22” TFT LCD COLOR MONITOR

Service
Service
Service

220CW8FB/00
220CW8FB/69
220CW8FB/93

Service Manual

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SAFETY NOTICE

ANY PERSON ATTEMPTING TO SERVICE THIS CHASSIS MUST FAMILIARIZE HIMSELF WITH THE CHASSIS AND BE AWARE OF THE NECESSARY SAFETY PRECAUTIONS TO BE USED WHEN SERVICING ELECTRONIC EQUIPMENT CONTAINING HIGH VOLTAGES.

CAUTION: USE A SEPARATE ISOLATION TRANSFORMER FOR THIS UNIT WHEN SERVICING.

REFER TO BACK COVER FOR IMPORTANT SAFETY GUIDELINE.

PHILIPS

Important Safety Notice

Proper service and repair is important to the safe, reliable operation of all Philips Consumer Electronics Company** Equipment. The service procedures recommended by Philips and described in this service manual are effective methods of performing service operations. Some of these service operations require the use of tools specially designed for the purpose. The special tools should be used when and as recommended.

It is important to note that this manual contains various CAUTIONS and NOTICES which should be carefully read in order to minimize the risk of personal injury to service personnel. The possibility exists that improper service methods may damage the equipment. It is also important to understand that these CAUTIONS and NOTICES ARE NOT EXHAUSTIVE. Philips could not possibly know, evaluate and advise the service trade of all conceivable ways in which service might be done or of the possible hazardous consequences of each way. Consequently, Philips has not undertaken any such broad evaluation. Accordingly , a servicer who uses a service procedure or tool which is not recommended by Philips must first satisfy himself thoroughly that neither his safety nor the safe operation of the equipment will be jeopardized by the service method selected.

* * Hereafter throughout this manual, Philips Consumer Electronics Company will be referred to as Philips.

WARNING

Critical components having special safety characteristics are identified with a ⚠ by the Ref. No.in the parts list and enclosed within a broken line*
(where several critical components are grouped in one area) along with the safety symbol ⚠ on the schematics or exploded views.

Use of substitute replacement parts which do not have the same specified safety characteristics may create shock, fire, or other hazards.

Under no circumstances should the original design be modified or altered without written permission from Philips. Philips assumes no liability , express or implied, arising out of any unauthorized modification of design.
Servicer assumes all liability .

* Broken Line

FOR PRODUCTS CONTAINING LASER :

DANGER - In visible laser radiation when open. AVOID DIRECT EXPOSURE TO BEAM.

CAUTION - Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

CAUTION - The use of optical instruments with this Product will increase eye hazard.

TO ENSURE THE CONTINUED RELIABILITY OF THIS PRODUCT, USE ONLY ORIGINAL MANUFACTURER'S REPLACEMENT PARTS, WHICH ARE LISTED WITH THEIR PART NUMBERS IN THE PARTS LIST SECTION OF THIS SERVICE MANUAL.

Take care during handling the LCD module with backlight unit

- Must mount the module using mounting holes arranged in four corners.
- Do not press on the panel, edge of the frame strongly or electric shock as this will result in damage to the screen.
- Do not scratch or press on the panel with any sharp objects, such as pencil or pen as this may result in damage to the panel.
- Protect the module from the ESD as it may damage the electronic circuit (C-MOS).
- Make certain that treatment persons body are grounded through wrist band.
- Do not leave the module in high temperature and in areas of high humidity for a long time.
- Avoid contact with water as it may a short circuit within the module.
- If the surface of panel become dirty, please wipe it off with a soft material.(Cleaning with a dirty or rough cloth may damage the panel.)

Technical Data

1. General Specification

1.1 Panel characteristic

Panel source	: LPL LM220WE1-TLD1 : CMO M220Z1-L03
Screen type	: TN+film
Screen dimensions	: 22 inches (diagonal) 16:10

CMO M220Z1-L03

Resolution	: 1680 X 1050 (WXGA+)
Outside dimensions	: 493.7 (W) X 320.1 (H) X 16.5 (D)
Pixel pitch (mm)	: 0.282 x 0.282
Color pixel arrangement	: R. G. B. Vertical Stripe
Display surface	: Hard-coating (3H), Non-glare type
Color depth	: 16.7M colors
Backlight	: 4 lamps
Active area (mm)	: 473.76 (H) x 296.1(V)
View angle (CR>10)	: >= 170 (H) / 160(V) (typical)
Contrast ratio	: >= 1000 : 1
White luminance	: >= 300 nits (7.0mA)
Color gamut	: >= 72%
Response time	: 5 ms

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Color gamut	: >= 72%
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1.2 Scanning frequencies

Horizontal scan range	: 30 - 93 K Hz (automatic)
Vertical scan range	: 56 - 76 Hz (automatic)

1.3 Video

Video dot rate	: < 205 MHz (Over 165 MHz, Warning message will show up)
Input impedance (Analog signal input)	
- video	: 75 ohm
- Sync	: 2.2K ohm
Input signal levels	: 700 mVpp
Sync. input signals	: Analog R/G/B separate inputs Separate horizontal and vertical / Composite (H+V) TTL level, Sync On Green (SOG) sync 0.3Vp-p Negative
Input impedance (Digital)	: Signal TMDS link (3 channels : Rx0 & Rx1 & RX2-/+)
Video interface	: Both Analog and Digital input. It can be switching via OSD option.

1.5 Physical characteristics

Unit dimensions	
- Width	: 513.8 mm
- Height	: 416.2 mm
- Depth	: 213.6 mm
Packed unit dimensions	
- Width	: 565 mm
- Height	: 174 mm
- Depth	: 472 mm
Packed unit dimensions (China only)	
- Width	: 567 mm
- Height	: 189 mm
- Depth	: 480 mm
Weight (monitor only)	: 5 Kg (Including I/F cable 240g)
Title angel	: - 5 ° + 2 / - 0 ° (forward) + 25 ° + 0 / - 3 ° (backward)
Swivel angel	: nil
Height adjustment	: nil
Portrait display	: nil
AC input: - voltage	: AC 90 - 264 V,
- frequency	: 50 / 60 ± 2 Hz
Power consumption	: < 50W maximum
Ambient temperature	: 0 to 40 degree C
Operating	
- Temperature	: 0 to 35 degree C
- Humidity	: 85% (max.)
- Altitude	: 0 - 3658 m
- Air pressure	: 600 - 1100 mBAR
Storage	
- Temperature	: -20 to 60 degree C
- Humidity	: 95% max
- Altitude	: 0 - 12192 m
- Air pressure	: 300 - 1100 mBAR (Recommend at 5 to 35 degree C, Humidity less then 60%)
System MTBF	: 50,000 Hrs

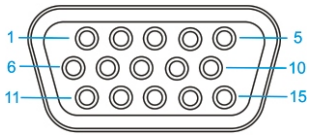
Technical Data

2. Pin Assignment

2.1 PC analog video input with D - sub connector.

Connector type of analog signal cable :
D - Sub male with DDC2B pin assignment.
Blue connector with thumb-operated jackscrews.

Pin assignment :

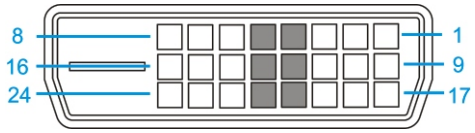


PIN No.	SIGNAL	PIN No.	SIGNAL	PIN No.	SIGNAL
1	Red	6	Red GND	11	Sense (GND)
2	Green/ SOG	7	Green GND	12	Bi-directional data
3	Blue	8	Blue GND	13	H/H+V sync
4	Sense (GND)	9	DDC +3.3V or +5V	14	V-sync
5	Cable Detect (GND)	10	Logic GND	15	Data clock

2.2 PC digital video input with DVI-D connector.

Connector type of DVI-D signal cable :
DVI-D male with DDC2B pin assignment.
White connector with thumb-operated jackscrews.

Pin assignment :



Pin No.	Description	Pin No.	Description	Pin No.	Description
1	T.M.D.S. data2-	9	T.M.D.S. data1-	17	T.M.D.S. data0-
2	T.M.D.S. data2+	10	T.M.D.S. data1+	18	T.M.D.S. data0+
3	T.M.D.S. data2 shield	11	T.M.D.S. data1 shield	19	T.M.D.S. data0 shield
4	No Connect	12	No Connect	20	No Connect
5	No Connect	13	No Connect	21	No Connect
6	DDC clock	14	+5V Power	22	T.M.D.S clock shield
7	DDC data	15	Ground (for +5V)	23	T.M.D.S. clock+
8	No Connect	16	Hot plug detect	24	T.M.D.S. clock-

Automatic Power Saving

If you have VESA / DPMS compliance display card or software installed in your PC, the monitor can automatically reduce power consumption when power saving function active. And if an input from keyboard, mouse or other devices is detected, the monitor will automatically wake up. The following table shows the power consumption and signaling of this automatic power saving feature:

Mode	HSYNC	VSYNC	Video	Pwr-cons.	Indication	Rec. time
Power-On	On	On	active	< 50 W	Green LED	--
Off	Off	Off	blanked	< 1 W	Amber LED	< 3 s
DC Power Off			N/A	< 1 W	LED Off	

This monitor must comply with the Microsoft On Now specification, with two power management states, as defined by the VESA DPMS document. And must appropriately display the DPMS states. Also comply with Environmental Protection Agency (EPA) Energy Star and TCO03 power management standard strictly.

ENERGY STAR is a U.S. Registered mark. AS AN ENERGY STAR PARTNER, PHILIPS HAS DETERMINED THAT THIS PRODUCT MEETS THE ENERGY STAR GUIDELINES OF ENERGY EFFICIENCY.

Data Storage

Factory preset mode:

This monitor has 18 factory-preset modes as indicated in the following table:

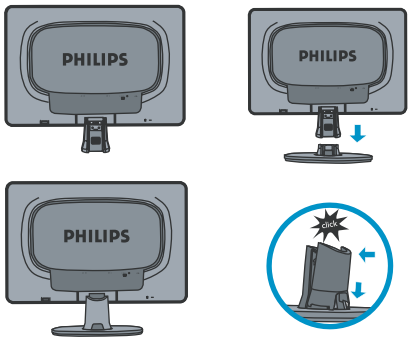
Item	H.Freq. (KHz)	Mode	Resolution	V.Freq. (Hz)	BW(MHz)
1	31.469	IBM VGA 10H	640x350	70.086	
2	31.469	IBM VGA 3H	720x400	70.087	
3	31.469	IBM VGA 12H	640x480	59.94	
4	35	MACINTOSH	640x480	67	
5	37.5	VESA	640x480	75	
6	35.156	VESA	800x600	56.25	
7	37.879	VESA	800x600	60.317	
8	46.875	VESA	800x600	75	
9	48.363	VESA	1024x768	60.004	
10	60.023	VESA	1024x768	75.029	
11	63.981	VESA	1280x1024	60.02	
12	79.976	VESA	1280x1024	75.025	
13	55.469	VESA-reduced blanking mode	1440x900	59.901	88.75
14	55.935	VESA	1440x900	59.887	106.5
15	70.635	VESA	1440x900	74.984	136.75
16	66.587	CVT 2.3MA-R	1920x1080	60.0 (for DVI-	138.5
17	65.29	CVT1.76MW	1680x1050	60	146
18		CVT1.76MW-R	1680x1050	60	119

Connection to PC

1. Connection to PC

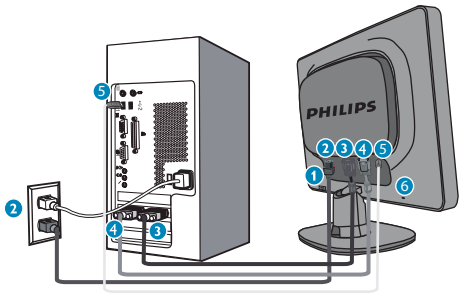
Please follow the steps to connect your LCD Monitor to PC.

a. Assembly LCD Monitor with base



b. Connect to PC

(1) Turn off your computer and unplug its power cable.
(2) Connect the monitor signal cable to the video connector on the back of your computer.
(3) Plug the power cord of your computer and your monitor Into a nearby outlet.
(4) Turn on your computer and monitor. If the monitor Displays an image, installation is complete.



Port definition:
(1) USB downstream port
(2) AC power input
(3) DVI-D input(Available for selected countries)
(4) VGA input
(5) USB upstream port
(6) Kensington anti-thief lock

Set your Monitor at 1680*1050@60Hz for best performance. It is also strongly recommended to use DVI input(may require the optional DVI cable) for the true digital enjoyment.

c. Accessory Pack

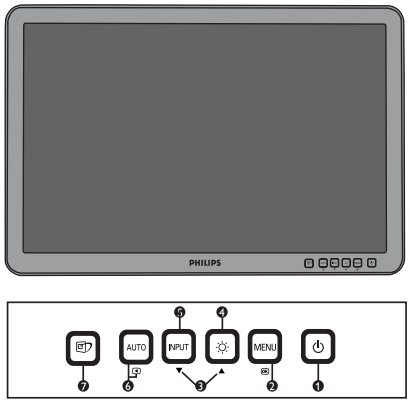
Power cord

VGA cable

EDFU CD

DVI cable (Optional)

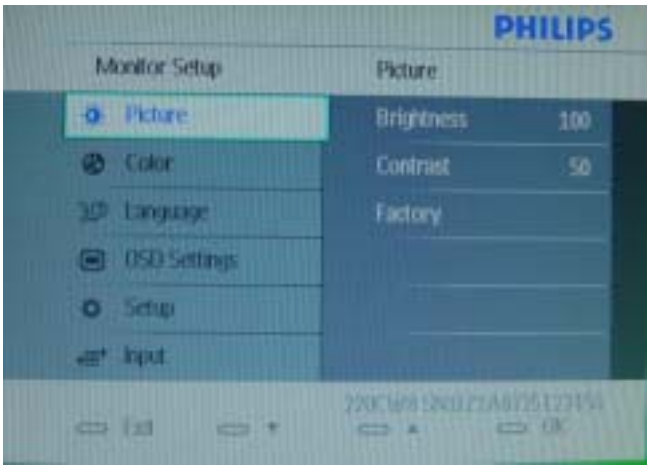
2. Function key definition



(1) To switch monitor's power on and off
(2) To access OSD menu
(3) To adjust the OSD menu
(4) To adjust brightness of the display
(5) To change the signal input source
(6) Automatically adjust the horizontal position, vertical position, phase and clock Settings/Return to previous OSD level
(7) SmartImage. There are five modes to be selected: Office Work, Image Viewing, Entertainment, Economy and Off.

3. Description of the On Screen Display

On-Screen Display(OSD) is a feature in all Philips LCD monitors. It allows and end user to adjust screen performance or select functions of the monitors directly through an on-screen instruction window. A user friendly on screen display interface is shown as below:



Basic and simple instruction on the control keys.

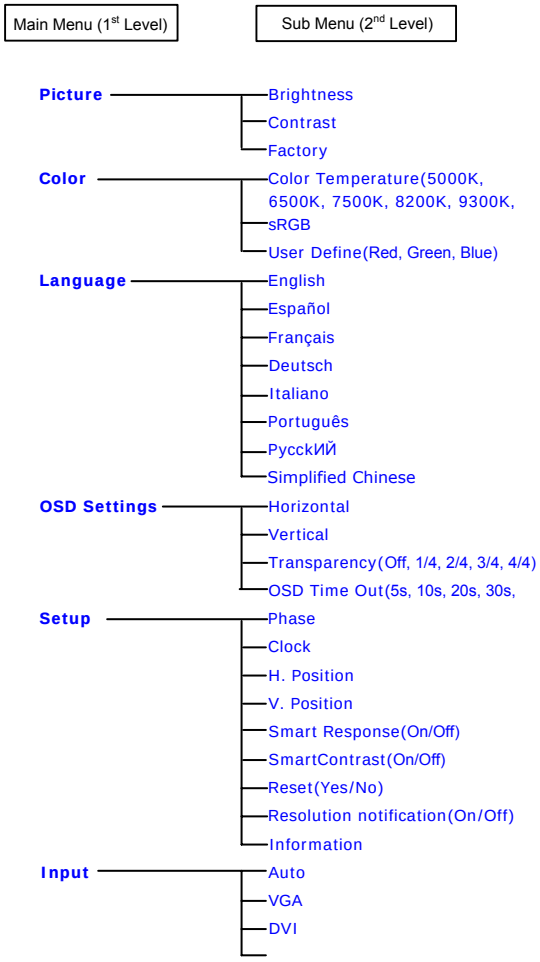
According to the above OSD structure, users can :
press **UP** or **DOWN** buttons to move the cursor,
press **MENU** button to confirm the choice or change,
press **UP** or **DOWN** button to adjust the value,
press **MENU** button to save the changes.
press **AUTO** button to automatically adjust the horizontal position, vertical position, phase and clock setting.

OSD Menu Control Structure

4. The OSD tree

Below is an overall view of the structure of the On-Screen Display. You can use this as a reference when you want to work your way around the different adjustments later on.

4.1 Available for EU/AP/CN Model



Note:

sRGB is a standard for ensuring correct exchange of colors between different devices(e. g. Digital cameras, monitor, printers, scanners, etc.)

Using a standard unified color space, sRGB will help represent pictures taken by an sRGB compatible device correctly on your sRGB enabled Philips monitor. In that way, the colors are calibrated and you can rely on the correctness of the colors shown on your screen.

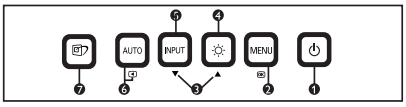
Important with the use of sRGB is that the brightness and contrast of your monitor is fixed to a predefined setting as well as the color gamut. Therefore it is important to select the sRGB setting in the monitor's OSD.

To do so, open the OSD by pressing the OK button on the side of your monitor. More the down button to go to color and press OK again. Use the right button to go to sRGB. Then move the down button and press OK again to exit the OSD.

After this, please do not change the brightness or contrast setting of your monitor. If you change either of these, the monitor will exit the sRGB mode and go to a color temperature setting of 6500K.

Advanced OSD Adjustment

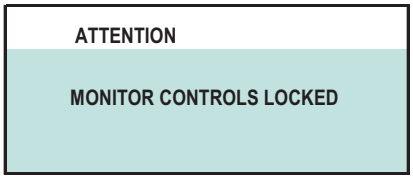
1. Front control panel



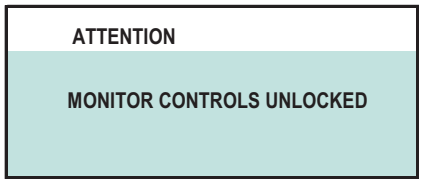
2. To Lock/Unlock OSD function

The OSD function can be locked by pressing **MENU** button for more than 10 seconds, the screen shows following windows for 3 seconds.

Every time when you press any button, this message appears on the screen automatically.

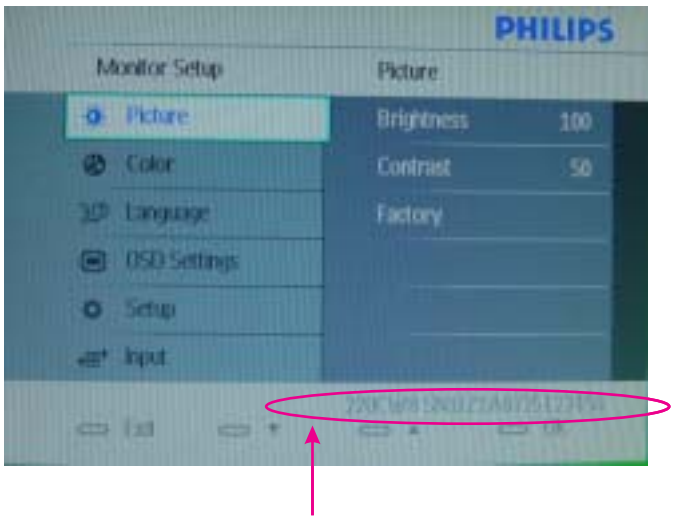


Locked OSD function can be released by pressing **MENU** button for more than 10 seconds. While press **MENU** button for OSD unlocked purpose, the screen will keep showing OSD MAIN MENU LOCKED until OSD function unlocked and screen automatically shows following window for 3 seconds.



3. Access Factory Mode

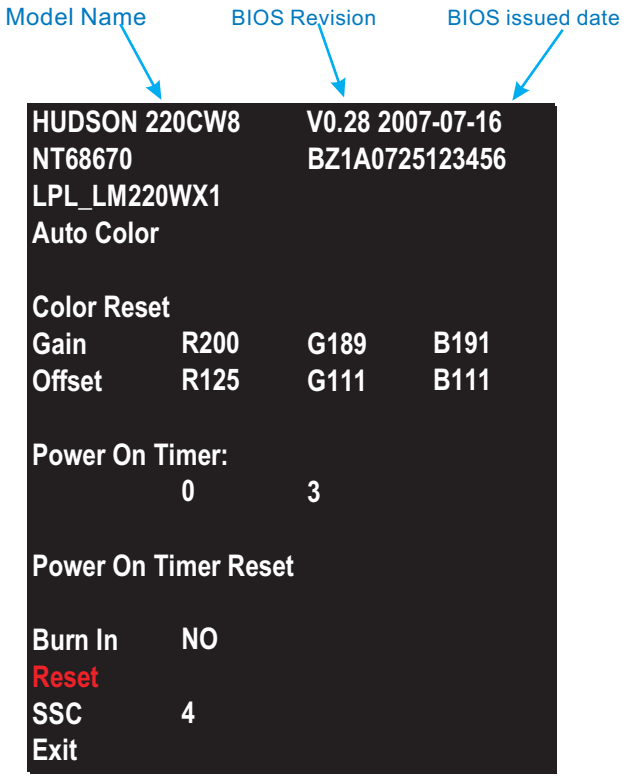
To hold **AUTO** and **POWER** buttons, you can saw the LED light flashing at this time. Then release the **AUTO** button and Keep pressing the **POWER** button. The monitor will power on and LED light give out orange light. Press **MENU** to bring up OSD menu for confirmation as below:



If this message appeared, means monitor already entered the factory mode.

4. Entering Burn-in mode and others

If you access into factory mode, press **MENU-PICTURE-FACTORY,** then press **MENU** to confirm, OSD menu will convert into another format as below:



Move the cursor by **MENU** button, and press the **UP** or **DOWN** button to change the burn-in mode from YES to NO.

Leave factory mode by simply power off the monitor.

Warning

* If you only want to enter burn in mode, please don't change any other setting items as above listed.
* Unfortunately, if some settings has been changed by unknown reasons or wrong operation. Please refer to the chapter of "W/B Adjustment" to guide the operator how to restore the default settings or do adjustment.

Appendix:

Explanation of above listed selections.

Selection	Description
Burn in On/Off	Enter Aging Mode
Auto Color	Auto Color Adjustment
Con	Contrast Adjustment
Bri	Brightness Adjustment
Gain	ADC Gain Value Adjustment (Auto adjustment by H/W when implement Auto Color function)
Offset	ADC Offset Value Adjustment (Auto adjustment by H/W when implement Auto Color function)
sRGB	sRGB Color Temperature Gain Value Adjustment
9300K	9300K Color Temperature Gain Value Adjustment
6500K	6500K Color Temperature Gain Value Adjustment
Color Update	Save All of Color Temperature Gain Value
Factory Reset	Memory Recall to Factory Default Settings

OSD Attention Signals

Clock & Phase Adjustment

Due to the different quality of video signal generated from graphics cards. It is necessary to adjust CLOCK and PHASE functions for the optimal video display of LCD monitor. So maybe some flicker appeared as Fig.1 & 2.

Fig.1

Fig.2

Following steps will guide you to make correct adjustment of CLOCK and PHASE:

a. Restart your computer.
b. Press **MENU** to bring up OSD menu after the OS (Operation System) boot up.
c. Press **UP** or **DOWN** to select the option of **More Settings** and then press **MENU** to bring up its submenu as shown in Fig.3.
d. Select the **Clock** or **Phase** adjustment items in submenu and press **UP** or**DOWN** to adjust.
(If the phenomenon as Fig.1, you should adjust "**Phase**")
(If the phenomenon as Fig.2, you should adjust "**Clock**")
e. Quit OSD by press **MENU** button to save the settings.

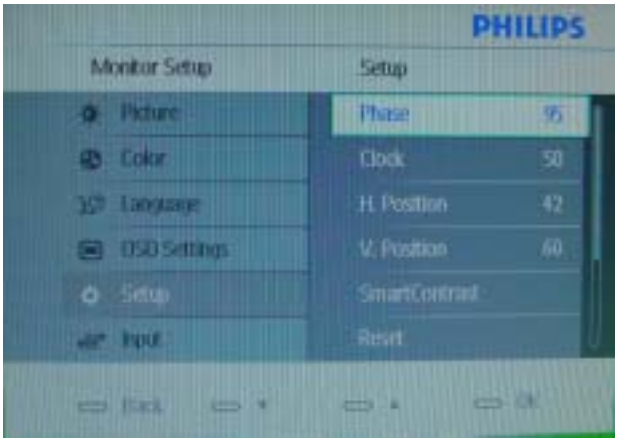


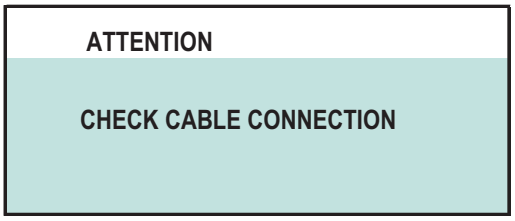
Fig.3

However, CLOCK and PHASE functions are only available while analog video signal is supplied. Operating unit under digital signal state, the video clock information can be obtained from graphics cards directly. Therefor, it is unnecessary to adjust these functions.

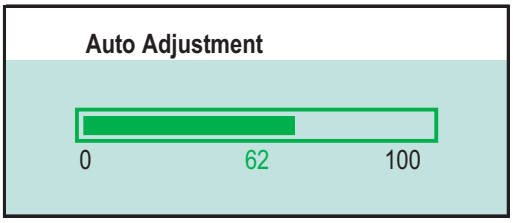
OSD Attention signal

The monitor will detect various display situation automatically. When the monitor detects the problems, the screen will show the different warning signals to remind you what is happen to your monitor.

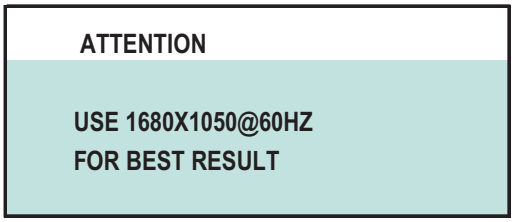
1. CHECK CABLE CONNECTION
This screen appears if there is no video signal input. Please check that the signal cable is properly connected to the video card of PC and make sure PC is on.



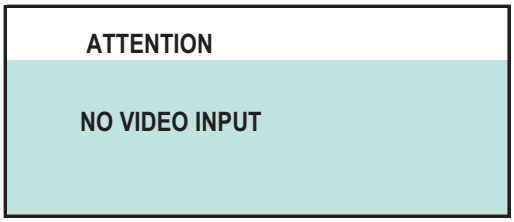
2. AUTO ADJUSTMENT
This screen appears when you touch the **AUTO** button. It will disappear when the monitor is properly adjusted.



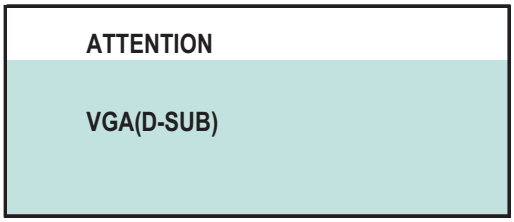
3. USE 1680X1050 FOR BEST RESULT
This message appears at the top of the OSD window when the video mode input is not the recommended 1680*1050. Other modes may result in some picture distortion. Please adjust the video mode to 1680*1050 at 60Hz for best display quality.



4. NO VIDEO INPUT
When you select video input between AUTO, VGA or DVI signal via INPUT function of OSD menu, if the DVI function you are selecting is not available, following message will appear on the screen.



5. VGA(D-SUB)
When you select VGA function, if it's not available, following message will appear on the screen.



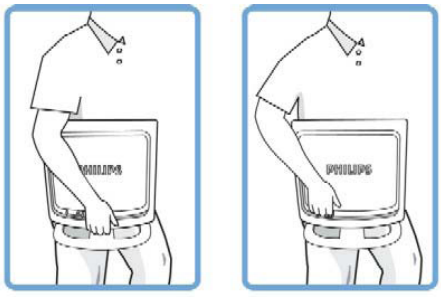
Safety and Troubleshooting Information

Safety precautions and maintenance

WARNING: Use of controls, adjustments or procedures other than those specified in this documentation may result in exposure to shock, electrical hazards and/or mechanical hazards.

Read and follow these instructions when connecting and using your computer monitor:

a. To protect your display from possible damage, do not put excessive pressure on the LCD panel. When moving your monitor, grasp the frame to lift; do not lift the monitor by placing your hand or fingers on the LCD panel.
b. Unplug the monitor if you are not going to use it for an extensive period of time.
c. Unplug the monitor if you need to clean it with a slightly damp cloth. The screen may be wiped with a dry cloth when the power is off. However, never use alcohol, solvents or ammonia-based liquids.
d. Consult a service technician if the monitor does not operate normally when you have followed the instructions in this manual.
e. The casing cover should be opened only by qualified service personnel.
f. Keep the monitor out of direct sunlight and away from stoves or any other heat source.
g. Remove any object that could fall into the vents or prevent proper cooling of the monitor's electronics.
h. Do not block the ventilation holes on the cabinet.
i. Keep the monitor dry. To avoid electric shock, do not expose it to rain or excessive moisture.
j. When positioning the monitor, make sure the power plug and outlet are easily accessible.
k. If turning off the monitor by detaching the power cable or DC power cord, wait for 6 seconds before attaching the power cable or DC power cord for normal operation.
l. To avoid the risk of shock or permanent damage to the set, do not expose the monitor to rain or excessive moisture.
m. IMPORTANT: Always activate a screen saver program during your application. If a still image in high contrast remains on the screen for an extended period of time, it may leave an 'after-image' or 'ghost image' on front of the screen. This is a well-known phenomenon that is caused by the shortcomings inherent in LCD technology. In most cases, the afterimage will disappear gradually over a period of time after the power has been switched off. Be aware, that the afterimage symptom cannot be repaired and is not covered under warranty.
o. Warning for lifting monitor - Do not use the area underneath the logo cover to grip or lift the monitor. Placing weight on the logo cover can cause it to break away from the body and cause the monitor to fall. When lifting the monitor, place one hand under the monitor's frame.



○ Do ✕ Don't

* Consult a service technician if the monitor does not operate normally when the operating instructions given in this manual have been followed.

Installation Locations

Avoid exposure to heat and extreme cold.

Do not store or use the LCD monitor in locations exposed to heat, direct sunlight or extreme cold.

Avoid moving the LCD monitor between locations with large temperature differences. Choose a site that falls within the following temperature and humidity ranges.
Temperature: 0-35°C 32-95°F
Humidity: 20-80% RH

Do not subject the LCD monitor to severe vibration or high impact conditions. Do not place the LCD monitor in the trunk of a car.

Take care not to mishandle this product by either knocking or dropping it during operation or transportation.

Do not store or use the LCD monitor in locations where there is a high level of humidity or in dusty environments. Do not allow water or other liquids to spill on or into the LCD monitor.

Trouble Shooting

This page deals with problems that can be corrected by the user. If the problem still persists after you have tried these solutions, contact your nearest Philips dealer.

Common Problems	
Having this problem	Check these items
No Picture (Power LED not lit)	a. Make sure the power cord is plugged into the power outlet and into the back of the monitor. b. First, ensure that the power button on the front of the monitor is in the OFF position, then press it to the ON position.
No Picture (Power LED is amber or yellow)	a. Make sure the computer is turned on. b. Make sure the signal cable is properly connected to your computer. c. Check to see if the monitor cable has bent pins. d. The Energy Saving feature may be activated.
Screen says	a. Make sure the monitor cable is properly connected to your computer. (Also refer to the Quick Set-Up Guide). b. Check to see if the monitor cable has bent pins. c. Make sure the computer is turned on.
Screen says	a. Make sure the monitor cable is properly connected to your computer. (Also refer to the Quick Set-Up Guide). b. Check to see if the monitor cable has bent pins. c. Make sure the computer is turned on.
AUTO button not working properly	a. The Auto Function is designed for use on standard Macintosh or IBM-compatible PCs running Microsoft Windows. b. It may not work properly if using nonstandard PC or video card.
Imaging Problems	
Display position is incorrect	a. Press the Auto button. b. Adjust the image position using the Phase/Clock of More Settings in OSD Main Controls.
Image vibrates on the screen	a. Check that the signal cable is properly connected to the graphics board or PC.
Vertical flicker appears	a. Press the Auto button. b. Eliminate the vertical bars using the Phase/Clock of More Settings in OSD Main Controls.
Horizontal flicker appears	a. Press the Auto button. b. Eliminate the vertical bars using the Phase/Clock of More Settings in OSD Main Controls.

