

Service  
Service  
Service



EPA POLLUTION PREVENTER



HP L1502  
AJ6S40/02  
w/o audio



Compaq fp5315  
AJ2S4M/02  
w/ audio



HP L1523  
AJ6S4M/02  
w/ audio

# Service Manual

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Horizontal frequencies  
47 - 63 kHz

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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 GUIDELINES

# IMPORTANT SAFETY NOTICE

◀◀ Go to cover page

Proper service and repair is important to the safe, reliable operation of all HP Consumer Electronics Company\*\* Equipment. The service procedures recommended by HP 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. HP 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, HP has not undertaken any such broad evaluation. Accordingly, a servicer who uses a service procedure or tool which is not recommended by HP 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, HP Consumer Electronics Company will be referred to as HP.

## 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- Invisible 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.

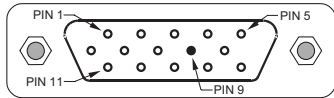
Take care during handling the LCD module with backlight unit

- 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 person's 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 cause 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 Specifications LCD

Vendor	LGPL	CPT	QDI
Updated date	2002-Aug-30	2002-Dec.-13	2003-June-02
<b>Physical Dimension (mm)</b>			
Model Number	LS150X05	CLAA150XG08	QD15Xr01
Diagonal Size --- inch	15.0"	15.0"	15.0"
Active Area (W x H)	304.1x228.1	304.1x228.1	304.1x228.1
Display Pixels (W x H)	1024(x3) x 768	1024(x3) x 768	1024(x3) x 768
Pixel Pitch	(0.099x3) x 0.297	(0.099x3) x 0.297	(0.099x3) x 0.297
Display Outline (W x H x T)	326.0x254.0x11.5	326.0x251.0x12	321x249x11
Weight	995g	1100g	1200g
<b>Optical Characteristics</b>			
Number of Colors	6 bits (262K)	6 bits (262K)	6 bits(262K)
Contrast Ratio	400(typ),250(min)	400(typ),300(min)	400(typ)
Viewing Angle (L/R) --- C/R>10	60/60(typ)	60/60(typ)	75/75(typ)
Viewing Angle (U/D) --- C/R>10	45/45(typ)	45/55(typ)	60/65(typ)
Luminance --- nits	250(typ),200(min)	250(typ),200(min)	250(typ),200(min)
White ( x , y )	313 , 329	312, 318	313,329
Red ( x , y )	626 , 347	643,344	637,340
Green ( x , y )	308 , 588	304,566	302,582
Blue ( x , y )	146 , 119	141, 85	146,97
Color Gamut -- %	59.5%	63%	62%
Luminance Uniformity (min)	75%	75%	75%
Backlight Life (min)	40Khrs	35Khrs	30Khrs
Crosstalk (max)	1.20%	1.5%	1.5%
<b>Electrical Characteristics</b>			
Supply Voltage	3.3V	3.3V ; 12V	3.3V
Operating Ambient Temp	0 ~ 50C	0 ~ 55C	0 ~ 50C
Power Consumption (max)	10.4W	10.8W	11W
Main Clock (Typ-Max)	50~79MHz	50~79MHz	50~80MHz
Response time (Tr+Tf)	25ms(typ)	25ms(typ)	25ms(typ)

### Pin Assignment:



PIN	MNEMONIC	SIGNAL
1	RV	Red Video
2	GV	Green Video/Sync on Green
3	BV	Blue Video
4	NC	None
5	GND	Ground (DDC Return) or Cable detect
6	RG	Red GND
7	GG	Green GND
8	BG	Blue GND
9	+5 V	+5 V
10	SG	Sync GND or Cable detect
11	NC	None
12	SDA	DDC Data
13	HS	Horizontal Sync
14	VS	Vertical Sync
15	SCL	DDC Clock

### Unit dimension / Weight

Set Dimension (incl. Pedestal): W340mm xD185.3mmxH338mm.  
 New weight: 3.6 Kg

### Temperature Ranges

Operating Temperature (Independent of altitude) : 5 to 35 DegreeC.  
 Non-Operating Temperature (Independent of altitude): -20 to 60 DegreeC.

