button.

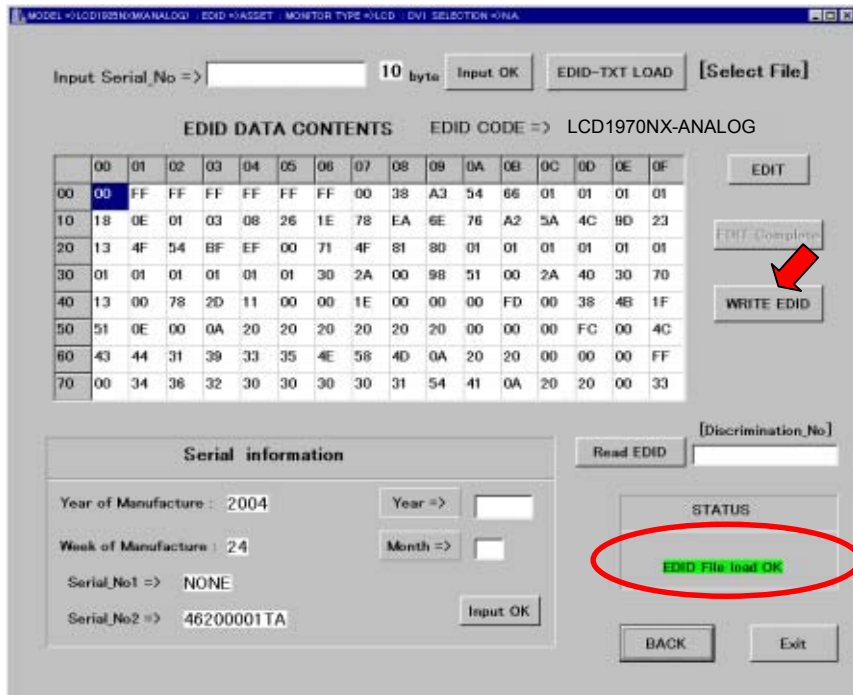


11) When the screen as shown below appears, examine the serial number of the unit, enter an input in the column of [Input Serial No.] through the keyboard, and press the [Input OK] button.

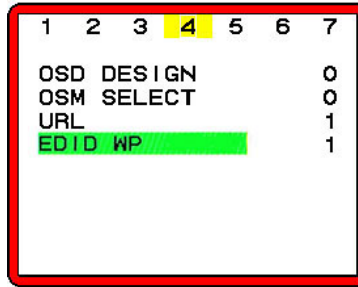
Enter an input in the column of [Year=> ] in manufactured year(A.D. four digits) and [Month=>] in manufactured month through the keyboard, and press the [Input OK] button.



12) 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].



13) If the writing of EDID data is completed normally, EDID WP will be returned to "1 (ON)" and Factory mode will be closed.



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

#### 5.4.2 EDID Data Inspection and Writing to the DVI Connector (Digital)

- 1) Connect the EDID data writing unit with jigs, etc. (Refer to a Fig.5.1.2 DVI-D connector connection figure)
- 2) The "BACK" button is pushed twice and the [MODEL SELECT] screen is displayed. Cursor is united and double-clicked to [LCD1970NX (DVI-D)].
- 3) 6) to 14) is carried out in the procedure of the "5.4.1 EDID Data Inspection and Writing to the D-SUB Connector (Analog) ".

## 5.5 EDID Data File

EDID date: LCD1970NX\_A.edi (ANALOG)

|    | 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    | 62    | 66    | 01    | 01    | 01    | 01 |       |
| 10 | Note1 | Note2 | 01    | 03    | 0E    | 26    | 1E    | 78    | EA    | CB    | 05    | A3    | 58    | 4C    | 9B    | 25 |       |
| 20 | 13    | 50    | 54    | BF    | EF    | 80    | 71    | 4F    | 81    | 40    | 81    | 80    | 01    | 01    | 01    | 01 |       |
| 30 | 01    | 01    | 01    | 01    | 01    | 01    | 30    | 2A    | 00    | 98    | 51    | 00    | 2A    | 40    | 30    | 70 |       |
| 40 | 13    | 00    | 78    | 2D    | 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    | 31    | 39    | 37    | 30    | 4E    | 58    | 0A    | 20    | 20    | 20    | 00    | 00    | 00    | FF |       |
| 70 | 00    | Note3 | Note3 | Note3 | Note3 | Note3 | Note3 | Note3 | Note3 | Note3 | Note3 | Note3 | Note3 | Note3 | Note3 | 00 | Note4 |

EDID date: LCD1970NX\_D.edi (DIGITAL)

|    | 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    | 62    | 66    | 01    | 01    | 01    | 01 |       |
| 10 | Note1 | Note2 | 01    | 03    | 80    | 26    | 1E    | 78    | EA    | CB    | 05    | A3    | 58    | 4C    | 9B    | 25 |       |
| 20 | 13    | 50    | 54    | BF    | EF    | 80    | 71    | 4F    | 81    | 40    | 81    | 80    | 01    | 01    | 01    | 01 |       |
| 30 | 01    | 01    | 01    | 01    | 01    | 01    | 30    | 2A    | 00    | 98    | 51    | 00    | 2A    | 40    | 30    | 70 |       |
| 40 | 13    | 00    | 78    | 2D    | 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    | 31    | 39    | 37    | 30    | 4E    | 58    | 0A    | 20    | 20    | 20    | 00    | 00    | 00    | FF |       |
| 70 | 00    | Note3 | 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)

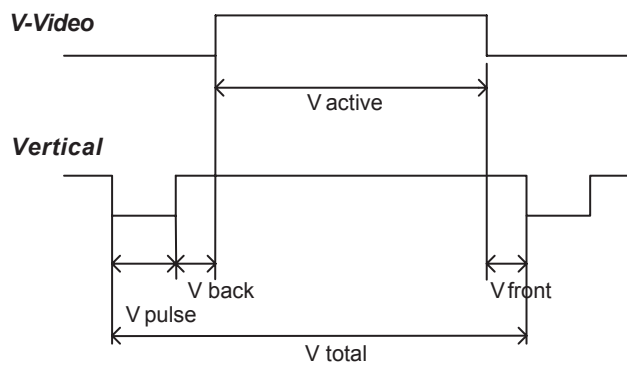
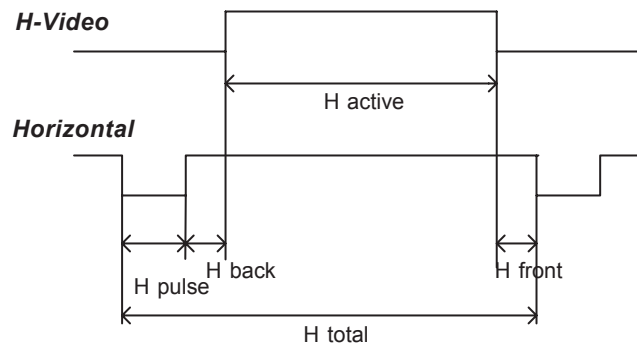
If less than 13 char, terminate with 0Ah and fill the rests with 20h.

Note 4: address 7Fh

Checksum

The sum of entire 128 byte should be equal to 00h.

## Appendix Reference Signal Timings



|                           | No.          | 1                |        | 2           |        |
|---------------------------|--------------|------------------|--------|-------------|--------|
| Item                      | Abbreviation | VGA 640x480 60Hz |        | MAC 640x480 |        |
| Pixel frequency           | fc           | 25.175MHz        |        | 30.24MHz    |        |
| Horizontal frequency      | fh           | 31.47kHz         |        | 35.00kHz    |        |
| Line Time total           | Th           | 31.78us          | 800CLK | 28.57us     | 864CLK |
| Horizontal active display | Thd          | 25.42us          | 640CLK | 21.16us     | 640CLK |
| Horizontal sync pulse     | Thp          | 3.81us           | 96CLK  | 2.12us      | 64CLK  |
| Horizontal back porch     | Thb          | 1.91us           | 48CLK  | 3.17us      | 96CLK  |
| Horizontal front porch    | Thf          | 0.64us           | 16CLK  | 2.12us      | 64CLK  |
| Horizontal sync polarity  |              | NEG              |        | NEG         |        |
| Vertical Frequency        | fv           | 59.992Hz         |        | 66.66Hz     |        |
| Frame time total          | Tv           | 16.68ms          | 525H   | 15.00ms     | 525H   |
| Vertical active display   | Tvd          | 15.25ms          | 480H   | 13.71ms     | 480H   |
| Vertical sync pulse       | Tvp          | 0.06ms           | 2H     | 0.09ms      | 3H     |
| Vertical back porch       | Tvb          | 1.02ms           | 33H    | 1.11ms      | 39H    |
| Vertical front porch      | Tvf          | 0.35ms           | 10H    | 0.09ms      | 3H     |
| Vertical sync polarity    |              | NEG              |        | NEG         |        |

|                           | No.          | 3                |        | 4                 |        |
|---------------------------|--------------|------------------|--------|-------------------|--------|
| Item                      | Abbreviation | VGA 640x480 72Hz |        | VESA 640x480 75Hz |        |
| Pixel frequency           | fc           | 31.500MHz        |        | 31.500MHz         |        |
| Horizontal frequency      | fh           | 37.86kHz         |        | 37.50kHz          |        |
| Line Time total           | Th           | 26.41us          | 832CLK | 26.67us           | 840CLK |
| Horizontal active display | Thd          | 20.32us          | 640CLK | 20.32us           | 640CLK |
| Horizontal sync pulse     | Thp          | 1.27us           | 40CLK  | 2.03us            | 64CLK  |
| Horizontal back porch     | Thb          | 4.06us           | 128CLK | 3.81us            | 120CLK |
| Horizontal front porch    | Thf          | 0.76us           | 24CLK  | 0.51us            | 16CLK  |
| Horizontal sync polarity  |              | NEG              |        | NEG               |        |
| Vertical Frequency        | fv           | 72.81Hz          |        | 75.00Hz           |        |
| Frame time total          | Tv           | 13.73ms          | 520H   | 13.33ms           | 500H   |
| Vertical active display   | Tvd          | 12.68ms          | 480H   | 12.80ms           | 480H   |
| Vertical sync pulse       | Tvp          | 0.08ms           | 3H     | 0.08ms            | 3H     |
| Vertical back porch       | Tvb          | 0.74ms           | 28H    | 0.43ms            | 16H    |
| Vertical front porch      | Tvf          | 0.24ms           | 9H     | 0.03ms            | 1H     |
| Vertical sync polarity    |              | NEG              |        | NEG               |        |

|                           | No.          | 5                |        | 6                |        |
|---------------------------|--------------|------------------|--------|------------------|--------|
| Item                      | Abbreviation | VGA 720x350 70Hz |        | VGA 720x400 70Hz |        |
| Pixel frequency           | fc           | 28.322MHz        |        | 28.322MHz        |        |
| Horizontal frequency      | fh           | 31.47kHz         |        | 31.47kHz         |        |
| Line Time total           | Th           | 31.78us          | 900CLK | 31.78us          | 900CLK |
| Horizontal active display | Thd          | 25.42us          | 720CLK | 25.42us          | 720CLK |
| Horizontal sync pulse     | Thp          | 3.81us           | 108CLK | 3.81us           | 108CLK |
| Horizontal back porch     | Thb          | 1.91us           | 54CLK  | 1.91us           | 54CLK  |
| Horizontal front porch    | Thf          | 0.64us           | 18CLK  | 0.63us           | 18CLK  |
| Horizontal sync polarity  |              | POS              |        | NEG              |        |
| Vertical Frequency        | fv           | 70.087Hz         |        | 70.087Hz         |        |
| Frame time total          | Tv           | 14.27ms          | 449H   | 14.27ms          | 449H   |
| Vertical active display   | Tvd          | 11.12ms          | 350H   | 12.71ms          | 400H   |
| Vertical sync pulse       | Tvp          | 0.06ms           | 2H     | 0.06ms           | 2H     |
| Vertical back porch       | Tvb          | 1.91ms           | 60H    | 1.11ms           | 35H    |
| Vertical front porch      | Tvf          | 1.18ms           | 37H    | 0.38ms           | 12H    |
| Vertical sync polarity    |              | NEG              |        | POS              |        |

|                           | No.          | 7                 |         | 8                 |         |
|---------------------------|--------------|-------------------|---------|-------------------|---------|
| Item                      | Abbreviation | VESA 800x600 56Hz |         | VESA 800x600 60Hz |         |
| Pixel frequency           | fc           | 36.00MHz          |         | 40.00MHz          |         |
| Horizontal frequency      | fh           | 35.16kHz          |         | 37.88kHz          |         |
| Line Time total           | Th           | 28.44us           | 1024CLK | 26.40us           | 1065CLK |
| Horizontal active display | Thd          | 22.22us           | 800CLK  | 20.00us           | 800CLK  |
| Horizontal sync pulse     | Thp          | 2.00us            | 72CLK   | 3.20us            | 128CLK  |
| Horizontal back porch     | Thb          | 3.56us            | 128CLK  | 2.20us            | 88CLK   |
| Horizontal front porch    | Thf          | 0.67us            | 24CLK   | 1.00us            | 40CLK   |
| Horizontal sync polarity  |              | POS               |         | POS               |         |
| Vertical Frequency        | fv           | 56.25Hz           |         | 60.32Hz           |         |
| Frame time total          | Tv           | 17.78ms           | 625H    | 16.58ms           | 628H    |
| Vertical active display   | Tvd          | 17.07ms           | 600H    | 15.84ms           | 600H    |
| Vertical sync pulse       | Tvp          | 0.06ms            | 2H      | 0.11ms            | 4H      |
| Vertical back porch       | Tvb          | 0.63ms            | 22H     | 0.61ms            | 23H     |
| Vertical front porch      | Tvf          | 0.03ms            | 1H      | 0.03ms            | 1H      |
| Vertical sync polarity    |              | POS               |         | POS               |         |

|                           | No.          | 9                 |         | 10                |         |
|---------------------------|--------------|-------------------|---------|-------------------|---------|
| Item                      | Abbreviation | VESA 800x600 72Hz |         | VESA 800x600 75Hz |         |
| Pixel frequency           | fc           | 50.000MHz         |         | 49.500MHz         |         |
| Horizontal frequency      | fh           | 48.08kHz          |         | 46.88kHz          |         |
| Line Time total           | Th           | 20.80us           | 1040CLK | 21.33us           | 1056CLK |
| Horizontal active display | Thd          | 16.00us           | 800CLK  | 16.16us           | 800CLK  |
| Horizontal sync pulse     | Thp          | 2.40us            | 120CLK  | 1.62us            | 80CLK   |
| Horizontal back porch     | Thb          | 1.28us            | 64CLK   | 3.23us            | 160CLK  |
| Horizontal front porch    | Thf          | 1.12us            | 56CLK   | 0.32us            | 16CLK   |
| Horizontal sync polarity  |              | POS(NEG)          |         | POS               |         |
| Vertical Frequency        | fv           | 72.19Hz           |         | 75.00Hz           |         |
| Frame time total          | Tv           | 13.85ms           | 666H    | 13.33ms           | 625H    |
| Vertical active display   | Tvd          | 12.48ms           | 600H    | 12.80ms           | 600H    |
| Vertical sync pulse       | Tvp          | 0.13ms            | 6H      | 0.06ms            | 3H      |
| Vertical back porch       | Tvb          | 0.48ms            | 23H     | 0.45ms            | 21H     |
| Vertical front porch      | Tvf          | 0.77ms            | 37H     | 0.02ms            | 1H      |
| Vertical sync polarity    |              | POS(NEG)          |         | POS               |         |

|                           | No.          | 11          |         | 12                 |         |
|---------------------------|--------------|-------------|---------|--------------------|---------|
| Item                      | Abbreviation | MAC 832x624 |         | VESA 1024x768 60Hz |         |
| Pixel frequency           | fc           | 57.28MHz    |         | 65.000MHz          |         |
| Horizontal frequency      | fh           | 49.73kHz    |         | 48.35kHz           |         |
| Line Time total           | Th           | 20.11us     | 1152CLK | 20.68us            | 1344CLK |
| Horizontal active display | Thd          | 14.52us     | 832CLK  | 15.75us            | 1024CLK |
| Horizontal sync pulse     | Thp          | 1.12us      | 64CLK   | 2.09us             | 136CLK  |
| Horizontal back porch     | Thb          | 3.91us      | 224CLK  | 2.46us             | 160CLK  |
| Horizontal front porch    | Thf          | 0.56us      | 32CLK   | 0.37us             | 24CLK   |
| Horizontal sync polarity  |              | NEG         |         | NEG                |         |
| Vertical Frequency        | fv           | 74.55Hz     |         | 60.00Hz            |         |
| Frame time total          | Tv           | 13.41ms     | 667H    | 16.67ms            | 806H    |
| Vertical active display   | Tvd          | 12.55ms     | 624H    | 15.88ms            | 768H    |
| Vertical sync pulse       | Tvp          | 0.06ms      | 3H      | 0.12ms             | 6H      |
| Vertical back porch       | Tvb          | 0.78ms      | 39H     | 0.60ms             | 29H     |
| Vertical front porch      | Tvf          | 0.02ms      | 1H      | 0.06ms             | 3H      |
| Vertical sync polarity    |              | NEG         |         | NEG                |         |

|                           | No.          | 13                 |         | 14                 |         |
|---------------------------|--------------|--------------------|---------|--------------------|---------|
| Item                      | Abbreviation | VESA 1024x768 70Hz |         | VESA 1024x768 75Hz |         |
| Pixel frequency           | fc           | 75.000MHz          |         | 78.75MHz           |         |
| Horizontal frequency      | fh           | 56.48kHz           |         | 60.02kHz           |         |
| Line Time total           | Th           | 17.71us            | 1328CLK | 16.66us            | 1312CLK |
| Horizontal active display | Thd          | 13.65us            | 1024CLK | 13.00us            | 1024CLK |
| Horizontal sync pulse     | Thp          | 1.81us             | 136CLK  | 1.22us             | 96CLK   |
| Horizontal back porch     | Thb          | 1.92us             | 144CLK  | 2.24us             | 176CLK  |
| Horizontal front porch    | Thf          | 0.32us             | 24CLK   | 0.20us             | 16CLK   |
| Horizontal sync polarity  |              | NEG                |         | POS                |         |
| Vertical Frequency        | fv           | 70.07Hz            |         | 75.03Hz            |         |
| Frame time total          | Tv           | 14.27ms            | 806H    | 13.33ms            | 800H    |
| Vertical active display   | Tvd          | 13.60ms            | 768H    | 12.80ms            | 768H    |
| Vertical sync pulse       | Tvp          | 0.11ms             | 6H      | 0.05ms             | 3H      |
| Vertical back porch       | Tvb          | 0.51ms             | 29H     | 0.47ms             | 28H     |
| Vertical front porch      | Tvf          | 0.05ms             | 3H      | 0.02ms             | 1H      |
| Vertical sync polarity    |              | NEG                |         | POS                |         |

|                           | No.          | 15                |         | 16                 |         |
|---------------------------|--------------|-------------------|---------|--------------------|---------|
| Item                      | Abbreviation | MAC 1152x870 75Hz |         | VESA 1280x960 60Hz |         |
| Pixel frequency           | fc           | 100.00MHz         |         | 108.00MHz          |         |
| Horizontal frequency      | fh           | 68.82kHz          |         | 60.00kHz           |         |
| Line Time total           | Th           | 14.56us           | 1456CLK | 16.67us            | 1800CLK |
| Horizontal active display | Thd          | 11.52us           | 1152CLK | 11.85us            | 1280CLK |
| Horizontal sync pulse     | Thp          | 1.28us            | 128CK   | 1.04us             | 112CLK  |
| Horizontal back porch     | Thb          | 1.44us            | 144CLK  | 2.89us             | 312CLK  |
| Horizontal front porch    | Thf          | 0.32us            | 32Clk   | 0.89us             | 96CLK   |
| Horizontal sync polarity  |              | NEG               |         | POS                |         |
| Vertical Frequency        | fv           | 75.06Hz           |         | 60.00Hz            |         |
| Frame time total          | Tv           | 13.32ms           | 915H    | 16.67ms            | 1000H   |
| Vertical active display   | Tvd          | 12.67ms           | 870H    | 16.0ms             | 960H    |
| Vertical sync pulse       | Tvp          | 0.04ms            | 3H      | 0.05ms             | 3H      |
| Vertical back porch       | Tvb          | 0.57ms            | 39H     | 0.60ms             | 36H     |
| Vertical front porch      | Tvf          | 0.04ms            | 3H      | 0.017ms            | 1H      |
| Vertical sync polarity    |              | NEG               |         | POS                |         |