Definition of Pixel Defects

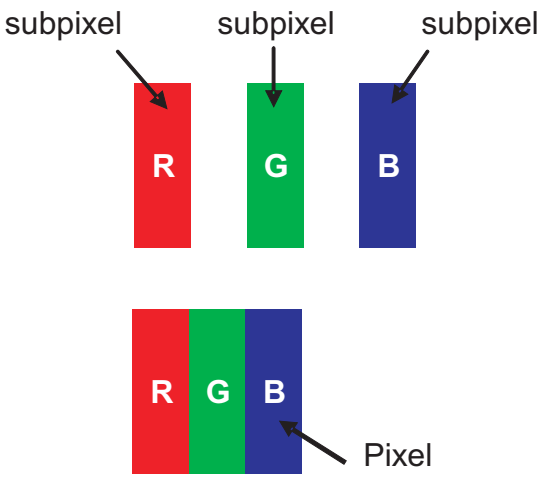
The screen is too bright or too dark	Adjust the contrast and brightness on On-Screen Display.(The backlight of the LCD monitor has a fixed life span. When the screen becomes dark or begins to flicked, please contact your sales representative).
An after-image appears	If an image remains on the screen for an extended period of time, it may be imprinted in the screen and leave an after-image. This usually disappears after a few hours.
An after-image remains after the power has been turned off	This is characteristic of liquid crystal and is not caused by a malfunction or deterioration of the liquid crystal. The after-image will disappear after a peroid of time.
Green, red, blue, dark, and white dots remains	The remaining dots are normal characteristic of the liquid crystal used in today's technology.
For further assistance, refer to the Consumer Information Centers list and contact your local Philips distributor.	

Definition of Pixel Defects

This section explains the different types of pixel defects and defines acceptable defect levels of each type. In order to quality for repair or replacement under warranty, the number of pixel defects on a TFT LCD panel must exceed these acceptable levels.

1. Definition of Pixels and Sub-pixels

A pixel, or picture element, is composed of three sub pixels in the primary colors of red, green and blue. Many pixels together form an image. When all sub pixels of a pixel are lit, the three colored sub pixels together appear as a single white pixel. When all are dark, the three colored sub pixels together appear as a single black pixel. Other combinations of lit and dark sub pixels appear as single pixels of other colors.



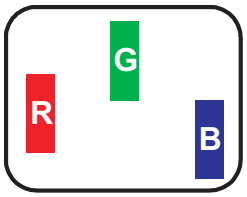
2. Types of Pixel Defects

Pixel and sub pixel defects appear on the screen in different ways. There are two categories of pixel defects and several types of sub pixel defects within each category.

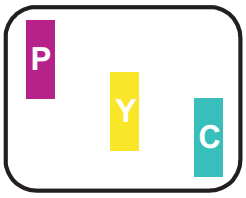
Bright Dot Defects

Bright dot defects appear as pixels or sub pixels that are always lit or 'on'. That is, a bright dot is a sub-pixel that stands out on the screen when the monitor displays a dark pattern. There are the types of bright dot defects:

One lit red, green or blue sub pixel



Two adjacent lit sub pixels:
- Red + Blue = Purple
- Red + Green = Yellow
- Green + Blue = Cyan (Light Blue)



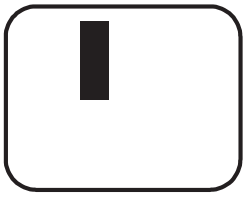
Three adjacent lit sub pixels (one white pixel)

A red or blue bright dot must be more than 50 percent brighter than neighboring dots while a green bright dot is 30 percent brighter than neighboring dots.

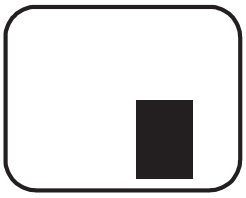
Black Dot Defects

Black dot defects appear as pixels or sub pixels that are always dark or 'off'. That is, a dark dot is a sub-pixel that stands out on the screen when the monitor displays a light pattern. These are the types of black dot defects:

One dark sub pixel



Two or three adjacent dark sub pixels



Definition of pixel defects

3. Proximity of Pixel Defects

Because pixel and sub pixels defects of the same type that are near to one another may be more noticeable, Philips also specifies tolerances for the proximity of pixel defects.
Perfect Panel - ISO 13406-2 Class II compliant do-defect-free-display.

BRIGHT DOT DEFECTS	ACCEPTABLE LEVEL
MODEL	*220CW8*
1 lit subpixel	3
2 adjacent lit subpixels	1
3 adjacent lit subpixels (one white pixel)	0
Distance between two bright dot defects*	15mm
Bright dot defects within 20 mm circle	0
Total bright dot defects of all types	3

BLACK DOT DEFECTS	ACCEPTABLE LEVEL
MODEL	*220CW8*
1 dark subpixel	5
2 adjacent dark subpixels	2
3 adjacent dark subpixels	1
Distance between two black dot defects*	15mm
Black dot defects within 20 mm circle*	1
Total black dot defects of all types	5

TOTAL DOT DEFECTS	ACCEPTABLE LEVEL
MODEL	*220CW8*
Total bright or black dot defects of all types	5

Note:
* 1 or 2 adjacent sub pixel defects = 1 dot defect

Wiring Diagram

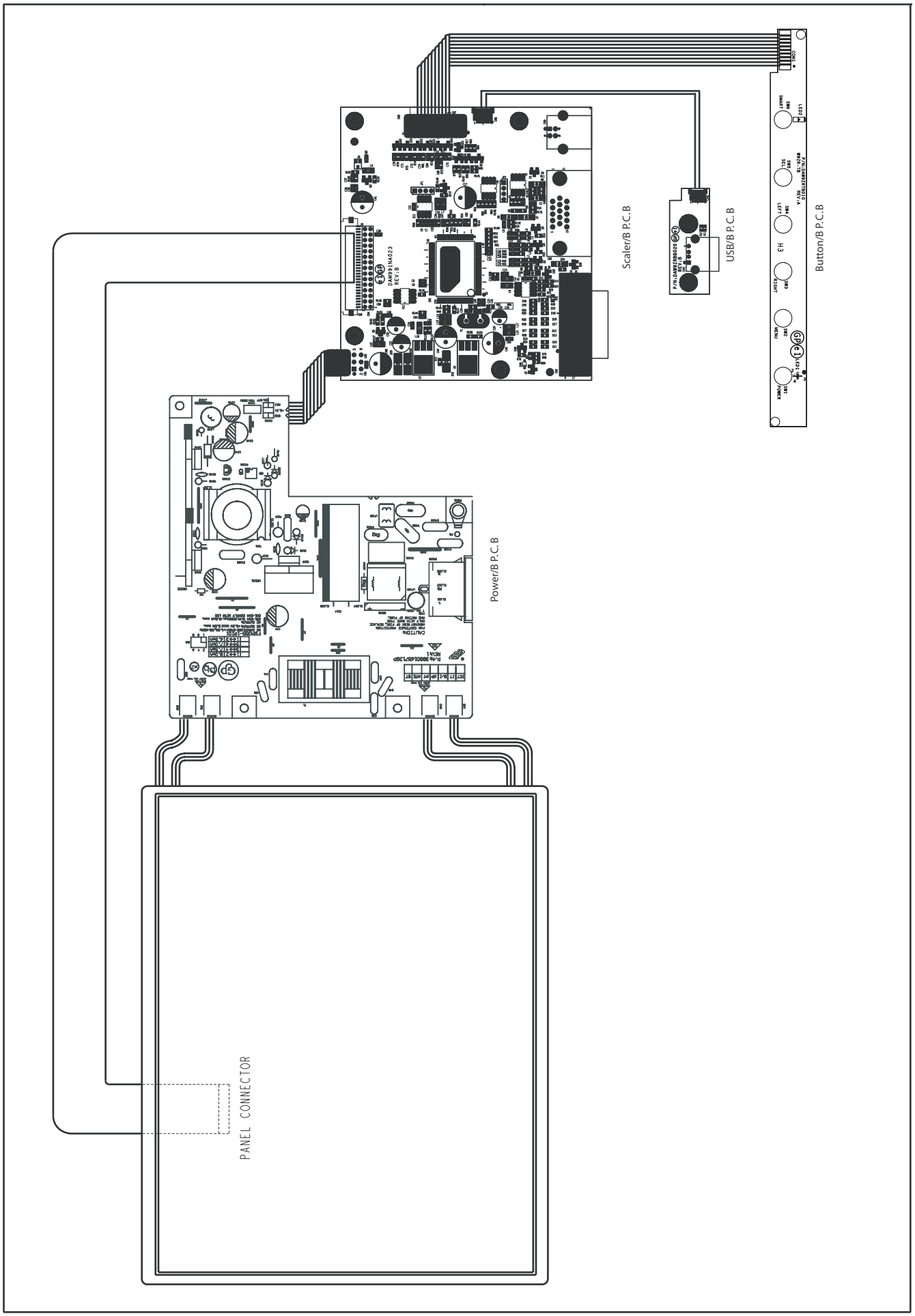


Fig. 1

1. Put down the LCD, all tools prepared.

Fig. 2

2. Take off the base.

Fig. 3

3. Take off the stand cover.

Fig. 4

4. Take off hinge cover.

Fig. 5

5. Remove 4pcs screws on stand and take off it.

Fig. 6

6. Separate the rear cover and panel.

Mechnical instructions

Fig. 7

7. Disconnect the B/B and USB/B cable and take off all the tapes.

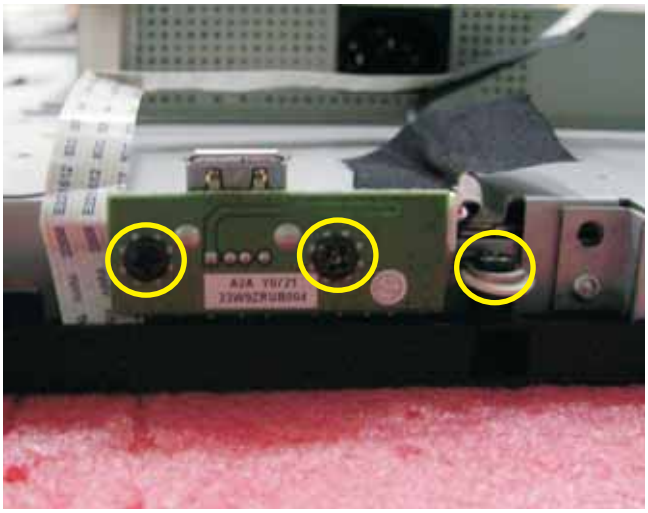


Fig. 8

8. Remove 3pcs screws from USB/B and take off it.

Fig. 9

9. Remove 3pcs screws from left side of panel.

Fig. 10

10. Remove 3pcs screws from right side of panel.

Fig. 11

11. Remove 2pcs screws from down side of panel.

12. Separate panel and bezel as picture show.

Fig. 13

13. Remove 3pcs screws from B/B and take off it from bezel.

Fig. 14

14. Remove 2pcs screws from left side panel.

Fig. 15

15. Remove 2pcs screws from right side panel.

Fig. 16

16. Remove 1pcs screws from P/B shielding.

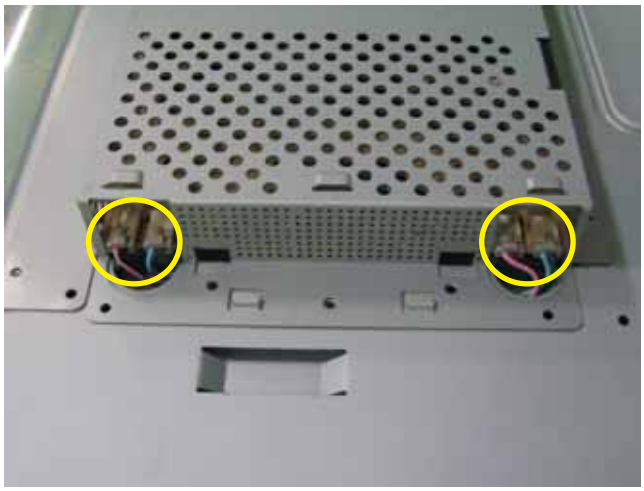


Fig. 17

17. Take off 4pcs lamp cable from P/B.

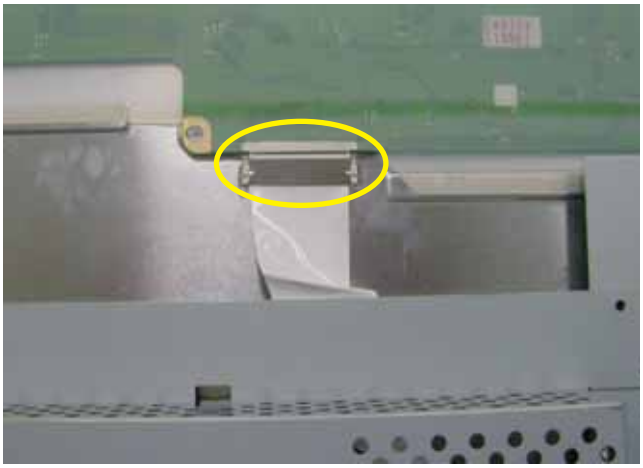


Fig. 18

17. Disconnect the LVDS cable..

Mechnical instructions

Fig. 19

19. Separate the panel and shielding.

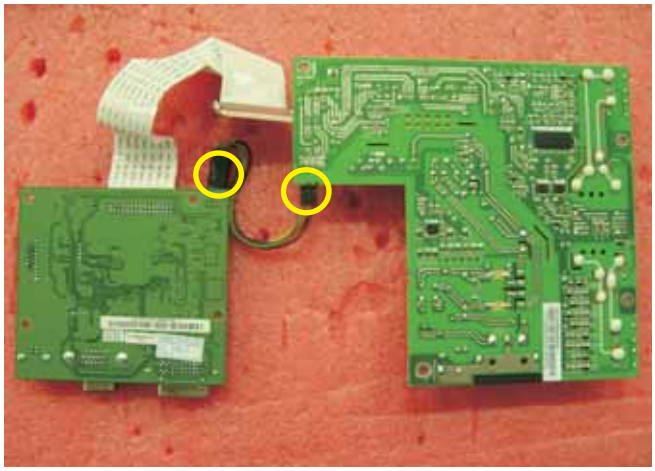


Fig. 22

22. Disconnect the M/B and P/B.

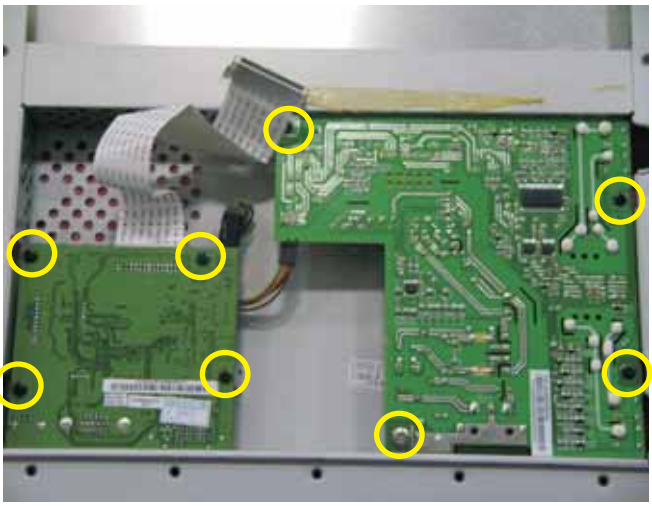


Fig. 20

20. Remove 8pcs screws from M/B and P/B.

Fig. 21

21.Remove 4pcs IO NUT from M/B.

F/W upload instruction

Configuration and procedure (ISP Tool)

"ISP Tool " software is provided by NOVATEK to upgrade the firmware of Scaler IC. It is a windows-based program, which cannot be run in MS-DOS.

System and equipment requirements:
1. An i486 (or above) personal computer or compatible.
2. Microsoft operation system Windows 98/2000/XP.
3. ISP software " EasyUSB Writer ".
(Need to install, it can not be performed directly.Double press "EasyUSB WriterV3.0.exe" to start installing,then chose the path that you want to install ,then it will perform automatically.)
4. Firmware uploading tool, as shown in Fig1.

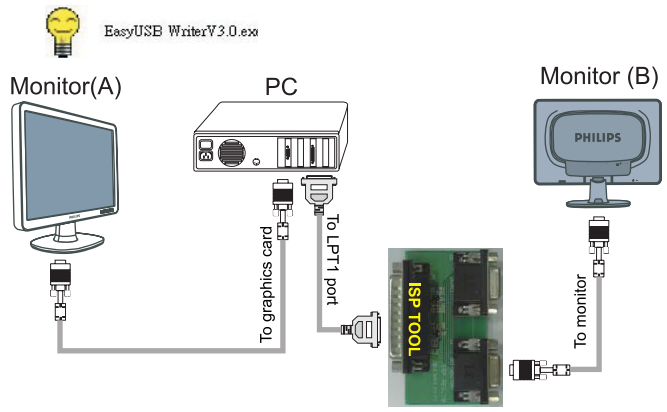


Fig.1

* Connect the firmware uploading tool as Fig.1 shown.
* Before the servicer perform the ISP Tool program, the Communicating connection must be well done.
* When the connection fixed, power on the monitor.

Setup and perform the ISP Tool program

1. Save the software in your PC, and create a shortcut on the desktop.

2. Double click the ISP Tool. exe icon at the desktop then appears window as shown in Fig. 2.

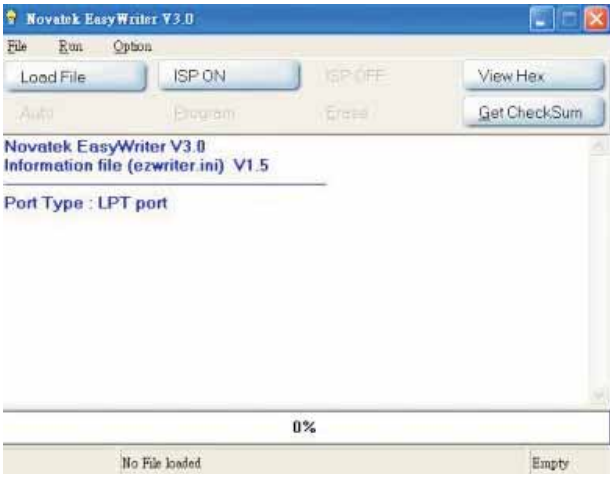


Fig. 2

3. Press the "Load File" button then select the path that save hex file ,then chose file type as "Bank Switch(128K,256K)" as shown in Fig. 3.

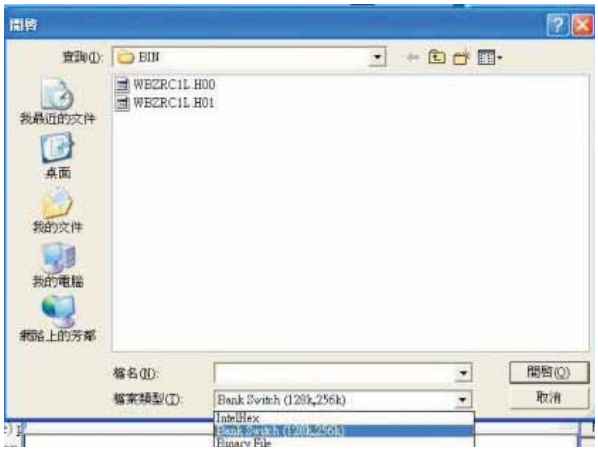


Fig. 3

4. Double press the "H00" file or "H01 file" ,then it acquires the hex file automatically, and a message will be showed in the dialog box to notice the operator. At this moment, please verify the checksum of the hex file with the firmware control table to make sure the suitable file will be used. Mentioned firmware control table will be provided by suppliers shown in Fig. 4.

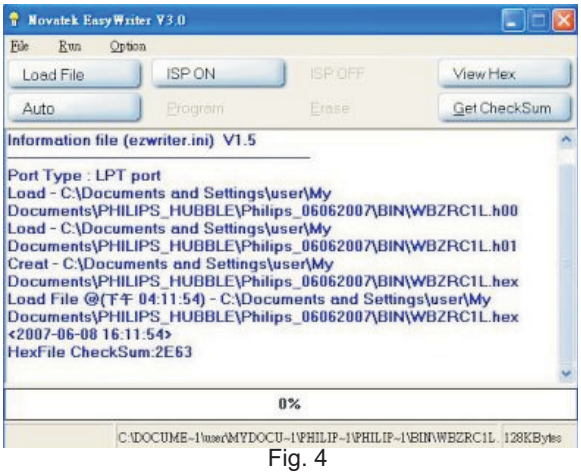


Fig. 4

5. Press the "ISP ON" button ,then the dialog box will has the information "ISP ON" ,else has the information "ISP Fail".If the information is "ISP Fail" ,check the connectivity ,then try it again as shown in Fig. 5.

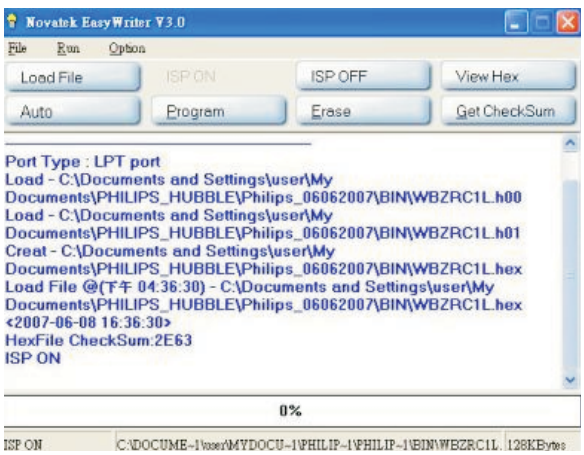


Fig. 5

Electrical instructions

6. Press "**Auto**"button of the toolbox. Program will perform the loading process automatically. When the loading process completed, and the dialog box appeared the message of Programing Success. If Program perform fail ,resume step 5.

DDC instructions

General

DDC Data Re-programming

In case the DDC data memory IC or main EEPROM which storage all factory settings were replaced due to a defect, the serial numbers have to be re-programmed.
It is advised to re-soldered DDC IC and main EEPROM from the old board onto the new board if circuit board have been replaced, in this case the DDC data does not need to be re-programmed.

* According to the design concept of this product, DDC data will be divided into two parts to deposit in different place:
DDC data of VGA interface are saved in scaler IC.
DDC data of DVI interface are saved in EEPROM(IC 24C02).

Additional information

Additional information about DDC (Display Data Channel) may be obtained from Video Electronics Standards Association (VESA). Extended Display Identification Data(EDID) information may be also obtained from VESA.

System and equipment requirements

1. An i486 (or above) personal computer or compatible.
2. Microsoft operation system Windows 98/2000/XP.
3. Installation software of " TVI Tool ".
4. Executive program " TVI Tool. exe ".
5. ISP tool kit, as shown in Fig1.
   Including: a. Alignment fixture x 1
   b. Printer cable (LPT type) x 1
   c. D-sub to D-sub cable x 1
   d. Analog to DVI adapter x 1
   e. DVI to DVI cable x 1

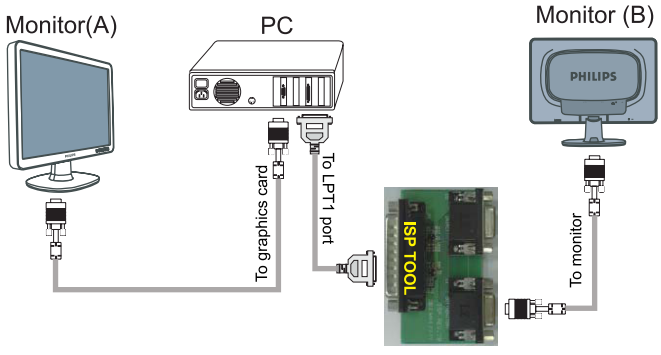


Fig. 1

Install and setup TVI-TOOL program

Step 1: Double press the "TVI-TOOL_234.exe".
Step 2: In Company text box key in any word as shown in the Fig.2.

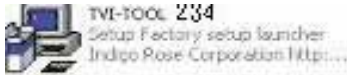


Fig. 2

Step 3: Closing the path that you want to install, then chose the shortcut folder ,press "Install" button ,and it will perform automatically.

Fig.3

Re-programming Analog DDC IC

Step 1: After initialize the alignment fixture, connecting all cables. Be using VGA port from monitor.

Step 2: Connect the power code of monitor and power on it.

Step 3: Double check the TVI_TOOL icon to run the TV_TOOL.exe.

Step 4: Click the OPEN icon at the main menu to open the DDC files.

Fig. 4

Step 5: In the "Detailed Timings" BLOCK2 key in the monitor serial number.

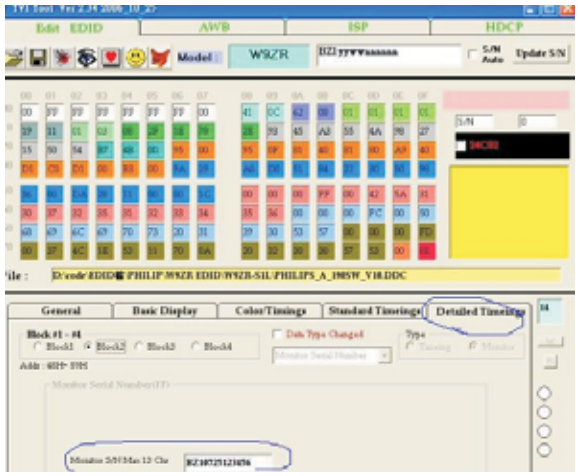


Fig. 5

Step 6: Press "WRITE TO IC " button in the tool bar ,when the DDC data download into the DDC IC, a dialog box will be appeared automatically as shown in below photos.

Fig. 6

Step 7: Power off the monitor.

Electrical instructions

Re-programming Digital DDC IC

Step 1: After initialize the alignment fixture, connecting all cables.Be using DVI port from monitor.
Step 2: Connect the power code of monitor and power on it.

Step 3: Double check the TVI_TOOL icon to run the TV_TOOL.exe.

Step 4: Click the OPEN icon at the main menu to open the DDC files.

Fig. 7

Step 5: In the "Detailed Timings" BLOCK2 key in the monitor serial number.

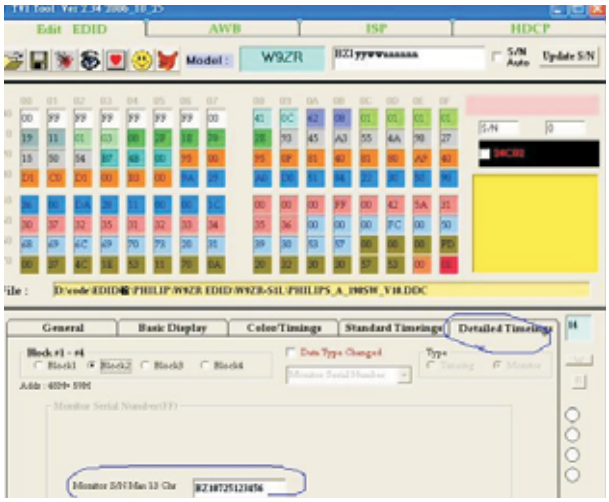


Fig. 8

Step 6: Press "WRITE TO IC " button in the tool bar ,when the DDC data download into the DDC IC, a dialog box will be appeared automatically as shown in below photos.

Fig. 9

Step 7: power off the monitor.

* If the operator don't want to key in the serial number, he or she can Keep the option as blank.

Press the **WRITE TO IC** icon to execute the download by program itself.

And select the **READ TO IC** icon to check the EDID contents.

Fig. 10

User Interface of DDC programming

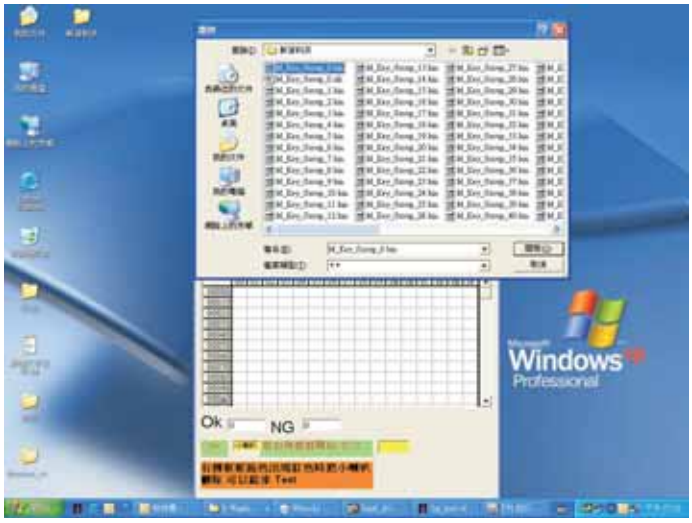
Toolbar function introduction

1. Open a DDC file
2. Save DDC file
3. Write to IC
4. Read from IC
5. Get a exsample
6. DDC report
7. Exit the program

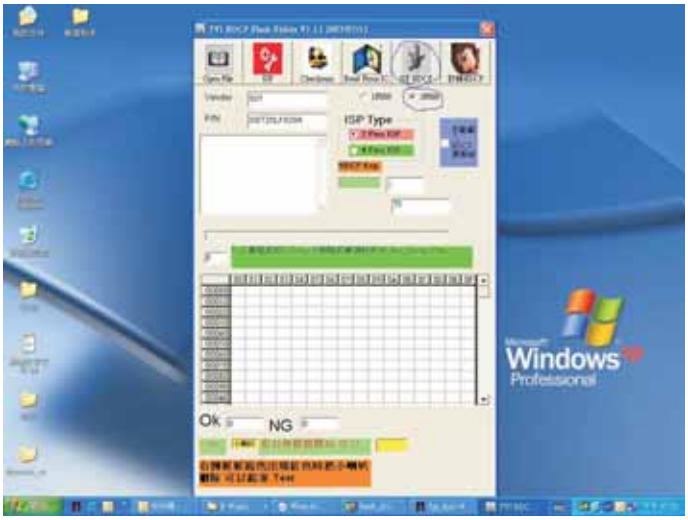
Re-programming of writing HDCP KEY

Step 1: Please install the software of isp HDCP key Version1.13 ,the tool is the same with isping EDID.
Step 2: Opening the software.
Step 3: Pressing the button of "OPEN FILE", as follows:

Step 4: Choosing the HDCP KEY that you save:



Step 5: If the Flash Rom of monitor is 2MB, please choose"3F000",but if it is 1MB please choose 1F000(if you choose amiss ,the monitor maybe shut down) ,then press the button of "ISP HDCP".



Step 6: The software will write HDCP KEY into monitor.

Step 7: If the software write HDCP KEY into monitor successfully ,the message will be display ,as follow , if the software write HDCP KEY into monitor unsuccessfully ,please check the cable ,and restart from step5 .

DDC Data

DDC DATA

THE DISPLAY DATA CHANNEL (DDC_2B) CONTENT INCLUDING:
(Analog mode)

---

128 BYTES OF EDID CODE :

	0	1	2	3	4	5	6	7	8	9
0	00	FF	FF	FF	FF	FF	FF	00	41	0C
10	1A	C0	01	01	01	01	19	11	01	03
20	00	2F	1E	78	2E	93	45	A3	55	4A
30	98	27	15	50	54	BF	EF	80	B3	00
40	95	0F	81	CA	81	80	95	00	81	4F
50	A9	40	D1	C0	21	39	90	30	62	1A
60	27	40	68	B0	36	00	DA	28	11	00
70	00	1C	00	00	00	FF	00	42	5A	31
80	30	37	32	35	31	32	33	34	35	36
90	00	00	00	FC	00	50	68	69	6C	69
100	70	73	20	32	32	30	43	57	00	00
110	00	FD	00	38	4C	1E	5D	11	70	0A
120	20	32	30	30	57	53	00	29		

(08-09) ID Manufacturer Name = PHL
(10-11) Product ID Code (Non-Alphanumerical) =
C01A - (49178)
(12-15) Last 5 Digits of Serial Number = NOT SPECIFIED
(16) Week of Manufacture = 25
(17) Year of Manufacture = 2007
(10-17) Complete Serial Number = NOT SPECIFIED
(18) EDID Structure Version Number = 1
(19) EDID Structure Revision Number = 3
(20) VIDEO INPUT DEFINITION : =
Analog signal, 0.700V/0.300V (1.000 Vp-p)
(21) Maximum Horizontal Image Size = 470mm
(22) Maximum Vertical Image Size = 300mm
(23) Display Gamma = 2.20
(24) DPMS Supported Feature: = Active Off.
Display type = RGB color display

(25-34) CHROMA INFO:
Red x = 0.639 Green x = 0.289
Blue x = 0.153 White x = 0.313
Red y = 0.333 Green y = 0.597
Blue y = 0.082 White y = 0.329

(35) ESTABLISHED TIMING I:
720 x 400 @ 70Hz (VGA, IBM)
640 x 480 @ 60Hz (VESA)
640 x 480 @ 67Hz (MAC II, Apple)
640 x 480 @ 72Hz (VESA)
640 x 480 @ 75Hz (VESA)
800 x 600 @ 56Hz (VESA)
800 x 600 @ 60Hz (VESA)

(36) ESTABLISHED TIMING II:
800 x 600 @ 72Hz (VESA)
800 x 600 @ 75Hz (VESA)
832 x 624 @ 75Hz (MAC II, Apple)
1024 x 768 @ 60Hz (VESA)
1024 x 768 @ 70Hz (VESA)
1024 x 768 @ 75Hz (VESA)
1280 x 1024 @ 75Hz (VESA)

(37) Manufacturer's Reserved Timing:
1152 x 870 @ 75Hz (MAC II, Apple)

(38-53) Standard Timing Identification:
#1: 1680 x 1050 @ 60Hz
#2: 1440 x 900 @ 75Hz
#3: 1280 x 720 @ 70Hz
#4: 1280 x 1024 @ 60Hz
#5: 1440 x 900 @ 60Hz
#6: 1280 x 960 @ 75Hz
#7: 1600 x 1200 @ 60Hz
#8: 1920 x 1080 @ 60Hz

(54-71) Detail Timing Description #1:
1680x1050 Pixel Clock=146.2MHz

Horizontal Image Size=474mm
Vertical Image Size=296mm
Refresh Mode:
Non-Interlaced Normal display, no stereo

HORIZONTAL:
Active Time = 1680 pixels
Blanking Time = 560 pixels
Sync Offset = 104 pixels
Sync Pulse Width = 176 pixels
Border = 0 pixels
Frequency = 65.3 kHz

VERTICAL:
Active Time = 1050 lines
Blanking Time = 39 lines
Sync Offset = 3 lines
Sync Pulse Width = 6 lines
Border = 0 lines
Frequency = 60.0 Hz

Sync configuration: Digital separate, V(+), H(-)

(72-89) Monitor Description:

Monitor S/N: BZ10725123456

(90-107) Monitor Description:

Monitor Name: Philips 220CW

(108-125) Monitor Description:

Monitor Range Limits:
Vertical Frequency (min) = 56Hz
Vertical Frequency (max) = 76Hz
Horizontal Frequency (min) = 30KHz
Horizontal Frequency (max) = 93KHz
Maximum Supported Pixel Clock = 170MHz

(127) Checksum OK.

DDC DATA

THE DISPLAY DATA CHANNEL (DDC_2B) CONTENT INCLUDING:
(Digital mode)

---

128 BYTES OF EDID CODE :

	0	1	2	3	4	5	6	7	8	9
0	00	FF	FF	FF	FF	FF	FF	00	41	0C
10	1A	C0	01	01	01	01	19	11	01	03
20	80	2F	1E	78	2E	93	45	A3	55	4A
30	98	27	15	50	54	BF	EF	80	B3	00
40	95	0F	81	CA	81	80	95	00	81	4F
50	A9	40	D1	C0	21	39	90	30	62	1A
60	27	40	68	B0	36	00	DA	28	11	00
70	00	1C	00	00	00	FF	00	42	5A	31
80	30	37	32	35	31	32	33	34	35	36
90	00	00	00	FC	00	50	68	69	6C	69
100	70	73	20	32	32	30	43	57	00	00
110	00	FD	00	38	4C	1E	5D	11	70	0A
120	20	32	30	30	57	53	00	A9		

(08-09) ID Manufacturer Name = PHL
(10-11) Product ID Code (Non-Alphanumerical) =
C01A - (49178)
(12-15) Last 5 Digits of Serial Number = NOT SPECIFIED
(16) Week of Manufacture = 25
(17) Year of Manufacture = 2007
(10-17) Complete Serial Number = NOT SPECIFIED
(18) EDID Structure Version Number = 1
(19) EDID Structure Revision Number = 3
(20) VIDEO INPUT DEFINITION : =
Digital signal, 0.700V/0.300V (1.000 Vp-p)
(21) Maximum Horizontal Image Size = 470mm
(22) Maximum Vertical Image Size = 300mm
(23) Display Gamma = 2.20
(24) DPMS Supported Feature: = Active Off.
Display type = RGB color display

(25-34) CHROMA INFO:
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800 x 600 @ 56Hz (VESA)
800 x 600 @ 60Hz (VESA)

(36) ESTABLISHED TIMING II:
800 x 600 @ 72Hz (VESA)
800 x 600 @ 75Hz (VESA)
832 x 624 @ 75Hz (MAC II, Apple)
1024 x 768 @ 60Hz (VESA)
1024 x 768 @ 70Hz (VESA)
1024 x 768 @ 75Hz (VESA)
1280 x 1024 @ 75Hz (VESA)

(37) Manufacturer's Reserved Timing:
1152 x 870 @ 75Hz (MAC II, Apple)

(38-53) Standard Timing Identification:
#1: 1680 x 1050 @ 60Hz
#2: 1440 x 900 @ 75Hz
#3: 1280 x 720 @ 70Hz
#4: 1280 x 1024 @ 60Hz
#5: 1440 x 900 @ 60Hz
#6: 1280 x 960 @ 75Hz
#7: 1600 x 1200 @ 60Hz
#8: 1920 x 1080 @ 60Hz

(54-71) Detail Timing Description #1:
1680x1050 Pixel Clock=146.2MHz

Horizontal Image Size=474mm
Vertical Image Size=296mm
Refresh Mode:
Non-Interlaced Normal display, no stereo

HORIZONTAL:
Active Time = 1680 pixels
Blanking Time = 560 pixels
Sync Offset = 104 pixels
Sync Pulse Width = 176 pixels
Border = 0 pixels
Frequency = 65.3 kHz

VERTICAL:
Active Time = 1050 lines
Blanking Time = 39 lines
Sync Offset = 3 lines
Sync Pulse Width = 6 lines
Border = 0 lines
Frequency = 60.0 Hz

Sync configuration: Digital separate, V(+), H(-)

(72-89) Monitor Description:

Monitor S/N: BZ10725123456

(90-107) Monitor Description:

Monitor Name: Philips 220CW

(108-125) Monitor Description:

Monitor Range Limits:
Vertical Frequency (min) = 56Hz
Vertical Frequency (max) = 76Hz
Horizontal Frequency (min) = 30KHz
Horizontal Frequency (max) = 93KHz
Maximum Supported Pixel Clock = 170MHz

(127) Checksum OK.

Safety Instruction, Warnings and Notes

Safety instruction, warnings and notes

index of this chapter:
1 Safety Instructions
2 Warnings
3 Notes

1 Safety Instructions

Safety regulations require that during a repair:
a. Connect the set to the AC Power via an isolation transformer (> 800 VA).
b. Replace safety components, indicated by the symbol ⚠, only by components identical to the original ones. Any other component substitution (other than original type) may increase risk of fire or electrical shock hazard.

Safety regulations require that after a repair, the set must be returned in its original condition. Pay in particular attention to the following points:

a. Route the wire trees correctly and fix them with the mounted cable clamps.
b. Check the insulation of the AC Power lead for external damage.
c. Check the strain relief of the AC Power cord for proper function.
d. Check the electrical DC resistance between the AC Power plug and the secondary side (only for sets which have a AC Power isolated power supply):
 * Unplug the AC Power cord and connect a wire between the two pins of the AC Power plug.
 * Set the AC Power switch to the "on" position (keep the AC Power cord unplugged!).
 * Measure the resistance value between the pins of the AC Power plug and the metal shielding of the tuner or the aerial connection on the set. The reading should be between 4.5 Mohm and 12 Mohm.
 * Switch "off" the set, and remove the wire between the two Pins of the AC Power plug.
e. Check the cabinet for defects, to avoid touching of any inner parts by the customer.

2 Warnings

a. All ICs and many other semiconductors are susceptible to electrostatic discharges (ESD ⚠). Careless handling during repair can reduce life drastically. Make sure that, during repair,
you are connected with the same potential as the mass of the set by a wristband with resistance. Keep components and tools also at this same potential.
b. Be careful during measurements in the high voltage section.
c. Never replace modules or other components while the unit is switched "on".
d. When you align the set, use plastic rather than metal tools. This will prevent any short circuits and the danger of a circuit becoming unstable.

3 Notes

3.1 General

Measure the voltages and waveforms with regard to the chassis ground or hot ground, depending on the tested area of circuitry. The voltages and waveforms shown in the diagrams are indicative.

The semiconductors indicated in the circuit diagram and in the parts lists, are interchangeable per position with the semiconductors in the unit, irrespective of the type indication on

3.2 Schematic Notes

All resistor values are in ohms and the value multiplier is often used to indicate the decimal point location (e.g. 2K2 indicates 2.2 Kohm).

Resistor values with no multiplier may be indicated with either an "E" or an "R" (e.g. 220E or 220R indicates 220 ohm).

All capacitor values are given in micro-farads ($X10^{-6}$), nano-farads (n= $X10^{-9}$), or pico-farads (p= $X10^{-12}$).

Capacitor values may also use the value multiplier as the decimal point indication (e.g. 2p2 indicates 2.2 pF).

An "asterisk" (*) indicates component usage varies. Refer to the diversity tables for the correct values.

The correct component values are listed in the Electrical Replacement Parts List. Therefore, always check this list when there is any doubt.

3.3 Lead Free Solder

Philips CE is going to produce lead-free sets (PBF) from 1.1.2005 onwards.
Lead-free sets will be indicated by the PHILIPS-lead-free logo on the Printed Wiring Boards (PWB):

Figure 2-1 Lead-free logo

This sign normally has a diameter of 6 mm, but if there is less space on a board also 3 mm is possible.

In case of doubt wether the board is lead-free or not (or with mixed technologies), you can use the following method:
 * Always use the highest temperature to solder, when using SAC305 (see also instructions below).
 * De-solder thoroughly (clean solder joints to avoid mix of two alloys).

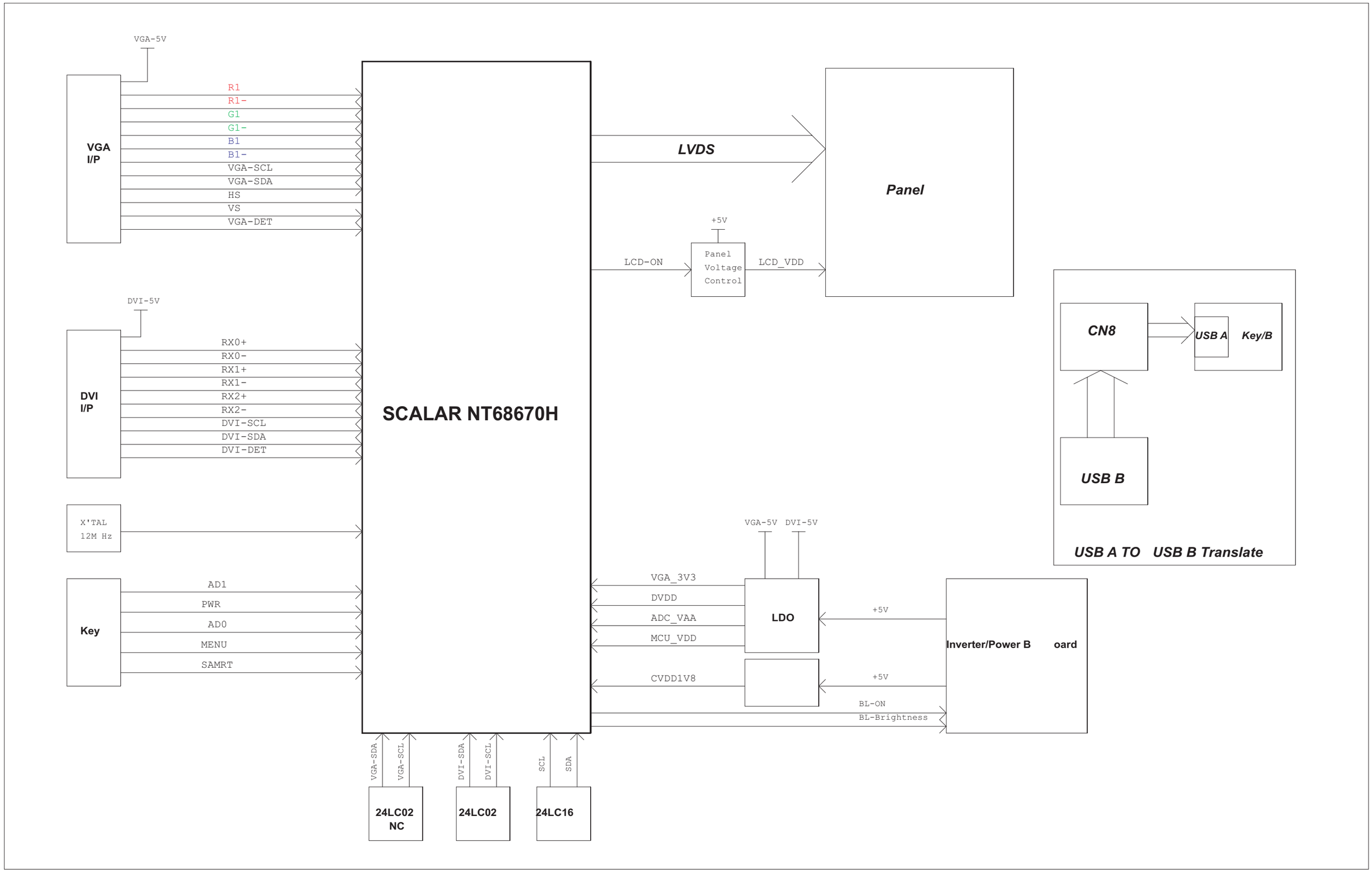
Caution: For BGA-ICs, you must use the correct temperature profile, which is coupled to the 12NC. For an overview of these profiles, visit the website *http://www.atyourservice.ce.philips.com/*
You will find this and more technical information within the "Magazine", chapter "Workshop information".
For additional questions please contact your local repair desk.

Due to lead-free technology some rules have to be respected by the workshop during a repair:

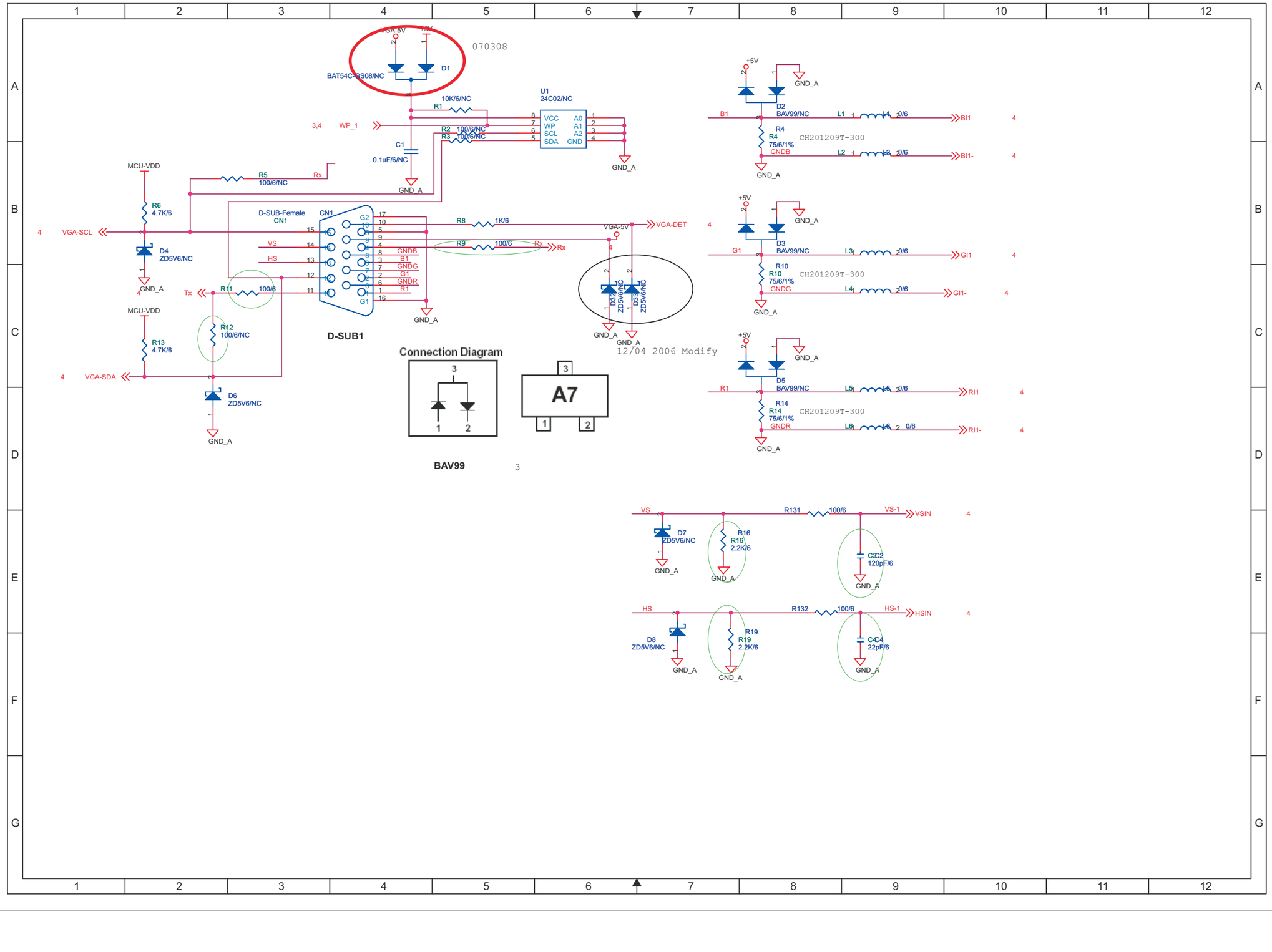
Use only lead-free soldering tin Philips SAC305 with order code 0622 149 00106. If lead-free solder paste is required, please contact the manufacturer of your soldering equipment.
In general, use of solder paste within workshops should be avoided because paste is not easy to store and to handle.

Use only adequate solder tools applicable for lead-free soldering tin. The solder tool must be able
 - To reach at least a solder-tip temperature of 400 degree C.
 - To stabilise the adjusted temperature at the solder-tip.
 - To exchange solder-tips for different applications.

Block Diagram



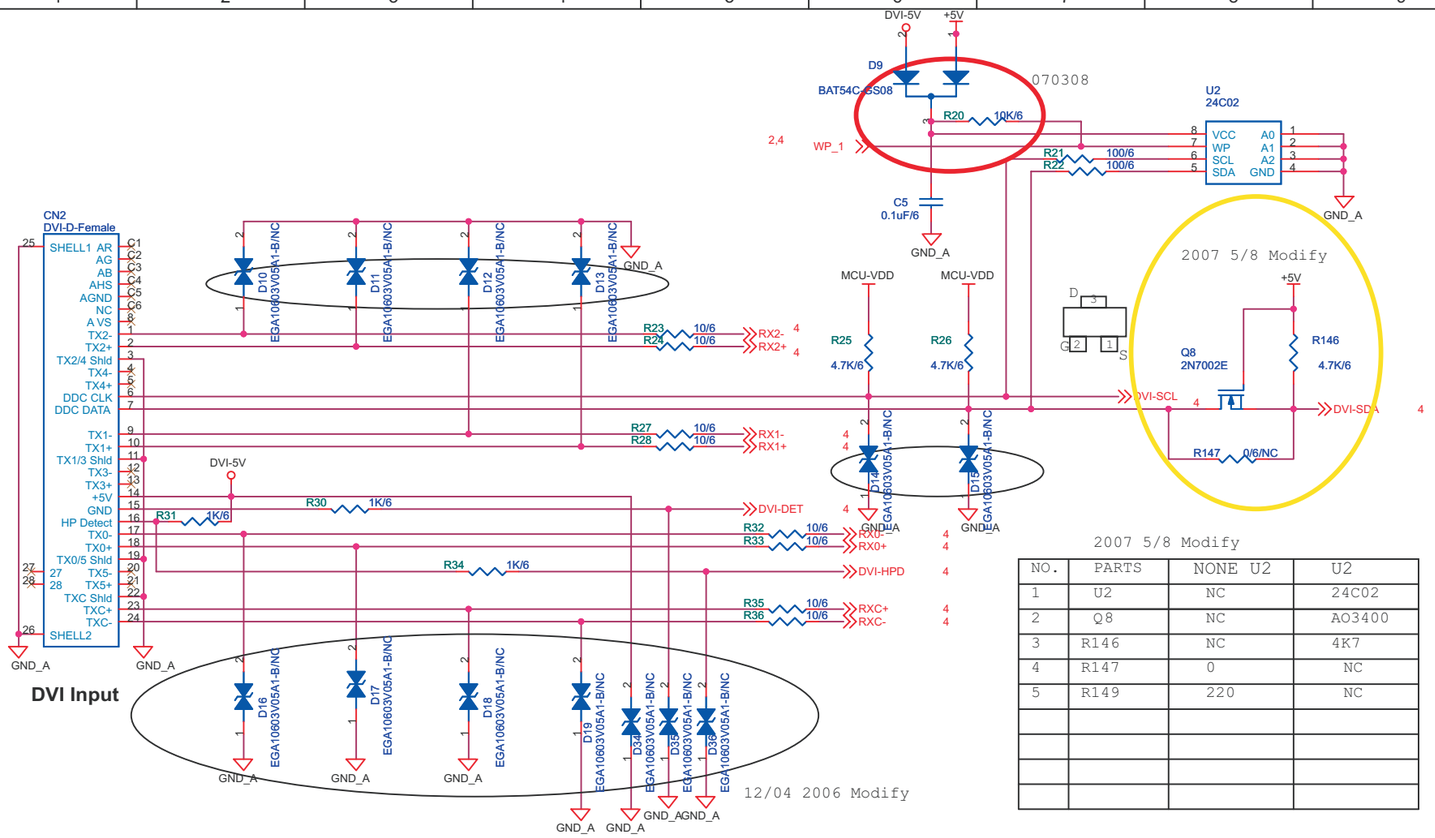
Schematic Diagram(Scaler Board - VGA Input)



S-A1

C1	B4
C2	E8
C4	E8
CN1	B3
D1	A4
D2	A7
D3	B7
D4	B2
D5	C7
D6	C2
D7	D7
D8	E7
D32	C6
D33	C6
L1	A8
L2	B8
L3	B8
L4	C8
L5	C8
L6	D9
R1	A5
R2	A5
R3	A5
R4	A7
R5	B2
R6	B2
R8	B5
R9	B5
R10	B7
R11	C3
R12	C2
R13	C2
R14	C7
R16	E7
R19	E7
R131	E8
R132	E8
U1	A5

Schematic Diagram(Scaler Board - DVI input)



2007 5/8 Modify

NO.	PARTS	NONE U2	U2
1	U2	NC	24C02
2	Q8	NC	AO3400
3	R146	NC	4K7
4	R147	0	NC
5	R149	220	NC

S-A2

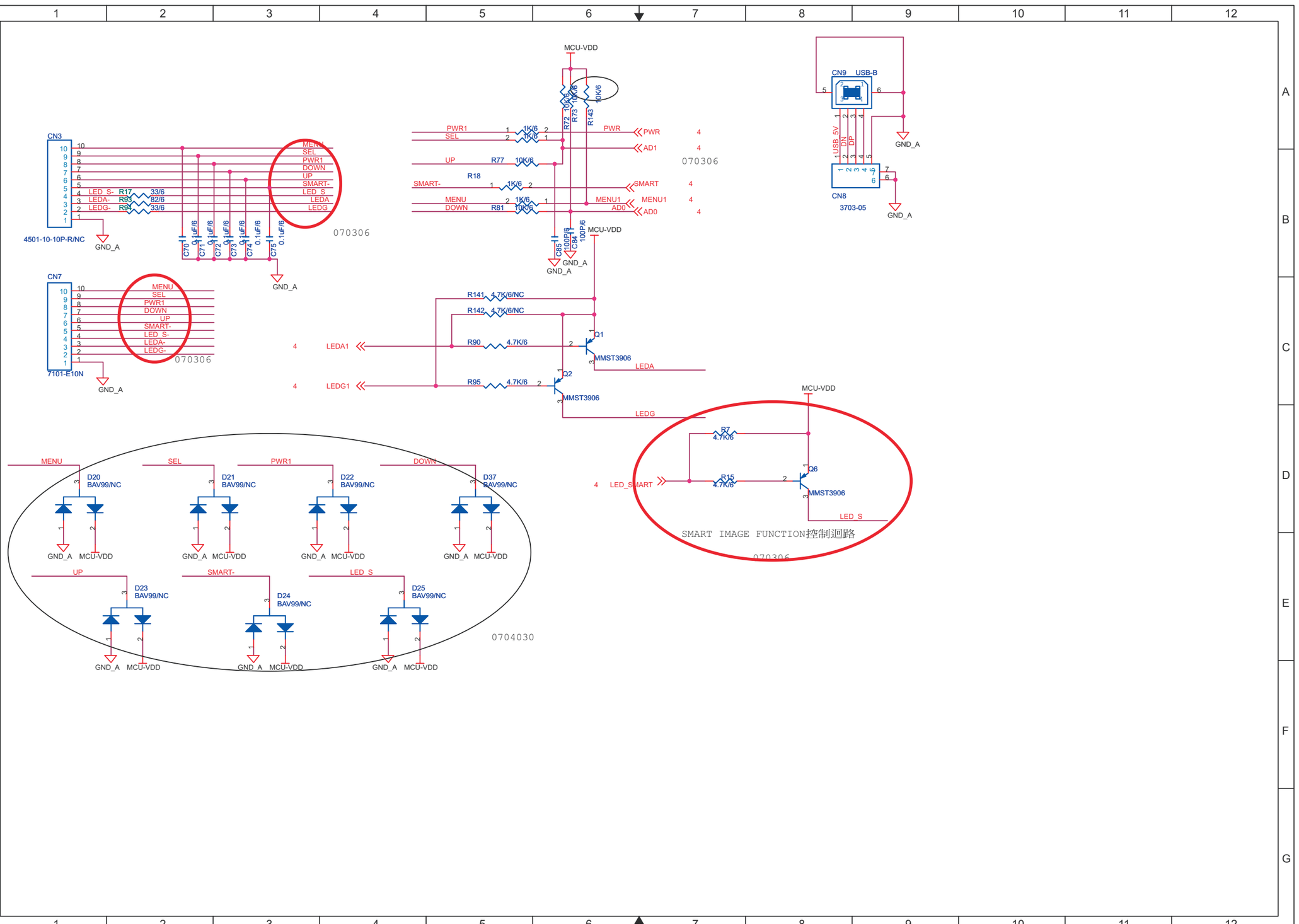
C5	A6
CN2	B1
D9	A6
D10	B2
D11	B3
D12	B3
D13	B4
D14	C6
D15	C6
D16	D2
D17	D3
D18	D3
D19	D4
D34	D4
D35	D4
D36	B5
D36	D5
Q8	B8
R20	A6
R21	A7
R22	A7
R23	B4
R24	B4
R25	B6
R26	B6
R27	B4
R28	C4
R30	C3
R31	C2
R32	B5
R32	C5
R33	B5
R33	C5
R34	C3
R35	B5
R35	C5
R36	B5
R36	C5
R146	B8
R147	C8
U2	A8
U2	D8

Schematic Diagram(Scaler Board - Scaler Nt68670)

S-A3

C6	A1	R39	B10
C7	A1	R41	C2
C8	A1	R42	C2
C9	A1	R43	C2
C10	A2	R44	C2
C11	A2	R45	C2
C12	A3	R47	C2
C13	A3	R48	C2
C14	A3	R49	C9
C15	A4	R50	D1
C16	B2	R51	D1
C17	B2	R52	D3
C18	B1	R53	D3
C19	B1	R54	D3
C20	B1	R55	D3
C21	B10	R57	D11
C22	C3	R58	E2
C23	C3	R59	E2
C24	C3	R61	D11
C25	C3	R62	E3
C26	C3	R63	A9
C27	C3	R64	A9
C28	C3	R65	E1
C29	C2	R66	F3
C31	D2	R82	A9
C32	F1	R83	A9
C33	F1	R135	F2
C34	F3	R136	F3
C67	E2	R137	C9
C69	F3	R144	F5
C82	E3	R145	F5
C83	F5	R148	A8
IC2	B9	R149	F6
JP1	E9	RSTn1	E3
JP2	E9	U11	G2
L7	A4	U3	B4
L8	A5	U6	A7
R38	B3	Y1	E1

Schematic Diagram(Scaler Board - USB KEY)



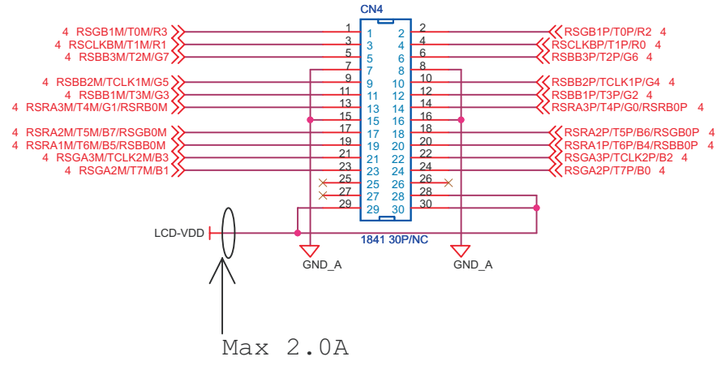
S-A4

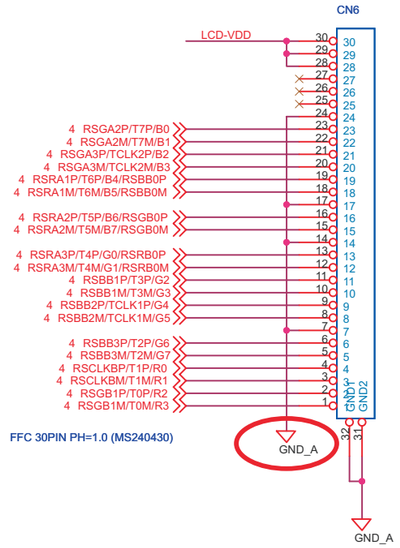
C70	B2
C71	B2
C72	B2
C73	B3
C74	B3
C75	B3
C84	B6
C85	B6
CN3	A1
CN7	B1
CN8	B8
CN9	A8
D20	D1
D21	D2
D22	D3
D23	E1
D24	E3
D25	E4
D37	D5
Q1	C6
Q2	C6
Q6	D9
R7	D7
R15	D7
R17	B2
R18	B5
R72	A6
R73	A6
R74	A5
R75	A5
R77	B5
R79	B5
R81	B5
R90	B5
R90	C5
R93	B2
R94	B2
R95	B5
R95	C5
R141	B5
R141	C5
R142	B5
R142	C5
R143	A6

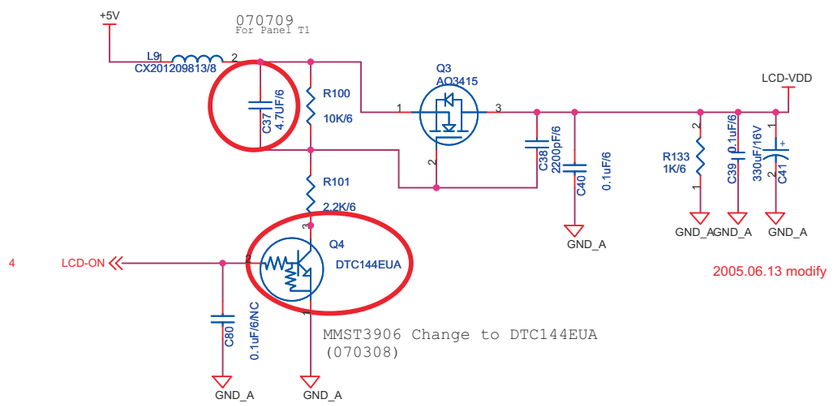
Schematic Diagram(Scaler Board - Panel Output)