|                           | No.          | 17                 |         | 18                  |         |
|---------------------------|--------------|--------------------|---------|---------------------|---------|
| Item                      | Abbreviation | VESA 1280x960 75Hz |         | VESA 1280x1024 60Hz |         |
| Pixel frequency           | fc           | 129.60MHz          |         | 108.00MHz           |         |
| Horizontal frequency      | fh           | 75.000kHz          |         | 63.981kHz           |         |
| Line Time total           | Th           | 13.333us           | 1728CLK | 15.63us             | 1688CLK |
| Horizontal active display | Thd          | 9.877us            | 1280CLK | 11.85us             | 1280CLK |
| Horizontal sync pulse     | Thp          | 0.988us            | 128CLK  | 1.04us              | 112CLK  |
| Horizontal back porch     | Thb          | 1.975us            | 256CLK  | 2.30us              | 248CLK  |
| Horizontal front porch    | Thf          | 0.494us            | 64CLK   | 0.44us              | 48CLK   |
| Horizontal sync polarity  |              | POS                |         | POS                 |         |
| Vertical Frequency        | fv           | 75.000Hz           |         | 60.02Hz             |         |
| Frame time total          | Tv           | 13.333ms           | 1000H   | 16.67ms             | 1066H   |
| Vertical active display   | Tvd          | 12.800ms           | 960H    | 16.00ms             | 1024H   |
| Vertical sync pulse       | Tvp          | 0.040ms            | 3H      | 0.05ms              | 3H      |
| Vertical back porch       | Tvb          | 0.480ms            | 36H     | 0.59ms              | 38H     |
| Vertical front porch      | Tvf          | 0.013ms            | 1H      | 0.02ms              | 1H      |
| Vertical sync polarity    |              | POS                |         | POS                 |         |

|                           |              | MODE                |         |  |
|---------------------------|--------------|---------------------|---------|--|
|                           | No.          | 19                  |         |  |
| Item                      | Abbreviation | VESA 1280x1024 75Hz |         |  |
| Pixel frequency           | fc           | 135.00MHz           |         |  |
| Horizontal frequency      | fh           | 79.98kHz            |         |  |
| Line Time total           | Th           | 12.50us             | 1688CLK |  |
| Horizontal active display | Thd          | 9.48us              | 1280CLK |  |
| Horizontal sync pulse     | Thp          | 1.07us              | 144CLK  |  |
| Horizontal back porch     | Thb          | 1.84us              | 248CLK  |  |
| Horizontal front porch    | Thf          | 0.12us              | 16CLK   |  |
| Horizontal sync polarity  |              | POS                 |         |  |
| Vertical Frequency        | fv           | 75.03Hz             |         |  |
| Frame time total          | Tv           | 13.33ms             | 1066H   |  |
| Vertical active display   | Tvd          | 12.80ms             | 1024H   |  |
| Vertical sync pulse       | Tvp          | 0.04ms              | 3H      |  |
| Vertical back porch       | Tvb          | 0.48us              | 38H     |  |
| Vertical front porch      | Tvf          | 0.01ms              | 1H      |  |
| Vertical sync polarity    |              | POS                 |         |  |

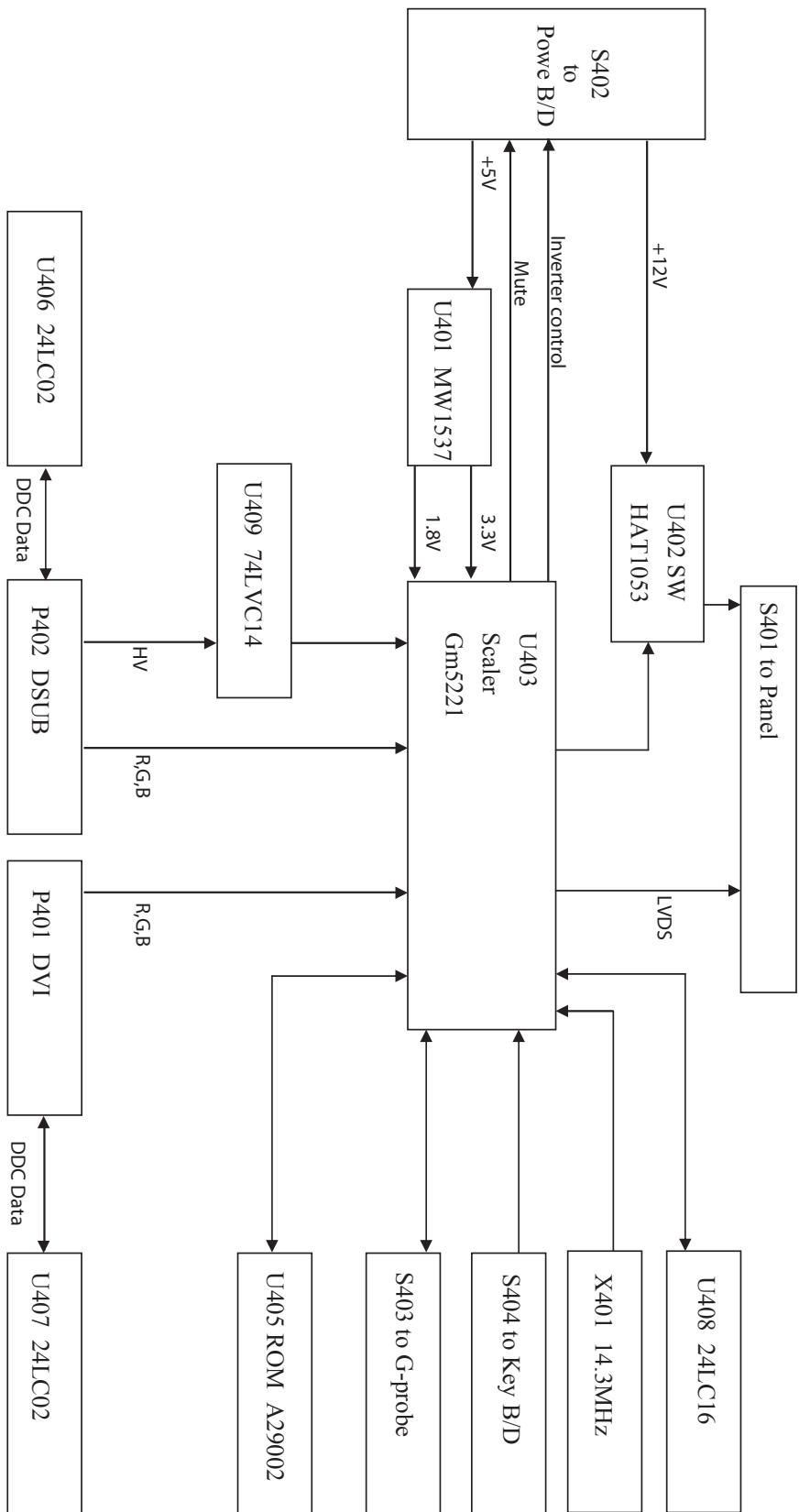


# CIRCUIT DESCRIPTION

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# 1. Block Diagram



## 2. Power Circuit

### 2.1 Power Input

15V & 5V DC input from Power Board through S402 to interface.

The 12V is provide Panel Vcc.

The 5V is provide Flash Memory, and EEPROM.

### 2.2 DC to DC Circuit

U401 is used generate the system power. It provides low-dropout voltage output 3.3V and 1.8V to provide Scalar.

U601 is used USB the system power. It provides low-dropout voltage output 3.3V to provide USB.

### 2.3 Panel Vcc Control

Panel power control used Q401 and U402 from U403 (pin 67) PPWR.

While the PPWR stay at High level; the panel voltage is 3.3V.

While the PPWR stay at Low level; the panel voltage is 0V.

## 3. Microprocessor Control Circuit

### 3.1 Clock Circuit

The X401 is crystal; it generates a 14.318MHz output for Scalar IC.

### 3.2 I<sup>2</sup>C Buses

There are 3 set I<sup>2</sup>C in the circuit:

The first I<sup>2</sup>C is used for Analog EDID in U406 (Pin6: SCL, Pin5: SDA)

And Analog DDC/CI in U403 (Pin77: SCL, Pin78: SDA)

The second I2C is used for Digital EDID in U407 (Pin6: SCL, Pin5 SDA)

The third I2C is used for OSD parameter stored in U403 (Pin92: SCL, Pin93: SDA).

### 3.3 General-purpose Port

#### 3.3.1 Key Scan Status

U403 pin 81 is for "POWER"

U403 pin 69 is for OSD "MENU/EXIT" adjust

U403 pin 85 is for OSD "SELECT/1 ◀▶ 2" adjust

U403 pin 88 is for OSD "RESET" adjust

|       | Pin 101 | Pin 100 | Pin 89 | Pin 84 |  |
|-------|---------|---------|--------|--------|--|
| UP    |         |         | v      | v      |  |
| DOWN  | v       | v       |        |        |  |
| RIGHT |         | v       | v      |        |  |
| LEFT  | v       |         |        | v      |  |

### **3.3.2 Scalar Control**

U403 Pin178 input scalar reset signal.

### **3.3.3 LED Control**

U403 pin 83 controls Q404 for Green LED.

U403 pin 82 controls Q403 for Amber LED.

### **3.3.4 Data Memory**

Flash Memory IC (U405) store F/W parameters.

## **4. Scalar**

The scalar IC (U403) is analog and digital interface input.

It embedded ADC, MCU, and LVDS circuit.

X401 output 14.318M Hz fed to U403.

U409 schmitt trigger for sync. Waveform processor. And fed to U403 for mode detect.

# REPLACEMENT PARTS LIST

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# REPLACEMENT PARTS LIST(For Europe)

The components specified for Model LCD1970NX(B)

| SYMBOL | For Europe<br>(NPG Part Number) | DESCRIPTION |
|--------|---------------------------------|-------------|
|--------|---------------------------------|-------------|

\*\*\* ICS \*\*\*

|      |          |                      |
|------|----------|----------------------|
| U401 | E1A12251 | IC SMD MW1537BCM5    |
| U402 | EQ500117 | CHIP FET P HAT1053M  |
| U403 | E1A12271 | IC SMD GM5221-LF-BC  |
| U405 | EHA12331 | IC SMD A290021TL-70  |
| U406 | EHA50051 | IC SMD 24LC02B       |
| U407 | EHA50051 | IC SMD 24LC02B       |
| U408 | EHA10081 | IC SMD 24LC16B SO8   |
| U409 | EHA50011 | IC MOS 74LVC14       |
| U410 | EHA10471 | IC SMD MIC1815 RESET |

\*\*\* TRANSISTORS \*\*\*

|      |          |                           |
|------|----------|---------------------------|
| Q401 | EN000211 | CHIP TR NPN DTC114EUA     |
| Q402 | EN000211 | CHIP TR NPN DTC114EUA     |
| Q403 | EN000211 | CHIP TR NPN DTC114EUA     |
| Q404 | EN000211 | CHIP TR NPN DTC114EUA     |
| Q405 | E2A00341 | TR SMD MMBT3906-LF PNP SO |

\*\*\* DIODES \*\*\*

|       |          |                           |
|-------|----------|---------------------------|
| D401  | E4K00341 | DI SMD SCS495D-LF         |
| D402  | E4K00351 | DI SMD SCS217K-LF         |
| D403  | E4K00351 | DI SMD SCS217K-LF         |
| D404  | E4K00351 | DI SMD SCS217K-LF         |
| D405  | E4K00341 | DI SMD SCS495D-LF         |
| D406  | E4K00351 | DI SMD SCS217K-LF         |
| D407  | E4K00351 | DI SMD SCS217K-LF         |
| D408  | E4K00351 | DI SMD SCS217K-LF         |
| D409  | E4K00351 | DI SMD SCS217K-LF         |
| D410  | E4K00351 | DI SMD SCS217K-LF         |
| D411  | E4K00351 | DI SMD SCS217K-LF         |
| D412  | E4K00351 | DI SMD SCS217K-LF         |
| D413  | E4K00351 | DI SMD SCS217K-LF         |
| D414  | EJ100231 | DIODE 1N4001              |
| D415  | EJ100231 | DIODE 1N4001              |
| D801  | EL500611 | LED SMD JEC-3227UOGE      |
| ZD401 | EYD40562 | CHIP DIODE ZENER UDZS5.6B |
| ZD402 | EYD40562 | CHIP DIODE ZENER UDZS5.6B |
| ZD403 | EYD40562 | CHIP DIODE ZENER UDZS5.6B |
| ZD404 | EYD40562 | CHIP DIODE ZENER UDZS5.6B |
| ZD405 | EYD40562 | CHIP DIODE ZENER UDZS5.6B |
| ZD406 | EYD40562 | CHIP DIODE ZENER UDZS5.6B |
| ZD407 | EYD40562 | CHIP DIODE ZENER UDZS5.6B |

| SYMBOL | For Europe<br>(NPG Part Number) | DESCRIPTION               |
|--------|---------------------------------|---------------------------|
| ZD408  | EYD40562                        | CHIP DIODE ZENER UDZS5.6B |

\*\*\* RELAYS & SWITCHES \*\*\*

|        |          |                         |
|--------|----------|-------------------------|
| SW801  | J3A00041 | SW SMD TACT TSXH-2G     |
| SW802  | J3A00041 | SW SMD TACT TSXH-2G     |
| SW803  | JCA00031 | SW SMD TACT TMFV-1502   |
| SW804  | J3A00041 | SW SMD TACT TSXH-2G     |
| SW805  | J3A00041 | SW SMD TACT TSXH-2G     |
| XD1012 | R3900251 | WIRE SW 1015#18L60 GRAY |

\*\*\* PWB ASSYS \*\*\*

|        |          |                          |
|--------|----------|--------------------------|
| INVPWR | JM100401 | U INVERT-POWER L194RJ LG |
| MAIN   | AM0RJ1ML | MAIN INSERT ASSY         |
| SW     | AS0RH1ML | SW INSERT ASSY           |

\*\*\* COILS & FILTERS \*\*\*

|      |          |                          |
|------|----------|--------------------------|
| B402 | HM017031 | L BEAD SMD MHC1608S121P  |
| B403 | HM017031 | L BEAD SMD MHC1608S121P  |
| B404 | HM017031 | L BEAD SMD MHC1608S121P  |
| B405 | HM017021 | L BEAD SMD MCB1608S121G  |
| B406 | HM017031 | L BEAD SMD MHC1608S121P  |
| B407 | HM017031 | L BEAD SMD MHC1608S121P  |
| B408 | HM017031 | L BEAD SMD MHC1608S121P  |
| B409 | HM017021 | L BEAD SMD MCB1608S121G  |
| B410 | HM017021 | L BEAD SMD MCB1608S121G  |
| B411 | HM017021 | L BEAD SMD MCB1608S121G  |
| B412 | HM017021 | L BEAD SMD MCB1608S121G  |
| B413 | HM017021 | L BEAD SMD MCB1608S121G  |
| B414 | HM017021 | L BEAD SMD MCB1608S121G  |
| B415 | HM017021 | L BEAD SMD MCB1608S121G  |
| B416 | HM017021 | L BEAD SMD MCB1608S121G  |
| B417 | HM017061 | L BEAD SMD MCB1608H750G  |
| B418 | HM017061 | L BEAD SMD MCB1608H750G  |
| B419 | HM017061 | L BEAD SMD MCB1608H750G  |
| B420 | HM011532 | CHIP FERRITE BK2125HS431 |
| B421 | HM011532 | CHIP FERRITE BK2125HS431 |
| B422 | HM017021 | L BEAD SMD MCB1608S121G  |
| B423 | HM017021 | L BEAD SMD MCB1608S121G  |
| B424 | HM017021 | L BEAD SMD MCB1608S121G  |
| B425 | HM017021 | L BEAD SMD MCB1608S121G  |
| B426 | HM017021 | L BEAD SMD MCB1608S121G  |
| B427 | HM017021 | L BEAD SMD MCB1608S121G  |
| B428 | HM017021 | L BEAD SMD MCB1608S121G  |
| B429 | HM017021 | L BEAD SMD MCB1608S121G  |
| B430 | HM017021 | L BEAD SMD MCB1608S121G  |
| B431 | HM017021 | L BEAD SMD MCB1608S121G  |
| B432 | HM017021 | L BEAD SMD MCB1608S121G  |
| B433 | 80000991 | BEAD WBR6H-3T-R7K-B5     |

| SYMBOL | For Europe<br>(NPG Part Number) | DESCRIPTION             |
|--------|---------------------------------|-------------------------|
| B434   | 80000991                        | BEAD WBR6H-3T-R7K-B5    |
| B435   | 80000991                        | BEAD WBR6H-3T-R7K-B5    |
| B436   | HM017021                        | L BEAD SMD MCB1608S121G |
| B437   | HM017021                        | L BEAD SMD MCB1608S121G |
| B439   | HM017021                        | L BEAD SMD MCB1608S121G |
| B442   | HM017021                        | L BEAD SMD MCB1608S121G |

\*\*\* ELECTRICAL PARTS & MISCELLANEOUS PARTS \*\*\*

|        |                               |                          |
|--------|-------------------------------|--------------------------|
| LCD    | 3A684091<br>(NMV Part Number) | TFT LM190E02-A4K5        |
| P402   | RA805152                      | CN MINI-D-SUB 15P SIDE   |
| X401   | E8100131                      | OSC X'TAL 49US 14.318MHZ |
| XD1002 | RE010081                      | CABLE VIDEO GR DSUB-DSUB |
| XD1007 | RG030031                      | PW CORD EU 2M R-PLUG GR  |
| XD1010 | R3201481                      | WIRE CC12P 1571#30L180   |
| XD1011 | R3201471                      | WIRE CC30P 1589#30L220   |

\*\*\* APPEARANCE PARTS \*\*\*

|        |          |                           |
|--------|----------|---------------------------|
| LABEL  | 15004101 | LABEL RATING LCD1970NXH W |
| M-CONN | 17002721 | PAD,L194,LPL              |
| XD1000 | 10107361 | BACK L194RJ (N) WH        |
| XD1001 | 10107611 | BEZEL WH(N) BC L194RJ     |
| XD1003 | 12001211 | CHASSIS BASE 1970NXH,(LPL |
| XD1004 | 11700771 | COVER UNIT WH L194RJ      |
| XD1008 | 12302271 | SHIELD 1970VH/NXH         |
| XD1009 | 14900211 | STAND UNIT L194R WH       |

\*\*\* PRINTED & PACKING MATERIALS \*\*\*

|        |          |                           |
|--------|----------|---------------------------|
| BAG-1  | 13700483 | BAG LCD1960NX EPE         |
| CARTON | 13204921 | CARTON BOX LCD1970NX B    |
| MANUAL | 15503533 | MANUAL ASSY LCD1970NX B   |
| WRNTY1 | 15802261 | SHEET CAUTION PISA19 B    |
| WRNTY2 | 15802161 | SHEET SETUP LCD1970NX/V B |
| XD1005 | 13401781 | FILLER B L194R,(A,B,C,)   |
| XD1006 | 13401771 | FILLER T L194R,(A,B,C,)   |