S-A5

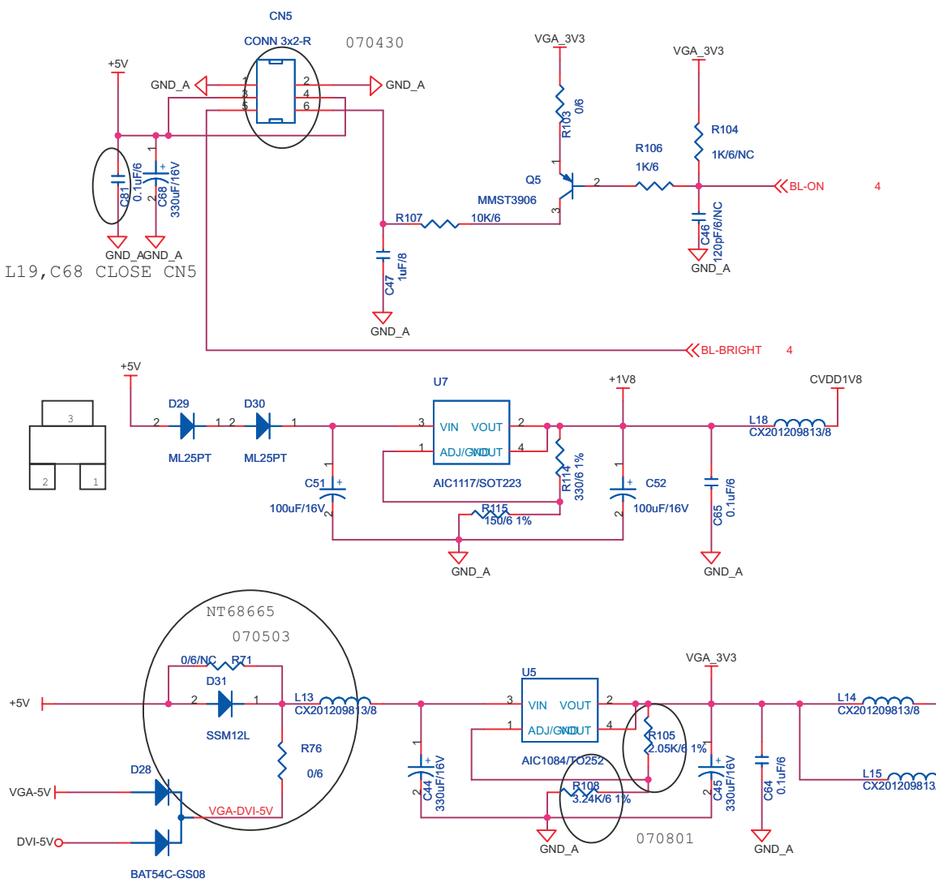
C37	E3
C38	E5
C39	E6
C40	E5
C41	E6
C80	F3
CN4	B4
CN6	B9
L9	D3
Q3	E4
Q4	E3
R100	E3
R101	E3
R133	E6







Schematic Diagram(Scaler Board - Power)

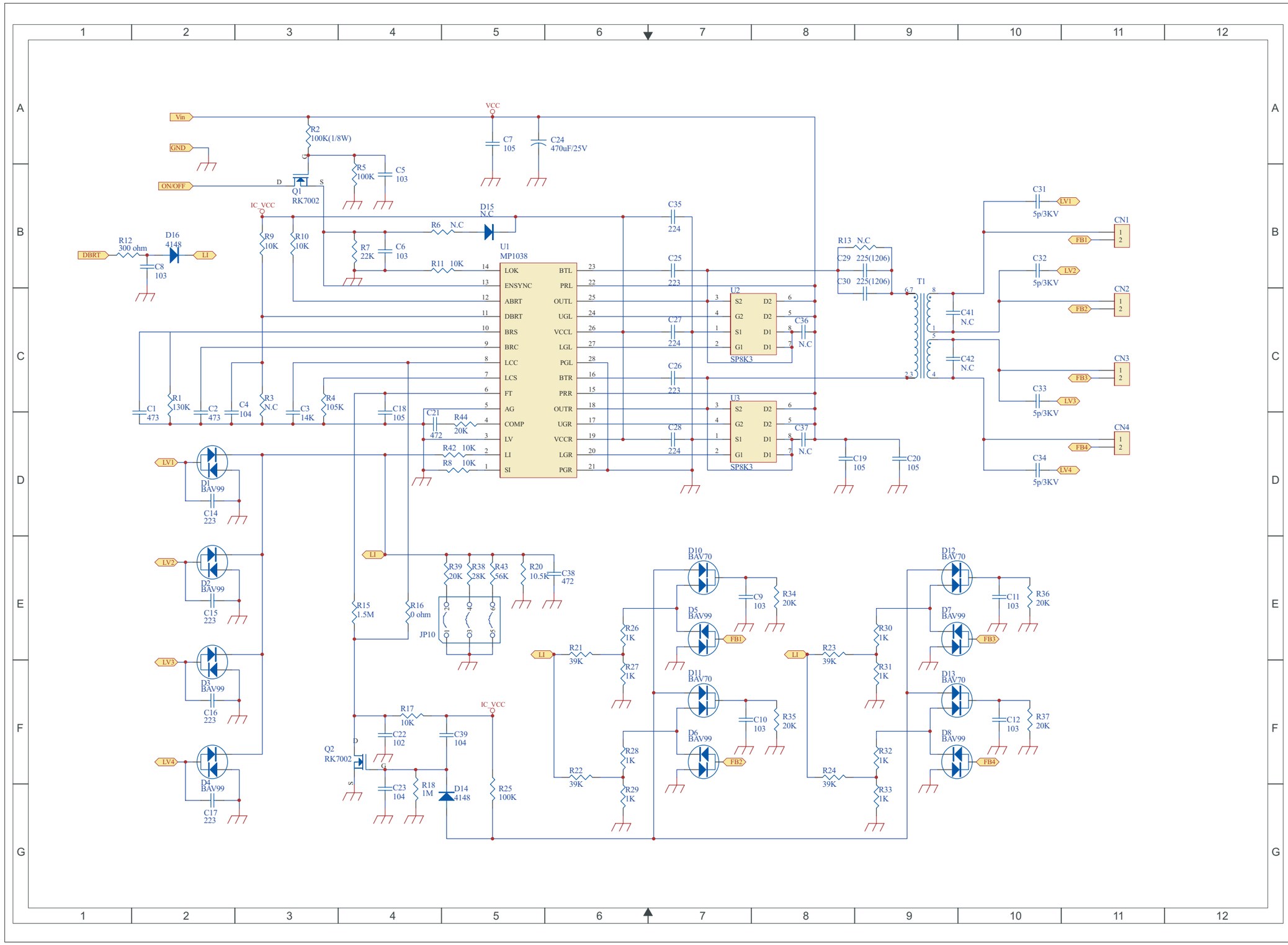


NO.	PARTS	NT68665	NT68670
1	D31	NC	ADD
2	R71	0R	NA
3	R76	NA	0R
4	R70		ADD
5	L17		ADD

S-A6

C44	D3
C45	D5
C46	B5
C47	B3
C51	C2
C52	C4
C64	D5
C65	B5
C65	C5
C68	A1
C81	A1
CN5	A2
D28	D1
D29	B2
D30	B2
D31	D2
D38	A7
D39	B8
L13	D2
L14	D6
L15	D6
L17	A8
L18	B5
Q5	A4
Q7	A7
R67	B7
R68	B7
R69	A8
R70	B8
R71	D2
R76	D2
R103	A4
R104	A5
R105	D4
R106	A4
R107	B3
R108	D4
R114	C4
R115	C3
U5	D4
U7	B3

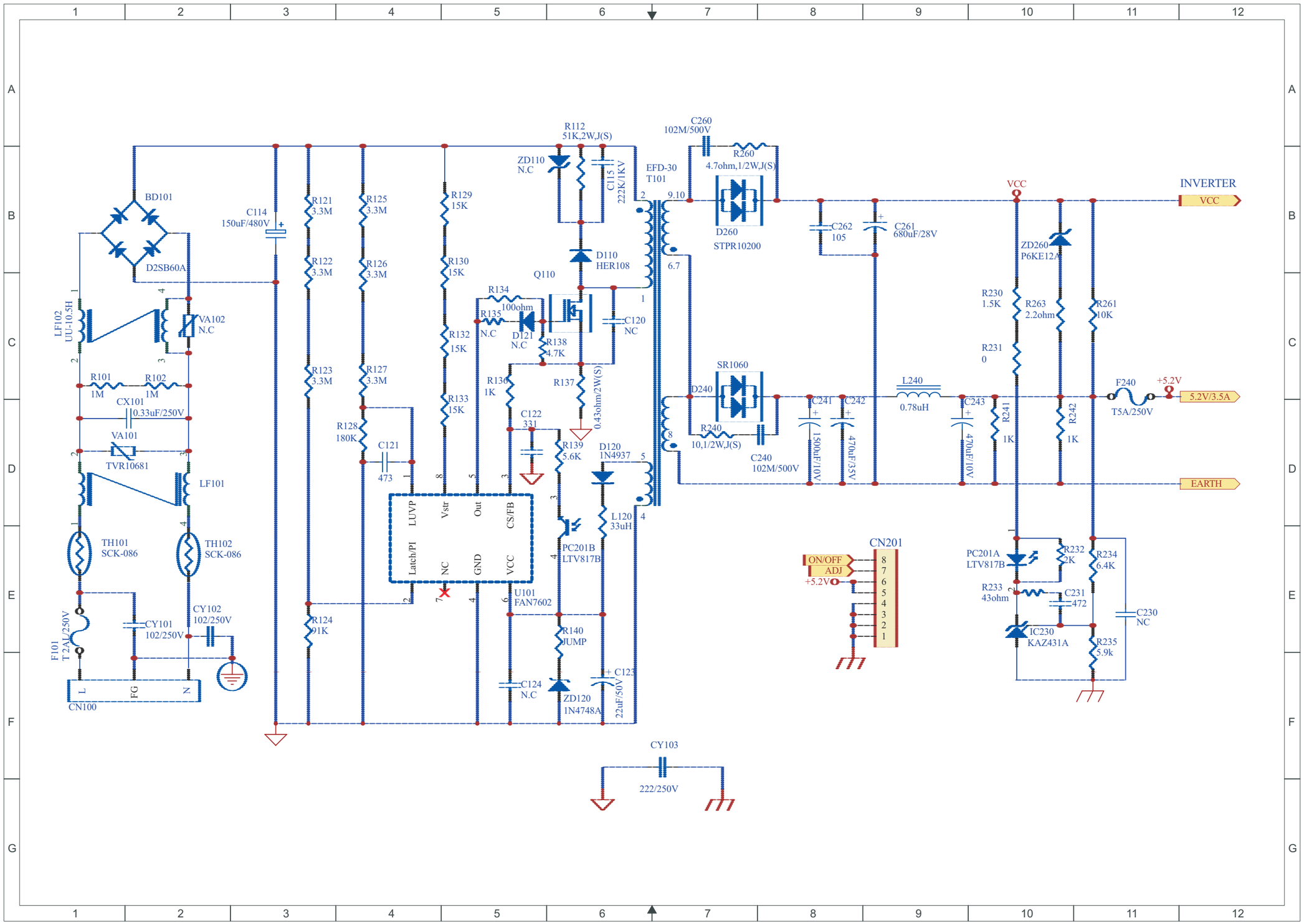
Schematic Diagram(Power Board)



P-A

C1	C2	FB3	E10
C2	C2	FB3	C11
C3	C3	FB4	F10
C4	C3	FB4	D11
C5	B4	JP10	E4
C6	B4	L1	B2
C7	A5	L1	E4
C8	B2	L1	E5
C9	E8	LV1	D2
C10	F8	LV1	B11
C11	E10	LV2	E2
C12	F10	LV2	B11
C14	D2	LV3	F2
C15	E2	LV3	C11
C16	F2	LV4	D11
C17	G2	Q1	B3
C18	C4	Q2	F3
C19	D9	R1	B4
C20	D9	R2	A3
C21	C4	R3	C3
C22	F4	R4	C3
C23	G4	R5	B4
C24	A6	R6	B4
C25	B7	R7	B4
C26	C7	R8	D5
C27	C7	R9	B3
C28	D7	R10	B3
C29	B8	R12	B1
C30	B8	R12	C2
C31	B10	R13	B8
C32	B10	R15	E4
C33	C10	R16	E4
C34	D10	R17	F4
C35	B7	R18	G4
C36	C8	R20	E5
C37	D8	R21	E6
C38	E6	R22	F6
C39	F5	R23	E8
C41	C10	R24	F8
C42	C10	R25	G5
CN1	B11	R26	E6
CN2	C11	R27	F6
CN3	C11	R28	F6
CN4	D11	R29	G6
D2	E2	R30	E9
D3	F2	R31	F9
D5	E7	R32	F9
D6	F7	R33	G9
D7	E9	R34	E8
D8	F9	R35	F8
D10	E7	R36	E10
D11	F7	R37	F10
D12	E9	R38	E5
D13	F9	R39	E5
D14	G5	R42	D5
D15	B5	R43	E5
D16	B2	R44	D5
D16	D2	T1	B9
FB1	E7	U1	B5
FB1	B11	U2	C7
FB2	F7	U3	C7
FB2	C11		

Schematic Diagram(Power Board)



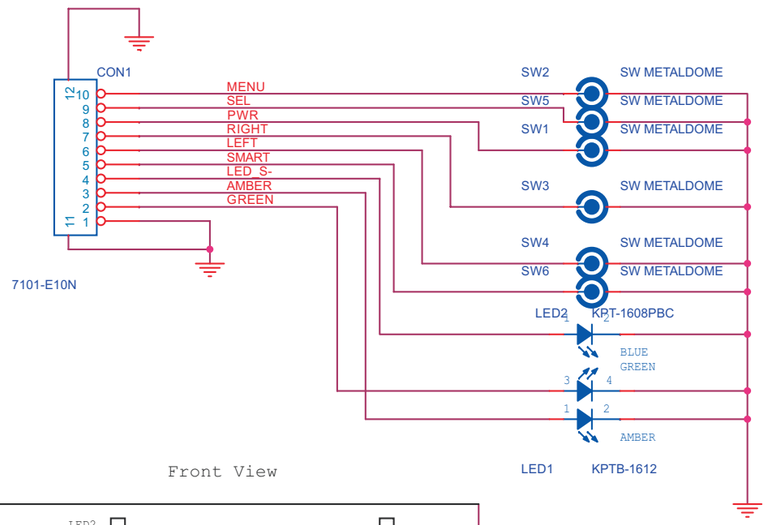
P-B

BD101	B2	R122	B3
C114	B3	R123	C3
C115	B6	R124	E3
C120	C6	R125	B4
C121	D4	R126	B4
C122	D5	R127	C4
C123	F6	R128	D4
C124	F5	R129	B5
C230	E11	R130	B5
C231	E10	R132	C5
C240	D8	R133	C5
C240	D8	R134	C5
C242	D8	R135	C5
C260	A7	R136	C5
C261	B9	R137	C6
C262	B8	R138	C6
CN100	F1	R139	D6
CN201	E9	R140	E6
CY101	E2	R230	C10
CY102	E2	R231	C10
CY103	F7	R232	E10
D110	B6	R233	E10
D120	D6	R234	E11
D121	C5	R235	E11
D240	C7	R240	D7
D260	B7	R241	D10
F101	E1	R242	D10
F240	C11	R260	B7
IC230	E10	R261	C11
L120	D6	R263	C10
L240	C9	TH101	E1
LF101	D2	TH102	E2
LF102	C1	U101	E5
PC201	E6	VA101	D1
PC201	E10	VA102	C2
R101	C1	ZD110	B5
R102	C2	ZD120	F6
R112	A6	ZD260	B10
R121	B3		

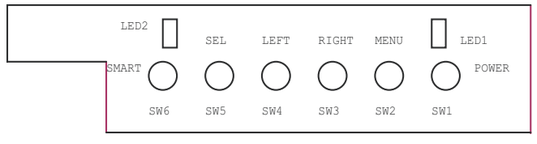
Schematic Diagram(Button Board)

B-1

CON1	C2
LED1	E5
LED2	E5
SW1	D5
SW2	D5
SW3	D5
SW4	D5
SW5	D5
SW6	D5



Front View



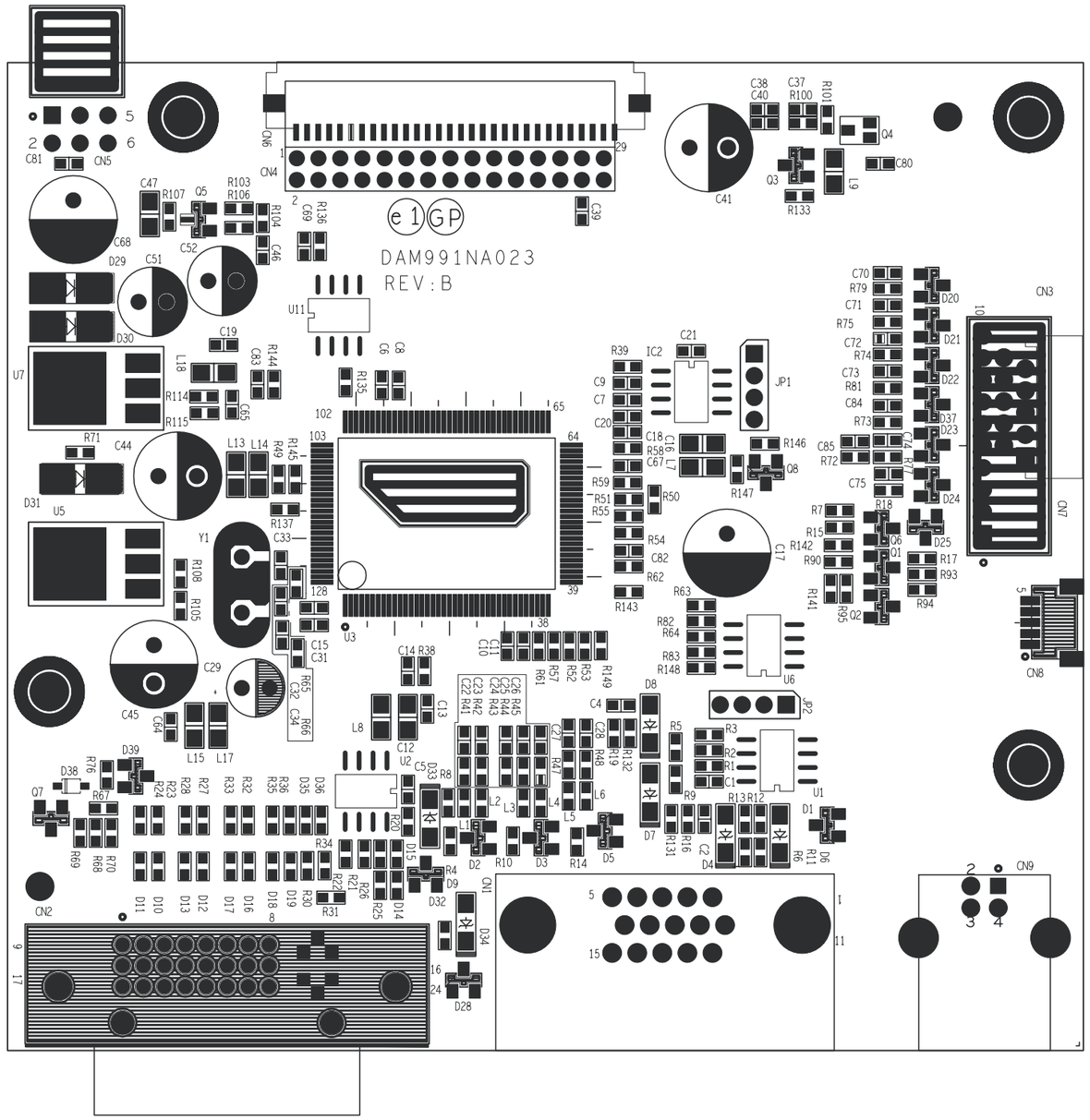
Schematic Diagram(USB Board)

U-1

CN8 F3
CN9 E3

Layout Side View (Scaler Board)

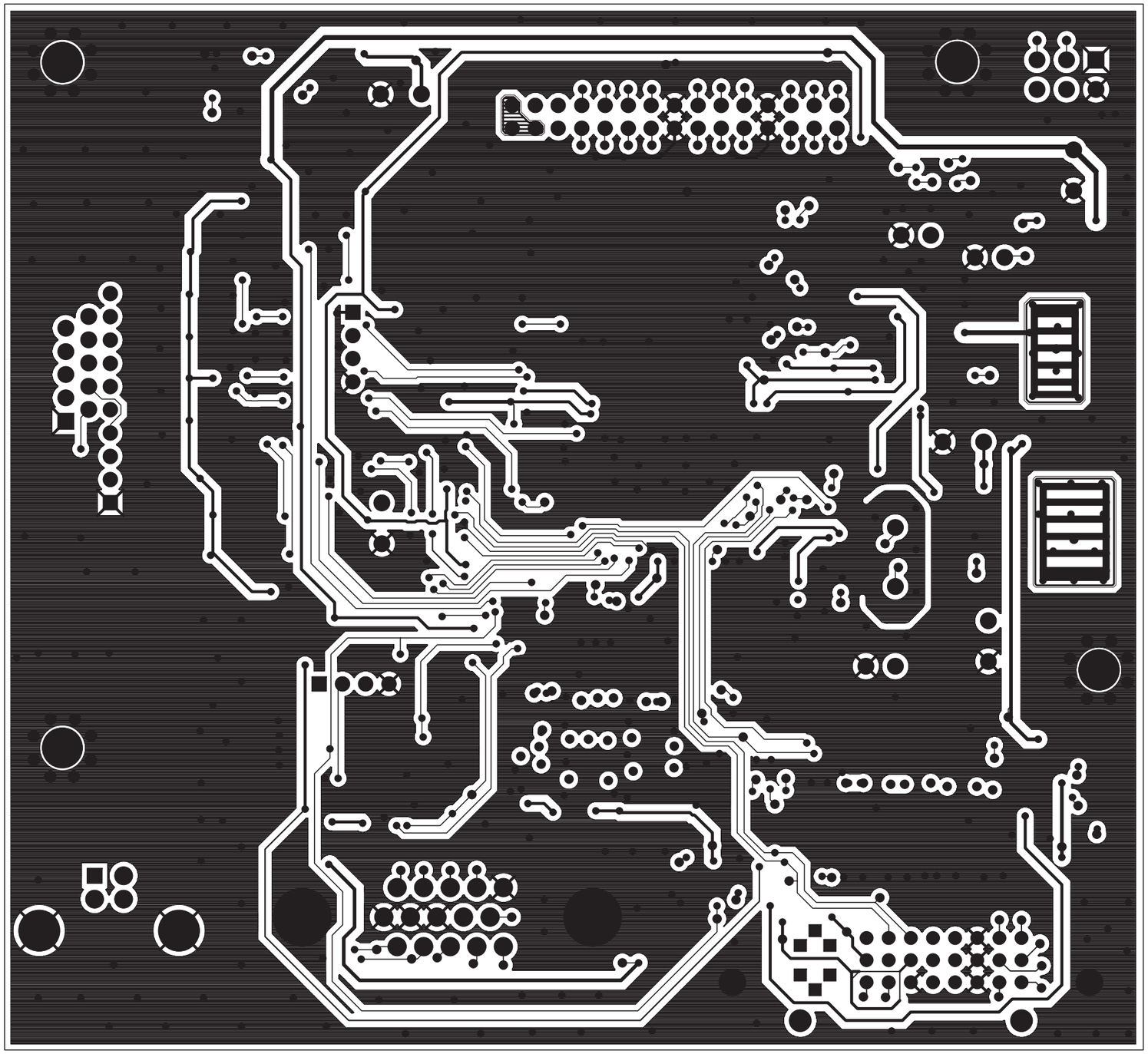
S-A



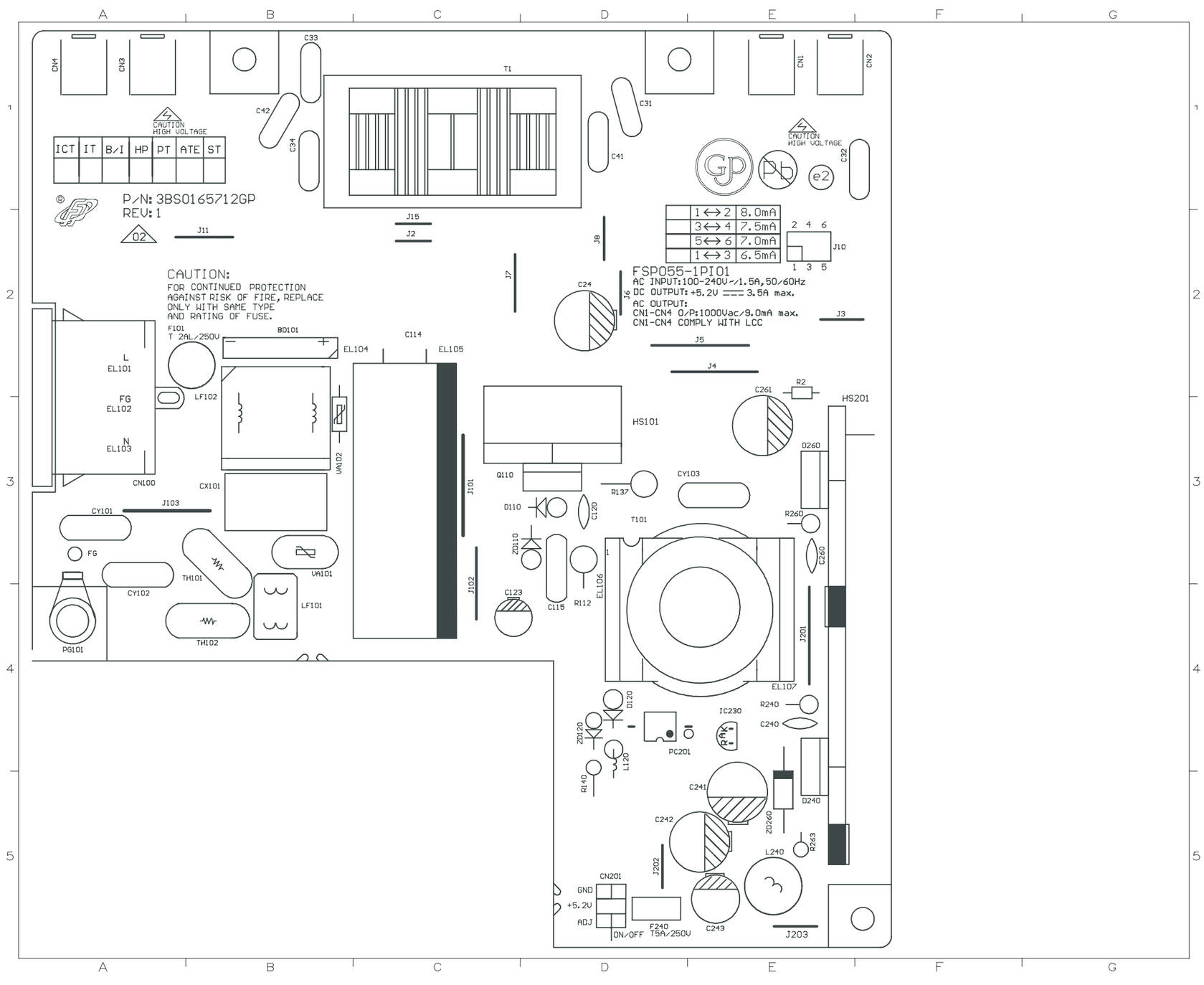
C1	D4	L17	B4
C2	D4	L18	B2
C4	C4	Q1	E3
C5	C4	Q2	E3
C6	B2	Q3	D2
C7	C3	Q4	E2
C8	C2	Q5	B2
C9	C2	Q6	E3
C10	C4	Q7	A4
C11	C4	Q8	D3
C12	C4	R1	D4
C13	C4	R2	D4
C14	C4	R3	D4
C15	B3	R4	C4
C16	D3	R5	D4
C17	D3	R6	D4
C18	D3	R7	D3
C19	B2	R8	C4
C20	C3	R9	D4
C21	D2	R10	C4
C22	C4	R11	D4
C23	C4	R12	D4
C24	C4	R13	D4
C25	C4	R15	D3
C26	C4	R16	D4
C27	C4	R17	E3
C28	C4	R18	E3
C29	B4	R19	C4
C31	B4	R19	D4
C32	B4	R20	C4
C33	B3	R21	B4
C34	B4	R22	B4
C37	D1	R23	B4
C38	D1	R24	B4
C39	C2	R25	B4
C40	D1	R26	B4
C41	D2	R27	B4
C44	A3	R28	B4
C45	A4	R30	B4
C46	B2	R30	C4
C47	B2	R31	B4
C51	B2	R32	B4
C52	B2	R33	B4
C64	B4	R34	B4
C65	B4	R35	B4
C65	B3	R36	B4
C67	D3	R39	D2
C68	A2	R41	C4
C69	B2	R42	C4
C70	E2	R43	C4
C71	E2	R44	C4
C72	E2	R45	C4
C73	E2	R47	C4
C74	E3	R48	C4
C75	E3	R49	B3
C80	E2	R50	D3
C81	A2	R51	C3
C82	D3	R52	C4
C83	B2	R53	C4
C84	E3	R54	D3
C85	D3	R55	C3
C141	D3	R57	C4
CN1	C4	R58	D3
CN2	A5	R59	C3
CN3	E2	R61	C4
CN4	B2	R62	D3
CN5	A2	R63	D3
CN6	B2	R64	D3
CN7	E3	R66	B4
CN8	E4	R67	A4
CN9	E4	R68	A4
D1	D4	R69	A4
D3	C4	R70	A4
D4	C4	R71	A3

Layout Side View (Scaler Board)

S-B



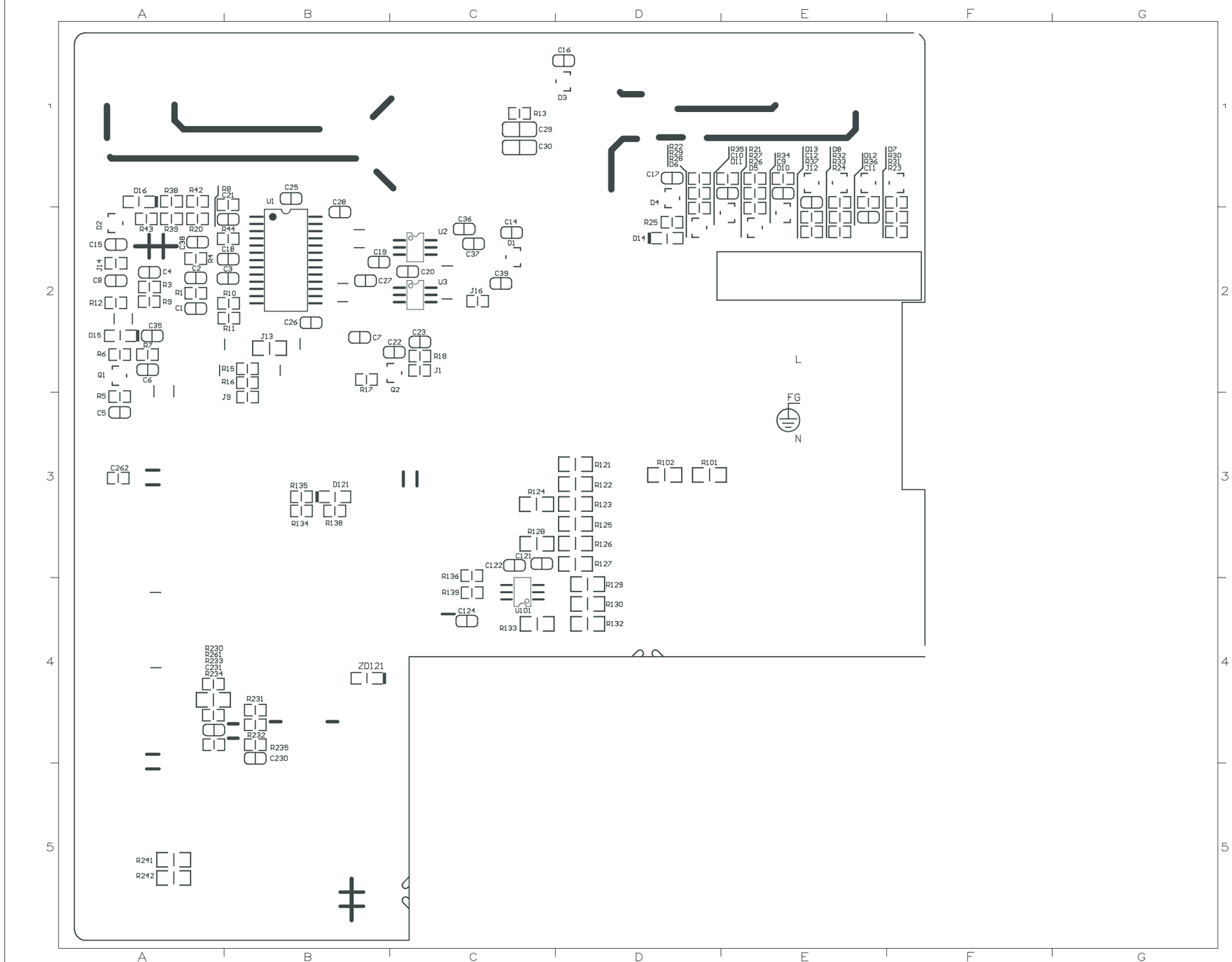
Layout Side View (Power Board)



P-A

BD101	B2	HS201	E3
C24	C3	IC230	E4
C31	D1	J2	C2
C32	E1	J3	D3
C33	B1	J4	D3
C34	B1	J5	D3
C41	D1	J6	C3
C42	B1	J7	C2
C114	C2	J8	C3
C115	D4	J10	D3
C120	D3	J11	B2
C128	C4	J15	C2
C240	E4	J101	C3
C241	E5	J102	C4
C242	D5	J103	A3
C243	E5	J201	E4
C260	E3	J202	D5
C261	D3	J203	E5
CN1	E1	J240	E5
CN2	F1	L120	D4
CN3	A1	LF101	B4
CN4	A1	LF102	B3
CN100	A3	PC201	D4
CN201	D5	PG101	A4
CX101	B3	Q110	C3
CY101	A3	R2	D3
CY102	A4	R112	D4
CY103	D3	R137	D3
D110	C3	R140	D5
D120	D4	R240	E4
D240	E5	R260	E3
D260	E3	R263	E5
EL101	A2	T1	C1
EL102	A3	T101	D3
EL103	A3	TH101	B3
EL104	C2	TH102	B4
EL105	C2	UA101	B3
EL106	D4	UA102	B3
EL107	E4	ZD110	C3
F240	D5	ZD120	D4
HS101	D3	ZD260	E5

Layout Side View (Power Board)



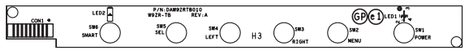
P-B

C1	A2	R9	A2
C2	A2	R10	B2
C3	B2	R11	B2
C4	A2	R12	A2
C5	A3	R12	A2
C6	A2	R13	C1
C7	B2	R15	B2
C8	A2	R16	B2
C9	E1	R17	B2
C10	E1	R18	C2
C11	E1	R20	A2
C12	E1	R21	E1
C14	C2	R22	D1
C15	A2	R23	F1
C16	D1	R24	E1
C17	D1	R25	D2
C18	B2	R26	E1
C19	B2	R27	E1
C20	C2	R28	D1
C21	B1	R29	D1
C22	C2	R30	F1
C23	C2	R31	F1
C25	B1	R32	E1
C26	B2	R33	E1
C27	B2	R34	E1
C28	B1	R35	E1
C29	C1	R36	E1
C30	C1	R37	E1
C35	A2	R38	A1
C36	C2	R39	A2
C37	C2	R39	A2
C38	A2	R42	A1
C39	C2	R43	A2
C121	C3	R44	B2
C122	C3	R101	D3
C124	C4	R102	D3
C230	B4	R121	D3
C231	A4	R122	D3
C262	A3	R123	D3
D2	A2	R124	C3
D3	D1	R125	D3
D4	D1	R126	D3
D5	E1	R127	D3
D6	D1	R128	C3
D7	F1	R129	D4
D8	E1	R130	D4
D10	E1	R132	D4
D11	E1	R133	C4
D12	E1	R134	B3
D13	E1	R135	B3
D14	D2	R136	C4
D15	A2	R138	B3
D15	C2	R139	C4
D16	A1	R230	A4
D121	B3	R231	B4
J1	C2	R232	B4
J9	B3	R233	A4
J12	E1	R234	A4
J13	B2	R235	B4
J14	A2	R241	A5
J16	C2	R242	A5
Q1	A2	R261	A4
Q2	C2	U1	B1
R4	A2	U2	C2
R5	A3	U3	C2
R6	A2	U101	C4
R7	A2	ZD121	B4
R8	B1		

Layout Side View (Button Board)

B-A

A5	CON1
A5	SW6
B5	LED2
B5	SW5
B5	SW4
C5	SW3
C5	SW2
C5	LED1
D5	SW1

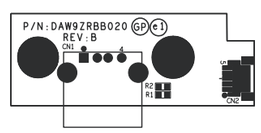


B-B

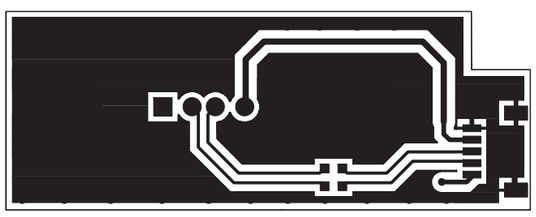
Layout Side View (USB Board)

U-A

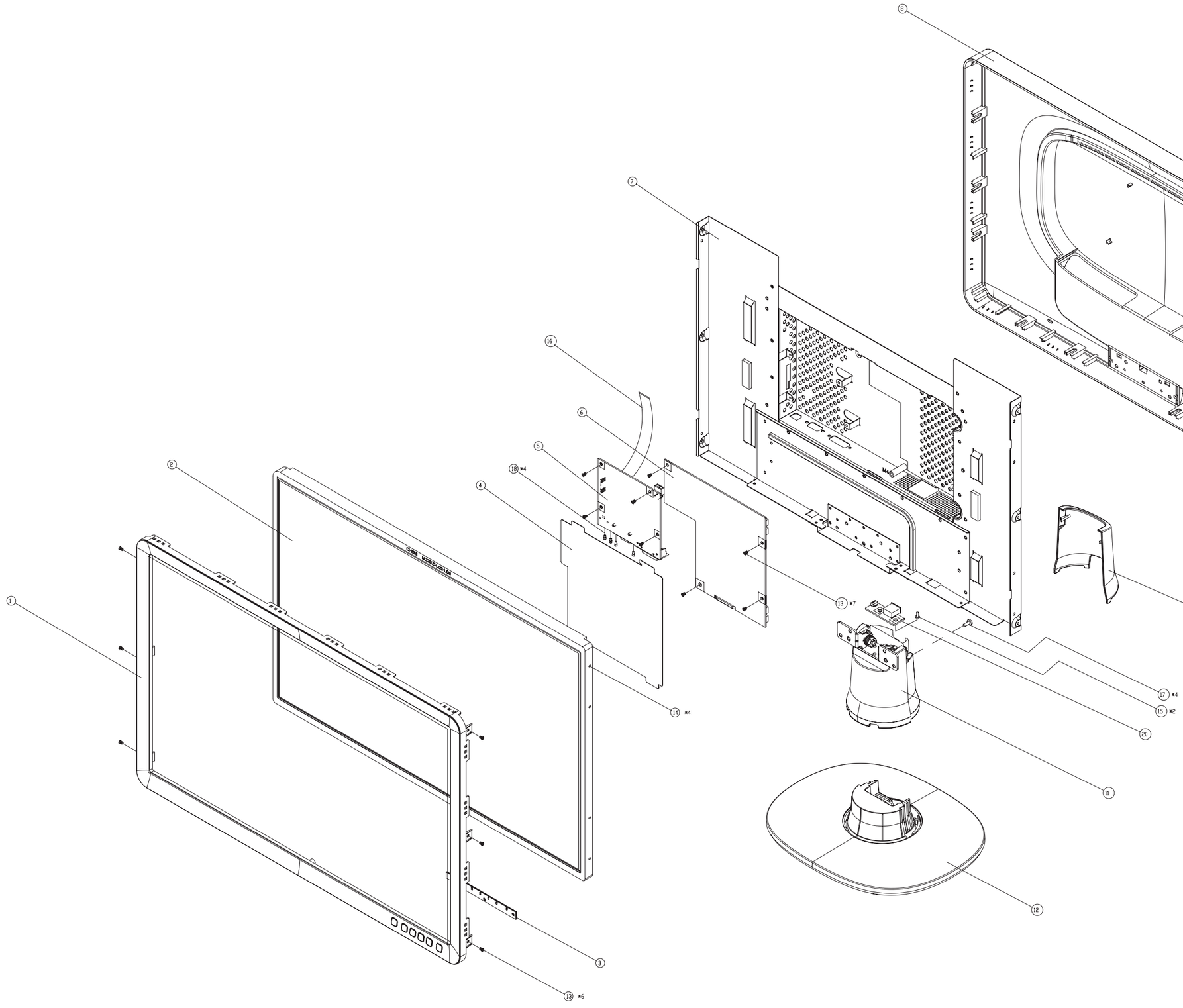
A5 CN1
B5 R1
B5 R2
B5 CN2



U-B



Exploded View



ITEM	PART NO	DESCRIPTION	QTY
1	34WBZRLB0G4	WBZR-C1L LCD BEZEL SUB ASSY GP	1
	AA220WE1208	LCD(TFT) 22" LM220WE1-TLD1 (WSXGA) GP	1
2	AA0220Z1105	LCD 22" M220Z1-L03(1680X1050,WSXGA)" GP	1
3	10WBZRBB020	W9ZR BUTTON/B ASSY(WBZR-C1L)GP	1
4	FCWBZR04016	POWER MYLAR WBZR-X1L(FCWBZR04,REV3A)GP	1
5	10WBZRMB068 10WBZRMB076	W9ZR M/B ASSY(WBZR-C1L,NT68670HTFG)GP	1
6	AS56B46SA00	PI 90~264 55W 4L(150*160)055-1PI01 G	1
7	36WBZRPS054	WBZR-C1L PCB SHIELDING ASSY GP	1
8	EAWBZR07013	LCD COVER WBZR-C1L(EAWBZR07,REV3A)GP	1
9	EBWBZR02012	HINGE COVER WBZR-C1L(EBWBZR02,REV3A)GP	1
10	EBWBZR04015	CABLE F-COVER WBZR-C1L(EBWBZR04, R3A)	1
11	37WBZRSU018	WBZR-C1L STAND SUB ASSY GP	1
12	38WBZRBS017	WBZR-C1L BASE SUB ASSY GP	1
13	MM30040BBJ4	SCREW M3.0*4.0-B(NI)GP	13
14	MM30050BJ21	SCREW M3.0*5.0-B BLACK GP	4
15	MM30040IBJ9	SCREW M3.0*4.0-I(NI) GP	2
16	DEFC1899001	CABLE FFC MB-LCD(30P,189MM)WBZR PTI GP	1
17	MM40080BCI5	SCREW M4.0*8-B(NI,NYLOK)GP	4
18	MBLI1004018	IO NUT LI1(MBLI1004,REV3A)GP	4
19	MF40080PBJ6	SCREW F4.0*8-P(NI)GP	1
20	10WBZRUB002	W9ZR USB/B ASSY GP	1

RSPL FOR 220CW8FB/69(WBZR-C1L)
1 P/N: 1WBZRCPL0A7(CMO & LPL PANEL)

Part Name		PHILIPS P/N	Techview P/N	Description	Q'ty	Location	Remark
Electronic Components:	LCD panel	996510005568	AA0220Z1105	LCD 22" M220Z1-L03(1680X1050,WSXGA)" GP	1	Item 2 in exploded view	CMO PANEL
	LCD panel	996510007910	AA220WE1208	LCD(TFT) 22" LM220WE1-TLD1 (WSXGA) GP	1	Item 2 in exploded view	LPL PANEL
	MB-LCD cable	996510007909	DEFC1899001	CABLE FFC MB-LCD(30P,189MM)WBZR PTI GP	1	Item 16 in exploded view	
	Button-MB cable		DEFC5409008	CABLE FFC MB-BB(10P/10P,540MM)WBZR GP	1		
	Power-MB cable		DD0W7VPB000	CABLE MB-POWER/B(6P/6P,100MM)W7V GP	1		
	IC	996510007923	AJ68670^F10	IC(128P)NT68670HTFG(165MHZ,QFP128L) GP	1	U3	SCALER IC
	IC	996510007622	AKE10800018	IC EEPROM(8P)24BC16-SI(2048*8,SOIC8) GP	1	IC2	Timing table ,HDCP KEY MEMORY
	IC	996500044124	AKE10800R01	IC EEPROM(8P) BR24L16F-WE2(2K*8,SOP8)GP	1	IC2	Timing table ,HDCP KEY MEMORY
	IC	996510007623	AKE1A800003	IC(8P) EEPROM 24BC02-SI(256*8,SOIC8)GP	1	U2	DVI EDID MEMORY
	IC	996500044122	AKE1A800R04	IC EEPROM(8P,5V) BR24L02F(2K*1,SOP) GP	1	U2	DVI EDID MEMORY
	IC	996500044123	AKE1A800Y11	IC EEPROM(8P,5V) 24LC02BT(2K*1,SOP) GP	1	U2	DVI EDID MEMORY
	IC	996500044125	AKE3A8S0Y10	IC EEPROM(8P)24LC16BT-I(2K*8,100KHZ) GP	1	IC2	Timing table ,HDCP KEY MEMORY
	IC	996500045091	AL001084021	IC(3P) AIC1084PE(TO-252) GP	1	U5	3.3V REGULATOR
	IC	996500045092	AL001084099	IC(3P)SMD AP1084DLA(T0-252) GP	1	U5	3.3V REGULATOR
	IC	996510007624	AL001117086	IC(3P) AIC1117PY(SOT-223) GP	1	U7	1.8V REGULATOR
	IC	996510007625	AL1117EL100	IC(3P) ATC AP1117EL-13(SOT-223) GP	1	U7	1.8V REGULATOR
	IC	996500045102	ALAT1084D01	IC(3P)SMD AT1084(T0-252)GP	1	U5	3.3V REGULATOR
	IC	996500045103	ALAT1117201	IC(3P) AT1117(SOT-223) GP	1	U7	1.8V REGULATOR
	TRANSISTOR	996510007626	BA001440Z87	TRANSISTOR SMD PDTC144EU (50V,30MA)GP	1	Q8	
	TRANSISTOR	996500044115	BA001440ZB8	TR CHDTC144EUPT(50V,30MA)SOT-323 GP	4	Q1,Q2,Q5,Q6	
		996510007627	BA001520Z05	TR CHDTC152EUPT(50V,70MA)SOT-323 GP	4	Q1,Q2,Q5,Q6	
		996500044110	BA039060Z10	TR,SMD PMBS3906(40V,200MA) GP	1	Q3	
	TRANSISTOR	996510002084	BA039060Z28	TRANSISTOR,SMD SST3906(40V,200MA) GP	1	Q4	
	TRANSISTOR	996510007629	BAM34150Z08	TR MOSFET AO3415(-20V,-4A)SOT-23 GP	1	Q4	
	TRANSISTOR	996500045107	BAN70020Z13	TR MOSFET 2N7002E-T1-E3 (60V,250MA) GP	1	Q4	
Mechanical Components:	Stand	996510007911	37WBZRSU018	WBZR-C1L STAND SUB ASSY GP	1	Item 11 in exploded view	
	DVI&D-SUB to shielding		MBLI1004018	IO NUT LI1(MBLI1004,REV3A)GP	4	Item 18 in exploded view	
	PCBAs to metal shielding		MF30060BJ28	SCREW F3.0*6-B(BNI)GP	7		
	Panel to L/R bracket		MM30040BBJ4	SCREW M3.0*4.0-B(NI)GP	9	Item 13 in exploded view	
	Hinge cover	996510007912	EBWBZR02012	HINGE COVER WBZR-C1L(EBWBZR02,REV3A)GP	1	Item 9 in exploded view	
	Base	996510007913	38WBZRBS017	WBZR-C1L BASE SUB ASSY GP	1	Item 12 in exploded view	
PCBA:	Inverter board	996510007914	AS56B46SA00	PI 90~264 55W 4L(150*160)055-1PI01 G	1	Item 6 in exploded view	
	Main board	996510007915 996510007916	10WBZRMB068 10WBZRMB076	W9ZR M/B ASSY(WBZR-C1L,NT68670HTFG)GP	1	Item 5 in exploded view	21W9ZRMB025
	Bios		AZWBZRBL105	WBZR SW BIOS(NT68670HTFG,LM220WE1-TLD1	1		
	Bios		AZWBZRBM101	WBZR SW BIOS(NT68670HTFG,M220Z1-L03)	1		
	Button board	996510007917	10WBZRBB020	W9ZR BUTTON/B ASSY(WBZR-C1L)GP	1	Item 3 in exploded view	23W9ZRBB013
	USB board	996510007674	10WBZRUB002	W9ZR USB/B ASSY GP	1	Item 20 in exploded view	23W9ZRUB004
Cabinets:	Front bezel assembly	996510007918	34WBZRLB0G4	WBZR-C1L LCD BEZEL SUB ASSY GP	1	Item 1 in exploded view	
	Back cover assembly	996510007919	EAWBZR07013	LCD COVER WBZR-C1L(EAWBZR07,REV3A)GP	1	Item 8 in exploded view	
Accessories:	VGA cable	996510002083	DDL7ZIPC002	CABLE MB-VGA(15/15P,1.8M)BLACK L7ZI GP	1		
	Power cord	996500044132	DM333181703	PWR CORD B 1.8M SP-60/13A SINGAPORE GP	1		
	Manual		HGWBZR05016	QSG+CD WBZR-C1L(HGWBZR05,R3A) GP	1		
	LCD film		JXWBC001018	LCD FILM 495*325 WBC-B1(JXWBC001,R3A)GP	1		
Packing Material:	EPE bag		HAWBZR01015	EPE BAG WBZR(HAWBZR01,R3A)GP	1		
	Carton	996510007920	HFWBZR20014	CARTON WBZR-C1L(HFWBZR20,R3A)WW_GP	1		
	Cushion	996510007921	HBWBZR05011	END CAP-L WBZR-C1L(HBWBZR05,REV3A)GP	1		
	Cushion	996510007922	HBWBZR06018	END CAP-R WBZR-C1L(HBWBZR06,REV3A)GP	1		

Recommended Spare Part List

RSPL FOR 220CW8FB/93(WBZR-C1L)
1 P/N: 1WBZRCPL0B5(CMO & LPL PANEL)

Part Name		PHILIPS P/N	Techview P/N	Description	Q'ty	Location	Remark
Electronic Components:	LCD panel	996510005568	AA0220Z1105	LCD 22" M220Z1-L03(1680X1050,WSXGA)" GP	1	Item 2 in exploded view	CMO PANEL
	LCD panel	996510007910	AA220WE1208	LCD(TFT) 22" LM220WE1-TLD1 (WSXGA) GP	1	Item 2 in exploded view	LPL PANEL
	MB-LCD cable	996510007909	DEFC1899001	CABLE FFC MB-LCD(30P,189MM)WBZR PTI GP	1	Item 16 in exploded view	
	Button-MB cable		DEFC5409008	CABLE FFC MB-BB(10P/10P,540MM)WBZR GP	1		
	Power-MB cable		DD0W7VPB000	CABLE MB-POWER/B(6P/6P,100MM)W7V GP	1		
	IC	996510007923	AJ68670^F10	IC(128P)NT68670HTFG(165MHZ,QFP128L) GP	1	U3	SCALER IC
	IC	996510007622	AKE10800018	IC EEPROM(8P)24BC16-SI(2048*8,SOIC8) GP	1	IC2	Timing table ,HDCP KEY MEMORY
	IC	996500044124	AKE10800R01	IC EEPROM(8P) BR24L16F-WE2(2K*8,SOP8)GP	1	IC2	Timing table ,HDCP KEY MEMORY
	IC	996510007623	AKE1A800003	IC(8P) EEPROM 24BC02-SI(256*8,SOIC8)GP	1	U2	DVI EDID MEMORY
	IC	996500044122	AKE1A800R04	IC EEPROM(8P,5V) BR24L02F(2K*1,SOP) GP	1	U2	DVI EDID MEMORY
	IC	996500044123	AKE1A800Y11	IC EEPROM(8P,5V) 24LC02BT(2K*1,SOP) GP	1	U2	DVI EDID MEMORY
	IC	996500044125	AKE3A8S0Y10	IC EEPROM(8P)24LC16BT-I(2K*8,100KHZ) GP	1	IC2	Timing table ,HDCP KEY MEMORY
	IC	996500045091	AL001084021	IC(3P) AIC1084PE(TO-252) GP	1	U5	3.3V REGULATOR
	IC	996500045092	AL001084099	IC(3P)SMD AP1084DLA(T0-252) GP	1	U5	3.3V REGULATOR
	IC	996510007624	AL001117086	IC(3P) AIC1117PY(SOT-223) GP	1	U7	1.8V REGULATOR
	IC	996510007625	AL1117EL100	IC(3P) ATC AP1117EL-13(SOT-223) GP	1	U7	1.8V REGULATOR
	IC	996500045102	ALAT1084D01	IC(3P)SMD AT1084(T0-252)GP	1	U5	3.3V REGULATOR
	IC	996500045103	ALAT1117201	IC(3P) AT1117(SOT-223) GP	1	U7	1.8V REGULATOR
	TRANSISTOR	996510007626	BA001440Z87	TRANSISTOR SMD PDTC144EU (50V,30MA)GP	1	Q8	
	TRANSISTOR	996500044115	BA001440ZB8	TR CHDTC144EUPT(50V,30MA)SOT-323 GP	4	Q1,Q2,Q5,Q6	
		996510007627	BA001520Z05	TR CHDTC152EUPT(50V,70MA)SOT-323 GP	4	Q1,Q2,Q5,Q6	
		996500044110	BA039060Z10	TR,SMD PMBS3906(40V,200MA) GP	1	Q3	
	TRANSISTOR	996510002084	BA039060Z28	TRANSISTOR,SMD SST3906(40V,200MA) GP	1	Q4	
	TRANSISTOR	996510007629	BAM34150Z08	TR MOSFET AO3415(-20V,-4A)SOT-23 GP	1	Q4	
	TRANSISTOR	996500045107	BAN70020Z13	TR MOSFET 2N7002E-T1-E3 (60V,250MA) GP	1	Q4	
Mechanical Components:	Stand	996510007911	37WBZRSU018	WBZR-C1L STAND SUB ASSY GP	1	Item 11 in exploded view	
	DVI&D-SUB to shielding		MBLI1004018	IO NUT LI1(MBLI1004,REV3A)GP	4	Item 18 in exploded view	
	PCBAs to metal shielding		MF30060BJ28	SCREW F3.0*6-B(BNI)GP	7		
	Panel to L/R bracket		MM30040BBJ4	SCREW M3.0*4.0-B(NI)GP	9	Item 13 in exploded view	
	Hinge cover	996510007912	EBWBZR02012	HINGE COVER WBZR-C1L(EBWBZR02,REV3A)GP	1	Item 9 in exploded view	
	Base	996510007913	38WBZRBS017	WBZR-C1L BASE SUB ASSY GP	1	Item 12 in exploded view	
PCBA:	Inverter board	996510007914	AS56B46SA00	PI 90~264 55W 4L(150*160)055-1PI01 G	1	Item 6 in exploded view	
	Main board	996510007915 996510007916	10WBZRMB068 10WBZRMB076	W9ZR M/B ASSY(WBZR-C1L,NT68670HTFG)GP	1	Item 5 in exploded view	21W9ZRMB025
	Bios		AZWBZRBL105	WBZR SW BIOS(NT68670HTFG,LM220WE1-TLD1	1		
	Bios		AZWBZRBM101	WBZR SW BIOS(NT68670HTFG,M220Z1-L03)	1		
	Button board	996510007917	10WBZRBB020	W9ZR BUTTON/B ASSY(WBZR-C1L)GP	1	Item 3 in exploded view	23W9ZRBB013
	USB board	996510007674	10WBZRUB002	W9ZR USB/B ASSY GP	1	Item 20 in exploded view	23W9ZRUB004
Cabinets:	Front bezel assembly	996510007918	34WBZRLB0G4	WBZR-C1L LCD BEZEL SUB ASSY GP	1	Item 1 in exploded view	
	Back cover assembly	996510007919	EAWBZR07013	LCD COVER WBZR-C1L(EAWBZR07,REV3A)GP	1	Item 8 in exploded view	
Accessories:	VGA cable	996510002083	DDL7ZIPC002	CABLE MB-VGA(15/15P,1.8M)BLACK L7ZI GP	1		
	Power cord		DM333181S01	POWER CORD B 1.8M SP-506/10A (CHN) GP	1		
	Manual		HGWBZR05016	QSG+CD WBZR-C1L(HGWBZR05,R3A) GP	1		
	LCD film		JXWBC001018	LCD FILM 495*325 WBC-B1(JXWBC001,R3A)GP	1		
Packing Material:	EPE bag		HAWBZR01015	EPE BAG WBZR(HAWBZR01,R3A)GP	1		
	Carton	996510007920	HFWBZR20014	CARTON WBZR-C1L(HFWBZR20,R3A)WW_GP	1		
	Cushion	996510007921	HBWBZR05011	END CAP-L WBZR-C1L(HBWBZR05,REV3A)GP	1		
	Cushion	996510007922	HBWBZR06018	END CAP-R WBZR-C1L(HBWBZR06,REV3A)GP	1		

RSPL FOR 220CW8FB/00(WBZR-C1L)
1 P/N: 1WBZRCPL092(CMO & LPL PANEL)

Part Name		PHILIPS P/N	Techview P/N	Description	Q'ty	Location	Remark
Electronic Components:	LCD panel	996510005568	AA0220Z1105	LCD 22" M220Z1-L03(1680X1050,WSXGA)" GP	1	Item 2 in exploded view	CMO PANEL
	LCD panel	996510007910	AA220WE1208	LCD(TFT) 22" LM220WE1-TLD1 (WSXGA) GP	1	Item 2 in exploded view	LPL PANEL
	MB-LCD cable	996510007909	DEFC1899001	CABLE FFC MB-LCD(30P,189MM)WBZR PTI GP	1	Item 16 in exploded view	
	Button-MB cable		DEFC5409008	CABLE FFC MB-BB(10P/10P,540MM)WBZR GP	1		
	Power-MB cable		DD0W7VPB000	CABLE MB-POWER/B(6P/6P,100MM)W7V GP	1		
	IC	996510007923	AJ68670^F10	IC(128P)NT68670HTFG(165MHZ,QFP128L) GP	1	U3	SCALER IC
	IC	996510007622	AKE10800018	IC EEPROM(8P)24BC16-SI(2048*8,SOIC8) GP	1	IC2	Timing table ,HDCP KEY MEMORY
	IC	996500044124	AKE10800R01	IC EEPROM(8P) BR24L16F-WE2(2K*8,SOP8)GP	1	IC2	Timing table ,HDCP KEY MEMORY
	IC	996510007623	AKE1A800003	IC(8P) EEPROM 24BC02-SI(256*8,SOIC8)GP	1	U2	DVI EDID MEMORY
	IC	996500044122	AKE1A800R04	IC EEPROM(8P,5V) BR24L02F(2K*1,SOP) GP	1	U2	DVI EDID MEMORY
	IC	996500044123	AKE1A800Y11	IC EEPROM(8P,5V) 24LC02BT(2K*1,SOP) GP	1	U2	DVI EDID MEMORY
	IC	996500044125	AKE3A8S0Y10	IC EEPROM(8P)24LC16BT-I(2K*8,100KHZ) GP	1	IC2	Timing table ,HDCP KEY MEMORY
	IC	996500045091	AL001084021	IC(3P) AIC1084PE(TO-252) GP	1	U5	3.3V REGULATOR
	IC	996500045092	AL001084099	IC(3P)SMD AP1084DLA(T0-252) GP	1	U5	3.3V REGULATOR
	IC	996510007624	AL001117086	IC(3P) AIC1117PY(SOT-223) GP	1	U7	1.8V REGULATOR
	IC	996510007625	AL1117EL100	IC(3P) ATC AP1117EL-13(SOT-223) GP	1	U7	1.8V REGULATOR
	IC	996500045102	ALAT1084D01	IC(3P)SMD AT1084(T0-252)GP	1	U5	3.3V REGULATOR
	IC	996500045103	ALAT1117201	IC(3P) AT1117(SOT-223) GP	1	U7	1.8V REGULATOR
	TRANSISTOR	996510007626	BA001440Z87	TRANSISTOR SMD PDTC144EU (50V,30MA)GP	1	Q8	
	TRANSISTOR	996500044115	BA001440ZB8	TR CHDTC144EUPT(50V,30MA)SOT-323 GP	4	Q1,Q2,Q5,Q6	
		996510007627	BA001520Z05	TR CHDTC152EUPT(50V,70MA)SOT-323 GP	4	Q1,Q2,Q5,Q6	
		996500044110	BA039060Z10	TR,SMD PMBS3906(40V,200MA) GP	1	Q3	
	TRANSISTOR	996510002084	BA039060Z28	TRANSISTOR,SMD SST3906(40V,200MA) GP	1	Q4	
	TRANSISTOR	996510007629	BAM34150Z08	TR MOSFET AO3415(-20V,-4A)SOT-23 GP	1	Q4	
	TRANSISTOR	996500045107	BAN70020Z13	TR MOSFET 2N7002E-T1-E3 (60V,250MA) GP	1	Q4	
Mechanical Components:	Stand	996510007911	37WBZRSU018	WBZR-C1L STAND SUB ASSY GP	1	Item 11 in exploded view	
	DVI&D-SUB to shielding		MBLI1004018	IO NUT LI1(MBLI1004,REV3A)GP	4	Item 18 in exploded view	
	PCBAs to metal shielding		MF30060BJ28	SCREW F3.0*6-B(BNI)GP	7		
	Panel to L/R bracket		MM30040BBJ4	SCREW M3.0*4.0-B(NI)GP	9	Item 13 in exploded view	
	Hinge cover	996510007912	EBWBZR02012	HINGE COVER WBZR-C1L(EBWBZR02,REV3A)GP	1	Item 9 in exploded view	
	Base	996510007913	38WBZRBS017	WBZR-C1L BASE SUB ASSY GP	1	Item 12 in exploded view	
PCBA:	Inverter board	996510007914	AS56B46SA00	PI 90~264 55W 4L(150*160)055-1PI01 G	1	Item 6 in exploded view	
	Main board	996510007915 996510007916	10WBZRMB068 10WBZRMB076	W9ZR M/B ASSY(WBZR-C1L,NT68670HTFG)GP	1	Item 5 in exploded view	21W9ZRMB025
	Bios		AZWBZRBL105	WBZR SW BIOS(NT68670HTFG,LM220WE1-TLD1	1		
	Bios		AZWBZRBM101	WBZR SW BIOS(NT68670HTFG,M220Z1-L03)	1		
	Button board	996510007917	10WBZRBB020	W9ZR BUTTON/B ASSY(WBZR-C1L)GP	1	Item 3 in exploded view	23W9ZRBB013
	USB board	996510007674	10WBZRUB002	W9ZR USB/B ASSY GP	1	Item 20 in exploded view	23W9ZRUB004
Cabinets:	Front bezel assembly	996510007918	34WBZRLB0G4	WBZR-C1L LCD BEZEL SUB ASSY GP	1	Item 1 in exploded view	
	Back cover assembly	996510007919	EAWBZR07013	LCD COVER WBZR-C1L(EAWBZR07,REV3A)GP	1	Item 8 in exploded view	
Accessories:	VGA cable	996510002083	DDL7ZIPC002	CABLE MB-VGA(15/15P,1.8M)BLACK L7ZI GP	1		
	Power cord	996500044109	DM333181801	PWR CORD B 1.8M SP-023/16A CT-12 EUR GP	1		
	Manual		HGWBZR05016	QSG+CD WBZR-C1L(HGWBZR05,R3A) GP	1		
	LCD film		JXWBC001018	LCD FILM 495*325 WBC-B1(JXWBC001,R3A)GP	1		
Packing Material:	EPE bag		HAWBZR01015	EPE BAG WBZR(HAWBZR01,R3A)GP	1		
	Carton	996510007920	HFWBZR20014	CARTON WBZR-C1L(HFWBZR20,R3A)WW_GP	1		
	Cushion	996510007921	HBWBZR05011	END CAP-L WBZR-C1L(HBWBZR05,REV3A)GP	1		
	Cushion	996510007922	HBWBZR06018	END CAP-R WBZR-C1L(HBWBZR06,REV3A)GP	1		