\*\*\* RESISTORS \*\*\*

|      |          |                           |
|------|----------|---------------------------|
| F401 | FM100000 | CHIP 1/8W(T) 5% 0 H       |
| F402 | FM100000 | CHIP 1/8W(T) 5% 0 H       |
| R401 | FM010103 | CHIP RES 1/10W(T) 5% 10KO |
| R403 | FM010103 | CHIP RES 1/10W(T) 5% 10KO |
| R404 | FM010103 | CHIP RES 1/10W(T) 5% 10KO |
| R405 | FM010103 | CHIP RES 1/10W(T) 5% 10KO |
| R406 | FM010000 | CHIP RES 1/10W(T) 5% 0OHM |
| R407 | FM010103 | CHIP RES 1/10W(T) 5% 10KO |
| R408 | FM010103 | CHIP RES 1/10W(T) 5% 10KO |
| R409 | F8012490 | R SMD METAL 1/10W 249 F 0 |
| R410 | FM010103 | CHIP RES 1/10W(T) 5% 10KO |
| R411 | FM010103 | CHIP RES 1/10W(T) 5% 10KO |



| SYMBOL | For Europe<br>(NPG Part Number) | DESCRIPTION               |
|--------|---------------------------------|---------------------------|
| R412   | FM010103                        | CHIP RES 1/10W(T) 5% 10KO |
| R416   | FM010103                        | CHIP RES 1/10W(T) 5% 10KO |
| R420   | FM010103                        | CHIP RES 1/10W(T) 5% 10KO |
| R421   | FM010103                        | CHIP RES 1/10W(T) 5% 10KO |
| R422   | FM010103                        | CHIP RES 1/10W(T) 5% 10KO |
| R428   | FM010103                        | CHIP RES 1/10W(T) 5% 10KO |
| R429   | FM010103                        | CHIP RES 1/10W(T) 5% 10KO |
| R431   | FM010103                        | CHIP RES 1/10W(T) 5% 10KO |
| R434   | FM010103                        | CHIP RES 1/10W(T) 5% 10KO |
| R437   | F8014709                        | R SMD METAL 1/10W 47 F 06 |
| R438   | FN517509                        | R SMD METAL 1/3W 75 F T 1 |
| R439   | F8018459                        | R SMD METAL 1/10W 84.5 F  |
| R440   | FM010103                        | CHIP RES 1/10W(T) 5% 10KO |
| R441   | FM010473                        | CHIP 1/10W(T) 5% 47K      |
| R442   | FM010101                        | CHIP RES 1/10W(T) 5% 100O |
| R443   | F8014709                        | R SMD METAL 1/10W 47 F 06 |
| R444   | FM010101                        | CHIP RES 1/10W(T) 5% 100O |
| R445   | FN517509                        | R SMD METAL 1/3W 75 F T 1 |
| R446   | F8018459                        | R SMD METAL 1/10W 84.5 F  |
| R447   | F8014709                        | R SMD METAL 1/10W 47 F 06 |
| R448   | FM010101                        | CHIP RES 1/10W(T) 5% 100O |
| R449   | FM010101                        | CHIP RES 1/10W(T) 5% 100O |
| R450   | FN517509                        | R SMD METAL 1/3W 75 F T 1 |
| R451   | F8018459                        | R SMD METAL 1/10W 84.5 F  |
| R452   | FM010101                        | CHIP RES 1/10W(T) 5% 100O |
| R453   | FM010101                        | CHIP RES 1/10W(T) 5% 100O |
| R454   | FM010222                        | CHIP RES 1/10W(T) 5% 2.2K |
| R455   | FM010222                        | CHIP RES 1/10W(T) 5% 2.2K |
| R456   | FM010103                        | CHIP RES 1/10W(T) 5% 10KO |
| R459   | FM010103                        | CHIP RES 1/10W(T) 5% 10KO |
| R460   | FM010473                        | CHIP 1/10W(T) 5% 47K      |
| R461   | FM010101                        | CHIP RES 1/10W(T) 5% 100O |
| R462   | FM010101                        | CHIP RES 1/10W(T) 5% 100O |
| R463   | FM010101                        | CHIP RES 1/10W(T) 5% 100O |
| R464   | FM010101                        | CHIP RES 1/10W(T) 5% 100O |
| R465   | FM010000                        | CHIP RES 1/10W(T) 5% 0OHM |
| R466   | FM010000                        | CHIP RES 1/10W(T) 5% 0OHM |
| R467   | FM010000                        | CHIP RES 1/10W(T) 5% 0OHM |
| R468   | FM010000                        | CHIP RES 1/10W(T) 5% 0OHM |
| R469   | FM010000                        | CHIP RES 1/10W(T) 5% 0OHM |
| R470   | FM010000                        | CHIP RES 1/10W(T) 5% 0OHM |
| R471   | FM010000                        | CHIP RES 1/10W(T) 5% 0OHM |
| R472   | FM010000                        | CHIP RES 1/10W(T) 5% 0OHM |
| R473   | FM010103                        | CHIP RES 1/10W(T) 5% 10KO |
| R474   | FM010472                        | CHIP RES 1/10W(T) 5% 4.7K |
| R475   | FM010472                        | CHIP RES 1/10W(T) 5% 4.7K |
| R476   | FM010101                        | CHIP RES 1/10W(T) 5% 100O |
| R477   | FM010101                        | CHIP RES 1/10W(T) 5% 100O |

| SYMBOL | For Europe<br>(NPG Part Number) | DESCRIPTION               |
|--------|---------------------------------|---------------------------|
| R478   | FM100222                        | CHIP RES 1/8W(T) 5% 2.2KO |
| R479   | FM010103                        | CHIP RES 1/10W(T) 5% 10KO |
| R480   | FM010103                        | CHIP RES 1/10W(T) 5% 10KO |
| R481   | FM010103                        | CHIP RES 1/10W(T) 5% 10KO |
| R482   | FM010103                        | CHIP RES 1/10W(T) 5% 10KO |
| R483   | FM100332                        | R SMD METAL 1/8W 3.3K J T |
| R484   | FM010103                        | CHIP RES 1/10W(T) 5% 10KO |
| R485   | FM010103                        | CHIP RES 1/10W(T) 5% 10KO |
| R486   | FM010103                        | CHIP RES 1/10W(T) 5% 10KO |
| R487   | FM010103                        | CHIP RES 1/10W(T) 5% 10KO |
| R488   | FN012009                        | R SMD 1/10W 20H F 0603    |
| R489   | FN012009                        | R SMD 1/10W 20H F 0603    |
| R490   | FM010103                        | CHIP RES 1/10W(T) 5% 10KO |
| R492   | FM010103                        | CHIP RES 1/10W(T) 5% 10KO |
| R493   | FM010472                        | CHIP RES 1/10W(T) 5% 4.7K |
| R494   | FM010103                        | CHIP RES 1/10W(T) 5% 10KO |
| R495   | FM010103                        | CHIP RES 1/10W(T) 5% 10KO |

\*\*\* CAPACITORS \*\*\*

|      |          |                           |
|------|----------|---------------------------|
| C401 | GGM10620 | C ELE105 10U 16V M (T) LO |
| C402 | GX433052 | C SMD C0G 33P 50V J 0603  |
| C403 | GX433052 | C SMD C0G 33P 50V J 0603  |
| C404 | GX410423 | C SMD X7R 0.1U 16V K 0603 |
| C409 | GX410423 | C SMD X7R 0.1U 16V K 0603 |
| C410 | GX410423 | C SMD X7R 0.1U 16V K 0603 |
| C411 | GGR22714 | VC ELE105 220U 10V M (T)L |
| C412 | GX410423 | C SMD X7R 0.1U 16V K 0603 |
| C413 | GGR22714 | VC ELE105 220U 10V M (T)L |
| C414 | GX410423 | C SMD X7R 0.1U 16V K 0603 |
| C415 | GGR10714 | C ELE105 100U 10V M (T) L |
| C416 | GX410423 | C SMD X7R 0.1U 16V K 0603 |
| C417 | GX410423 | C SMD X7R 0.1U 16V K 0603 |
| C418 | GGR22714 | VC ELE105 220U 10V M (T)L |
| C419 | GX410423 | C SMD X7R 0.1U 16V K 0603 |
| C420 | GGR22714 | VC ELE105 220U 10V M (T)L |
| C421 | GGM22610 | C ELE105 22U 10V M(T) LOW |
| C422 | GX410423 | C SMD X7R 0.1U 16V K 0603 |
| C423 | GX410423 | C SMD X7R 0.1U 16V K 0603 |
| C424 | GX410423 | C SMD X7R 0.1U 16V K 0603 |
| C425 | GX410423 | C SMD X7R 0.1U 16V K 0603 |
| C426 | GGM22610 | C ELE105 22U 10V M(T) LOW |
| C427 | GX410423 | C SMD X7R 0.1U 16V K 0603 |
| C428 | GX410423 | C SMD X7R 0.1U 16V K 0603 |
| C429 | GX410423 | C SMD X7R 0.1U 16V K 0603 |
| C430 | GX410423 | C SMD X7R 0.1U 16V K 0603 |
| C431 | GX410423 | C SMD X7R 0.1U 16V K 0603 |
| C432 | G2M10550 | C ELE105 1U 50V M T PW    |
| C433 | GX410353 | C SMD X7R 0.01U 50V K 060 |

| SYMBOL | For Europe<br>(NPG Part Number) | DESCRIPTION               |
|--------|---------------------------------|---------------------------|
| C434   | GX410423                        | C SMD X7R 0.1U 16V K 0603 |
| C435   | GGM22610                        | C ELE105 22U 10V M(T) LOW |
| C436   | GX410423                        | C SMD X7R 0.1U 16V K 0603 |
| C437   | GGM22610                        | C ELE105 22U 10V M(T) LOW |
| C438   | GX410423                        | C SMD X7R 0.1U 16V K 0603 |
| C439   | GX410423                        | C SMD X7R 0.1U 16V K 0603 |
| C440   | GX410423                        | C SMD X7R 0.1U 16V K 0603 |
| C441   | GX410423                        | C SMD X7R 0.1U 16V K 0603 |
| C442   | G2M10550                        | C ELE105 1U 50V M T PW    |
| C443   | GX410353                        | C SMD X7R 0.01U 50V K 060 |
| C444   | GGM22610                        | C ELE105 22U 10V M(T) LOW |
| C445   | GX410423                        | C SMD X7R 0.1U 16V K 0603 |
| C446   | GX410423                        | C SMD X7R 0.1U 16V K 0603 |
| C447   | GX410423                        | C SMD X7R 0.1U 16V K 0603 |
| C448   | GX410423                        | C SMD X7R 0.1U 16V K 0603 |
| C449   | GX410423                        | C SMD X7R 0.1U 16V K 0603 |
| C450   | GX410423                        | C SMD X7R 0.1U 16V K 0603 |
| C451   | GX410423                        | C SMD X7R 0.1U 16V K 0603 |
| C452   | M745R65D                        | C SMD C0G 5.6P 50V D 0603 |
| C453   | M745R65D                        | C SMD C0G 5.6P 50V D 0603 |
| C454   | GGM22610                        | C ELE105 22U 10V M(T) LOW |
| C455   | GX410423                        | C SMD X7R 0.1U 16V K 0603 |
| C456   | GX410423                        | C SMD X7R 0.1U 16V K 0603 |
| C457   | GX410423                        | C SMD X7R 0.1U 16V K 0603 |
| C458   | GX410423                        | C SMD X7R 0.1U 16V K 0603 |
| C459   | GX410423                        | C SMD X7R 0.1U 16V K 0603 |
| C460   | GGM22610                        | C ELE105 22U 10V M(T) LOW |
| C461   | GX410423                        | C SMD X7R 0.1U 16V K 0603 |
| C462   | GX410423                        | C SMD X7R 0.1U 16V K 0603 |
| C463   | GX410423                        | C SMD X7R 0.1U 16V K 0603 |
| C464   | GX410423                        | C SMD X7R 0.1U 16V K 0603 |
| C465   | GX410423                        | C SMD X7R 0.1U 16V K 0603 |
| C467   | GX410423                        | C SMD X7R 0.1U 16V K 0603 |
| C468   | GX410353                        | C SMD X7R 0.01U 50V K 060 |
| C470   | GX410353                        | C SMD X7R 0.01U 50V K 060 |
| C471   | GX410423                        | C SMD X7R 0.1U 16V K 0603 |
| C472   | GX410423                        | C SMD X7R 0.1U 16V K 0603 |
| C473   | GX410353                        | C SMD X7R 0.01U 50V K 060 |
| C475   | GX410423                        | C SMD X7R 0.1U 16V K 0603 |
| C476   | GX410423                        | C SMD X7R 0.1U 16V K 0603 |
| C477   | GX410353                        | C SMD X7R 0.01U 50V K 060 |
| C478   | GX410353                        | C SMD X7R 0.01U 50V K 060 |
| C480   | GX410423                        | C SMD X7R 0.1U 16V K 0603 |
| C481   | GX410353                        | C SMD X7R 0.01U 50V K 060 |
| C484   | GX447052                        | C SMD C0G 47P 50V J 0603  |
| C485   | GX447052                        | C SMD C0G 47P 50V J 0603  |
| C486   | GX410423                        | C SMD X7R 0.1U 16V K 0603 |
| C487   | GX410423                        | C SMD X7R 0.1U 16V K 0603 |

| SYMBOL | For Europe<br>(NPG Part Number) | DESCRIPTION               |
|--------|---------------------------------|---------------------------|
| C488   | GX410423                        | C SMD X7R 0.1U 16V K 0603 |
| C489   | GX410423                        | C SMD X7R 0.1U 16V K 0603 |
| C490   | GX410423                        | C SMD X7R 0.1U 16V K 0603 |
| C491   | GX410423                        | C SMD X7R 0.1U 16V K 0603 |
| C492   | GX410423                        | C SMD X7R 0.1U 16V K 0603 |
| C493   | GX410423                        | C SMD X7R 0.1U 16V K 0603 |
| C494   | GX410423                        | C SMD X7R 0.1U 16V K 0603 |
| C495   | GX410423                        | C SMD X7R 0.1U 16V K 0603 |
| C496   | GX410423                        | C SMD X7R 0.1U 16V K 0603 |
| C497   | GX410423                        | C SMD X7R 0.1U 16V K 0603 |
| C498   | GX410423                        | C SMD X7R 0.1U 16V K 0603 |
| C499   | GX410423                        | C SMD X7R 0.1U 16V K 0603 |
| C500   | GX410423                        | C SMD X7R 0.1U 16V K 0603 |
| C501   | GX410423                        | C SMD X7R 0.1U 16V K 0603 |
| C502   | GX410423                        | C SMD X7R 0.1U 16V K 0603 |
| C503   | GX410423                        | C SMD X7R 0.1U 16V K 0603 |
| C504   | GX410423                        | C SMD X7R 0.1U 16V K 0603 |
| C505   | GX410423                        | C SMD X7R 0.1U 16V K 0603 |
| C506   | GX410353                        | C SMD X7R 0.01U 50V K 060 |
| C507   | GX410423                        | C SMD X7R 0.1U 16V K 0603 |
| C510   | GX410423                        | C SMD X7R 0.1U 16V K 0603 |
| C511   | GX410423                        | C SMD X7R 0.1U 16V K 0603 |

# REPLACEMENT PARTS LIST(For Europe)

The components specified for Model LCD1970NX-BK(B)

| SYMBOL | For Europe<br>(NPG Part Number) | DESCRIPTION |
|--------|---------------------------------|-------------|
|--------|---------------------------------|-------------|

\*\*\* ICS \*\*\*

|      |          |                      |
|------|----------|----------------------|
| U401 | E1A12251 | IC SMD MW1537BCM5    |
| U402 | EQ500117 | CHIP FET P HAT1053M  |
| U403 | E1A12271 | IC SMD GM5221-LF-BC  |
| U405 | EHA12331 | IC SMD A290021TL-70  |
| U406 | EHA50051 | IC SMD 24LC02B       |
| U407 | EHA50051 | IC SMD 24LC02B       |
| U408 | EHA10081 | IC SMD 24LC16B SO8   |
| U409 | EHA50011 | IC MOS 74LVC14       |
| U410 | EHA10471 | IC SMD MIC1815 RESET |

\*\*\* TRANSISTORS \*\*\*

|      |          |                           |
|------|----------|---------------------------|
| Q401 | EN000211 | CHIP TR NPN DTC114EUA     |
| Q402 | EN000211 | CHIP TR NPN DTC114EUA     |
| Q403 | EN000211 | CHIP TR NPN DTC114EUA     |
| Q404 | EN000211 | CHIP TR NPN DTC114EUA     |
| Q405 | E2A00341 | TR SMD MMBT3906-LF PNP SO |

\*\*\* DIODES \*\*\*

|       |          |                           |
|-------|----------|---------------------------|
| D401  | E4K00341 | DI SMD SCS495D-LF         |
| D402  | E4K00351 | DI SMD SCS217K-LF         |
| D403  | E4K00351 | DI SMD SCS217K-LF         |
| D404  | E4K00351 | DI SMD SCS217K-LF         |
| D405  | E4K00341 | DI SMD SCS495D-LF         |
| D406  | E4K00351 | DI SMD SCS217K-LF         |
| D407  | E4K00351 | DI SMD SCS217K-LF         |
| D408  | E4K00351 | DI SMD SCS217K-LF         |
| D409  | E4K00351 | DI SMD SCS217K-LF         |
| D410  | E4K00351 | DI SMD SCS217K-LF         |
| D411  | E4K00351 | DI SMD SCS217K-LF         |
| D412  | E4K00351 | DI SMD SCS217K-LF         |
| D413  | E4K00351 | DI SMD SCS217K-LF         |
| D414  | EJ100231 | DIODE 1N4001              |
| D415  | EJ100231 | DIODE 1N4001              |
| D801  | EL500611 | LED SMD JEC-3227UOGE      |
| ZD401 | EYD40562 | CHIP DIODE ZENER UDZS5.6B |
| ZD402 | EYD40562 | CHIP DIODE ZENER UDZS5.6B |
| ZD403 | EYD40562 | CHIP DIODE ZENER UDZS5.6B |
| ZD404 | EYD40562 | CHIP DIODE ZENER UDZS5.6B |
| ZD405 | EYD40562 | CHIP DIODE ZENER UDZS5.6B |
| ZD406 | EYD40562 | CHIP DIODE ZENER UDZS5.6B |
| ZD407 | EYD40562 | CHIP DIODE ZENER UDZS5.6B |

| SYMBOL | For Europe<br>(NPG Part Number) | DESCRIPTION               |
|--------|---------------------------------|---------------------------|
| ZD408  | EYD40562                        | CHIP DIODE ZENER UDZS5.6B |

\*\*\* RELAYS & SWITCHES \*\*\*

|        |          |                        |
|--------|----------|------------------------|
| SW801  | J3A00041 | SW SMD TACT TSXH-2G    |
| SW802  | J3A00041 | SW SMD TACT TSXH-2G    |
| SW803  | JCA00031 | SW SMD TACT TMFV-1502  |
| SW804  | J3A00041 | SW SMD TACT TSXH-2G    |
| SW805  | J3A00041 | SW SMD TACT TSXH-2G    |
| XD1012 | R3900241 | WIRE SW 1015#18L60 BLK |

\*\*\* PWB ASSYS \*\*\*

|        |          |                          |
|--------|----------|--------------------------|
| INVPWR | JM100401 | U INVERT-POWER L194RJ LG |
| MAIN   | AM0RJ1ML | MAIN INSERT ASSY         |
| SW     | AS0RH1ML | SW INSERT ASSY           |