Spare Part List

>> MAIN BOARD ASSY

	W9ZR M/B ASSY(WBZR-C1L,NT68670HTFG)GP
	21W9ZRMB025 WBZR-C1L M/B Schematic(NT68670HTFG)B3
	W9ZR MB S/S ASSY(WBZR-C1L,NT68670HTFG)GP
	PCB M/BW9ZR(2L,98*90,REV B)NT68665 GP
CN6	CONN SMD FFC 30P 1R FS(P1.0,H2.24) GP
CN6	CONN SMD FFC 30P 1R FS(P1.0,H2.0)GP
CN8	CONN SMD HEADER 5P 1R MS(P1.0,H2.95)GP
C4	CAP CHIP 22P 50V(+-5%,NPO,0603) GP
C32	CAP CHIP 22P 50V(+-5%,NPO,0603) GP
C33	CAP CHIP 22P 50V(+-5%,NPO,0603) GP
C84	CAP CHIP 100P 50V(+-5%,NPO,0603) GP
C85	CAP CHIP 100P 50V(+-5%,NPO,0603) GP
C2	CAP CHIP 120P 50V(+-5%,NPO,0603) GP
C13	CAP CHIP 120P 50V(+-5%,NPO,0603) GP
C38	CAP CHIP 2200P 50V(+-10%,X7R,0603)GP
C22	CAP CHIP 0.047UF 16V(+-10%,X7R,0603) GP
C23	CAP CHIP 0.047UF 16V(+-10%,X7R,0603) GP
C24	CAP CHIP 0.047UF 16V(+-10%,X7R,0603) GP
C25	CAP CHIP 0.047UF 16V(+-10%,X7R,0603) GP
C26	CAP CHIP 0.047UF 16V(+-10%,X7R,0603) GP
C27	CAP CHIP 0.047UF 16V(+-10%,X7R,0603) GP
C28	CAP CHIP 0.047UF 16V(+-10%,X7R,0603) GP
C5	CAP CHIP 0.1U,25V(+80-20%,Y5V,0603) GP
C6	CAP CHIP 0.1U,25V(+80-20%,Y5V,0603) GP
C7	CAP CHIP 0.1U,25V(+80-20%,Y5V,0603) GP
C11	CAP CHIP 0.1U,25V(+80-20%,Y5V,0603) GP
C14	CAP CHIP 0.1U,25V(+80-20%,Y5V,0603) GP
C15	CAP CHIP 0.1U,25V(+80-20%,Y5V,0603) GP
C19	CAP CHIP 0.1U,25V(+80-20%,Y5V,0603) GP
C20	CAP CHIP 0.1U,25V(+80-20%,Y5V,0603) GP
C21	CAP CHIP 0.1U,25V(+80-20%,Y5V,0603) GP
C31	CAP CHIP 0.1U,25V(+80-20%,Y5V,0603) GP
C34	CAP CHIP 0.1U,25V(+80-20%,Y5V,0603) GP
C39	CAP CHIP 0.1U,25V(+80-20%,Y5V,0603) GP
C40	CAP CHIP 0.1U,25V(+80-20%,Y5V,0603) GP
C64	CAP CHIP 0.1U,25V(+80-20%,Y5V,0603) GP
C65	CAP CHIP 0.1U,25V(+80-20%,Y5V,0603) GP
C67	CAP CHIP 0.1U,25V(+80-20%,Y5V,0603) GP
C70	CAP CHIP 0.1U,25V(+80-20%,Y5V,0603) GP
C71	CAP CHIP 0.1U,25V(+80-20%,Y5V,0603) GP
C72	CAP CHIP 0.1U,25V(+80-20%,Y5V,0603) GP
C73	CAP CHIP 0.1U,25V(+80-20%,Y5V,0603) GP
C74	CAP CHIP 0.1U,25V(+80-20%,Y5V,0603) GP
C75	CAP CHIP 0.1U,25V(+80-20%,Y5V,0603) GP
C81	CAP CHIP 0.1U,25V(+80-20%,Y5V,0603) GP
C83	CAP CHIP 0.1U,25V(+80-20%,Y5V,0603) GP
C12	CAP CHIP 1U 25V(+-10%,X7R,0805)GP
C47	CAP CHIP 1U 25V(+-10%,X7R,0805)GP
C37	CAP CHIP 2.2U 10V(+80%-20%,Y5V,0603) GP
C16	CAP CHIP 10U 6.3V(+80%-20%,Y5V,0805) GP
D9	DIODE SMD SS1030CPT(30V,0.2A,SHTKY) GP
D28	DIODE SMD SS1030CPT(30V,0.2A,SHTKY) GP
D9	DIODE SMD BAT54C(30V,200MA,SCHOTTKY)GP
D28	DIODE SMD BAT54C(30V,200MA,SCHOTTKY)GP
D29	DIODE SMD ML25PT (600V,2A) GP
D30	DIODE SMD ML25PT (600V,2A) GP
L1	RES CHIP 0 1/10W+-5%(0603) GP
L2	RES CHIP 0 1/10W+-5%(0603) GP
L3	RES CHIP 0 1/10W+-5%(0603) GP
L4	RES CHIP 0 1/10W+-5%(0603) GP
L5	RES CHIP 0 1/10W+-5%(0603) GP
L6	RES CHIP 0 1/10W+-5%(0603) GP
R58	RES CHIP 0 1/10W+-5%(0603) GP
R76	RES CHIP 0 1/10W+-5%(0603) GP
R103	RES CHIP 0 1/10W+-5%(0603) GP
R144	RES CHIP 0 1/10W+-5%(0603) GP
R145	RES CHIP 0 1/10W+-5%(0603) GP
L7	EMI FILT CHIP FBMA-11-201209-102 GP
L8	EMI FILT CHIP FBMA-11-201209-121A40 GP
L9	EMI FILT CHIP FBMA-11-201209-121A40 GP
L13	EMI FILT CHIP FBMA-11-201209-121A40 GP
L14	EMI FILT CHIP FBMA-11-201209-121A40 GP
L15	EMI FILT CHIP FBMA-11-201209-121A40 GP
L18	EMI FILT CHIP FBMA-11-201209-121A40 GP
Q8	TR MOSFET 2N7002E-T1-E3 (60V,250MA) GP
Q1	TR,SMD PMBS3906(40V,200MA) GP
Q2	TR,SMD PMBS3906(40V,200MA) GP
Q5	TR,SMD PMBS3906(40V,200MA) GP
Q6	TR,SMD PMBS3906(40V,200MA) GP
Q1	TRANSISTOR,SMD SST3906(40V,200MA) GP
Q2	TRANSISTOR,SMD SST3906(40V,200MA) GP
Q5	TRANSISTOR,SMD SST3906(40V,200MA) GP
Q6	TRANSISTOR,SMD SST3906(40V,200MA) GP
Q3	TR MOSFET AO3415(-20V,-4A)SOT-23 GP
Q4	TRANSISTOR SMD PDTC144EU (50V,30MA)GP
Q4	TR CHDTC144EUPT(50V,30MA)SOT-323 GP
Q4	TR CHDTC152EUPT(50V,70MA)SOT-323 GP
R23	RES CHIP 10 1/10W +-5%(0603)GP
R24	RES CHIP 10 1/10W +-5%(0603)GP
R27	RES CHIP 10 1/10W +-5%(0603)GP
R28	RES CHIP 10 1/10W +-5%(0603)GP
R32	RES CHIP 10 1/10W +-5%(0603)GP
R33	RES CHIP 10 1/10W +-5%(0603)GP
R35	RES CHIP 10 1/10W +-5%(0603)GP
R36	RES CHIP 10 1/10W +-5%(0603)GP
R49	RES CHIP 10 1/10W +-5%(0603)GP
R65	RES CHIP 1M 1/10W +-5% (1608) GP
R4	RES CHIP 75 1/10W +-1%(0603) GP
R10	RES CHIP 75 1/10W +-1%(0603) GP
R14	RES CHIP 75 1/10W +-1%(0603) GP
R41	RES CHIP 75 1/10W +-1%(0603) GP
R44	RES CHIP 75 1/10W +-1%(0603) GP
R47	RES CHIP 75 1/10W +-1%(0603) GP
R9	RES CHIP 100 1/10W +-5%(0603) GP
R11	RES CHIP 100 1/10W +-5%(0603) GP
R21	RES CHIP 100 1/10W +-5%(0603) GP
R22	RES CHIP 100 1/10W +-5%(0603) GP
R39	RES CHIP 100 1/10W +-5%(0603) GP
R52	RES CHIP 100 1/10W +-5%(0603) GP
R53	RES CHIP 100 1/10W +-5%(0603) GP
R54	RES CHIP 100 1/10W +-5%(0603) GP
R55	RES CHIP 100 1/10W +-5%(0603) GP
R131	RES CHIP 100 1/10W +-5%(0603) GP
R132	RES CHIP 100 1/10W +-5%(0603) GP
R42	RES CHIP 100 1/10W+-1%(0603)GP
R45	RES CHIP 100 1/10W+-1%(0603)GP
R48	RES CHIP 100 1/10W+-1%(0603)GP
R105	RES CHIP 124 1/10W +-1%(0603)GP
R115	RES CHIP 150,1/10W,+-1%(0603) GP
R108	RES CHIP 205 1/10W +-1%(0603) GP
R114	RES CHIP 330 1/10W +-1%(0603) GP
R17	RESISTOR CHIP 330 1/10W +-5% (0603) GP
R93	RESISTOR CHIP 330 1/10W +-5% (0603) GP
R94	RESISTOR CHIP 330 1/10W +-5% (0603) GP
R43	RES CHIP 390 1/10W+-1%(0603) GP
R38	RES CHIP 470 1/10W +-1%(0603) GP
R8	RES CHIP 1K 1/10W +-5%(0603) GP
R18	RES CHIP 1K 1/10W +-5%(0603) GP
R30	RES CHIP 1K 1/10W +-5%(0603) GP
R31	RES CHIP 1K 1/10W +-5%(0603) GP
R34	RES CHIP 1K 1/10W +-5%(0603) GP
R74	RES CHIP 1K 1/10W +-5%(0603) GP
R75	RES CHIP 1K 1/10W +-5%(0603) GP
R79	RES CHIP 1K 1/10W +-5%(0603) GP
R106	RES CHIP 1K 1/10W +-5%(0603) GP
R133	RES CHIP 1K 1/10W +-5%(0603) GP
R16	RES CHIP 2.2K 1/10W +-5%(0603) GP
R19	RES CHIP 2.2K 1/10W +-5%(0603) GP
R101	RES CHIP 2.2K 1/10W +-5%(0603) GP
R6	RES CHIP 4.7K 1/10W +-5%(0603) GP
R7	RES CHIP 4.7K 1/10W +-5%(0603) GP
R13	RES CHIP 4.7K 1/10W +-5%(0603) GP
R15	RES CHIP 4.7K 1/10W +-5%(0603) GP
R25	RES CHIP 4.7K 1/10W +-5%(0603) GP
R26	RES CHIP 4.7K 1/10W +-5%(0603) GP
R90	RES CHIP 4.7K 1/10W +-5%(0603) GP
R95	RES CHIP 4.7K 1/10W +-5%(0603) GP
R146	RES CHIP 4.7K 1/10W +-5%(0603) GP
R20	RES CHIP 10K 1/10W +-5%(0603) GP
R50	RES CHIP 10K 1/10W +-5%(0603) GP
R51	RES CHIP 10K 1/10W +-5%(0603) GP
R57	RES CHIP 10K 1/10W +-5%(0603) GP
R72	RES CHIP 10K 1/10W +-5%(0603) GP
R73	RES CHIP 10K 1/10W +-5%(0603) GP
R77	RES CHIP 10K 1/10W +-5%(0603) GP
R81	RES CHIP 10K 1/10W +-5%(0603) GP
R100	RES CHIP 10K 1/10W +-5%(0603) GP
R107	RES CHIP 10K 1/10W +-5%(0603) GP
R143	RES CHIP 10K 1/10W +-5%(0603) GP

R61	RES CHIP 15K 1/10W +-5%(0603) GP
R66	RES CHIP 100K 1/10W +-5%(0603) GP
IC2	IC EEPROM(8P)24BC16-SI(2048*8,SOIC8) GP
IC2	IC EEPROM(8P) BR24L16F-WE2(2K*8,SOP8)GP
IC2	IC EEPROM(8P)24LC16BT-I(2K*8,100KHZ) GP
U2	IC(8P) EEPROM 24BC02-SI(256*8,SOIC8)GP
U2	IC EEPROM(8P,5V) BR24L02F(2K*1,SOP) GP
U2	IC EEPROM(8P,5V) 24LC02BT(2K*1,SOP) GP
U5	IC(3P) AIC1084PE(TO-252) GP
U5	IC(3P)SMD AP1084DLA(T0-252) GP
U5	IC(3P)SMD AT1084(T0-252)GP
U7	IC(3P) AIC1117PY(SOT-223) GP
U7	IC(3P) ATC AP1117EL-13(SOT-223) GP
U7	IC(3P) AT1117(SOT-223) GP
U3	IC(128P)NT68670HTFG(165MHZ,QFP128L) GP
D31	DIODE SSM12LLPT(20V,1A,VF:0.27V)SMA GP
C29	CAP EC 47U 10V(+-20%,105C,5*11,2K)OSTGP
C29	CAP EC 47U 10V(+-20%,105C,5*11,2000H)GP
C51	CAP EC 100U16V(+-20%,105C,6*7 DIP)TPE GP
C52	CAP EC 100U16V(+-20%,105C,6*7 DIP)TPE GP
C51	CAP EC100U16V(+-20%,105C,6.3*11,2K)OSTGP
C52	CAP EC100U16V(+-20%,105C,6.3*11,2K)OSTGP
C17	CAP EC 330U 16V(+-20%,105C,8*11,LESR)GP
C41	CAP EC 330U 16V(+-20%,105C,8*11,LESR)GP
C44	CAP EC 330U 16V(+-20%,105C,8*11,LESR)GP
C45	CAP EC 330U 16V(+-20%,105C,8*11,LESR)GP
C68	CAP EC 330U 16V(+-20%,105C,8*11,LESR)GP
C17	CAP EC 330U 16V(+-20%,105C,8*12,2K)OSTGP
C41	CAP EC 330U 16V(+-20%,105C,8*12,2K)OSTGP
C44	CAP EC 330U 16V(+-20%,105C,8*12,2K)OSTGP
C45	CAP EC 330U 16V(+-20%,105C,8*12,2K)OSTGP
C68	CAP EC 330U 16V(+-20%,105C,8*12,2K)OSTGP
CN1	CONN D-SUB 15P 3R FR(P1.15,H12.55) GP
CN1	CONN D-SUB 15P 3R FR(P1.15,H12.55) GP
CN2	CONN DIP DVI 24P 3R FR(P1.905,H9.91) GP
CN2	CONN DIP DVI 24P3R FR(P1.905,H10.04)GP
CN5	CONN DIP HEADER 6P 2R MR(P2.5,H6.0) GP
CN7	CONN DIP HEADER 10P 2R FR(P1.0,H3.0)GP
CN9	CONN DIP USB B-T 4P 2R MR(P2.5,H11.3) GP
Y1	XTAL DIP 12MHZ(+-30PPM,HC-49/S TYPE) GP

>> BUTTON BOARD ASSY

	W9ZR BUTTON/B ASSY(WBZR-C1L)GP
	23W9ZRBB013 WBZR-C1L BUTTON/B Schematic(B3A)
	PCB BUTTON/B W9ZR TB(2L,110*10,REVB) GP
	METAL DOME SWITCH W9ZR(FCW9ZR01,R3A) GP
LED1	LED(SMD) Y/G(KPTB-1612NSGC) GP
LED2	LED(SMD) BLUE(KPT-1608PBC-A) GP
	CABLE FFC MB-BB(10P/10P,540MM)WBZR GP

>> USB BOARD ASSY

	W9ZR USB/B ASSY GP
	23W9ZRUB004 W9ZR USB/B Schematic(B3A)
	PCB W9ZR TRANSITION USB/B(2L,45*17,R.B)G
CN1	CONN DIP USB A-T D-4P 2R MR(P2,H15.35)GP
CN2	CONN SMD HEADER 5P 1R MS(P1.0,H2.95)GP
R1	EMI FILT CHIP FBMA-11-160808-601T GP
R2	EMI FILT CHIP FBMA-11-160808-601T GP

>> POWER BOARD

	PI 90~264 55W 4L(150*160)055-1PI01 G

>> PANEL KIT ASSY

	WBZR-C1L PANEL KIT ASSY(CMO,5MS)GP
	LCD 22" M220Z1-L03(1680X1050,WSXGA)" GP
	WBZR SW BIOS(NT68670HTFG,M220Z1-L03)
	WBZR SW EDID(NT68670HTFG,M220Z1-L03)
	CABLE FFC MB-LCD(30P,189MM)WBZR PTI GP

>> LCD MODULE ASSY

WBZR-C1L LCD MODULE ASSY GP
WBZR-C1L LCD BEZEL SUB ASSY GP
LCD BEZEL WBZR-C1L(EAWBZR06,REV3A)GP
CONTROL BUTTON WBZR-C1L(EBWBZR01,R3A)GP
WBZR-C1L PCB SHIELDING ASSY GP
PCB SHIELD WBZR-C1L(FAWBZR06,REV3A)GP
SHIELDING MYLAR WBZR(FCWBZR06,REV3A) GP
WBZR-C1L STAND SUB ASSY GP
HINGE ASSY WBZR-C1L(FAWBZR07,REV3A)GP
CABLE R-COVER WBZR-C1L(EBWBZR05,R3A)GP
CLIP WBZR-C1L(EBWBZR03,REV3A)GP
SCREW M4.0*8-B(NI,NYLOK)GP
SCREW M4.0*8.0-B(NI,WASHER)GP
SCREW M3.0*4.0-B(NI)GP
SCREW F3.0*6-B(BNI)GP
SCREW F2*2.5-I(NI) GP
SCREW M4.0*8.0-F (BNI,NYLOK)GP
LCD COVER WBZR-C1L(EAWBZR07,REV3A)GP
INVERTER SHIELD WBZR-C1L(FBWBZR03,R3A)GP
HINGE COVER WBZR-C1L(EBWBZR02,REV3A)GP
SCREW F4.0*8-P(NI)GP
CABLE MB-POWER/B(6P/6P,100MM)W7V GP
SCREW M3.0*4.0-I(NI) GP
IO NUT LI1(MBLI1004,REV3A)GP
IO NUT LI1
SCREW M3.0*5.0-B BLACK GP
POWER MYLAR WBZR-X1L(FCWBZR04,REV3A)GP

>> PACKING ASSY

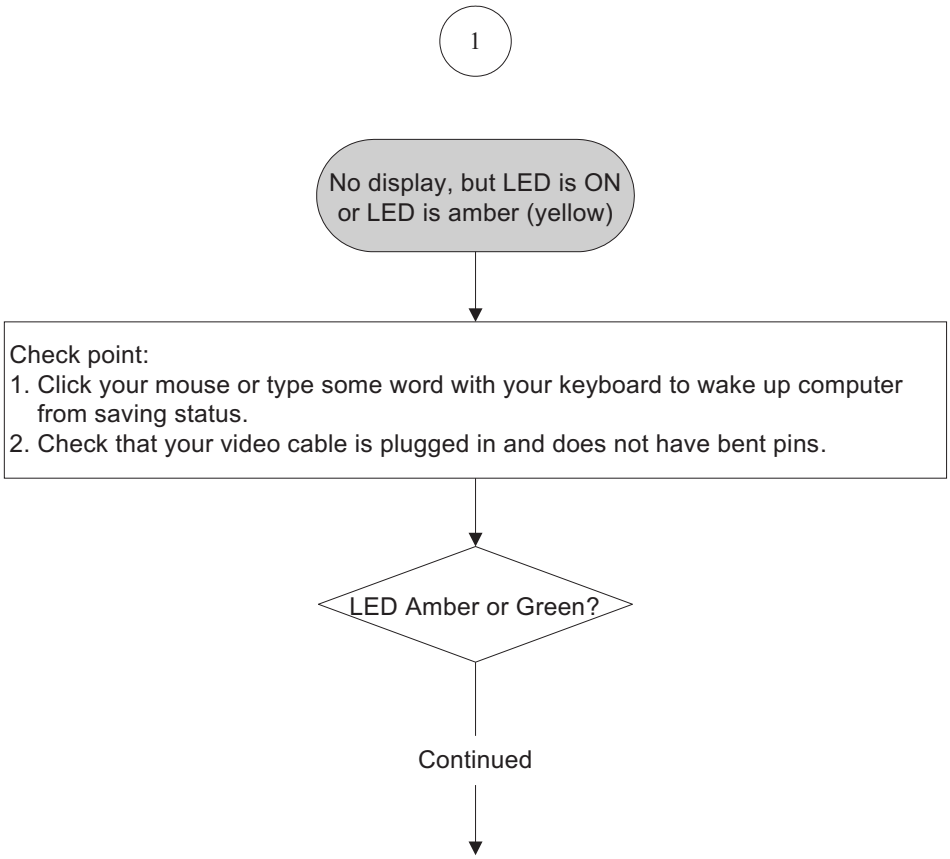
WBZR-C1L PACKING(220CW8FB/00,EU/AP)GP
WBZR-C1L BASE SUB ASSY GP
STAND BASE WBZR-C1L(EAWBZR08,REV3A)GP
RUBBER-A FOOT W9ZR(GAW9ZR01,R3A) GP
RUBBER-B FOOT W9ZR(GAW9ZR02,R3A) GP
EPE BAG WBZR(HAWBZR01,R3A)GP
EPE BAG
END CAP-L WBZR-C1L(HBWBZR05,REV3A)GP
END CAP-R WBZR-C1L(HBWBZR06,REV3A)GP
TRAVEL CARD L7ZI(HCL7ZI04,REV3A) GP
TRAVEL CARD
ENERGY START STICKER W0ZR(HCW0ZR04,3A)GP
ENERGY START STICKER
RATING WBZR-C1L(HCWBZR11,R3A) GP
CARTON LABEL W0ZR(HCW0ZR03,REV3A)GP
CARTON LABEL
QSG+CD WBZR-C1L(HGWBZR05,R3A) GP
CARTON WBZR-C1L(HFWBZR20,R3A)WW_GP
SPACE PLATE1135X949WBZR(HFWBZR03,R3A)GP
SPACE PLATE
PAPER BOARD1135*954WBZR(HFWBZR07,R3A)GP
PAPER BOARD
HANDLE UPPER W9C-B1(JXW9C001,REV3A)GP
HANDLE UPPER
HANDLE DOWN W9C-B1(JXW9C002,REV3A)GP
HANDLE DOWN
LCD FILM 495*325 WBC-B1(JXWBC001,R3A)GP
LCD FILM
CABLE MB-VGA(15/15P,1.8M)BLACK L7ZI GP
PWR CORD B 1.8M SP-023/16A CT-12 EUR GP
HI-POT LABEL L70L(HCL70021,REV3A)GP
HI-POT LABEL
CABLE USB(TYPE A-B,1.8M) BLACK W0E GP
WBZR-C1L PANEL KIT ASSY(LG,5MS)GP
LCD(TFT) 22" LM220WE1-TLD1 (WSXGA) GP
WBZR SW BIOS(NT68670HTFG,LM220WE1-TLD1
WBZR SW EDID(NT68670HTFG,LM220WE1-TLD1
CABLE FFC MB-LCD(30P,189MM)WBZR PTI GP

Different Part List

22 inch monitor different parts list				220CW8FB/00(WBZR-C1L)	220CW8FB/69(WBZR-C1L)	220CW8FB/93(WBZR-C1L)
Item	**Part Number**	**Part Description**	**2nd source**			
1	28WBZRPK0M5	WBZR-C1L PACKING(220CW8FB/00,EU/AP)GP		V		
	28WBZRPK0N3	WBZR-C1L PACKING(220CW8FB/69,AP)GP			V	
	28WBZRPK0L7	WBZR-C1L PACKING(220CW8FB/93,CN)GP				V

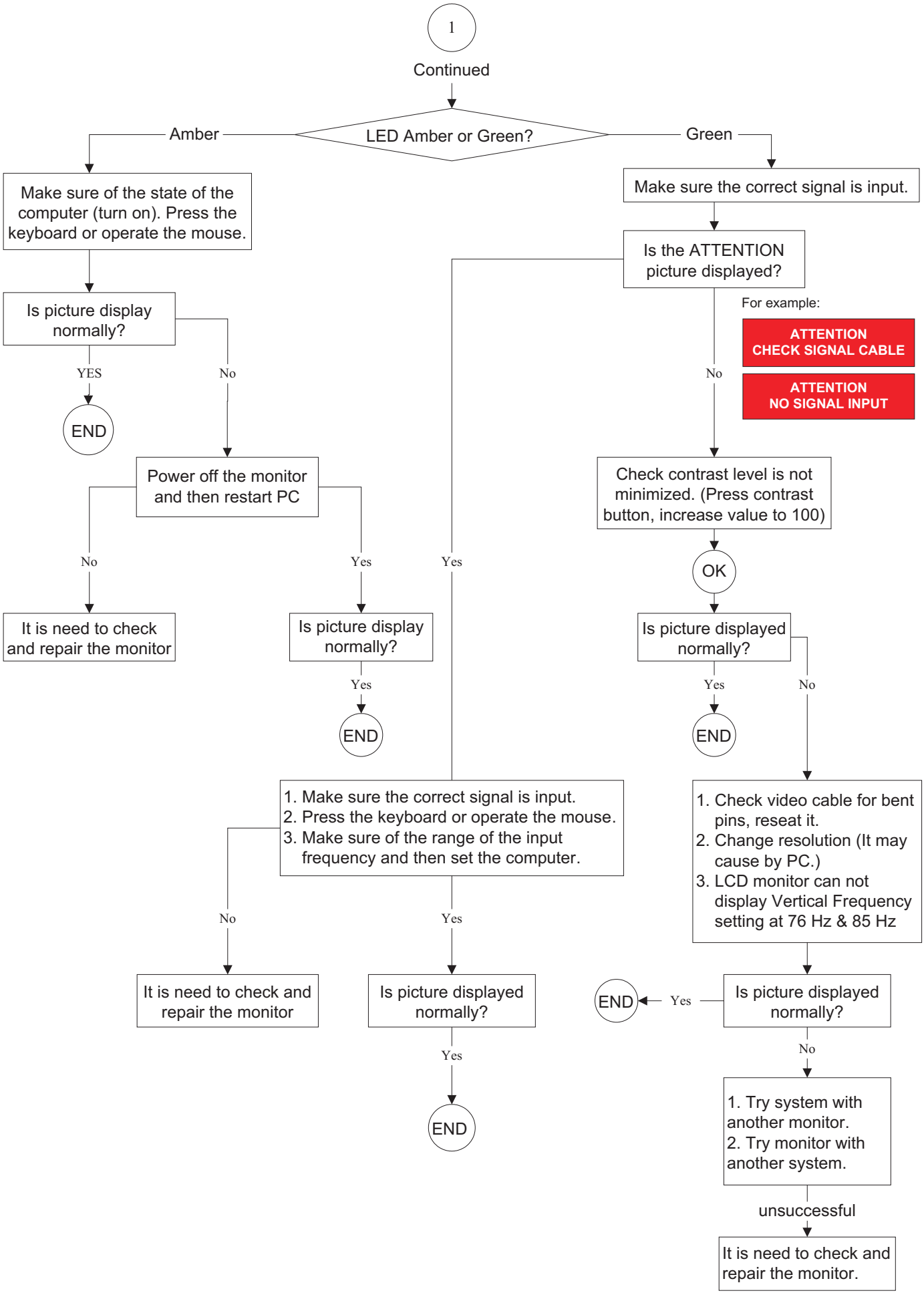
General Trouble Shooting Guide

General Trouble Shooting Guide



Note:
Do not set screen saver – at “14” minutes.
It will cause “ no display” problem as above mentioned.
Action: Change timer setting of screen saver or disable screen saver.

General Trouble Shooting Guide



General Trouble Shooting Guide

2

Monitor drivers (inf file)

FOR WINDOWS 95/98/2000/ME OR LATER

Philips's monitors build in VESA DDC2B feature to support Plug & Play requirement for Windows 95/98/2000/Me. You can install the information file(.inf) in order to select your Philips monitor from "Monitor" dialog box in Windows 95/98/2000/Me to activate Plug & Play application. The installation procedure based on Windows 95 OEM Release 2, 98, Me and 2000 is specified as follows, (in case of connecting the monitor to the PC compliant with VESA standard with the designated signal cable, the PC reads display pixels, frequency and color feature of this monitor to optimize the picture for the monitor automatically.)
DDC: Abbreviation for Display Data Channel

**** Windows NT 4.0 does not require driver (inf file) for monitor.****

For Windows 95

For Windows 95 drivers, your monitor is listed under manufacture name "Philips Business Electronics Co.".

1. Start Windows 95
2. Click the 'Start' button, point to 'setting', and then click 'control panel'.
3. Double click the 'display' Icon.
4. Choose the 'setting' tab then click 'advanced…'
5. Choose 'monitor' button, point to 'change…' then click 'have disk…'.
6. Click 'browse…' button then choose the appropriate drive F:(CD-ROM Drive) then click 'ok' button.
7. Click the 'ok' button then choose your monitor model and click the 'ok'.
8. Click 'close' button.

For Windows 98

For Windows 98 drivers, our monitors are listed under 2 manufactures name "Philips", and "Philips Consumer Electronics Co." Please select "Philips" when you would like to set up your monitor in Windows setting, if you can not find the right model name just as the label indication on the back of set. For those set that have been issued since the release of Window 98, drivers can be found in CD-ROM under the directory path of "\pc\driver\" or it may be downloaded at http://www.philips.com. Once you have installed the new driver, Windows will add a new manufacture name "Philips Business Electronics" in your system.

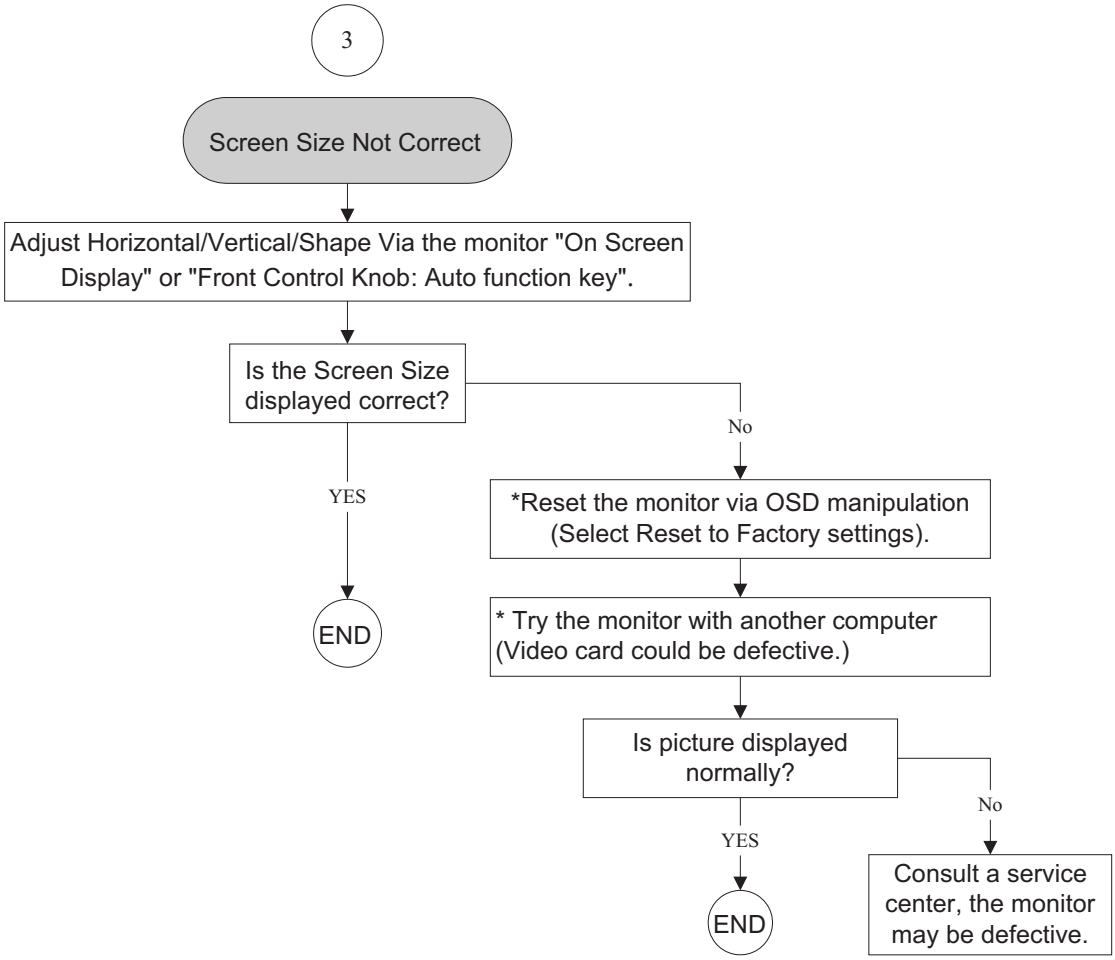
1. Start Windows 98
2. Click the 'Start' button, point to 'setting', and then clock 'control panel'.
3. Double click the 'display' Icon.
4. Choose the 'setting' tab then click 'advanced…'
5. Choose 'monitor' button, point to 'change…' then click 'next'.
6. Choose 'display a list of all the drivers in a specify location, so you can select the driver you want', then click 'next' and then click 'have disk…'
7. Click 'browse…' button then choose the appropriate drive F: (RD-ROM Drive) then click 'ok" button.
8. Click the 'ok' button then choose your monitor model and click the 'next' button.
9. Click 'finish' button then click 'close' button.

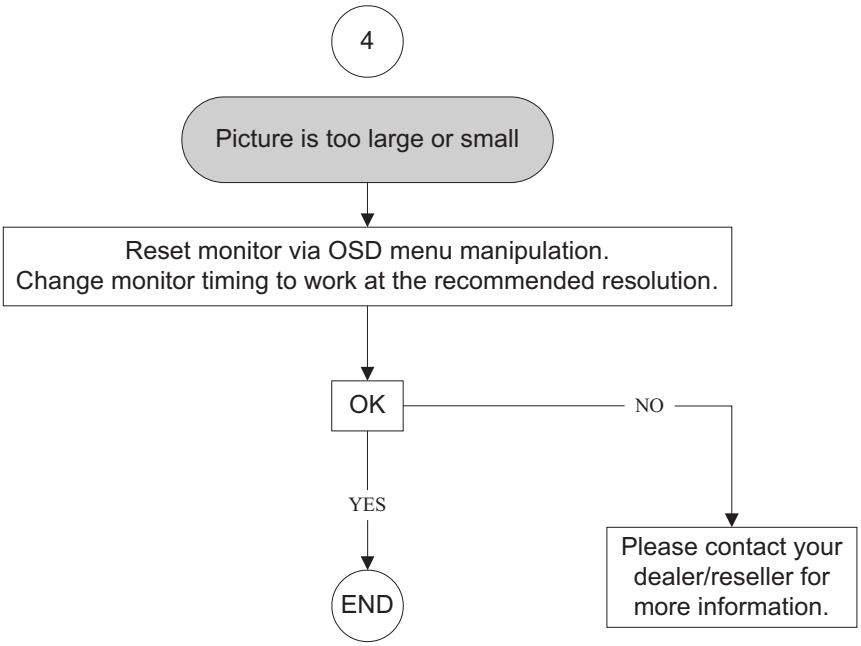
For Window Me

1. Start Window Me
2. Click the 'start' button, point to 'setting' , and then click 'control panel'.
3. Double click the 'display' Icon.
4. Choose the 'setting' tab then click 'advanced…'.
5. Choose 'monitor' button, then click 'change…' button.
6. Choose 'specify the location of the driver (advanced)' and click the 'next' button.
7. Choose 'display a list of all the drivers in a specific location, so you can select the driver you want', then click 'next' and then click 'have disk…'.
8. Click 'browse…' button then choose the appropriate drive F: (CD-ROM Drive) then click 'ok' button.
9. Click the 'ok' button then choose your monitor model and click the 'next' button.
10. Click 'finish' button then click 'close' button.

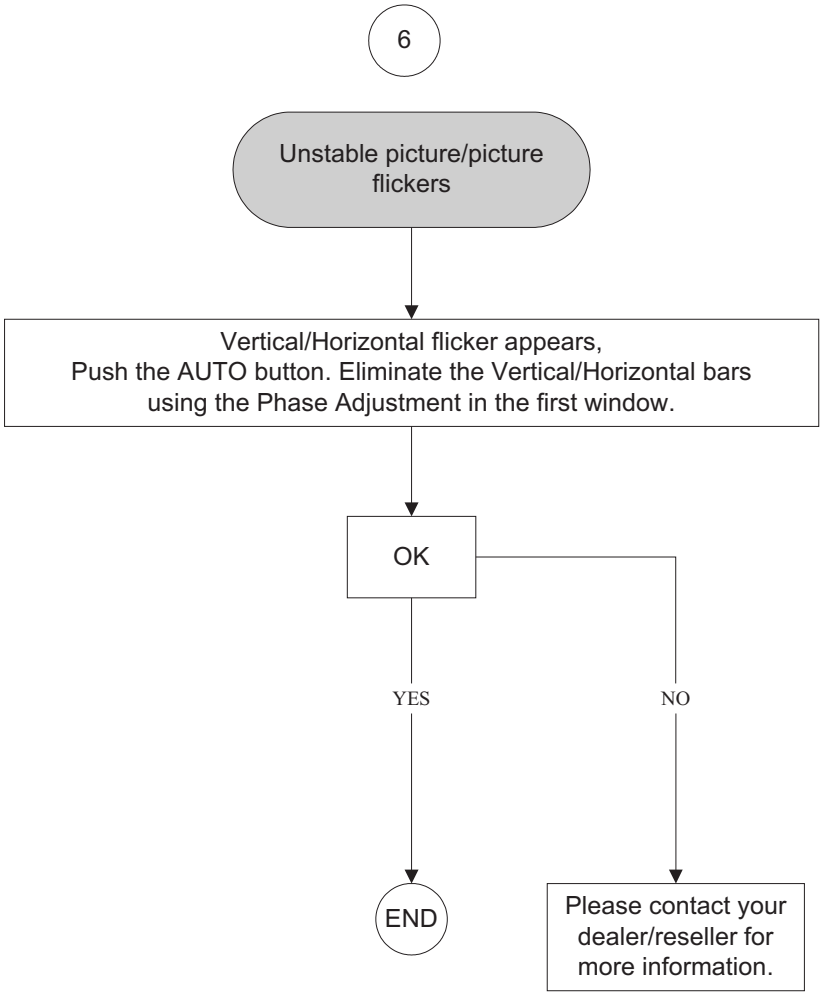
For Windows 2000

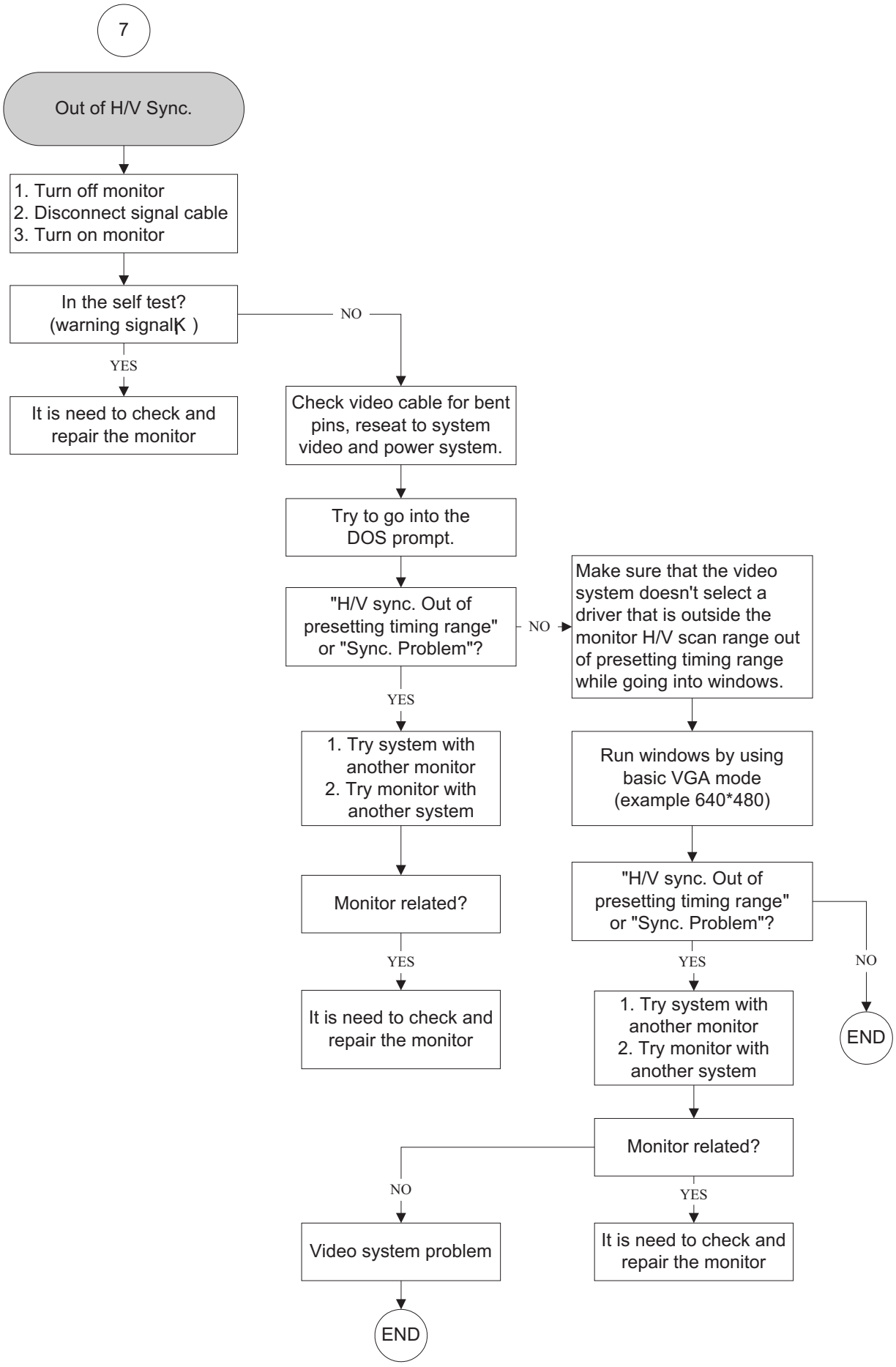
1. Start Windows 2000
2. Click the 'start' button, point to 'setting', and then click 'control panel'.
3. Double click the 'display' Icon.
4. Choose the 'setting' tab then click 'advanced…'.
5. Choose 'monitor;
   - If the 'properties' button is inactive, it means your monitor is properly configured. Please stop installation.
   - If the 'properties' button is active, click 'properties' button.
6. Click 'driver' and then click on 'update driver…' then click on the 'next' button.
7. Choose 'display a list of the known drivers for this device so that I can choose a specific driver' then click 'next' and then click 'have disk…'.
8. Click 'browse…' button then choose the appropriate drive F: (CD-ROM Drive).
9. Click the 'open' button then click the 'ok' button.
10. Choose your monitor model and click the 'next' button.
11. Click 'finish' button and then click the 'close' button. If you can see the 'digital signature not found' window then click the 'yes' button.


3
Screen Size Not Correct
Adjust Horizontal/Vertical/Shape Via the monitor "On Screen Display" or "Front Control Knob: Auto function key".
Is the Screen Size displayed correct?
No
YES
*Reset the monitor via OSD manipulation (Select Reset to Factory settings).
END
* Try the monitor with another computer (Video card could be defective.)
Is picture displayed normally?
No
YES
Consult a service center, the monitor may be defective.
END

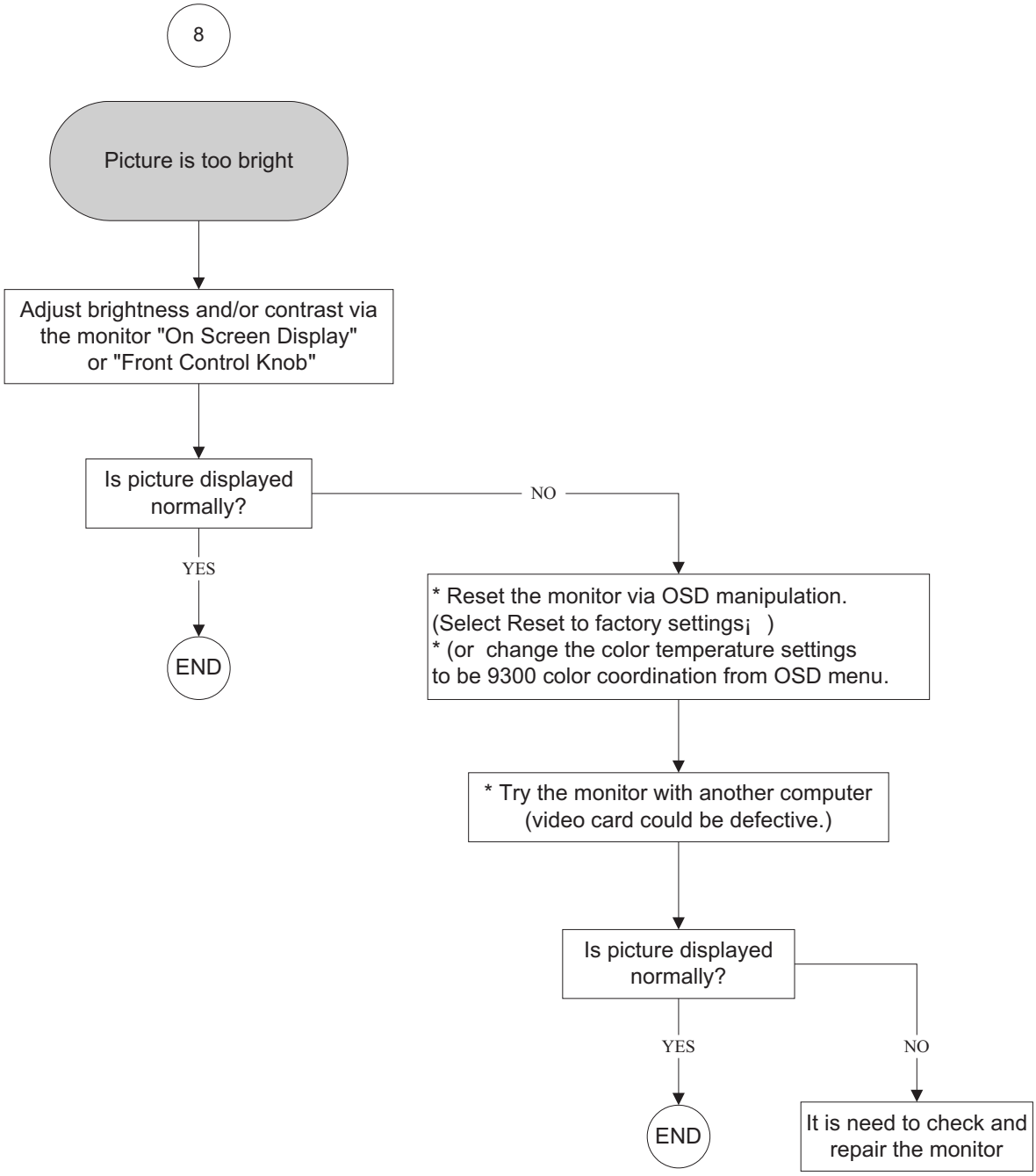

4
Picture is too large or small
Reset monitor via OSD menu manipulation.
Change monitor timing to work at the recommended resolution.
OK
NO
YES
Please contact your dealer/reseller for more information.
END

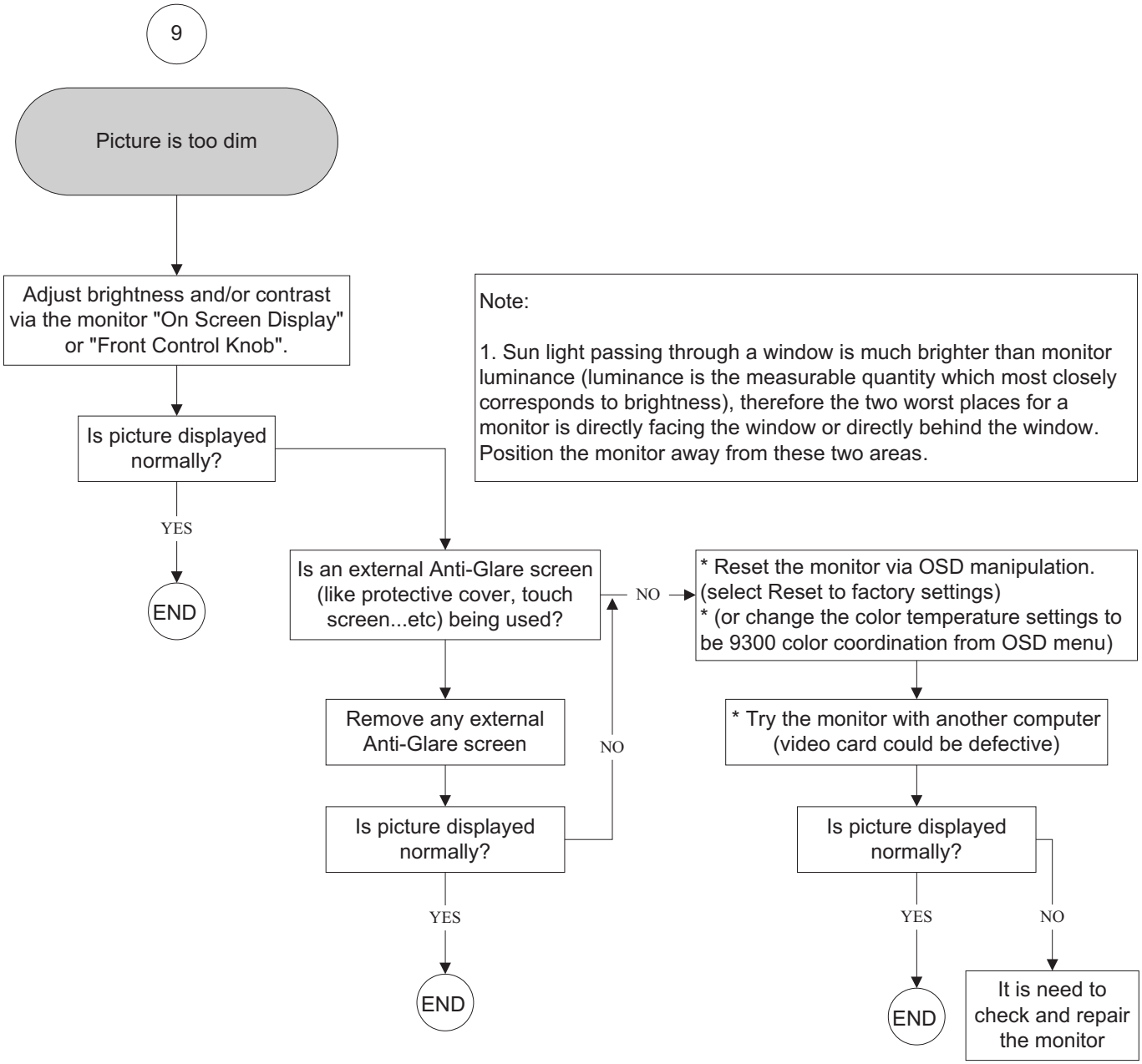
General Trouble Shooting Guide



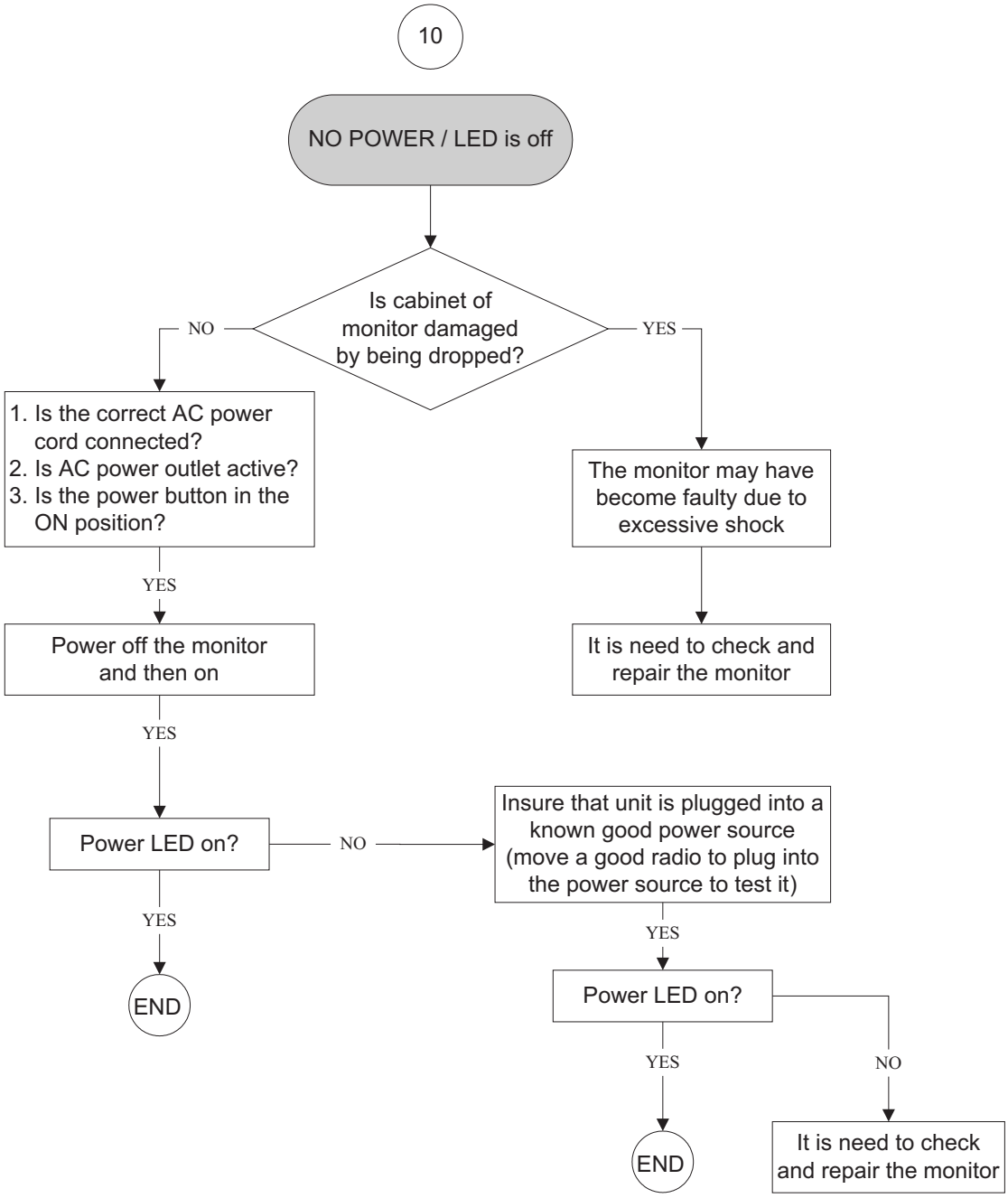

7
Out of H/V Sync.
1. Turn off monitor
2. Disconnect signal cable
3. Turn on monitor
In the self test?
(warning signal OK)
NO
YES
It is need to check and repair the monitor
Check video cable for bent pins, reseat to system video and power system.
Try to go into the DOS prompt.
"H/V sync. Out of presetting timing range" or "Sync. Problem"?
NO
YES
Make sure that the video system doesn't select a driver that is outside the monitor H/V scan range out of presetting timing range while going into windows.
1. Try system with another monitor
2. Try monitor with another system
Monitor related?
YES
It is need to check and repair the monitor
Run windows by using basic VGA mode (example 640*480)
"H/V sync. Out of presetting timing range" or "Sync. Problem"?
YES
NO
END
1. Try system with another monitor
2. Try monitor with another system
Monitor related?
NO
YES
Video system problem
It is need to check and repair the monitor
END

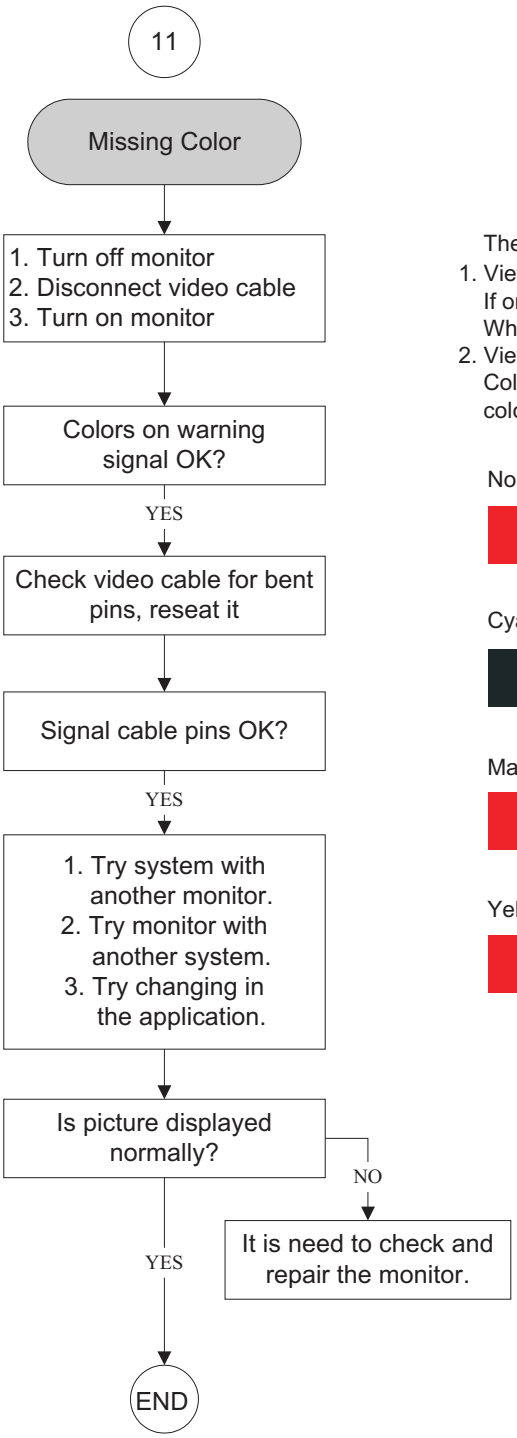
General Trouble Shooting Guide




9
Picture is too dim
Adjust brightness and/or contrast via the monitor "On Screen Display" or "Front Control Knob".
Is picture displayed normally?
YES
END
Note:
1. Sun light passing through a window is much brighter than monitor luminance (luminance is the measurable quantity which most closely corresponds to brightness), therefore the two worst places for a monitor is directly facing the window or directly behind the window. Position the monitor away from these two areas.
Is an external Anti-Glare screen (like protective cover, touch screen...etc) being used?
NO
* Reset the monitor via OSD manipulation. (select Reset to factory settings)
* (or change the color temperature settings to be 9300 color coordination from OSD menu)
Remove any external Anti-Glare screen
NO
* Try the monitor with another computer (video card could be defective)
Is picture displayed normally?
Is picture displayed normally?
YES
END
YES
END
NO
It is need to check and repair the monitor

General Trouble Shooting Guide





There are 2 easy ways to determine the Missing color problem.

1. View an image that is supposed to be "White".
   If one of the colors (RGB) is not functioning.
   White can not be produced.
2. View an image that supposed to contain Red, Green and Blue.
   Color problems will be apparent when one or more of these colors can not be displayed.

Normal White:

RED + GREEN + BLUE = WHITE

Cyan Color means that the red sub pixel is missing.

RED + GREEN + BLUE = Cyan

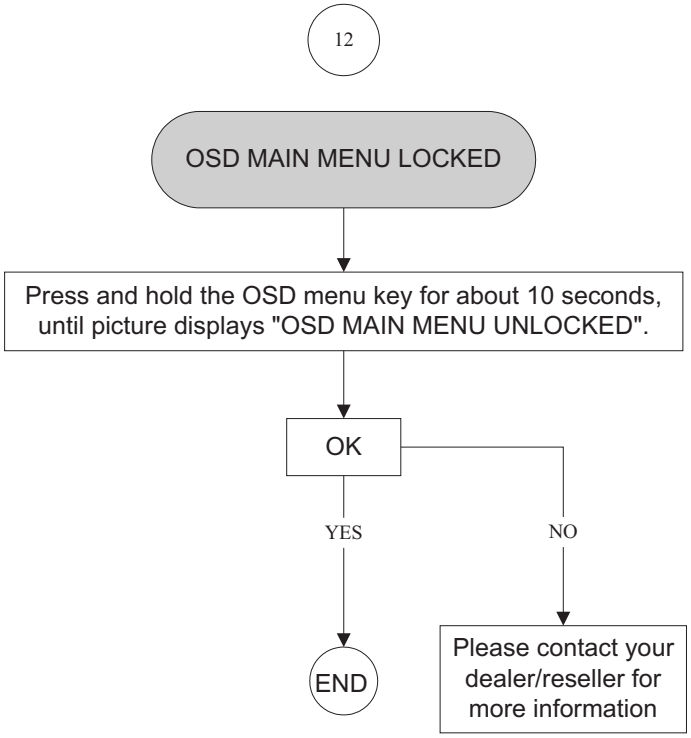
Magenta or Purple Color means that the green sub pixel is missing.

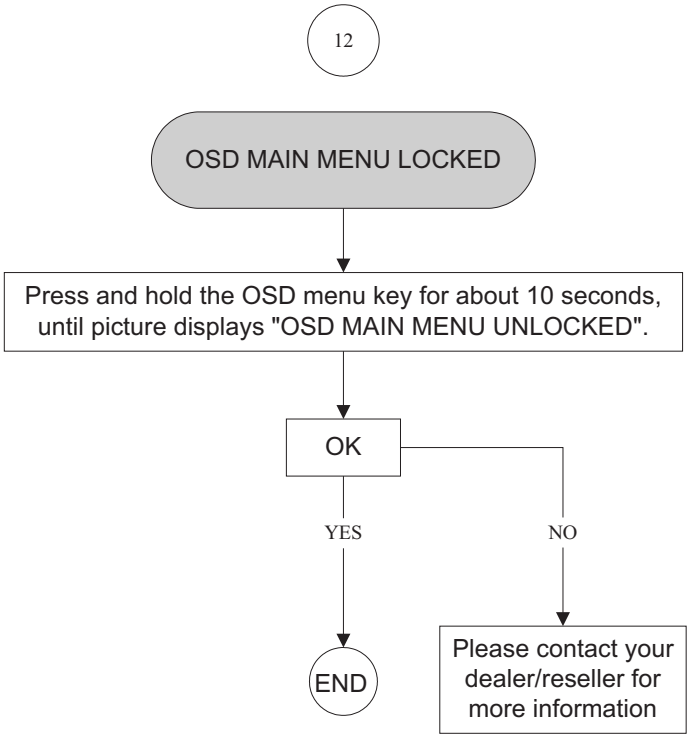
RED + GREEN + BLUE = Magenta

Yellow Color means that the blue sub pixel is missing.