\*\*\* COILS & FILTERS \*\*\*

|      |          |                          |
|------|----------|--------------------------|
| B402 | HM017031 | L BEAD SMD MHC1608S121P  |
| B403 | HM017031 | L BEAD SMD MHC1608S121P  |
| B404 | HM017031 | L BEAD SMD MHC1608S121P  |
| B405 | HM017021 | L BEAD SMD MCB1608S121G  |
| B406 | HM017031 | L BEAD SMD MHC1608S121P  |
| B407 | HM017031 | L BEAD SMD MHC1608S121P  |
| B408 | HM017031 | L BEAD SMD MHC1608S121P  |
| B409 | HM017021 | L BEAD SMD MCB1608S121G  |
| B410 | HM017021 | L BEAD SMD MCB1608S121G  |
| B411 | HM017021 | L BEAD SMD MCB1608S121G  |
| B412 | HM017021 | L BEAD SMD MCB1608S121G  |
| B413 | HM017021 | L BEAD SMD MCB1608S121G  |
| B414 | HM017021 | L BEAD SMD MCB1608S121G  |
| B415 | HM017021 | L BEAD SMD MCB1608S121G  |
| B416 | HM017021 | L BEAD SMD MCB1608S121G  |
| B417 | HM017061 | L BEAD SMD MCB1608H750G  |
| B418 | HM017061 | L BEAD SMD MCB1608H750G  |
| B419 | HM017061 | L BEAD SMD MCB1608H750G  |
| B420 | HM011532 | CHIP FERRITE BK2125HS431 |
| B421 | HM011532 | CHIP FERRITE BK2125HS431 |
| B422 | HM017021 | L BEAD SMD MCB1608S121G  |
| B423 | HM017021 | L BEAD SMD MCB1608S121G  |
| B424 | HM017021 | L BEAD SMD MCB1608S121G  |
| B425 | HM017021 | L BEAD SMD MCB1608S121G  |
| B426 | HM017021 | L BEAD SMD MCB1608S121G  |
| B427 | HM017021 | L BEAD SMD MCB1608S121G  |
| B428 | HM017021 | L BEAD SMD MCB1608S121G  |
| B429 | HM017021 | L BEAD SMD MCB1608S121G  |
| B430 | HM017021 | L BEAD SMD MCB1608S121G  |
| B431 | HM017021 | L BEAD SMD MCB1608S121G  |
| B432 | HM017021 | L BEAD SMD MCB1608S121G  |
| B433 | 80000991 | BEAD WBR6H-3T-R7K-B5     |

| SYMBOL | For Europe<br>(NPG Part Number) | DESCRIPTION             |
|--------|---------------------------------|-------------------------|
| B434   | 80000991                        | BEAD WBR6H-3T-R7K-B5    |
| B435   | 80000991                        | BEAD WBR6H-3T-R7K-B5    |
| B436   | HM017021                        | L BEAD SMD MCB1608S121G |
| B437   | HM017021                        | L BEAD SMD MCB1608S121G |
| B439   | HM017021                        | L BEAD SMD MCB1608S121G |
| B442   | HM017021                        | L BEAD SMD MCB1608S121G |

\*\*\* ELECTRICAL PARTS & MISCELLANEOUS PARTS \*\*\*

|        |                               |                           |
|--------|-------------------------------|---------------------------|
| LCD    | 3A684091<br>(NMV Part Number) | TFT LM190E02-A4K5         |
| P402   | RA805152                      | CN MINI-D-SUB 15P SIDE    |
| X401   | E8100131                      | OSC X'TAL 49US 14.318MHZ  |
| XD1002 | RE010091                      | CABLE VIDEO BLK DSUB-DSUB |
| XD1007 | RG030051                      | PW CORD EU 2M BLK WANSHIN |
| XD1010 | R3201481                      | WIRE CC12P 1571#30L180    |
| XD1011 | R3201471                      | WIRE CC30P 1589#30L220    |

\*\*\* APPEARANCE PARTS \*\*\*

|        |          |                           |
|--------|----------|---------------------------|
| LABEL  | 15004111 | LABEL RATING LCD1970NXH B |
| M-CONN | 17002721 | PAD,L194,LPL              |
| XD1000 | 10107371 | BACK L194RJ (N) BK        |
| XD1001 | 10107611 | BEZEL WH(N) BC L194RJ     |
| XD1003 | 12001211 | CHASSIS BASE 1970NXH,(LPL |
| XD1004 | 11700781 | COVER UNIT BK L194RJ      |
| XD1008 | 12302271 | SHIELD 1970VH/NXH         |
| XD1009 | 14900221 | STAND UNIT L194R BK       |

\*\*\* PRINTED & PACKING MATERIALS \*\*\*

|        |          |                           |
|--------|----------|---------------------------|
| BAG-1  | 13700483 | BAG LCD1960NX EPE         |
| CARTON | 13204921 | CARTON BOX LCD1970NX B    |
| MANUAL | 15503533 | MANUAL ASSY LCD1970NX B   |
| WRNTY1 | 15802261 | SHEET CAUTION PISA19 B    |
| WRNTY2 | 15802161 | SHEET SETUP LCD1970NX/V B |
| XD1005 | 13401781 | FILLER B L194R,(A,B,C,)   |
| XD1006 | 13401771 | FILLER T L194R,(A,B,C,)   |

\*\*\* RESISTORS \*\*\*

|      |          |                           |
|------|----------|---------------------------|
| F401 | FM100000 | CHIP 1/8W(T) 5% 0 H       |
| F402 | FM100000 | CHIP 1/8W(T) 5% 0 H       |
| R401 | FM010103 | CHIP RES 1/10W(T) 5% 10KO |
| R403 | FM010103 | CHIP RES 1/10W(T) 5% 10KO |
| R404 | FM010103 | CHIP RES 1/10W(T) 5% 10KO |
| R405 | FM010103 | CHIP RES 1/10W(T) 5% 10KO |
| R406 | FM010000 | CHIP RES 1/10W(T) 5% 0OHM |
| R407 | FM010103 | CHIP RES 1/10W(T) 5% 10KO |
| R408 | FM010103 | CHIP RES 1/10W(T) 5% 10KO |
| R409 | F8012490 | R SMD METAL 1/10W 249 F 0 |
| R410 | FM010103 | CHIP RES 1/10W(T) 5% 10KO |
| R411 | FM010103 | CHIP RES 1/10W(T) 5% 10KO |

| SYMBOL | For Europe<br>(NPG Part Number) | DESCRIPTION               |
|--------|---------------------------------|---------------------------|
| R412   | FM010103                        | CHIP RES 1/10W(T) 5% 10KO |
| R416   | FM010103                        | CHIP RES 1/10W(T) 5% 10KO |
| R420   | FM010103                        | CHIP RES 1/10W(T) 5% 10KO |
| R421   | FM010103                        | CHIP RES 1/10W(T) 5% 10KO |
| R422   | FM010103                        | CHIP RES 1/10W(T) 5% 10KO |
| R428   | FM010103                        | CHIP RES 1/10W(T) 5% 10KO |
| R429   | FM010103                        | CHIP RES 1/10W(T) 5% 10KO |
| R431   | FM010103                        | CHIP RES 1/10W(T) 5% 10KO |
| R434   | FM010103                        | CHIP RES 1/10W(T) 5% 10KO |
| R437   | F8014709                        | R SMD METAL 1/10W 47 F 06 |
| R438   | FN517509                        | R SMD METAL 1/3W 75 F T 1 |
| R439   | F8018459                        | R SMD METAL 1/10W 84.5 F  |
| R440   | FM010103                        | CHIP RES 1/10W(T) 5% 10KO |
| R441   | FM010473                        | CHIP 1/10W(T) 5% 47K      |
| R442   | FM010101                        | CHIP RES 1/10W(T) 5% 100O |
| R443   | F8014709                        | R SMD METAL 1/10W 47 F 06 |
| R444   | FM010101                        | CHIP RES 1/10W(T) 5% 100O |
| R445   | FN517509                        | R SMD METAL 1/3W 75 F T 1 |
| R446   | F8018459                        | R SMD METAL 1/10W 84.5 F  |
| R447   | F8014709                        | R SMD METAL 1/10W 47 F 06 |
| R448   | FM010101                        | CHIP RES 1/10W(T) 5% 100O |
| R449   | FM010101                        | CHIP RES 1/10W(T) 5% 100O |
| R450   | FN517509                        | R SMD METAL 1/3W 75 F T 1 |
| R451   | F8018459                        | R SMD METAL 1/10W 84.5 F  |
| R452   | FM010101                        | CHIP RES 1/10W(T) 5% 100O |
| R453   | FM010101                        | CHIP RES 1/10W(T) 5% 100O |
| R454   | FM010222                        | CHIP RES 1/10W(T) 5% 2.2K |
| R455   | FM010222                        | CHIP RES 1/10W(T) 5% 2.2K |
| R456   | FM010103                        | CHIP RES 1/10W(T) 5% 10KO |
| R459   | FM010103                        | CHIP RES 1/10W(T) 5% 10KO |
| R460   | FM010473                        | CHIP 1/10W(T) 5% 47K      |
| R461   | FM010101                        | CHIP RES 1/10W(T) 5% 100O |
| R462   | FM010101                        | CHIP RES 1/10W(T) 5% 100O |
| R463   | FM010101                        | CHIP RES 1/10W(T) 5% 100O |
| R464   | FM010101                        | CHIP RES 1/10W(T) 5% 100O |
| R465   | FM010000                        | CHIP RES 1/10W(T) 5% 0OHM |
| R466   | FM010000                        | CHIP RES 1/10W(T) 5% 0OHM |
| R467   | FM010000                        | CHIP RES 1/10W(T) 5% 0OHM |
| R468   | FM010000                        | CHIP RES 1/10W(T) 5% 0OHM |
| R469   | FM010000                        | CHIP RES 1/10W(T) 5% 0OHM |
| R470   | FM010000                        | CHIP RES 1/10W(T) 5% 0OHM |
| R471   | FM010000                        | CHIP RES 1/10W(T) 5% 0OHM |
| R472   | FM010000                        | CHIP RES 1/10W(T) 5% 0OHM |
| R473   | FM010103                        | CHIP RES 1/10W(T) 5% 10KO |
| R474   | FM010472                        | CHIP RES 1/10W(T) 5% 4.7K |
| R475   | FM010472                        | CHIP RES 1/10W(T) 5% 4.7K |
| R476   | FM010101                        | CHIP RES 1/10W(T) 5% 100O |
| R477   | FM010101                        | CHIP RES 1/10W(T) 5% 100O |



| SYMBOL | For Europe<br>(NPG Part Number) | DESCRIPTION               |
|--------|---------------------------------|---------------------------|
| R478   | FM100222                        | CHIP RES 1/8W(T) 5% 2.2KO |
| R479   | FM010103                        | CHIP RES 1/10W(T) 5% 10KO |
| R480   | FM010103                        | CHIP RES 1/10W(T) 5% 10KO |
| R481   | FM010103                        | CHIP RES 1/10W(T) 5% 10KO |
| R482   | FM010103                        | CHIP RES 1/10W(T) 5% 10KO |
| R483   | FM100332                        | R SMD METAL 1/8W 3.3K J T |
| R484   | FM010103                        | CHIP RES 1/10W(T) 5% 10KO |
| R485   | FM010103                        | CHIP RES 1/10W(T) 5% 10KO |
| R486   | FM010103                        | CHIP RES 1/10W(T) 5% 10KO |
| R487   | FM010103                        | CHIP RES 1/10W(T) 5% 10KO |
| R488   | FN012009                        | R SMD 1/10W 20H F 0603    |
| R489   | FN012009                        | R SMD 1/10W 20H F 0603    |
| R490   | FM010103                        | CHIP RES 1/10W(T) 5% 10KO |
| R492   | FM010103                        | CHIP RES 1/10W(T) 5% 10KO |
| R493   | FM010472                        | CHIP RES 1/10W(T) 5% 4.7K |
| R494   | FM010103                        | CHIP RES 1/10W(T) 5% 10KO |
| R495   | FM010103                        | CHIP RES 1/10W(T) 5% 10KO |

\*\*\* CAPACITORS \*\*\*

|      |          |                           |
|------|----------|---------------------------|
| C401 | GGM10620 | C ELE105 10U 16V M (T) LO |
| C402 | GX433052 | C SMD C0G 33P 50V J 0603  |
| C403 | GX433052 | C SMD C0G 33P 50V J 0603  |
| C404 | GX410423 | C SMD X7R 0.1U 16V K 0603 |
| C409 | GX410423 | C SMD X7R 0.1U 16V K 0603 |
| C410 | GX410423 | C SMD X7R 0.1U 16V K 0603 |
| C411 | GGR22714 | VC ELE105 220U 10V M (T)L |
| C412 | GX410423 | C SMD X7R 0.1U 16V K 0603 |
| C413 | GGR22714 | VC ELE105 220U 10V M (T)L |
| C414 | GX410423 | C SMD X7R 0.1U 16V K 0603 |
| C415 | GGR10714 | C ELE105 100U 10V M (T) L |
| C416 | GX410423 | C SMD X7R 0.1U 16V K 0603 |
| C417 | GX410423 | C SMD X7R 0.1U 16V K 0603 |
| C418 | GGR22714 | VC ELE105 220U 10V M (T)L |
| C419 | GX410423 | C SMD X7R 0.1U 16V K 0603 |
| C420 | GGR22714 | VC ELE105 220U 10V M (T)L |
| C421 | GGM22610 | C ELE105 22U 10V M(T) LOW |
| C422 | GX410423 | C SMD X7R 0.1U 16V K 0603 |
| C423 | GX410423 | C SMD X7R 0.1U 16V K 0603 |
| C424 | GX410423 | C SMD X7R 0.1U 16V K 0603 |
| C425 | GX410423 | C SMD X7R 0.1U 16V K 0603 |
| C426 | GGM22610 | C ELE105 22U 10V M(T) LOW |
| C427 | GX410423 | C SMD X7R 0.1U 16V K 0603 |
| C428 | GX410423 | C SMD X7R 0.1U 16V K 0603 |
| C429 | GX410423 | C SMD X7R 0.1U 16V K 0603 |
| C430 | GX410423 | C SMD X7R 0.1U 16V K 0603 |
| C431 | GX410423 | C SMD X7R 0.1U 16V K 0603 |
| C432 | G2M10550 | C ELE105 1U 50V M T PW    |
| C433 | GX410353 | C SMD X7R 0.01U 50V K 060 |

| SYMBOL | For Europe<br>(NPG Part Number) | DESCRIPTION               |
|--------|---------------------------------|---------------------------|
| C434   | GX410423                        | C SMD X7R 0.1U 16V K 0603 |
| C435   | GGM22610                        | C ELE105 22U 10V M(T) LOW |
| C436   | GX410423                        | C SMD X7R 0.1U 16V K 0603 |
| C437   | GGM22610                        | C ELE105 22U 10V M(T) LOW |
| C438   | GX410423                        | C SMD X7R 0.1U 16V K 0603 |
| C439   | GX410423                        | C SMD X7R 0.1U 16V K 0603 |
| C440   | GX410423                        | C SMD X7R 0.1U 16V K 0603 |
| C441   | GX410423                        | C SMD X7R 0.1U 16V K 0603 |
| C442   | G2M10550                        | C ELE105 1U 50V M T PW    |
| C443   | GX410353                        | C SMD X7R 0.01U 50V K 060 |
| C444   | GGM22610                        | C ELE105 22U 10V M(T) LOW |
| C445   | GX410423                        | C SMD X7R 0.1U 16V K 0603 |
| C446   | GX410423                        | C SMD X7R 0.1U 16V K 0603 |
| C447   | GX410423                        | C SMD X7R 0.1U 16V K 0603 |
| C448   | GX410423                        | C SMD X7R 0.1U 16V K 0603 |
| C449   | GX410423                        | C SMD X7R 0.1U 16V K 0603 |
| C450   | GX410423                        | C SMD X7R 0.1U 16V K 0603 |
| C451   | GX410423                        | C SMD X7R 0.1U 16V K 0603 |
| C452   | M745R65D                        | C SMD C0G 5.6P 50V D 0603 |
| C453   | M745R65D                        | C SMD C0G 5.6P 50V D 0603 |
| C454   | GGM22610                        | C ELE105 22U 10V M(T) LOW |
| C455   | GX410423                        | C SMD X7R 0.1U 16V K 0603 |
| C456   | GX410423                        | C SMD X7R 0.1U 16V K 0603 |
| C457   | GX410423                        | C SMD X7R 0.1U 16V K 0603 |
| C458   | GX410423                        | C SMD X7R 0.1U 16V K 0603 |
| C459   | GX410423                        | C SMD X7R 0.1U 16V K 0603 |
| C460   | GGM22610                        | C ELE105 22U 10V M(T) LOW |
| C461   | GX410423                        | C SMD X7R 0.1U 16V K 0603 |
| C462   | GX410423                        | C SMD X7R 0.1U 16V K 0603 |
| C463   | GX410423                        | C SMD X7R 0.1U 16V K 0603 |
| C464   | GX410423                        | C SMD X7R 0.1U 16V K 0603 |
| C465   | GX410423                        | C SMD X7R 0.1U 16V K 0603 |
| C467   | GX410423                        | C SMD X7R 0.1U 16V K 0603 |
| C468   | GX410353                        | C SMD X7R 0.01U 50V K 060 |
| C470   | GX410353                        | C SMD X7R 0.01U 50V K 060 |
| C471   | GX410423                        | C SMD X7R 0.1U 16V K 0603 |
| C472   | GX410423                        | C SMD X7R 0.1U 16V K 0603 |
| C473   | GX410353                        | C SMD X7R 0.01U 50V K 060 |
| C475   | GX410423                        | C SMD X7R 0.1U 16V K 0603 |
| C476   | GX410423                        | C SMD X7R 0.1U 16V K 0603 |
| C477   | GX410353                        | C SMD X7R 0.01U 50V K 060 |
| C478   | GX410353                        | C SMD X7R 0.01U 50V K 060 |
| C480   | GX410423                        | C SMD X7R 0.1U 16V K 0603 |
| C481   | GX410353                        | C SMD X7R 0.01U 50V K 060 |
| C484   | GX447052                        | C SMD C0G 47P 50V J 0603  |
| C485   | GX447052                        | C SMD C0G 47P 50V J 0603  |
| C486   | GX410423                        | C SMD X7R 0.1U 16V K 0603 |
| C487   | GX410423                        | C SMD X7R 0.1U 16V K 0603 |

| SYMBOL | For Europe<br>(NPG Part Number) | DESCRIPTION               |
|--------|---------------------------------|---------------------------|
| C488   | GX410423                        | C SMD X7R 0.1U 16V K 0603 |
| C489   | GX410423                        | C SMD X7R 0.1U 16V K 0603 |
| C490   | GX410423                        | C SMD X7R 0.1U 16V K 0603 |
| C491   | GX410423                        | C SMD X7R 0.1U 16V K 0603 |
| C492   | GX410423                        | C SMD X7R 0.1U 16V K 0603 |
| C493   | GX410423                        | C SMD X7R 0.1U 16V K 0603 |
| C494   | GX410423                        | C SMD X7R 0.1U 16V K 0603 |
| C495   | GX410423                        | C SMD X7R 0.1U 16V K 0603 |
| C496   | GX410423                        | C SMD X7R 0.1U 16V K 0603 |
| C497   | GX410423                        | C SMD X7R 0.1U 16V K 0603 |
| C498   | GX410423                        | C SMD X7R 0.1U 16V K 0603 |
| C499   | GX410423                        | C SMD X7R 0.1U 16V K 0603 |
| C500   | GX410423                        | C SMD X7R 0.1U 16V K 0603 |
| C501   | GX410423                        | C SMD X7R 0.1U 16V K 0603 |
| C502   | GX410423                        | C SMD X7R 0.1U 16V K 0603 |
| C503   | GX410423                        | C SMD X7R 0.1U 16V K 0603 |
| C504   | GX410423                        | C SMD X7R 0.1U 16V K 0603 |
| C505   | GX410423                        | C SMD X7R 0.1U 16V K 0603 |
| C506   | GX410353                        | C SMD X7R 0.01U 50V K 060 |
| C507   | GX410423                        | C SMD X7R 0.1U 16V K 0603 |
| C510   | GX410423                        | C SMD X7R 0.1U 16V K 0603 |
| C511   | GX410423                        | C SMD X7R 0.1U 16V K 0603 |