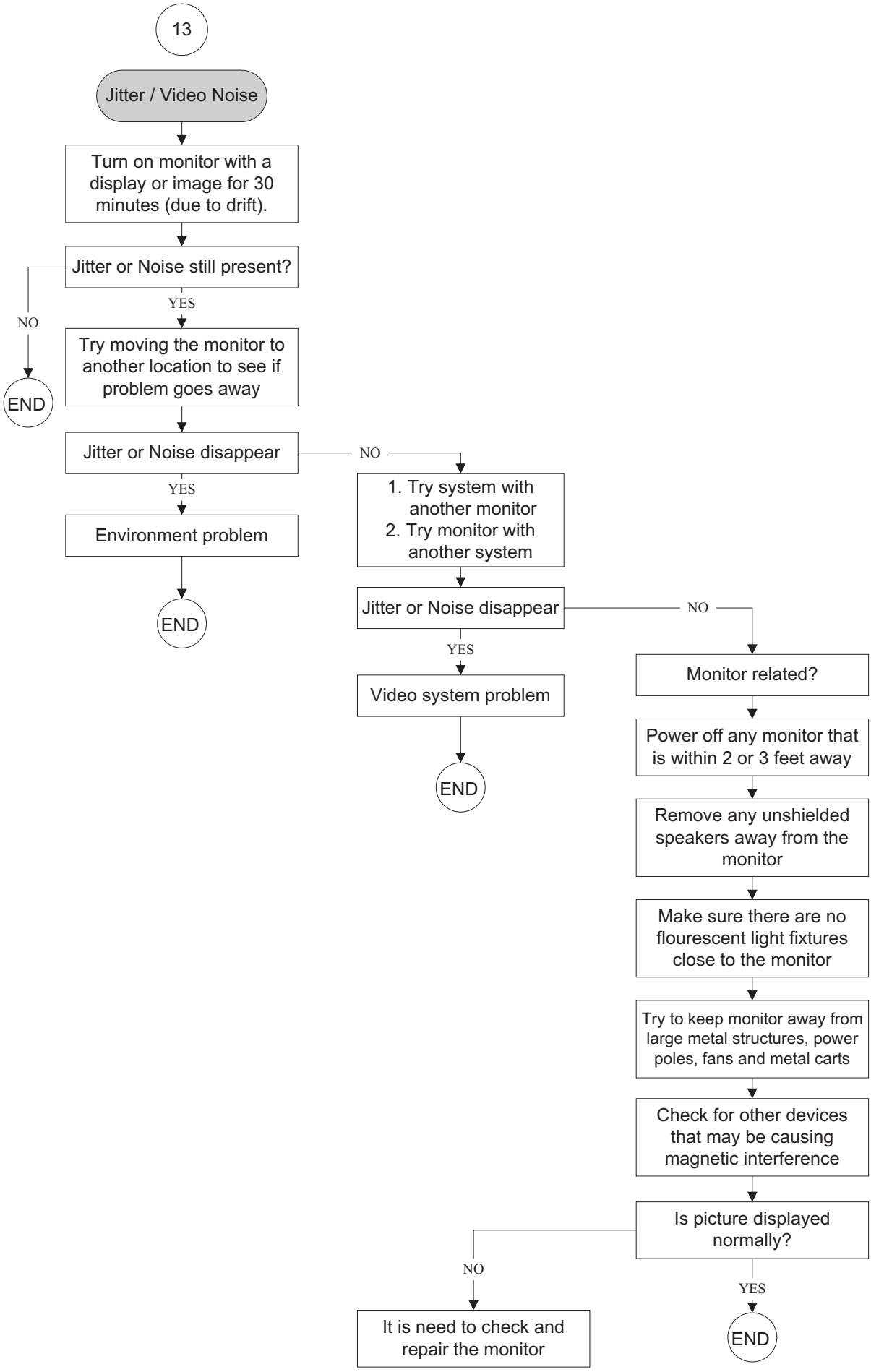
RED + GREEN + BLUE = Yellow

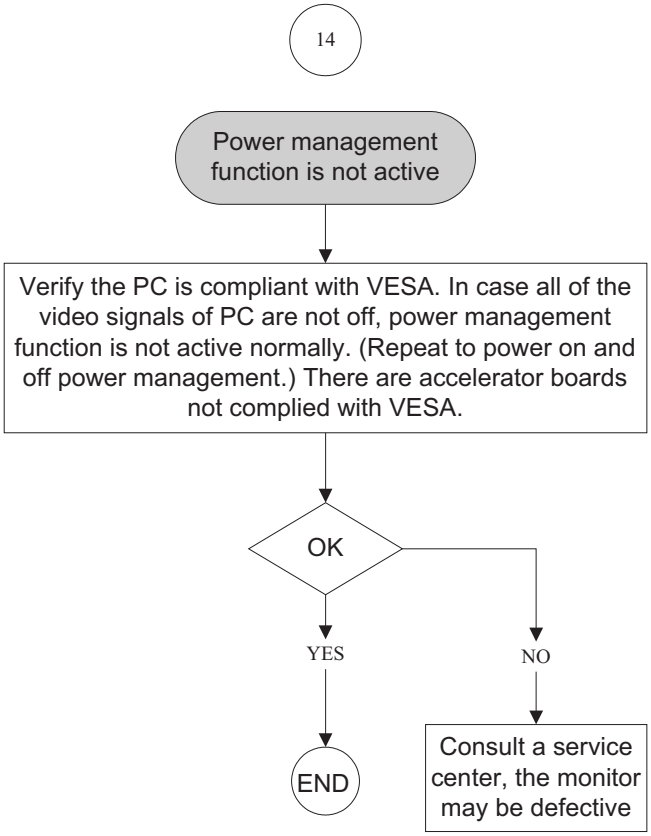
General Trouble Shooting Guide




12
OSD MAIN MENU LOCKED
Press and hold the OSD menu key for about 10 seconds, until picture displays "OSD MAIN MENU UNLOCKED".
OK
YES
NO
END
Please contact your dealer/reseller for more information

General Trouble Shooting Guide




14
Power management function is not active
Verify the PC is compliant with VESA. In case all of the video signals of PC are not off, power management function is not active normally. (Repeat to power on and off power management.) There are accelerator boards not complied with VESA.
OK
YES
NO
END
Consult a service center, the monitor may be defective

General Product Specification

Specification for TVI WBZR-C1L
Philips Hudson 8 – 220CW8

22"W TFT LCD Monitor,
30 - 93 kHz, 56 - 76 Hz, Dual input

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1. PRODUCT SPECIFICATION

1.1 Relationship

Supplier: TVI Model: WBZR-C1L
Customer: Philips Model: Hudson 8 -220CW8

- Monitor No: HWC8220Q
- Monitor ID:
  220CW8FB/00
  220CW8FB/69
  220CW8FB/93

- EAN No.:

CTN	UPC/EAN
220CW8FB/00	EAN: 87 12581 35153 3

- Site Code: CJ (TVE); CU (QCG)

1.2 Product Data

22" W TFT LCD monitor

Horizontal frequency	30 - 93	KHz
Vertical frequency	56 – 76	Hz
Screen diagonal	22	Inch
Viewing Angle(CR>10)(H/V)	160/160	°
Max. opening horizontal picture size	TBD	mm
Max. opening vertical picture size	TBD	mm
Max. active horizontal picture size	473.76	mm
Max. active vertical picture size	296.1	mm

2. MECHANICAL SPECIFICATION

2.1.1 Monitor Housing

The front bezel and the back cabinet are based on TVI OEM tooling and Philips design chin.

2.1.2 VESA mounting holes

According to VESA FPMPMI standard.
Holes 100 mm x 100 mm (M 4.0, 0.7 pitch threaded) in the rear center for ARM.

2.1.3 Kensington Slot

The monitor is equipped with a 7 mm x 3 mm slot.

2.2 Tilt of the monitor

Forward	-5 ° +2/- 0
Backward	+25 °+0/- 3 °

2.3 Dimensions of monitor

The monitor has the following dimensions:
Unit dimension : 513.8mm (W) * 416.2mm (H) * 213.6mm (D)
Packed unit dimension : 565mm (W) * 174.0mm (H) * 472.0mm (D) for WW
: 567.0mm (W) * 189mm (H) * 480.0mm (D) for China
Net weight : 5 Kg (Including I/F cable 240 g)

Gross weight : 5.3 Kg for WW
: 5.3 Kg for China

3. LCD SPECIFICATION

3.1 LCD specification

Panel	CMO	LPL
	M220Z1-L03	**LM220WE1-TLD1**
Resolution	1680x1050	1680x1050
Active area (HxV)	473.76(H) x 296.1	473.76(H) x 296.1
Outside dimensions(WxHxD)	493.7x 320.1 x 16.5	493.7x 320.1 x 16.5 (Not for Audio model)
Pitch (mm)	0.282 x 0.282	0.282 x 0.282
Display surface	Non-glare type	Non-glare type
Color depth	16.7M colors	16.7M colors
Backlight	4 CCFL	4 CCFL
Viewing angle	170:H/ 160:V	160 for H/V
Contrast ratio	1000:1 (Typ); 700:1 (Min)	1000:1 (Typ); 600:1 (Min)
White luminance	300nit (Typ); 250nit (Min)	300nit (Typ); 250nit (Min)
Color gamut	72%	72%
Gate IC	TBC	TBC
Source IC	TBC	TBC
Response time	5ms	5ms

4 COSMETICS APPEARANCE

4.1 GAP definition

The gap between LCD and front bezel must be **<= 1.0mm**

4.2 Panel Offset

Panel Offset: Panel disposition tolerance inside the front bezel must be <=1.0mm

4.3 Horizontal tilt

Horizontal tilt between front bezel & LCD shall be <= 1.0mm

5. CONNECTORS

5.1 Video Connection

The monitor is equipped with a 15 pin mini D-SUB connector.

5.2 PIN Assignment

5.2.1 15 pin mini D-Sub connector

The PIN assignment of the 15 pin mini D-SUB connector / cable is as follows:

PIN No.	SIGNAL
1	Red
2	Green/ SOG
3	Blue
4	Sense (GND)
5	Cable Detect (GND)
6	Red GND
7	Green GND
8	Blue GND
9	DDC +3.3V or +5V
10	Logic GND
11	Sense (GND)
12	Bi-directional data
13	H/H+V sync
14	V-sync
15	Data clock

5.2.2 DVI-D connector

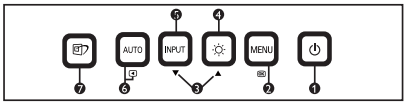
The PIN assignment of the 24 pin DVI-D connector / cable is as follows:

Pin No.	Description
1	T.M.D.S. data2-
2	T.M.D.S. data2+
3	T.M.D.S. data2 shield
4	No Connect
5	No Connect
6	DDC clock
7	DDC data
8	No Connect
9	T.M.D.S. data1-
10	T.M.D.S. data1+
11	T.M.D.S. data1 shield
12	No Connect
13	No Connect
14	+5V Power
15	Ground (for +5V)
16	Hot plug detect
17	T.M.D.S. data0-
18	T.M.D.S. data0+
19	T.M.D.S. data0 shield
20	No Connect
21	No Connect
22	T.M.D.S clock shield
23	T.M.D.S. clock+
24	T.M.D.S. clock-

6. OSD

6.1 Control of OSD

The positions and functions of the buttons are defined as below.



6.2 Adjustment Parameters

Hot-key definition

	Key	Key Press Time	OSD Timeout	EDFU implement	Service menu
Monitor Controls Lock	OK(Menu)	6 sec (lock/unlock)	3 sec	V	V
Factory Mode	AUTO+OK+Power On	Keep pressing when power on			V
Demo mode for smart image	Smart Image Key	3 sec (Enter/Quit)		V	V
DDC/CI On/OFF for VISTA	UP+DOWN	6 sec (lock/unlock)	3 sec	V	V

OSD Tree

1st LEVEL	2nd LEVEL	3rd LEVEL
Picture	Brightness	
	Contrast	
	Factory	
Color	Color Temperature	5000K, 6500K, 7500K, 8200K, 9300K, 11500K
	sRGB	
	User Define	Red, Green, Blue
Language	English	
	Español	
	Français	
	Deutsch	
	Italiano	
	Português	
	PycckNN	
	Simplified Chinese	
OSD Settings	Horizontal	
	Vertical	
	Transparency	Off, 1/4, 2/4, 3/4, 4/4
	OSD Time Out	5s, 10s, 20s, 30s, 60s
Setup	Phase	
	Clock	
	H.Position	
	V.Position	
	Smart Response	On/Off
	SmartContrast	On/Off
	Reset	Yes/No
	Resolution notification	On/Off
	Information	
Input	Auto	
	VGA	
	DVI	

7. ELECTRICAL SPECIFICATION

7.1 Power Specification

7.1.1 AC-DC converter

Input voltage	90- 264V
Frequency range	50/ 60 ± 2 Hz
Inrush current	Shall be less than the ratings of critical components (including fuse, rectifiers and surge limiting device) for all conditions of line in voltage.
Maximum power consumption:	<50W (Max) / <45W (Typ.)

7.1.2 Power Management

Mode	HSYNC	VSYNC	Video	Pwr-cons.	Indication	Rec. time
Power-On	On	On	active	< 50 W	Green LED	--
Off	Off	Off	blanked	< 1 W	Amber LED	< 3 s
DC Power Off			N/A	< 1 W	LED Off	

7.2 Standard Test conditions

Unless otherwise specified, this specification is defined under the following conditions.

(1) Input signal: As defined in Timing table, 1680 x 1050 non-interlaced mode (1680X1050@60Hz 146.25MHz), signal sources must have 75 ohm output impedance.

(2) Luminance setting : controls to be set to 300 nits with full screen 100 % duty cycle white signal

(3) Warm up: more than 30 minutes after power on with signal supplied.

(4) Ambient light: 400 – 600 lux.

(5) Ambient temperature: 20 ± 5 °C

7.3 Test equipment

- ❑ Personal computer with Windows 98/2000/XP
- ❑ Luminance meter Minolta CA110
- ❑ Videogenerator: Chroma 2000, 2135, 2250 or equivalent
- ❑ Colour analyzer: Minolta or Chroma
- ❑ 10 times magnifier
- ❑ Ruler / Template
- ❑ Thickness gauge
- ❑ Watt / Power Meter

7.4 Video Generator test sequence

Will be defined by TVI or its subcontracted quality providers.

7.5 Analog input

Analog input R,G,B level:	0 - 850 mV max.
Polarity:	positive, negative
Impedance:	75 Ω ± 1%
Sync:	HV separate sync, composite sync,

7.6 Optical response time

Video Bandwidth: 205 MHz (dot rate)
Typical rise time(CMO) 5 ms

7.7 Protection circuit

The monitor will not be damaged by:

- ❑ missing vertical or horizontal sync pulse
- ❑ improper vertical or horizontal sync pulse (picture must be black at improper signals, unsynchronized pictures are not allowed)

7.8 DDC

The monitor can support DDC 2 B and DDC-CI according to the latest VESA standard.

7.8.1 DDC Details

1	User visible strings on .inf file	Philips 220CW (22inch WIDE LCD MONITOR 220CW8)
2	Manufacturer ID (EDID data)	PHL
3	Product ID, "xxxx" 4 codes	MSB(byte 12): C0 LSB (byte 11): 1A
4	maximum resolution	1680x1050
5	Horizontal Frequency Range	30~93 KHz
6	Vertical Frequency Range	56~76Hz
7	Monitor Name (13 characteries max.)	Philips 220CW

7.9 Timings

Factory preset modes : 18
Preset modes : 48
User modes : 10

Note: 1. Screen displays perfect picture at 18 factory-preset modes.
2. Screen displays visible picture with OSD warning when input modes are the 48 preset modes.

Factory preset modes (18 modes)

Item	H.Freq. (KHz)	Mode	Resolution	V.Freq. (Hz)	BW(MHz)
1	31.469	IBM VGA 10H	640x350	70.086	
2	31.469	IBM VGA 3H	720x400	70.087	
3	31.469	IBM VGA 12H	640x480	59.94	
4	35	MACINTOSH	640x480	67	
5	37.861	VESA	640x480	72.809	
6	37.5	VESA	640x480	75	
7	43.269	VESA	640x480	85.008	
8	35.156	VESA	800x600	56.25	
9	37.879	VESA	800x600	60.317	
10	48.077	VESA	800x600	72.188	
11	46.875	VESA	800x600	75	
12	53.674	VESA	800x600	85.061	
13	49.7	MACINTOSH	832x624	75	
14	56.4	-	960x720	75	
15	44.75	-	960x720	60	
16	48.363	VESA	1024x768	60.004	

17	56.476	VESA	1024x768	70.069	
18	60.023	VESA	1024x768	75.029	
19	61.08	IBM XGA-2	1024x768	75.781	
20	68.677	VESA	1024x768	84.997	
21		CVT 2.3MA	1280 x768	60	
22	60.289	CVT 2.3MA	1280 x768	75	
23	54.1		1152x864	60	
24	63.851	VESA	1152x864	70.012	
25	67.5	VESA	1152x864	75	
26	68.7	MACINTOSH	1152x870	75	
27	61.845	SUN WS	1152x900	66.004	
28	71.81	SUN WS	1152x900	76.15	
29	60	VESA	1280x960	60	
30	75	VESA	1280x960	75	
31	63.981	VESA	1280x1024	60.02	
32	71.691	SUN WS	1280x1024	67.189	
33	76	DOS/V	1280x1024	72	
34	79.976	VESA	1280x1024	75.025	
35	81.13	SUN WS	1280x1024	76.11	
36	91.1	VESA	1280x1024	85	
37	44.772	-	1280x720	60	
38	52.5	-	1280x720	70	
39	64	CVT-reduced blanking	1400x1050	60	101
40	80	CVT	1400x1050	75	121.75
41	91.1	CVT	1400x1050	85	156
42	55.469	VESA-reduced blanking mode	1440x900	59.901	88.75
43	55.935	VESA	1440x900	59.887	106.5
44	70.635	VESA	1440x900	74.984	136.75
45	75	VESA	1600x1200	60	161
46	66.587	CVT 2.3MA-R	1920x1080	60.0 (for DVI-D	138.5
47	65.29	CVT1.76MW	1680x1050	60	146
48		CVT1.76MW-R	1680x1050	60	119

Remark, Timing with light blue are factory mode.

7.10 Audio Specification

N/A

8. DISPLAY PERFORMANCE

8.1 Picture performance

Optical performance test must be done in a dark room.
Note: Test under standard test conditions unless otherwise specified
Active Image Size (all modes)

8.2 Geometric defects

No vertical or/and horizontal line defect.

No cross line defect.

8.3 Picture stability during warm up

During 10 - 30 minutes warm up time from cold condition of the monitor
at ambient temperature (25°C ± 5°C) the decrease of brightness must be less than 6 Fl.

8.4 Scratches

No scratches and foreign particles visible.

8.5 Viewing angle

	Typical(10:1)
Horizental (Right + Left)	160°
Vertical (Up + Down)	160°

8.6 Jitter

No jitter visible in each condition. In case of problem a limit sample has to be defined.

8.7 Missing Pixels / missing subpixel

BRIGHT DOT DEFECTS	ACCEPTABLE LEVEL
MODEL	**220CW8**
1 lit sub-pixel	3
2 adjacent lit sub-pixels	1
3 adjacent lit sub-pixels (one white pixel)	0
Distance between two bright dots	15mm
Bright dot defects within 20 mm circle	0
Total bright dot defects of all type	3

BLACK DOT DEFECTS	ACCEPTABLE LEVEL
MODEL	**220CW8**
1 dark sub-pixel	5
2 adjacent dark sub-pixels	2
3 adjacent dark sub-pixels (one white pixel)	1
Distance between two black dots	15mm
Black dot defects within 20 mm circle*	1
Total black dot defects of all type	5

TOTAL DOT DEFECTS	ACCEPTABLE LEVEL
MODEL	**220CW8**
Total bright or black dot defects of all type	5

8.8 Newton Ring

No Newton Rings visible.

8.9 Luminance Output

8.9.1 Luminance Output

Test resolution: 1680 x 1050 at 60 Hz
Test condition: video input (RGB) = maximum white

8.9.2 Brightness

To follow Panel specification. sRGB = 80 ± 10 nits.

8.9.3 Brightness uniformity

Set contrast at 100% and turn the brightness to get average above 300 nits at centre of the screen. Apply the Fig 1, it should comply with the following formula:

$$\frac{B\_min}{B\_max} \text{ X } 100\% > 75\%$$

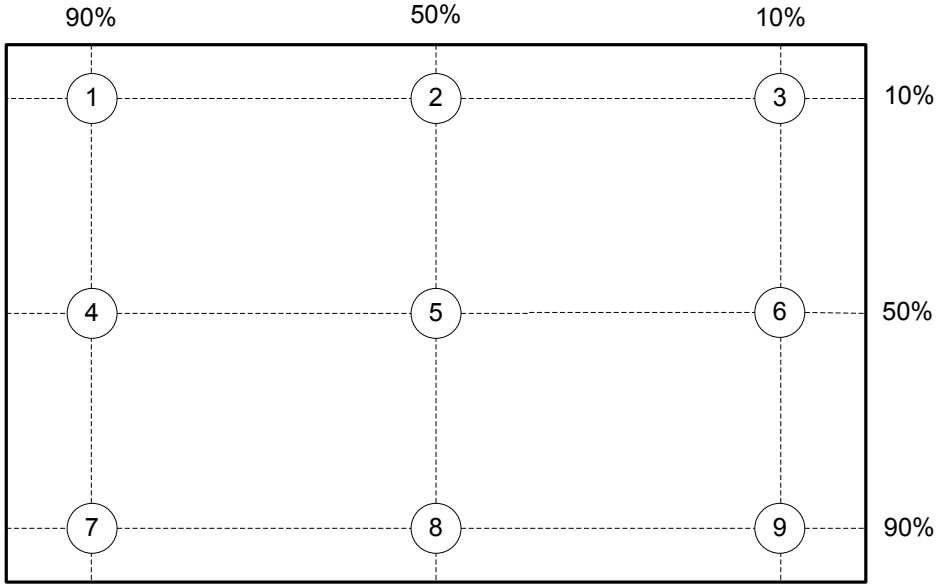
Where B_max = Maximum brightness
B_min = Minimum brightness

8.10 White Uniformity

Definition of White Variation (δW):

Measure the luminance of gray level 255 at 9 points

δW = Maximum [L(1), L(2) …… L(9)] / Minimum [L(1), L(2) …… L(9)]



Spec : =< 1.33 (In all ranges)

8.11 Contrast ratio

The contrast ration can be calculated by following expression.
Contrast Ratio (CR) = L255 / L0
L255 : Luminance of gray level 255
L0 : Luminance of gray level 0

Typical value: 1000:1

8.12 White color adjustment

There are three factory preset white color 9300K, 6500K, sRGB.

Apply full gray 64 pattern, with brightness in 100 % position and the contrast control at 50 % position. The 1931 CIE Chromaticity (color triangle) diagram (x,y) coordinate for the screen center should be:

Product specification:

CIE coordinates	(x,y)	
11500K	x = 0.270 ± 0.02	FGA
	y = 0.281 ± 0.02	
9300K	x = 0.283 ± 0.02	
	y = 0.297 ± 0.02	
8200K	x = 0.291 ± 0.02	FGA
	y = 0.306 ± 0.02	
7500K	x = 0.298 ± 0.02	FGA
	y = 0.314 ± 0.02	
6500K/sRGB	x = 0.313 ± 0.02	
	y = 0.329 ± 0.02	
sRGB	x = 0.313 ± 0.02	
	y = 0.329 ± 0.02	
5000K	x = 0.345 ± 0.02	FGA
	y = 0.357 ± 0.02	

Production alignment spec :

CIE coordinates	(x,y)	
11500K	x = 0.270 ± 0.005	FGA
	y = 0.281 ± 0.005	
9300K	x = 0.283 ± 0.005	
	y = 0.297 ± 0.005	
8200K	x = 0.291 ± 0.005	FGA
	y = 0.306 ± 0.005	
7500K	x = 0.298 ± 0.005	FGA
	y = 0.314 ± 0.005	
6500K/sRGB	x = 0.313 ± 0.005	
	y = 0.329 ± 0.005	
sRGB	x = 0.313 ± 0.005	
	y = 0.329 ± 0.005	
5000K	x = 0.345 ± 0.005	FGA
	y = 0.357 ± 0.005	

Quality Inspection specification:

CIE coordinates	(x,y)	
9300K	x = 0.283 ± 0.015	
	y = 0.297 ± 0.015	
6500K/sRGB	x = 0.313 ± 0.015	
	y = 0.329 ± 0.015	
sRGB	x = 0.313 ± 0.015	
	y = 0.329 ± 0.015	

8.13 Distance between TFT LCD monitor and CRT/TFT monitor

Conducted with different modes or frequencies. No interference in a distance down to 25 cm.

9. ENVIRONMENT

9.1 Environmental characteristics

The following sections define the interference and susceptibility condition limits that might occur between external environment and the display device.

Operating:

- Temperature : 0 to 35 degree C
- Humidity : 80% max
- Altitude : 0-3658m
- Air pressure : 600-1100 mBAR

Storage:

- Temperature : -20 to 60 degree C
- Humidity : 95% max
- Altitude : 0-12192m
- Air pressure : 300-1100 mBAR

Note: recommend at 5 to 35°C, Humidity less than 60 %

10. REGULATORY STANDARDS

Note: All certificates must be raised under the name of Philips

10.1 Safety approvals

- ☑ CB report
- ☑ CE
- ☑ TUV GS
- ☑ TCO'03

10.2 Power management

- ☑ Energy Star

10.3 Certificates, Reports for the production start

When the first production of the monitor starts the following documents must be sent to Philips by mail. All reports must be raised under "Philips" and have to show W0ZR model name .

- ☑CB report
- ☑CE
- ☑FCC
- ☑Service manual

11 RELIABILITY

11.1 Reliability of the monitor

The MTBF of the monitor has to be greater than 50.000 hours. The MTBF shall be calculated according to the MIL Standard HBDK 217 E/F. The report about the calculation detail shall be provided on component level before mass- production by TVI. The calculation shall be performed for a primary test/preset mode under ambient temperature of 25°C.

12. CUSTOMIZATION

12.1 Identity Customization

Refer to SKU

12.2 EAN /SAP Identification

Refer to SKU

12.3 Plastic

The plastic material of the monitor must be PC-ABS (Front/ back) ABS-HB (base).
Plastic type and color is released as follows:

Refer to MakeUp sheet/ Graphic sheet

12.4 Definition of serial number

Refer to Philips' definition

12.5 Definition of the barcode label

Refer to Philips' definition

12.6 Accessories

Refer to SKU

13. ECR-HANDLING

Not any change without approved ECR.
Every ECR to the golden " samples" must be approved by PHILIPS, Even ECR for minor changes must be released by PHILIPS.
For the ECR procedure the vendor has to send an ECR formular, necessary spec updates, datasheets and a photo documentation. On based on documents, PHILIPS has to decide if samples are necessary till release to changes. The vendor also has to proof be certificates and test reports, that the change has no effect on safety, EMI and TCO03.
After testing, PHILIPS has to release or reject the change request.

Safety Check Process

Safety Checks

After the original service problem has been corrected, a complete safety check should be made. Be sure to check over the entire set, not just the areas where you have worked. Some previous service may have left an unsafe condition, which could be unknowingly passed on to your customer. Be sure to check all of the following:

Fire and Shock Hazard

1. Be sure all components are positioned in such a way as to avoid the possibility of adjacent component shorts. This is especially important on those chassis which are transported to and form the service shop.
2. Never release a repaired unit unless all protective devices such as insulators, barries, covers, strain reliefs, and other hardware have been installed in accordance with the original design.
3. Soldering and wiring must be inspected to locate possible cold solder joints, solder splashes, sharp solder points, frayed leads, pinched leads, or damaged insulation(including the accord). Be certain to remove loose solder balls and all other loose foreign particles.
4. Check across-the-line components and other components for physical evidence of damage or deteriortion and replace if necessary. Follow original layout, lead length and dress.
5. No lead or component should touch a receiving tube or a resistor rated at 1watt or more. Lead tension around protruding metal surfaces or edges must be avoided.
6. Critical components having special safety characteristics are identified with ans bythe Ref.No in the parts list and enclosed within a broken line *(Where several critical components are grouped in one area) along with the safety symbols on the schematic diagrams and/or exploded views.
7.When servicing any unit, always use a separate isolation transformer for the chassis failure to use a separate isolation transformer may expose you to possible shock hazard, and may cause damage to servicing instruments.
8. Many electronic products use a polarized ac line cord(one wide pin on the plug). Defeating this safety feature may create a potential hazard to the service and the user. Extension cords which do not incorporate the polarizing feature should never be used.
9. After reassembly of the unit, always perform an leakage test or resistance test from the line cord to all exposed metal parts of the cabinets. Also check all metal control shafts(with knobs removed), antenna terminals, handles, screws, etc. To be sure the unit may be safety operated without danger of electrical shock.
* Broken line

Implosion

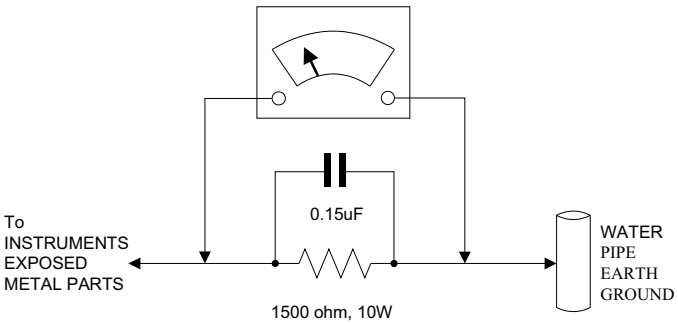
1. All picture tubes used in current model receivers are equipped with an intergral implosion system care should always be used, and safety glasses worn, whenever handling any picture tube. Avoid scratching or other wise damaging the picture tube during installation.
2. Use only replacement tubes specified by the manufacturer.

X-radiation

1. Be sure procedures and instructions to all your service personal cover the subject of X-radiation. Potential sources of X-rays in TV receivers are the picture tube and the high voltage circuits. The basic precaution which must be exercised is to keep the high voltage at the factory recommended level.
2. To avoid possible exposure to X-radiation and electrical shock, only the manufacturer's specified anode connectors must be used.
3. It is essential that the service technician has an accurate HV meter available at all times. The calibration of this meter should be checked periodically against a reference standard.
4. When the HV circuitry isoperating properly there is no possibility of an X-radiation problem. High voltage should always be kept at the manufacture, rated value-no higher- for optimum performance. Every time a color set is serviced, the brightness should be run up and while monitoring the HV with a meter to be certain that the HV is requation correctly and does not exceed the specified value. We suggest that you and your technicians review test procedures so that HV requation are always checked as a standard servicing procedure, and the reason for this prudent routine is cleanly understood by everyone. It is important ot use an accurate and reliable HV meter. It is recommended that the HV recorded on each customer's invoice, which will demonstrate a proper concern for the customer's safety.
5. When troubleshooting and making test measurements in a receiver with a problem of excessive high voltage, reduce the line voltage by means of a variac to bring the HV into acceptable limits while troubleshooting. Do not operate the chassis loner than necessary to locate the cause of the excessive HV.
6. New picture tubes are specifically designed to withstand higher operating voltages without creating undesirable X-radiation. It is strongly recommended that any shop test fixture which is to be used with the new higher voltage chassis be equipped with one of the new type tubes designed for this service. Addition of a permanently connected HV meter to the shop test fixture is advisable. The CRT types used in these new sets should never be replaced with any other types, as this may result in excessive X-radiation.
7. It is essential to use the specified picture tube to avoid a possible X-radiation problem.
8. Most TV receivers contain come types of emergency" Hold Down" circuit to prevent HV from rising to excessive levels in the presence of a failure mode. These various circuits should be understood by all technicians servicing them, especially since many hold down circuits are inoperative as long as the receiver performs normally.

Leakage Current Cold Check

1. Unplug the ac line cord and connect a jumper between the two prongs of the plug.
2. Turn on the power switch.
3. Measure the resistance value between the jumpered ac plug and all exposed cabinet parts of the receiver, such as screw heads, antennas, and control shafts. When the exposed metallic part has a return path to the chassis, the reading should be between 1 megohm and 5.2 megohms. When the exposed metal does not have a return path to the chassis, the reading must be infinity. Remove the jumper from the ac line cord.



Leakage Current Hot Check

1. Do not use an isolation transformer for this test. Plug the completely reassembled receiver directly into the ac outlet.
2. Connect a 1.5k, 10w resistor paralleled by a 0.15uf capacitor between each exposed metallic cabinet part and a good earth ground such as a water pipe, as shown above.
3. Use an ac voltmeter with at least 5000 ohms volt sensitivity to measure the potential across the resistor.
4. The potential at any point should not exceed 0.75 volts. A leakage current tester may be used to make this test; leakage current must not exceed a possibility of shock hazard. The receiver should be repaired and rechecked before returning it to the customer.
5. Repeat the above procedure with the ac plug reversed.(note: an ac adapter is necessary when a polarized plug is used. Do not defeat the polarizing feature of the plug.)

Picture Tube Replacement

The primary source of X-radiation in this television receiver is the picture tube. The picture tube utilized in this chassis is specially constructed to limit X-radiation emissions. For continued X-radiation protection, the replacement tube must be the same types as the original, including suffix letter, or a Philips approved tube.

Parts Replacement

Many electrical and mechanical parts in Philips television sets have special safety related characteristics. These characteristics are often not evident from visual inspection nor can the protection afforded by them necessarily be obtained by using replacement components r=ated for higher voltage, wattage, etc. The use of a substitute part which does not have the same safety characteristics as the Philips recommended replacement part should in this service manual may create shock, fire, or other hazards.

WARNING: Before removing the back cover, turn the unit OFF and short the HIGH VOLTAGE to the ground.