# REPLACEMENT PARTS LIST(For China)

The components specified for Model LCD1970NX(C)

| SYMBOL | For China<br>(NMV Part Number) | DESCRIPTION |
|--------|--------------------------------|-------------|
|--------|--------------------------------|-------------|

\*\*\* ICS \*\*\*

|      |          |                      |
|------|----------|----------------------|
| U401 | 79PQ7789 | IC SMD MW1537BCM5    |
| U402 | 79PQ5258 | CHIP FET P HAT1053M  |
| U403 | 79PQ7791 | IC SMD GM5221-LF-BC  |
| U405 | 79PQ7796 | IC SMD A290021TL-70  |
| U406 | 79PQ5880 | IC SMD 24LC02B       |
| U407 | 79PQ5880 | IC SMD 24LC02B       |
| U408 | 79PQ5015 | IC SMD 24LC16B SO8   |
| U409 | 79PQ5257 | IC MOS 74LVC14       |
| U410 | 79PQ5884 | IC SMD MIC1815 RESET |

\*\*\* TRANSISTORS \*\*\*

|      |          |                           |
|------|----------|---------------------------|
| Q401 | 79PQ5304 | CHIP TR NPN DTC114EUA     |
| Q402 | 79PQ5304 | CHIP TR NPN DTC114EUA     |
| Q403 | 79PQ5304 | CHIP TR NPN DTC114EUA     |
| Q404 | 79PQ5304 | CHIP TR NPN DTC114EUA     |
| Q405 | 79PQ7797 | TR SMD MMBT3906-LF PNP SO |

\*\*\* DIODES \*\*\*

|       |          |                           |
|-------|----------|---------------------------|
| D401  | 79PQ7798 | DI SMD SCS495D-LF         |
| D402  | 79PQ7799 | DI SMD SCS217K-LF         |
| D403  | 79PQ7799 | DI SMD SCS217K-LF         |
| D404  | 79PQ7799 | DI SMD SCS217K-LF         |
| D405  | 79PQ7798 | DI SMD SCS495D-LF         |
| D406  | 79PQ7799 | DI SMD SCS217K-LF         |
| D407  | 79PQ7799 | DI SMD SCS217K-LF         |
| D408  | 79PQ7799 | DI SMD SCS217K-LF         |
| D409  | 79PQ7799 | DI SMD SCS217K-LF         |
| D410  | 79PQ7799 | DI SMD SCS217K-LF         |
| D411  | 79PQ7799 | DI SMD SCS217K-LF         |
| D412  | 79PQ7799 | DI SMD SCS217K-LF         |
| D413  | 79PQ7799 | DI SMD SCS217K-LF         |
| D414  | 79PQ5847 | DIODE 1N4001              |
| D415  | 79PQ5847 | DIODE 1N4001              |
| D801  | 79PQ7800 | LED SMD JEC-3227UOGE      |
| ZD401 | 79PQ5250 | CHIP DIODE ZENER UDZS5.6B |
| ZD402 | 79PQ5250 | CHIP DIODE ZENER UDZS5.6B |
| ZD403 | 79PQ5250 | CHIP DIODE ZENER UDZS5.6B |
| ZD404 | 79PQ5250 | CHIP DIODE ZENER UDZS5.6B |
| ZD405 | 79PQ5250 | CHIP DIODE ZENER UDZS5.6B |
| ZD406 | 79PQ5250 | CHIP DIODE ZENER UDZS5.6B |
| ZD407 | 79PQ5250 | CHIP DIODE ZENER UDZS5.6B |

| SYMBOL | For China<br>(NMV Part Number) | DESCRIPTION               |
|--------|--------------------------------|---------------------------|
| ZD408  | 79PQ5250                       | CHIP DIODE ZENER UDZS5.6B |

\*\*\* RELAYS & SWITCHES \*\*\*

|        |          |                         |
|--------|----------|-------------------------|
| SW801  | 79PQ7801 | SW SMD TACT TSXH-2G     |
| SW802  | 79PQ7801 | SW SMD TACT TSXH-2G     |
| SW803  | 79PQ7802 | SW SMD TACT TMFV-1502   |
| SW804  | 79PQ7801 | SW SMD TACT TSXH-2G     |
| SW805  | 79PQ7801 | SW SMD TACT TSXH-2G     |
| XD1012 | 79PQ7804 | WIRE SW 1015#18L60 GRAY |

\*\*\* PWB ASSYS \*\*\*

|        |          |                          |
|--------|----------|--------------------------|
| INVPWR | 79PQ7815 | U INVERT-POWER L194RJ LG |
| MAIN   | 79PQ7808 | MAIN INSERT ASSY         |
| SW     | 79PQ7812 | SW INSERT ASSY           |

\*\*\* COILS & FILTERS \*\*\*

|      |          |                          |
|------|----------|--------------------------|
| B402 | 79PQ5848 | L BEAD SMD MHC1608S121P  |
| B403 | 79PQ5848 | L BEAD SMD MHC1608S121P  |
| B404 | 79PQ5848 | L BEAD SMD MHC1608S121P  |
| B405 | 79PQ5850 | L BEAD SMD MCB1608S121G  |
| B406 | 79PQ5848 | L BEAD SMD MHC1608S121P  |
| B407 | 79PQ5848 | L BEAD SMD MHC1608S121P  |
| B408 | 79PQ5848 | L BEAD SMD MHC1608S121P  |
| B409 | 79PQ5850 | L BEAD SMD MCB1608S121G  |
| B410 | 79PQ5850 | L BEAD SMD MCB1608S121G  |
| B411 | 79PQ5850 | L BEAD SMD MCB1608S121G  |
| B412 | 79PQ5850 | L BEAD SMD MCB1608S121G  |
| B413 | 79PQ5850 | L BEAD SMD MCB1608S121G  |
| B414 | 79PQ5850 | L BEAD SMD MCB1608S121G  |
| B415 | 79PQ5850 | L BEAD SMD MCB1608S121G  |
| B416 | 79PQ5850 | L BEAD SMD MCB1608S121G  |
| B417 | 79PQ5865 | L BEAD SMD MCB1608H750G  |
| B418 | 79PQ5865 | L BEAD SMD MCB1608H750G  |
| B419 | 79PQ5865 | L BEAD SMD MCB1608H750G  |
| B420 | 79PQ5265 | CHIP FERRITE BK2125HS431 |
| B421 | 79PQ5265 | CHIP FERRITE BK2125HS431 |
| B422 | 79PQ5850 | L BEAD SMD MCB1608S121G  |
| B423 | 79PQ5850 | L BEAD SMD MCB1608S121G  |
| B424 | 79PQ5850 | L BEAD SMD MCB1608S121G  |
| B425 | 79PQ5850 | L BEAD SMD MCB1608S121G  |
| B426 | 79PQ5850 | L BEAD SMD MCB1608S121G  |
| B427 | 79PQ5850 | L BEAD SMD MCB1608S121G  |
| B428 | 79PQ5850 | L BEAD SMD MCB1608S121G  |
| B429 | 79PQ5850 | L BEAD SMD MCB1608S121G  |
| B430 | 79PQ5850 | L BEAD SMD MCB1608S121G  |
| B431 | 79PQ5850 | L BEAD SMD MCB1608S121G  |
| B432 | 79PQ5850 | L BEAD SMD MCB1608S121G  |
| B433 | 79PQ1233 | BEAD WBR6H-3T-R7K-B5     |

| SYMBOL | For China<br>(NMV Part Number) | DESCRIPTION             |
|--------|--------------------------------|-------------------------|
| B434   | 79PQ1233                       | BEAD WBR6H-3T-R7K-B5    |
| B435   | 79PQ1233                       | BEAD WBR6H-3T-R7K-B5    |
| B436   | 79PQ5850                       | L BEAD SMD MCB1608S121G |
| B437   | 79PQ5850                       | L BEAD SMD MCB1608S121G |
| B439   | 79PQ5850                       | L BEAD SMD MCB1608S121G |
| B442   | 79PQ5850                       | L BEAD SMD MCB1608S121G |

\*\*\* ELECTRICAL PARTS & MISCELLANEOUS PARTS \*\*\*

|        |          |                           |
|--------|----------|---------------------------|
| LCD    | 3A684091 | TFT LM190E02-A4K5         |
| P402   | 79PQ7176 | CN MINI-D-SUB 15P SIDE    |
| X401   | 79PQ7820 | OSC X'TAL 49US 14.318MHZ  |
| XD1002 | 79PQ5083 | CABLE VIDEO GR DSUB-DSUB  |
| XD1007 | 79PQ7909 | PW CORD CHN CCC 2M GRY WA |
| XD1010 | 79PQ7825 | WIRE CC12P 1571#30L180    |
| XD1011 | 79PQ7824 | WIRE CC30P 1589#30L220    |

\*\*\* APPEARANCE PARTS \*\*\*

|        |          |                           |
|--------|----------|---------------------------|
| LABEL  | 79PQ7881 | LABEL RATING LCD1970NXH W |
| M-CONN | 79PQ7904 | PAD,L194,LPL              |
| XD1000 | 79PQ7832 | BACK L194RJ (N) WH        |
| XD1001 | 79PQ7840 | BEZEL WH(N) BC L194RJ     |
| XD1003 | 79PQ7855 | CHASSIS BASE 1970NXH,(LPL |
| XD1004 | 79PQ7849 | COVER UNIT WH L194RJ      |
| XD1008 | 79PQ7857 | SHIELD 1970VH/NXH         |
| XD1009 | 79PQ7860 | STAND UNIT L194R WH       |

\*\*\* PRINTED & PACKING MATERIALS \*\*\*

|        |          |                           |
|--------|----------|---------------------------|
| BAG-1  | 79PQ7382 | BAG LCD1960NX EPE         |
| BAG-3  | 79PQ5129 | PE BAG (340*225)          |
| CRTON1 | 79PQ7865 | CARTON BOX LCD1970NX C    |
| CRTON2 | 79PQ5613 | CARTON SHEET FOR 15 IN LC |
| MANU1  | 79PQ7894 | MANUAL ASSY LCD1970NX C   |
| MANU2  | 79PQ7891 | MANUAL LCD1970NX C        |
| WRNTY1 | 79PQ7900 | SHEET SETUP LCD1970NX C   |
| WRNTY2 | 79PQ7226 | NAVISET CARTON BOX FLYER  |
| WRNTY3 | 79PQ7112 | SALES OFFICE LIST(B)      |
| XD1005 | 79PQ7875 | FILLER B L194R,(A,B,C,)   |
| XD1006 | 79PQ7874 | FILLER T L194R,(A,B,C,)   |

\*\*\* RESISTORS \*\*\*

|      |          |                           |
|------|----------|---------------------------|
| F401 | 79PQ1890 | CHIP 1/8W(T) 5% 0 H       |
| F402 | 79PQ1890 | CHIP 1/8W(T) 5% 0 H       |
| R401 | 79PQ5675 | CHIP RES 1/10W(T) 5% 10KO |
| R403 | 79PQ5675 | CHIP RES 1/10W(T) 5% 10KO |
| R404 | 79PQ5675 | CHIP RES 1/10W(T) 5% 10KO |
| R405 | 79PQ5675 | CHIP RES 1/10W(T) 5% 10KO |
| R406 | 79PQ5320 | CHIP RES 1/10W(T) 5% 0OHM |
| R407 | 79PQ5675 | CHIP RES 1/10W(T) 5% 10KO |

| SYMBOL | For China<br>(NMV Part Number) | DESCRIPTION               |
|--------|--------------------------------|---------------------------|
| R408   | 79PQ5675                       | CHIP RES 1/10W(T) 5% 10KO |
| R409   | 79PQ7910                       | R SMD METAL 1/10W 249 F 0 |
| R410   | 79PQ5675                       | CHIP RES 1/10W(T) 5% 10KO |
| R411   | 79PQ5675                       | CHIP RES 1/10W(T) 5% 10KO |
| R412   | 79PQ5675                       | CHIP RES 1/10W(T) 5% 10KO |
| R416   | 79PQ5675                       | CHIP RES 1/10W(T) 5% 10KO |
| R420   | 79PQ5675                       | CHIP RES 1/10W(T) 5% 10KO |
| R421   | 79PQ5675                       | CHIP RES 1/10W(T) 5% 10KO |
| R422   | 79PQ5675                       | CHIP RES 1/10W(T) 5% 10KO |
| R428   | 79PQ5675                       | CHIP RES 1/10W(T) 5% 10KO |
| R429   | 79PQ5675                       | CHIP RES 1/10W(T) 5% 10KO |
| R431   | 79PQ5675                       | CHIP RES 1/10W(T) 5% 10KO |
| R434   | 79PQ5675                       | CHIP RES 1/10W(T) 5% 10KO |
| R437   | 79PQ7911                       | R SMD METAL 1/10W 47 F 06 |
| R438   | 79PQ6053                       | R SMD METAL 1/3W 75 F T 1 |
| R439   | 79PQ7912                       | R SMD METAL 1/10W 84.5 F  |
| R440   | 79PQ5675                       | CHIP RES 1/10W(T) 5% 10KO |
| R441   | 79PQ5039                       | CHIP 1/10W(T) 5% 47K      |
| R442   | 79PQ5272                       | CHIP RES 1/10W(T) 5% 100O |
| R443   | 79PQ7911                       | R SMD METAL 1/10W 47 F 06 |
| R444   | 79PQ5272                       | CHIP RES 1/10W(T) 5% 100O |
| R445   | 79PQ6053                       | R SMD METAL 1/3W 75 F T 1 |
| R446   | 79PQ7912                       | R SMD METAL 1/10W 84.5 F  |
| R447   | 79PQ7911                       | R SMD METAL 1/10W 47 F 06 |
| R448   | 79PQ5272                       | CHIP RES 1/10W(T) 5% 100O |
| R449   | 79PQ5272                       | CHIP RES 1/10W(T) 5% 100O |
| R450   | 79PQ6053                       | R SMD METAL 1/3W 75 F T 1 |
| R451   | 79PQ7912                       | R SMD METAL 1/10W 84.5 F  |
| R452   | 79PQ5272                       | CHIP RES 1/10W(T) 5% 100O |
| R453   | 79PQ5272                       | CHIP RES 1/10W(T) 5% 100O |
| R454   | 79PQ5315                       | CHIP RES 1/10W(T) 5% 2.2K |
| R455   | 79PQ5315                       | CHIP RES 1/10W(T) 5% 2.2K |
| R456   | 79PQ5675                       | CHIP RES 1/10W(T) 5% 10KO |
| R459   | 79PQ5675                       | CHIP RES 1/10W(T) 5% 10KO |
| R460   | 79PQ5039                       | CHIP 1/10W(T) 5% 47K      |
| R461   | 79PQ5272                       | CHIP RES 1/10W(T) 5% 100O |
| R462   | 79PQ5272                       | CHIP RES 1/10W(T) 5% 100O |
| R463   | 79PQ5272                       | CHIP RES 1/10W(T) 5% 100O |
| R464   | 79PQ5272                       | CHIP RES 1/10W(T) 5% 100O |
| R465   | 79PQ5320                       | CHIP RES 1/10W(T) 5% 0OHM |
| R466   | 79PQ5320                       | CHIP RES 1/10W(T) 5% 0OHM |
| R467   | 79PQ5320                       | CHIP RES 1/10W(T) 5% 0OHM |
| R468   | 79PQ5320                       | CHIP RES 1/10W(T) 5% 0OHM |
| R469   | 79PQ5320                       | CHIP RES 1/10W(T) 5% 0OHM |
| R470   | 79PQ5320                       | CHIP RES 1/10W(T) 5% 0OHM |
| R471   | 79PQ5320                       | CHIP RES 1/10W(T) 5% 0OHM |
| R472   | 79PQ5320                       | CHIP RES 1/10W(T) 5% 0OHM |
| R473   | 79PQ5675                       | CHIP RES 1/10W(T) 5% 10KO |

| SYMBOL | For China<br>(NMV Part Number) | DESCRIPTION               |
|--------|--------------------------------|---------------------------|
| R474   | 79PQ5277                       | CHIP RES 1/10W(T) 5% 4.7K |
| R475   | 79PQ5277                       | CHIP RES 1/10W(T) 5% 4.7K |
| R476   | 79PQ5272                       | CHIP RES 1/10W(T) 5% 100O |
| R477   | 79PQ5272                       | CHIP RES 1/10W(T) 5% 100O |
| R478   | 79PQ5681                       | CHIP RES 1/8W(T) 5% 2.2KO |
| R479   | 79PQ5675                       | CHIP RES 1/10W(T) 5% 10KO |
| R480   | 79PQ5675                       | CHIP RES 1/10W(T) 5% 10KO |
| R481   | 79PQ5675                       | CHIP RES 1/10W(T) 5% 10KO |
| R482   | 79PQ5675                       | CHIP RES 1/10W(T) 5% 10KO |
| R483   | 79PQ6604                       | R SMD METAL 1/8W 3.3K J T |
| R484   | 79PQ5675                       | CHIP RES 1/10W(T) 5% 10KO |
| R485   | 79PQ5675                       | CHIP RES 1/10W(T) 5% 10KO |
| R486   | 79PQ5675                       | CHIP RES 1/10W(T) 5% 10KO |
| R487   | 79PQ5675                       | CHIP RES 1/10W(T) 5% 10KO |
| R488   | 79PQ5868                       | R SMD 1/10W 20H F 0603    |
| R489   | 79PQ5868                       | R SMD 1/10W 20H F 0603    |
| R490   | 79PQ5675                       | CHIP RES 1/10W(T) 5% 10KO |
| R492   | 79PQ5675                       | CHIP RES 1/10W(T) 5% 10KO |
| R493   | 79PQ5277                       | CHIP RES 1/10W(T) 5% 4.7K |
| R494   | 79PQ5675                       | CHIP RES 1/10W(T) 5% 10KO |
| R495   | 79PQ5675                       | CHIP RES 1/10W(T) 5% 10KO |

\*\*\* CAPACITORS \*\*\*

|      |          |                           |
|------|----------|---------------------------|
| C401 | 79PQ7916 | C ELE105 10U 16V M (T) LO |
| C402 | 79PQ5489 | C SMD C0G 33P 50V J 0603  |
| C403 | 79PQ5489 | C SMD C0G 33P 50V J 0603  |
| C404 | 79PQ5240 | C SMD X7R 0.1U 16V K 0603 |
| C409 | 79PQ5240 | C SMD X7R 0.1U 16V K 0603 |
| C410 | 79PQ5240 | C SMD X7R 0.1U 16V K 0603 |
| C411 | 79PQ5838 | VC ELE105 220U 10V M (T)L |
| C412 | 79PQ5240 | C SMD X7R 0.1U 16V K 0603 |
| C413 | 79PQ5838 | VC ELE105 220U 10V M (T)L |
| C414 | 79PQ5240 | C SMD X7R 0.1U 16V K 0603 |
| C415 | 79PQ5889 | C ELE105 100U 10V M (T) L |
| C416 | 79PQ5240 | C SMD X7R 0.1U 16V K 0603 |
| C417 | 79PQ5240 | C SMD X7R 0.1U 16V K 0603 |
| C418 | 79PQ5838 | VC ELE105 220U 10V M (T)L |
| C419 | 79PQ5240 | C SMD X7R 0.1U 16V K 0603 |
| C420 | 79PQ5838 | VC ELE105 220U 10V M (T)L |
| C421 | 79PQ6038 | C ELE105 22U 10V M(T) LOW |
| C422 | 79PQ5240 | C SMD X7R 0.1U 16V K 0603 |
| C423 | 79PQ5240 | C SMD X7R 0.1U 16V K 0603 |
| C424 | 79PQ5240 | C SMD X7R 0.1U 16V K 0603 |
| C425 | 79PQ5240 | C SMD X7R 0.1U 16V K 0603 |
| C426 | 79PQ6038 | C ELE105 22U 10V M(T) LOW |
| C427 | 79PQ5240 | C SMD X7R 0.1U 16V K 0603 |
| C428 | 79PQ5240 | C SMD X7R 0.1U 16V K 0603 |
| C429 | 79PQ5240 | C SMD X7R 0.1U 16V K 0603 |



| SYMBOL | For China<br>(NMV Part Number) | DESCRIPTION               |
|--------|--------------------------------|---------------------------|
| C430   | 79PQ5240                       | C SMD X7R 0.1U 16V K 0603 |
| C431   | 79PQ5240                       | C SMD X7R 0.1U 16V K 0603 |
| C432   | 79PQ7913                       | C ELE105 1U 50V M T PW    |
| C433   | 79PQ5355                       | C SMD X7R 0.01U 50V K 060 |
| C434   | 79PQ5240                       | C SMD X7R 0.1U 16V K 0603 |
| C435   | 79PQ6038                       | C ELE105 22U 10V M(T) LOW |
| C436   | 79PQ5240                       | C SMD X7R 0.1U 16V K 0603 |
| C437   | 79PQ6038                       | C ELE105 22U 10V M(T) LOW |
| C438   | 79PQ5240                       | C SMD X7R 0.1U 16V K 0603 |
| C439   | 79PQ5240                       | C SMD X7R 0.1U 16V K 0603 |
| C440   | 79PQ5240                       | C SMD X7R 0.1U 16V K 0603 |
| C441   | 79PQ5240                       | C SMD X7R 0.1U 16V K 0603 |
| C442   | 79PQ7913                       | C ELE105 1U 50V M T PW    |
| C443   | 79PQ5355                       | C SMD X7R 0.01U 50V K 060 |
| C444   | 79PQ6038                       | C ELE105 22U 10V M(T) LOW |
| C445   | 79PQ5240                       | C SMD X7R 0.1U 16V K 0603 |
| C446   | 79PQ5240                       | C SMD X7R 0.1U 16V K 0603 |
| C447   | 79PQ5240                       | C SMD X7R 0.1U 16V K 0603 |
| C448   | 79PQ5240                       | C SMD X7R 0.1U 16V K 0603 |
| C449   | 79PQ5240                       | C SMD X7R 0.1U 16V K 0603 |
| C450   | 79PQ5240                       | C SMD X7R 0.1U 16V K 0603 |
| C451   | 79PQ5240                       | C SMD X7R 0.1U 16V K 0603 |
| C452   | 79PQ7918                       | C SMD C0G 5.6P 50V D 0603 |
| C453   | 79PQ7918                       | C SMD C0G 5.6P 50V D 0603 |
| C454   | 79PQ6038                       | C ELE105 22U 10V M(T) LOW |
| C455   | 79PQ5240                       | C SMD X7R 0.1U 16V K 0603 |
| C456   | 79PQ5240                       | C SMD X7R 0.1U 16V K 0603 |
| C457   | 79PQ5240                       | C SMD X7R 0.1U 16V K 0603 |
| C458   | 79PQ5240                       | C SMD X7R 0.1U 16V K 0603 |
| C459   | 79PQ5240                       | C SMD X7R 0.1U 16V K 0603 |
| C460   | 79PQ6038                       | C ELE105 22U 10V M(T) LOW |
| C461   | 79PQ5240                       | C SMD X7R 0.1U 16V K 0603 |
| C462   | 79PQ5240                       | C SMD X7R 0.1U 16V K 0603 |
| C463   | 79PQ5240                       | C SMD X7R 0.1U 16V K 0603 |
| C464   | 79PQ5240                       | C SMD X7R 0.1U 16V K 0603 |
| C465   | 79PQ5240                       | C SMD X7R 0.1U 16V K 0603 |
| C467   | 79PQ5240                       | C SMD X7R 0.1U 16V K 0603 |
| C468   | 79PQ5355                       | C SMD X7R 0.01U 50V K 060 |
| C470   | 79PQ5355                       | C SMD X7R 0.01U 50V K 060 |
| C471   | 79PQ5240                       | C SMD X7R 0.1U 16V K 0603 |
| C472   | 79PQ5240                       | C SMD X7R 0.1U 16V K 0603 |
| C473   | 79PQ5355                       | C SMD X7R 0.01U 50V K 060 |
| C475   | 79PQ5240                       | C SMD X7R 0.1U 16V K 0603 |
| C476   | 79PQ5240                       | C SMD X7R 0.1U 16V K 0603 |
| C477   | 79PQ5355                       | C SMD X7R 0.01U 50V K 060 |
| C478   | 79PQ5355                       | C SMD X7R 0.01U 50V K 060 |
| C480   | 79PQ5240                       | C SMD X7R 0.1U 16V K 0603 |
| C481   | 79PQ5355                       | C SMD X7R 0.01U 50V K 060 |

| SYMBOL | For China<br>(NMV Part Number) | DESCRIPTION               |
|--------|--------------------------------|---------------------------|
| C484   | 79PQ5244                       | C SMD C0G 47P 50V J 0603  |
| C485   | 79PQ5244                       | C SMD C0G 47P 50V J 0603  |
| C486   | 79PQ5240                       | C SMD X7R 0.1U 16V K 0603 |
| C487   | 79PQ5240                       | C SMD X7R 0.1U 16V K 0603 |
| C488   | 79PQ5240                       | C SMD X7R 0.1U 16V K 0603 |
| C489   | 79PQ5240                       | C SMD X7R 0.1U 16V K 0603 |
| C490   | 79PQ5240                       | C SMD X7R 0.1U 16V K 0603 |
| C491   | 79PQ5240                       | C SMD X7R 0.1U 16V K 0603 |
| C492   | 79PQ5240                       | C SMD X7R 0.1U 16V K 0603 |
| C493   | 79PQ5240                       | C SMD X7R 0.1U 16V K 0603 |
| C494   | 79PQ5240                       | C SMD X7R 0.1U 16V K 0603 |
| C495   | 79PQ5240                       | C SMD X7R 0.1U 16V K 0603 |
| C496   | 79PQ5240                       | C SMD X7R 0.1U 16V K 0603 |
| C497   | 79PQ5240                       | C SMD X7R 0.1U 16V K 0603 |
| C498   | 79PQ5240                       | C SMD X7R 0.1U 16V K 0603 |
| C499   | 79PQ5240                       | C SMD X7R 0.1U 16V K 0603 |
| C500   | 79PQ5240                       | C SMD X7R 0.1U 16V K 0603 |
| C501   | 79PQ5240                       | C SMD X7R 0.1U 16V K 0603 |
| C502   | 79PQ5240                       | C SMD X7R 0.1U 16V K 0603 |
| C503   | 79PQ5240                       | C SMD X7R 0.1U 16V K 0603 |
| C504   | 79PQ5240                       | C SMD X7R 0.1U 16V K 0603 |
| C505   | 79PQ5240                       | C SMD X7R 0.1U 16V K 0603 |
| C506   | 79PQ5355                       | C SMD X7R 0.01U 50V K 060 |
| C507   | 79PQ5240                       | C SMD X7R 0.1U 16V K 0603 |
| C510   | 79PQ5240                       | C SMD X7R 0.1U 16V K 0603 |
| C511   | 79PQ5240                       | C SMD X7R 0.1U 16V K 0603 |

# REPLACEMENT PARTS LIST(For China)

The components specified for Model LCD1970NX-BK(C)

| SYMBOL | For China<br>(NMV Part Number) | DESCRIPTION |
|--------|--------------------------------|-------------|
|--------|--------------------------------|-------------|

\*\*\* ICS \*\*\*

|      |          |                      |
|------|----------|----------------------|
| U401 | 79PQ7789 | IC SMD MW1537BCM5    |
| U402 | 79PQ5258 | CHIP FET P HAT1053M  |
| U403 | 79PQ7791 | IC SMD GM5221-LF-BC  |
| U405 | 79PQ7796 | IC SMD A290021TL-70  |
| U406 | 79PQ5880 | IC SMD 24LC02B       |
| U407 | 79PQ5880 | IC SMD 24LC02B       |
| U408 | 79PQ5015 | IC SMD 24LC16B SO8   |
| U409 | 79PQ5257 | IC MOS 74LVC14       |
| U410 | 79PQ5884 | IC SMD MIC1815 RESET |

\*\*\* TRANSISTORS \*\*\*

|      |          |                           |
|------|----------|---------------------------|
| Q401 | 79PQ5304 | CHIP TR NPN DTC114EUA     |
| Q402 | 79PQ5304 | CHIP TR NPN DTC114EUA     |
| Q403 | 79PQ5304 | CHIP TR NPN DTC114EUA     |
| Q404 | 79PQ5304 | CHIP TR NPN DTC114EUA     |
| Q405 | 79PQ7797 | TR SMD MMBT3906-LF PNP SO |

\*\*\* DIODES \*\*\*

|       |          |                           |
|-------|----------|---------------------------|
| D401  | 79PQ7798 | DI SMD SCS495D-LF         |
| D402  | 79PQ7799 | DI SMD SCS217K-LF         |
| D403  | 79PQ7799 | DI SMD SCS217K-LF         |
| D404  | 79PQ7799 | DI SMD SCS217K-LF         |
| D405  | 79PQ7798 | DI SMD SCS495D-LF         |
| D406  | 79PQ7799 | DI SMD SCS217K-LF         |
| D407  | 79PQ7799 | DI SMD SCS217K-LF         |
| D408  | 79PQ7799 | DI SMD SCS217K-LF         |
| D409  | 79PQ7799 | DI SMD SCS217K-LF         |
| D410  | 79PQ7799 | DI SMD SCS217K-LF         |
| D411  | 79PQ7799 | DI SMD SCS217K-LF         |
| D412  | 79PQ7799 | DI SMD SCS217K-LF         |
| D413  | 79PQ7799 | DI SMD SCS217K-LF         |
| D414  | 79PQ5847 | DIODE 1N4001              |
| D415  | 79PQ5847 | DIODE 1N4001              |
| D801  | 79PQ7800 | LED SMD JEC-3227UOGE      |
| ZD401 | 79PQ5250 | CHIP DIODE ZENER UDZS5.6B |
| ZD402 | 79PQ5250 | CHIP DIODE ZENER UDZS5.6B |
| ZD403 | 79PQ5250 | CHIP DIODE ZENER UDZS5.6B |
| ZD404 | 79PQ5250 | CHIP DIODE ZENER UDZS5.6B |
| ZD405 | 79PQ5250 | CHIP DIODE ZENER UDZS5.6B |
| ZD406 | 79PQ5250 | CHIP DIODE ZENER UDZS5.6B |
| ZD407 | 79PQ5250 | CHIP DIODE ZENER UDZS5.6B |

| SYMBOL | For China<br>(NMV Part Number) | DESCRIPTION               |
|--------|--------------------------------|---------------------------|
| ZD408  | 79PQ5250                       | CHIP DIODE ZENER UDZS5.6B |

\*\*\* RELAYS & SWITCHES \*\*\*

|        |          |                        |
|--------|----------|------------------------|
| SW801  | 79PQ7801 | SW SMD TACT TSXH-2G    |
| SW802  | 79PQ7801 | SW SMD TACT TSXH-2G    |
| SW803  | 79PQ7802 | SW SMD TACT TMFV-1502  |
| SW804  | 79PQ7801 | SW SMD TACT TSXH-2G    |
| SW805  | 79PQ7801 | SW SMD TACT TSXH-2G    |
| XD1012 | 79PQ7803 | WIRE SW 1015#18L60 BLK |

\*\*\* PWB ASSYS \*\*\*

|        |          |                          |
|--------|----------|--------------------------|
| INVPWR | 79PQ7815 | U INVERT-POWER L194RJ LG |
| MAIN   | 79PQ7808 | MAIN INSERT ASSY         |
| SW     | 79PQ7812 | SW INSERT ASSY           |

\*\*\* COILS & FILTERS \*\*\*

|      |          |                          |
|------|----------|--------------------------|
| B402 | 79PQ5848 | L BEAD SMD MHC1608S121P  |
| B403 | 79PQ5848 | L BEAD SMD MHC1608S121P  |
| B404 | 79PQ5848 | L BEAD SMD MHC1608S121P  |
| B405 | 79PQ5850 | L BEAD SMD MCB1608S121G  |
| B406 | 79PQ5848 | L BEAD SMD MHC1608S121P  |
| B407 | 79PQ5848 | L BEAD SMD MHC1608S121P  |
| B408 | 79PQ5848 | L BEAD SMD MHC1608S121P  |
| B409 | 79PQ5850 | L BEAD SMD MCB1608S121G  |
| B410 | 79PQ5850 | L BEAD SMD MCB1608S121G  |
| B411 | 79PQ5850 | L BEAD SMD MCB1608S121G  |
| B412 | 79PQ5850 | L BEAD SMD MCB1608S121G  |
| B413 | 79PQ5850 | L BEAD SMD MCB1608S121G  |
| B414 | 79PQ5850 | L BEAD SMD MCB1608S121G  |
| B415 | 79PQ5850 | L BEAD SMD MCB1608S121G  |
| B416 | 79PQ5850 | L BEAD SMD MCB1608S121G  |
| B417 | 79PQ5865 | L BEAD SMD MCB1608H750G  |
| B418 | 79PQ5865 | L BEAD SMD MCB1608H750G  |
| B419 | 79PQ5865 | L BEAD SMD MCB1608H750G  |
| B420 | 79PQ5265 | CHIP FERRITE BK2125HS431 |
| B421 | 79PQ5265 | CHIP FERRITE BK2125HS431 |
| B422 | 79PQ5850 | L BEAD SMD MCB1608S121G  |
| B423 | 79PQ5850 | L BEAD SMD MCB1608S121G  |
| B424 | 79PQ5850 | L BEAD SMD MCB1608S121G  |
| B425 | 79PQ5850 | L BEAD SMD MCB1608S121G  |
| B426 | 79PQ5850 | L BEAD SMD MCB1608S121G  |
| B427 | 79PQ5850 | L BEAD SMD MCB1608S121G  |
| B428 | 79PQ5850 | L BEAD SMD MCB1608S121G  |
| B429 | 79PQ5850 | L BEAD SMD MCB1608S121G  |
| B430 | 79PQ5850 | L BEAD SMD MCB1608S121G  |
| B431 | 79PQ5850 | L BEAD SMD MCB1608S121G  |
| B432 | 79PQ5850 | L BEAD SMD MCB1608S121G  |
| B433 | 79PQ1233 | BEAD WBR6H-3T-R7K-B5     |

| SYMBOL | For China<br>(NMV Part Number) | DESCRIPTION             |
|--------|--------------------------------|-------------------------|
| B434   | 79PQ1233                       | BEAD WBR6H-3T-R7K-B5    |
| B435   | 79PQ1233                       | BEAD WBR6H-3T-R7K-B5    |
| B436   | 79PQ5850                       | L BEAD SMD MCB1608S121G |
| B437   | 79PQ5850                       | L BEAD SMD MCB1608S121G |
| B439   | 79PQ5850                       | L BEAD SMD MCB1608S121G |
| B442   | 79PQ5850                       | L BEAD SMD MCB1608S121G |

\*\*\* ELECTRICAL PARTS & MISCELLANEOUS PARTS \*\*\*

|        |          |                           |
|--------|----------|---------------------------|
| LCD    | 3A684091 | TFT LM190E02-A4K5         |
| P402   | 79PQ7176 | CN MINI-D-SUB 15P SIDE    |
| X401   | 79PQ7820 | OSC X'TAL 49US 14.318MHZ  |
| XD1002 | 79PQ5086 | CABLE VIDEO BLK DSUB-DSUB |
| XD1007 | 79PQ7908 | PW CORD CHN CCC 2M BLK WA |
| XD1010 | 79PQ7825 | WIRE CC12P 1571#30L180    |
| XD1011 | 79PQ7824 | WIRE CC30P 1589#30L220    |

\*\*\* APPEARANCE PARTS \*\*\*

|        |          |                           |
|--------|----------|---------------------------|
| LABEL  | 79PQ7882 | LABEL RATING LCD1970NXH B |
| M-CONN | 79PQ7904 | PAD,L194,LPL              |
| XD1000 | 79PQ7833 | BACK L194RJ (N) BK        |
| XD1001 | 79PQ7842 | BEZEL BK(N) C L194RJ      |
| XD1003 | 79PQ7855 | CHASSIS BASE 1970NXH,(LPL |
| XD1004 | 79PQ7850 | COVER UNIT BK L194RJ      |
| XD1008 | 79PQ7857 | SHIELD 1970VH/NXH         |
| XD1009 | 79PQ7861 | STAND UNIT L194R BK       |

\*\*\* PRINTED & PACKING MATERIALS \*\*\*

|        |          |                           |
|--------|----------|---------------------------|
| BAG-1  | 79PQ7382 | BAG LCD1960NX EPE         |
| BAG-3  | 79PQ5129 | PE BAG (340*225)          |
| CRTON1 | 79PQ7865 | CARTON BOX LCD1970NX C    |
| CRTON2 | 79PQ5613 | CARTON SHEET FOR 15 IN LC |
| MANU1  | 79PQ7894 | MANUAL ASSY LCD1970NX C   |
| MANU2  | 79PQ7891 | MANUAL LCD1970NX C        |
| WRNTY1 | 79PQ7900 | SHEET SETUP LCD1970NX C   |
| WRNTY2 | 79PQ7226 | NAVISET CARTON BOX FLYER  |
| WRNTY3 | 79PQ7112 | SALES OFFICE LIST(B)      |
| XD1005 | 79PQ7875 | FILLER B L194R,(A,B,C,)   |
| XD1006 | 79PQ7874 | FILLER T L194R,(A,B,C,)   |

\*\*\* RESISTORS \*\*\*

|      |          |                           |
|------|----------|---------------------------|
| F401 | 79PQ1890 | CHIP 1/8W(T) 5% 0 H       |
| F402 | 79PQ1890 | CHIP 1/8W(T) 5% 0 H       |
| R401 | 79PQ5675 | CHIP RES 1/10W(T) 5% 10KO |
| R403 | 79PQ5675 | CHIP RES 1/10W(T) 5% 10KO |
| R404 | 79PQ5675 | CHIP RES 1/10W(T) 5% 10KO |
| R405 | 79PQ5675 | CHIP RES 1/10W(T) 5% 10KO |
| R406 | 79PQ5320 | CHIP RES 1/10W(T) 5% 0OHM |
| R407 | 79PQ5675 | CHIP RES 1/10W(T) 5% 10KO |

| SYMBOL | For China<br>(NMV Part Number) | DESCRIPTION               |
|--------|--------------------------------|---------------------------|
| R408   | 79PQ5675                       | CHIP RES 1/10W(T) 5% 10KO |
| R409   | 79PQ7910                       | R SMD METAL 1/10W 249 F 0 |
| R410   | 79PQ5675                       | CHIP RES 1/10W(T) 5% 10KO |
| R411   | 79PQ5675                       | CHIP RES 1/10W(T) 5% 10KO |
| R412   | 79PQ5675                       | CHIP RES 1/10W(T) 5% 10KO |
| R416   | 79PQ5675                       | CHIP RES 1/10W(T) 5% 10KO |
| R420   | 79PQ5675                       | CHIP RES 1/10W(T) 5% 10KO |
| R421   | 79PQ5675                       | CHIP RES 1/10W(T) 5% 10KO |
| R422   | 79PQ5675                       | CHIP RES 1/10W(T) 5% 10KO |
| R428   | 79PQ5675                       | CHIP RES 1/10W(T) 5% 10KO |
| R429   | 79PQ5675                       | CHIP RES 1/10W(T) 5% 10KO |
| R431   | 79PQ5675                       | CHIP RES 1/10W(T) 5% 10KO |
| R434   | 79PQ5675                       | CHIP RES 1/10W(T) 5% 10KO |
| R437   | 79PQ7911                       | R SMD METAL 1/10W 47 F 06 |
| R438   | 79PQ6053                       | R SMD METAL 1/3W 75 F T 1 |
| R439   | 79PQ7912                       | R SMD METAL 1/10W 84.5 F  |
| R440   | 79PQ5675                       | CHIP RES 1/10W(T) 5% 10KO |
| R441   | 79PQ5039                       | CHIP 1/10W(T) 5% 47K      |
| R442   | 79PQ5272                       | CHIP RES 1/10W(T) 5% 1000 |
| R443   | 79PQ7911                       | R SMD METAL 1/10W 47 F 06 |
| R444   | 79PQ5272                       | CHIP RES 1/10W(T) 5% 1000 |
| R445   | 79PQ6053                       | R SMD METAL 1/3W 75 F T 1 |
| R446   | 79PQ7912                       | R SMD METAL 1/10W 84.5 F  |
| R447   | 79PQ7911                       | R SMD METAL 1/10W 47 F 06 |
| R448   | 79PQ5272                       | CHIP RES 1/10W(T) 5% 1000 |
| R449   | 79PQ5272                       | CHIP RES 1/10W(T) 5% 1000 |
| R450   | 79PQ6053                       | R SMD METAL 1/3W 75 F T 1 |
| R451   | 79PQ7912                       | R SMD METAL 1/10W 84.5 F  |
| R452   | 79PQ5272                       | CHIP RES 1/10W(T) 5% 1000 |
| R453   | 79PQ5272                       | CHIP RES 1/10W(T) 5% 1000 |
| R454   | 79PQ5315                       | CHIP RES 1/10W(T) 5% 2.2K |
| R455   | 79PQ5315                       | CHIP RES 1/10W(T) 5% 2.2K |
| R456   | 79PQ5675                       | CHIP RES 1/10W(T) 5% 10KO |
| R459   | 79PQ5675                       | CHIP RES 1/10W(T) 5% 10KO |
| R460   | 79PQ5039                       | CHIP 1/10W(T) 5% 47K      |
| R461   | 79PQ5272                       | CHIP RES 1/10W(T) 5% 1000 |
| R462   | 79PQ5272                       | CHIP RES 1/10W(T) 5% 1000 |
| R463   | 79PQ5272                       | CHIP RES 1/10W(T) 5% 1000 |
| R464   | 79PQ5272                       | CHIP RES 1/10W(T) 5% 1000 |
| R465   | 79PQ5320                       | CHIP RES 1/10W(T) 5% 0OHM |
| R466   | 79PQ5320                       | CHIP RES 1/10W(T) 5% 0OHM |
| R467   | 79PQ5320                       | CHIP RES 1/10W(T) 5% 0OHM |
| R468   | 79PQ5320                       | CHIP RES 1/10W(T) 5% 0OHM |
| R469   | 79PQ5320                       | CHIP RES 1/10W(T) 5% 0OHM |
| R470   | 79PQ5320                       | CHIP RES 1/10W(T) 5% 0OHM |
| R471   | 79PQ5320                       | CHIP RES 1/10W(T) 5% 0OHM |
| R472   | 79PQ5320                       | CHIP RES 1/10W(T) 5% 0OHM |
| R473   | 79PQ5675                       | CHIP RES 1/10W(T) 5% 10KO |

| SYMBOL | For China<br>(NMV Part Number) | DESCRIPTION               |
|--------|--------------------------------|---------------------------|
| R474   | 79PQ5277                       | CHIP RES 1/10W(T) 5% 4.7K |
| R475   | 79PQ5277                       | CHIP RES 1/10W(T) 5% 4.7K |
| R476   | 79PQ5272                       | CHIP RES 1/10W(T) 5% 100O |
| R477   | 79PQ5272                       | CHIP RES 1/10W(T) 5% 100O |
| R478   | 79PQ5681                       | CHIP RES 1/8W(T) 5% 2.2KO |
| R479   | 79PQ5675                       | CHIP RES 1/10W(T) 5% 10KO |
| R480   | 79PQ5675                       | CHIP RES 1/10W(T) 5% 10KO |
| R481   | 79PQ5675                       | CHIP RES 1/10W(T) 5% 10KO |
| R482   | 79PQ5675                       | CHIP RES 1/10W(T) 5% 10KO |
| R483   | 79PQ6604                       | R SMD METAL 1/8W 3.3K J T |
| R484   | 79PQ5675                       | CHIP RES 1/10W(T) 5% 10KO |
| R485   | 79PQ5675                       | CHIP RES 1/10W(T) 5% 10KO |
| R486   | 79PQ5675                       | CHIP RES 1/10W(T) 5% 10KO |
| R487   | 79PQ5675                       | CHIP RES 1/10W(T) 5% 10KO |
| R488   | 79PQ5868                       | R SMD 1/10W 20H F 0603    |
| R489   | 79PQ5868                       | R SMD 1/10W 20H F 0603    |
| R490   | 79PQ5675                       | CHIP RES 1/10W(T) 5% 10KO |
| R492   | 79PQ5675                       | CHIP RES 1/10W(T) 5% 10KO |
| R493   | 79PQ5277                       | CHIP RES 1/10W(T) 5% 4.7K |
| R494   | 79PQ5675                       | CHIP RES 1/10W(T) 5% 10KO |
| R495   | 79PQ5675                       | CHIP RES 1/10W(T) 5% 10KO |

\*\*\* CAPACITORS \*\*\*

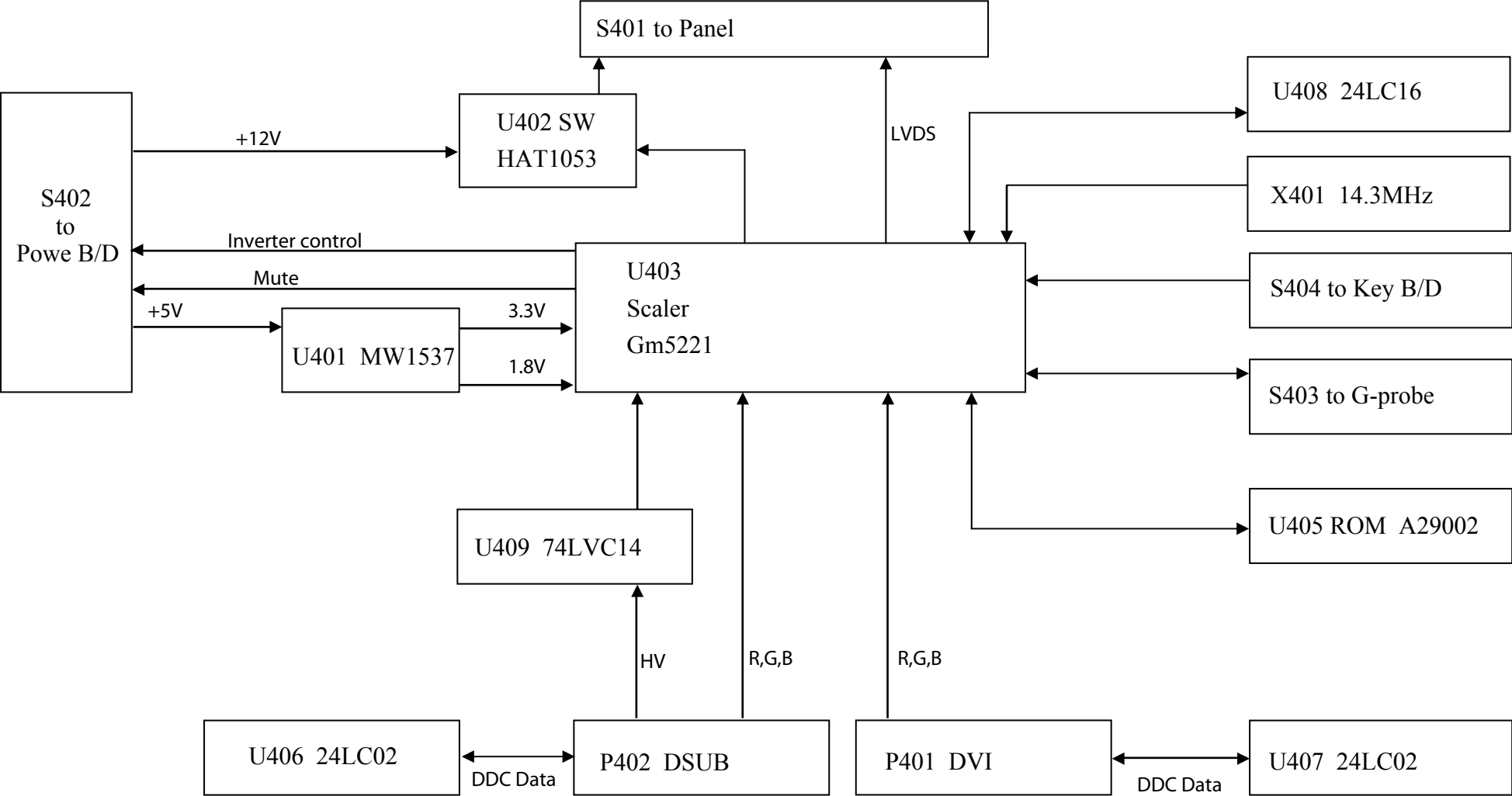
|      |          |                           |
|------|----------|---------------------------|
| C401 | 79PQ7916 | C ELE105 10U 16V M (T) LO |
| C402 | 79PQ5489 | C SMD C0G 33P 50V J 0603  |
| C403 | 79PQ5489 | C SMD C0G 33P 50V J 0603  |
| C404 | 79PQ5240 | C SMD X7R 0.1U 16V K 0603 |
| C409 | 79PQ5240 | C SMD X7R 0.1U 16V K 0603 |
| C410 | 79PQ5240 | C SMD X7R 0.1U 16V K 0603 |
| C411 | 79PQ5838 | VC ELE105 220U 10V M (T)L |
| C412 | 79PQ5240 | C SMD X7R 0.1U 16V K 0603 |
| C413 | 79PQ5838 | VC ELE105 220U 10V M (T)L |
| C414 | 79PQ5240 | C SMD X7R 0.1U 16V K 0603 |
| C415 | 79PQ5889 | C ELE105 100U 10V M (T) L |
| C416 | 79PQ5240 | C SMD X7R 0.1U 16V K 0603 |
| C417 | 79PQ5240 | C SMD X7R 0.1U 16V K 0603 |
| C418 | 79PQ5838 | VC ELE105 220U 10V M (T)L |
| C419 | 79PQ5240 | C SMD X7R 0.1U 16V K 0603 |
| C420 | 79PQ5838 | VC ELE105 220U 10V M (T)L |
| C421 | 79PQ6038 | C ELE105 22U 10V M(T) LOW |
| C422 | 79PQ5240 | C SMD X7R 0.1U 16V K 0603 |
| C423 | 79PQ5240 | C SMD X7R 0.1U 16V K 0603 |
| C424 | 79PQ5240 | C SMD X7R 0.1U 16V K 0603 |
| C425 | 79PQ5240 | C SMD X7R 0.1U 16V K 0603 |
| C426 | 79PQ6038 | C ELE105 22U 10V M(T) LOW |
| C427 | 79PQ5240 | C SMD X7R 0.1U 16V K 0603 |
| C428 | 79PQ5240 | C SMD X7R 0.1U 16V K 0603 |
| C429 | 79PQ5240 | C SMD X7R 0.1U 16V K 0603 |

| SYMBOL | For China<br>(NMV Part Number) | DESCRIPTION               |
|--------|--------------------------------|---------------------------|
| C430   | 79PQ5240                       | C SMD X7R 0.1U 16V K 0603 |
| C431   | 79PQ5240                       | C SMD X7R 0.1U 16V K 0603 |
| C432   | 79PQ7913                       | C ELE105 1U 50V M T PW    |
| C433   | 79PQ5355                       | C SMD X7R 0.01U 50V K 060 |
| C434   | 79PQ5240                       | C SMD X7R 0.1U 16V K 0603 |
| C435   | 79PQ6038                       | C ELE105 22U 10V M(T) LOW |
| C436   | 79PQ5240                       | C SMD X7R 0.1U 16V K 0603 |
| C437   | 79PQ6038                       | C ELE105 22U 10V M(T) LOW |
| C438   | 79PQ5240                       | C SMD X7R 0.1U 16V K 0603 |
| C439   | 79PQ5240                       | C SMD X7R 0.1U 16V K 0603 |
| C440   | 79PQ5240                       | C SMD X7R 0.1U 16V K 0603 |
| C441   | 79PQ5240                       | C SMD X7R 0.1U 16V K 0603 |
| C442   | 79PQ7913                       | C ELE105 1U 50V M T PW    |
| C443   | 79PQ5355                       | C SMD X7R 0.01U 50V K 060 |
| C444   | 79PQ6038                       | C ELE105 22U 10V M(T) LOW |
| C445   | 79PQ5240                       | C SMD X7R 0.1U 16V K 0603 |
| C446   | 79PQ5240                       | C SMD X7R 0.1U 16V K 0603 |
| C447   | 79PQ5240                       | C SMD X7R 0.1U 16V K 0603 |
| C448   | 79PQ5240                       | C SMD X7R 0.1U 16V K 0603 |
| C449   | 79PQ5240                       | C SMD X7R 0.1U 16V K 0603 |
| C450   | 79PQ5240                       | C SMD X7R 0.1U 16V K 0603 |
| C451   | 79PQ5240                       | C SMD X7R 0.1U 16V K 0603 |
| C452   | 79PQ7918                       | C SMD C0G 5.6P 50V D 0603 |
| C453   | 79PQ7918                       | C SMD C0G 5.6P 50V D 0603 |
| C454   | 79PQ6038                       | C ELE105 22U 10V M(T) LOW |
| C455   | 79PQ5240                       | C SMD X7R 0.1U 16V K 0603 |
| C456   | 79PQ5240                       | C SMD X7R 0.1U 16V K 0603 |
| C457   | 79PQ5240                       | C SMD X7R 0.1U 16V K 0603 |
| C458   | 79PQ5240                       | C SMD X7R 0.1U 16V K 0603 |
| C459   | 79PQ5240                       | C SMD X7R 0.1U 16V K 0603 |
| C460   | 79PQ6038                       | C ELE105 22U 10V M(T) LOW |
| C461   | 79PQ5240                       | C SMD X7R 0.1U 16V K 0603 |
| C462   | 79PQ5240                       | C SMD X7R 0.1U 16V K 0603 |
| C463   | 79PQ5240                       | C SMD X7R 0.1U 16V K 0603 |
| C464   | 79PQ5240                       | C SMD X7R 0.1U 16V K 0603 |
| C465   | 79PQ5240                       | C SMD X7R 0.1U 16V K 0603 |
| C467   | 79PQ5240                       | C SMD X7R 0.1U 16V K 0603 |
| C468   | 79PQ5355                       | C SMD X7R 0.01U 50V K 060 |
| C470   | 79PQ5355                       | C SMD X7R 0.01U 50V K 060 |
| C471   | 79PQ5240                       | C SMD X7R 0.1U 16V K 0603 |
| C472   | 79PQ5240                       | C SMD X7R 0.1U 16V K 0603 |
| C473   | 79PQ5355                       | C SMD X7R 0.01U 50V K 060 |
| C475   | 79PQ5240                       | C SMD X7R 0.1U 16V K 0603 |
| C476   | 79PQ5240                       | C SMD X7R 0.1U 16V K 0603 |
| C477   | 79PQ5355                       | C SMD X7R 0.01U 50V K 060 |
| C478   | 79PQ5355                       | C SMD X7R 0.01U 50V K 060 |
| C480   | 79PQ5240                       | C SMD X7R 0.1U 16V K 0603 |
| C481   | 79PQ5355                       | C SMD X7R 0.01U 50V K 060 |

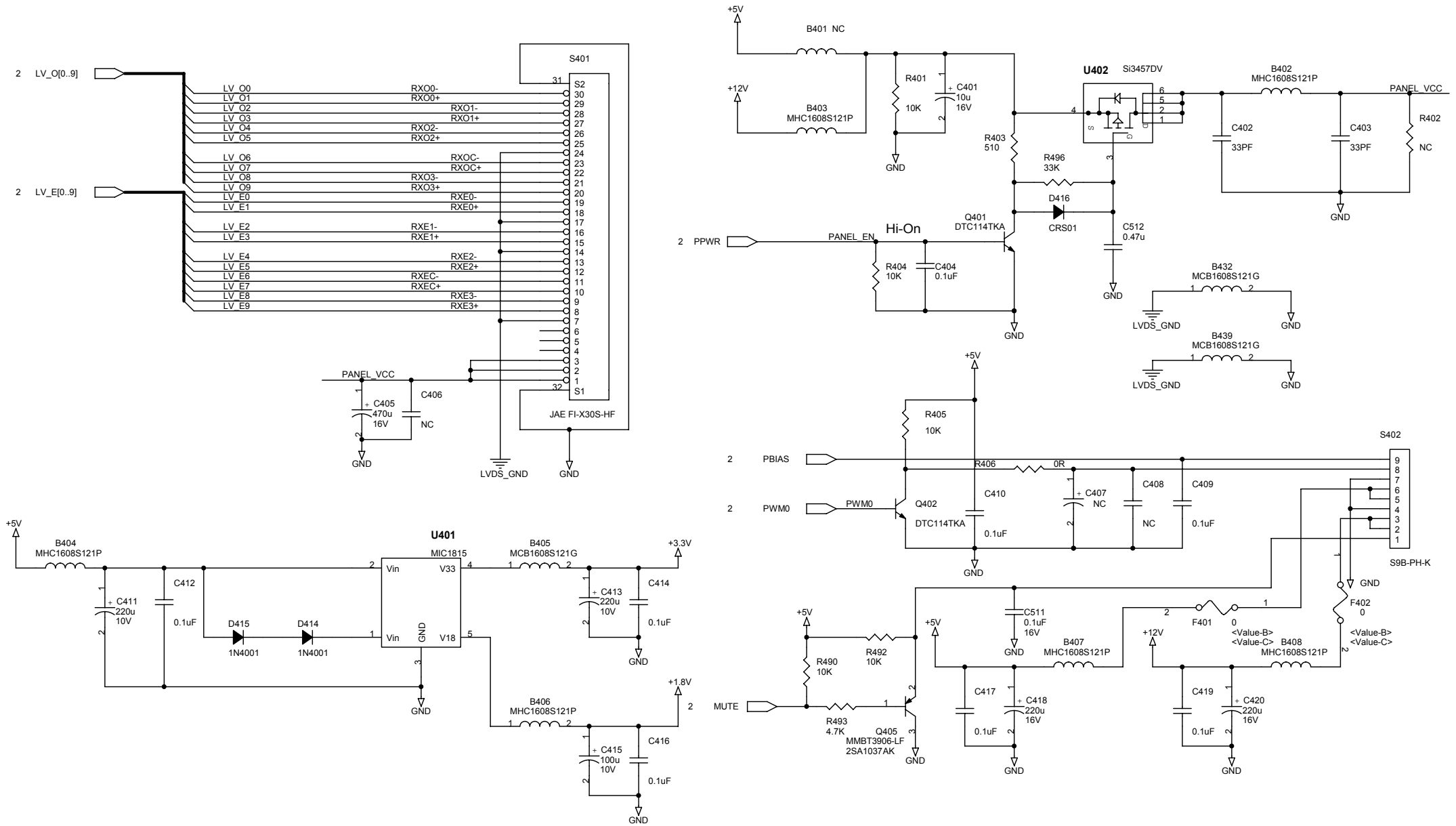


| SYMBOL | For China<br>(NMV Part Number) | DESCRIPTION               |
|--------|--------------------------------|---------------------------|
| C484   | 79PQ5244                       | C SMD C0G 47P 50V J 0603  |
| C485   | 79PQ5244                       | C SMD C0G 47P 50V J 0603  |
| C486   | 79PQ5240                       | C SMD X7R 0.1U 16V K 0603 |
| C487   | 79PQ5240                       | C SMD X7R 0.1U 16V K 0603 |
| C488   | 79PQ5240                       | C SMD X7R 0.1U 16V K 0603 |
| C489   | 79PQ5240                       | C SMD X7R 0.1U 16V K 0603 |
| C490   | 79PQ5240                       | C SMD X7R 0.1U 16V K 0603 |
| C491   | 79PQ5240                       | C SMD X7R 0.1U 16V K 0603 |
| C492   | 79PQ5240                       | C SMD X7R 0.1U 16V K 0603 |
| C493   | 79PQ5240                       | C SMD X7R 0.1U 16V K 0603 |
| C494   | 79PQ5240                       | C SMD X7R 0.1U 16V K 0603 |
| C495   | 79PQ5240                       | C SMD X7R 0.1U 16V K 0603 |
| C496   | 79PQ5240                       | C SMD X7R 0.1U 16V K 0603 |
| C497   | 79PQ5240                       | C SMD X7R 0.1U 16V K 0603 |
| C498   | 79PQ5240                       | C SMD X7R 0.1U 16V K 0603 |
| C499   | 79PQ5240                       | C SMD X7R 0.1U 16V K 0603 |
| C500   | 79PQ5240                       | C SMD X7R 0.1U 16V K 0603 |
| C501   | 79PQ5240                       | C SMD X7R 0.1U 16V K 0603 |
| C502   | 79PQ5240                       | C SMD X7R 0.1U 16V K 0603 |
| C503   | 79PQ5240                       | C SMD X7R 0.1U 16V K 0603 |
| C504   | 79PQ5240                       | C SMD X7R 0.1U 16V K 0603 |
| C505   | 79PQ5240                       | C SMD X7R 0.1U 16V K 0603 |
| C506   | 79PQ5355                       | C SMD X7R 0.01U 50V K 060 |
| C507   | 79PQ5240                       | C SMD X7R 0.1U 16V K 0603 |
| C510   | 79PQ5240                       | C SMD X7R 0.1U 16V K 0603 |
| C511   | 79PQ5240                       | C SMD X7R 0.1U 16V K 0603 |

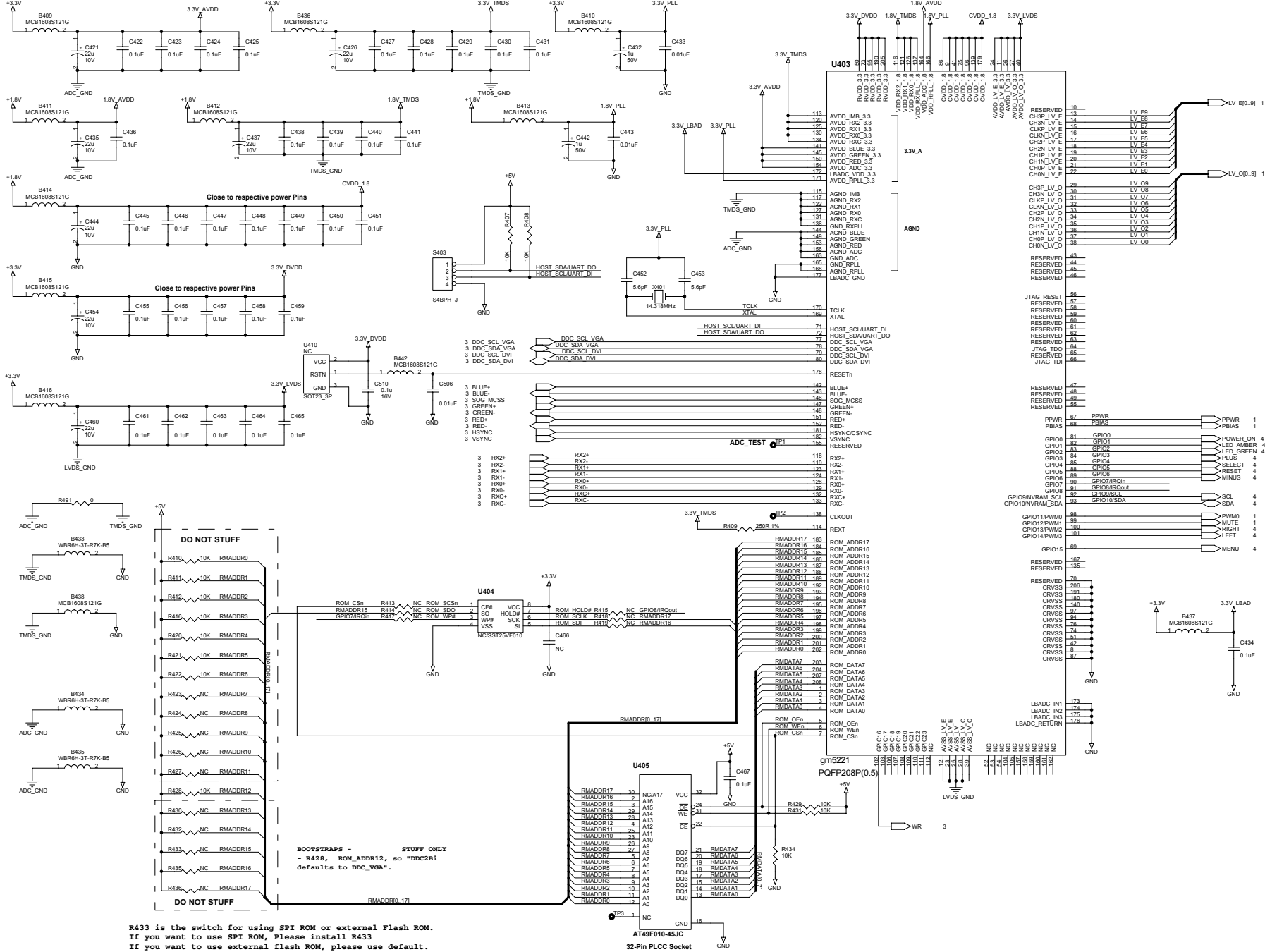
# BLOCK DIAGRAM



# MODEL LCD1970NX(B)/(C) SCHEMATIC DIAGRAM MAIN BOARD (Display) (1/4)

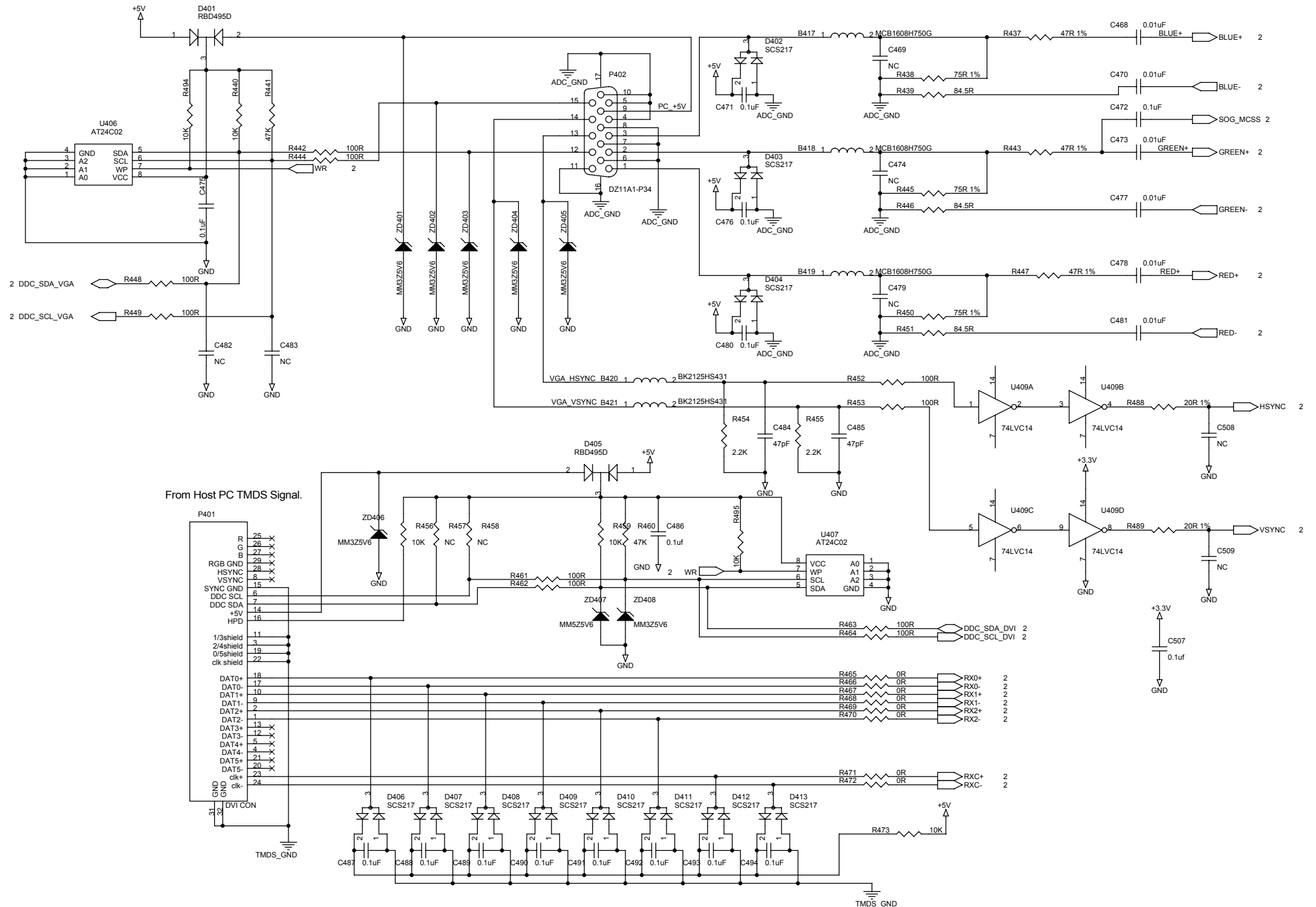


# MODEL LCD1970NX(B)/(C) SCHEMATIC DIAGRAM MAIN BOARD (Scaler) (2/4)

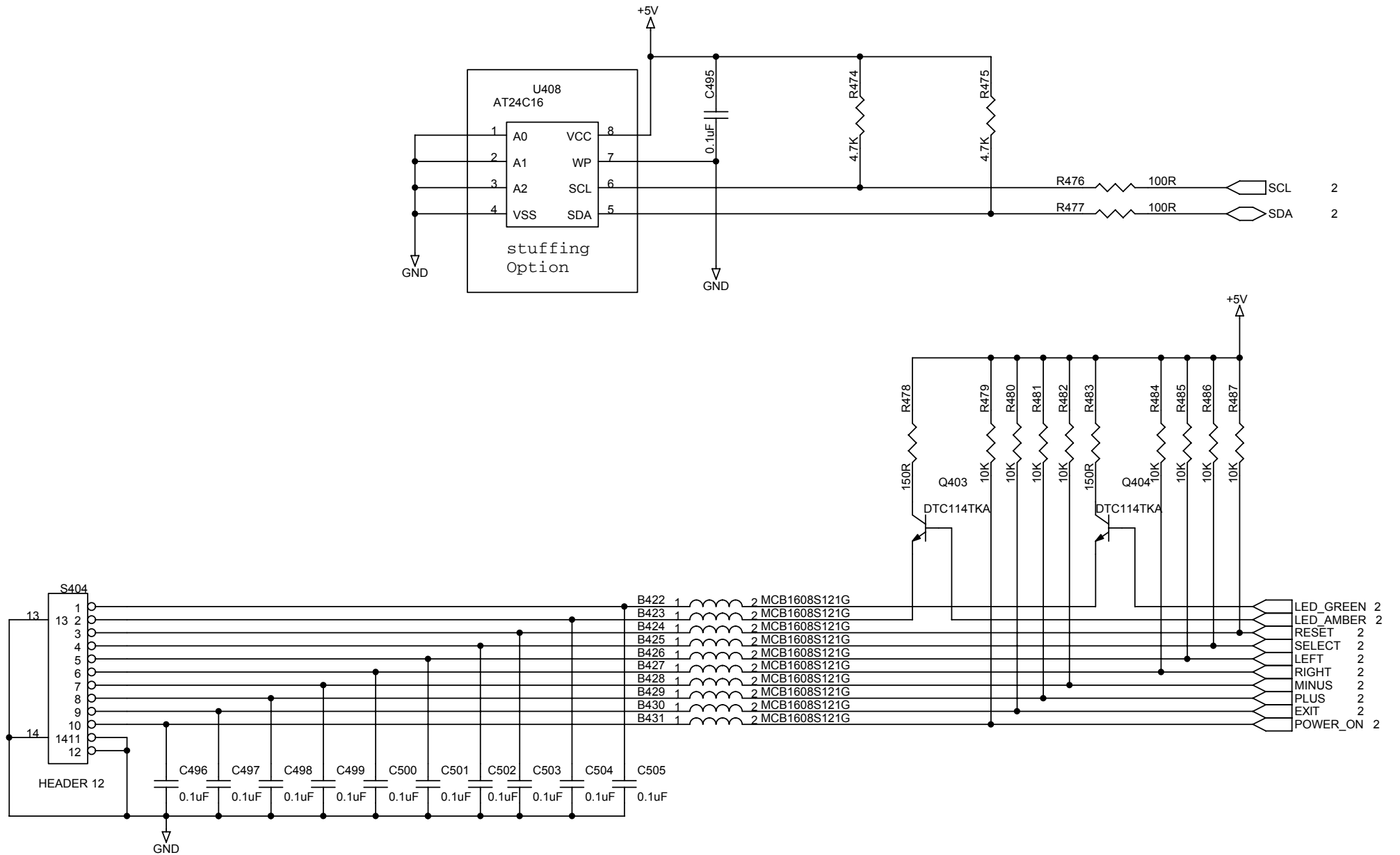


R433 is the switch for using SPI ROM or external Flash ROM.  
If you want to use SPI ROM, please install R433  
If you want to use external flash ROM, please use default.

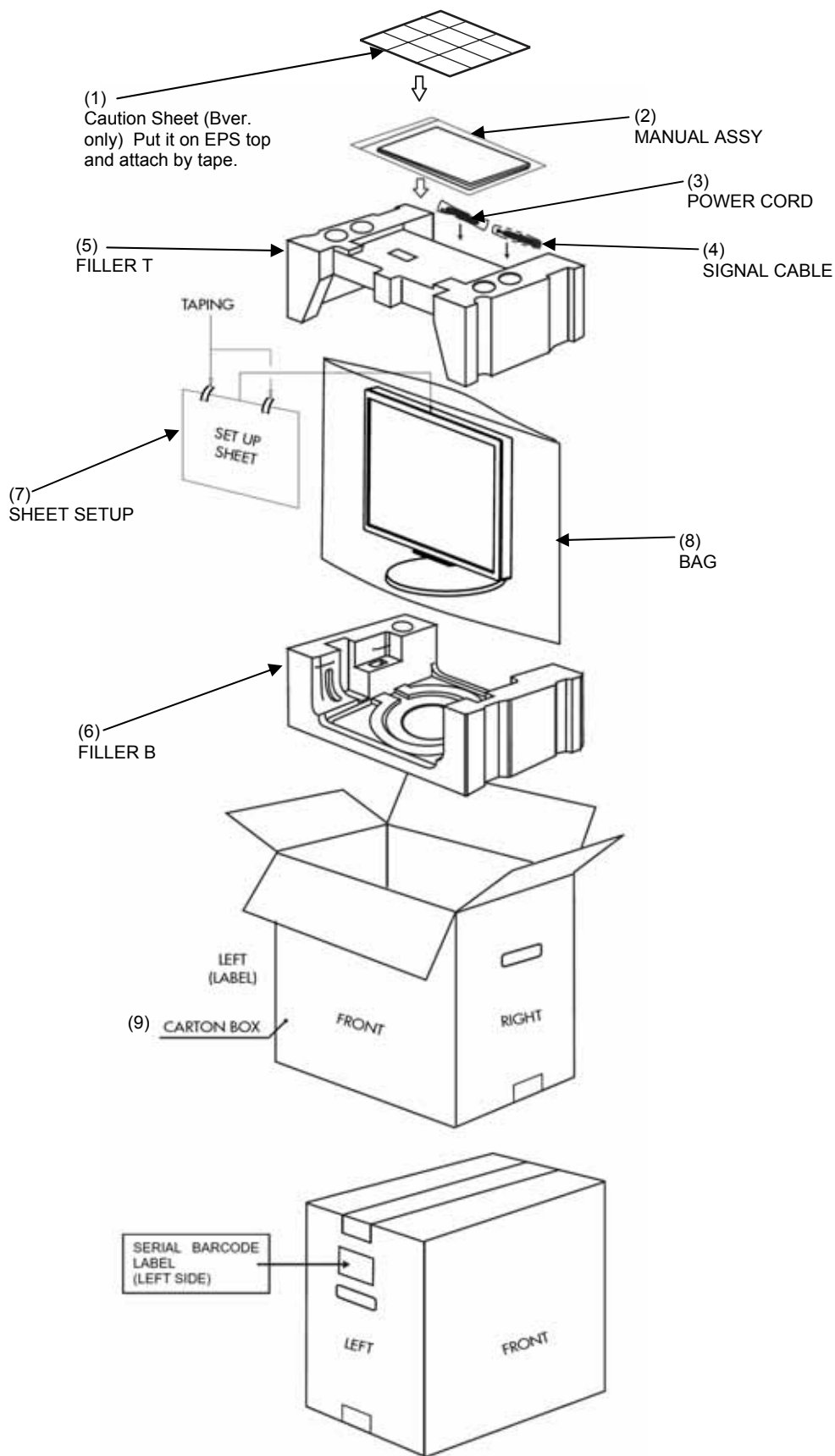
# MODEL LCD1970NX(B)/(C) SCHEMATIC DIAGRAM MAIN BOARD (DVI/VGA Input) (3/4)



# MODEL LCD1970NX(B)/(C) SCHEMATIC DIAGRAM MAIN BOARD (Key Pad EEPROM) (4/4)



# Packing Specification



| ITEM | DESCRIPTION               | For Europe<br>(NPG Part<br>Number) | For China<br>(NMV Part<br>Number) | Cabinet color | Version |
|------|---------------------------|------------------------------------|-----------------------------------|---------------|---------|
| (1)  | SHEET CAUTION PISA19 B    | 15802261                           | ---                               | White/Black   | B       |
| (2)  | MANUAL ASSY LCD1970NX B   | 15503533                           | ---                               | White/Black   | B       |
| (2)  | MANUAL ASSY LCD1970NX C   | ---                                | 79PQ7894                          | White/Black   | C       |
| (3)  | PW CORD EU 2M R-PLUG GR   | RG030031                           | ---                               | White         | B       |
| (3)  | PW CORD EU 2M BLK WANSHIN | RG030051                           | ---                               | Black         | B       |
| (3)  | PW CORD CHN CCC 2M GRY WA | ---                                | 79PQ7909                          | White         | C       |
| (3)  | PW CORD CHN CCC 2M BLK WA | ---                                | 79PQ7908                          | Black         | C       |
| (4)  | CABLE VIDEO GR DSUB-DSUB  | RE010081                           | 79PQ5083                          | White         | B/C     |
| (4)  | CABLE VIDEO BLK DSUB-DSUB | RE010091                           | 79PQ5086                          | Black         | B/C     |
| (5)  | FILLER T L194R,(A,B,C,)   | 13401771                           | 79PQ7874                          | White/Black   | B/C     |
| (6)  | FILLER B L194R,(A,B,C,)   | 13401781                           | 79PQ7875                          | White/Black   | B/C     |
| (7)  | SHEET SETUP LCD1970NX/V B | 15802161                           | ---                               | White/Black   | B       |
| (7)  | SHEET SETUP LCD1970NX C   | ---                                | 79PQ7900                          | White/Black   | C       |
| (8)  | BAG LCD1960NX EPE         | 13700483                           | 79PQ7382                          | White/Black   | B/C     |
| (9)  | CARTON BOX LCD1970NX B    | 13204921                           | ---                               | White/Black   | B       |
| (9)  | CARTON BOX LCD1970NX C    | ---                                | 79PQ7865                          | White/Black   | C       |