### Humidity

Operating (non-condensing) : 20% to 80%  
 Non-Operating (38.7Degree C maximum wet bulb temperature) : 5% to 90%

### Altitude

Operating : 0 to 12,000 feet [3,658 m].Equivalent to 14.7 to 10.1 psia.  
 Non-Operating : 0 to 40,000 feet [12,192 m].Equivalent to 14.7 to 4.4 psia

### FACTORY PRESET DISPLAY MODES

Preset	Pixel Format	Horz Freq (KHz)	Horz Polarity	Vert Freq (Hz)	Vert Polarity	Pixel Clk (MHz)	Source
1	640 x 480	31.469	-	59.940	-	25.175	VGA
2	640 x 480	37.861	-	72.809	-	31.500	VESA
3	640 x 480	37.500	-	75.000	-	31.500	VESA
4	720 x 400	31.469	-	70.087	+	28.322	VGA
5	800 x 600	37.879	+	60.317	+	40.000	VESA
6	800 x 600	48.077	+	72.188	+	50.000	VESA
7	800 x 600	46.875	+	75.000	+	49.500	VESA
8	832 x 624	49.726	+/-	74.551	+/-	57.284	MAC
9	1024 x 768	48.363	-	60.004	-	65.000	VESA
10	1024 x 768	56.476	-	70.069	-	75.000	VESA
11	1024 x 768	60.023	+	75.029	+	78.750	VESA

### Power management

CPU State	Monitor State	Maximum Power (Watts)	Power Switch LED Color
Full Power	Full Power	25	Green
Sleep	Sleep	2	Amber
-	Switch Off	2	(LED off)



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# Connecting The Monitor

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## Connecting to Your PC

1. Place the monitor in a convenient, well-ventilated location near your computer.
2. Connect the monitor signal cable on the back of the monitor to the video connector on the rear panel of the computer.
3. Connect one end of the power cable to the back of the monitor, and the other end to an electrical wall outlet.



Connecting the VGA and Power Cables

4. If your monitor is a multimedia model, connect one end of the audio cable to the back of the monitor, and the other end to the audio Connector on the back of the computer.



Connecting the Audio Cable

## Installing the Monitor Pedestal

To install the monitor pedestal:

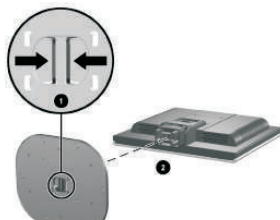
1. Place the pedestal plate on your desktop or table and check to be sure the arrow on the underside of the plate is facing forward.

Do not install the base if the monitor will be used on a wall, swing arm, or other mounting fixture; instead see the section on □Mounting the Monitor□ in this chapter.

2. Using both hands, position the monitor over the pedestal base and press down firmly to lock the pedestal base in place. When the base locks, it will make a clicking sound. Make sure the pedestal base is securely locked before continuing with the setup.



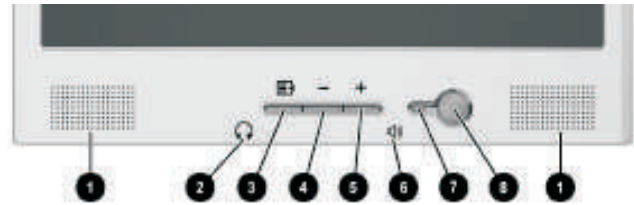
Inserting the Monitor into the Pedestal Base



Removing the Pedestal Base

If you need to remove the pedestal base, lay the monitor down on a soft protected surface. On the bottom side of the pedestal base, press together the two tabs as shown in the following illustration. This will release the pedestal from the base.

## Front Panel Components



L1502m, L1702m, f1523, f1723, FP5315, and FP7317 Monitors

- 1 Speakers Audio feature for music,alarms,etc.(multimedia models only)
- 2 (Headphone jack)Connects a headphone set to the monitor.
- 3 Menu button Launches the On-Screen Display (OSD) menu and selects functions.
- 4 (Minus button) When OSD is inactive, auto-adjusts the screen Image. When OSD is active, navigates in reverse through the OSD and adjusts OSD scale settings.
- 5 + (Plus button) When the OSD is active, navigates through the OSD and adjusts OSD scale settings.
- 6(Volume control)Controls the volume level of the monitor speakers.
- 7 Power LED Fully powered = Green.  
Sleep mode = Amber.  
Sleep Timer mode = Flashing Amber.
- 8 Power Switch Powers the monitor on and off.  
No. Control Function  
No. Control Function




FP15, FP17, L1502, L1702, v15, and v17 Monitors

- 1 Menu button Launches the On-Screen Display (OSD) menu and selects functions.
- 2 (Minus button) When OSD is inactive, auto-adjusts the screen image. When OSD is active, navigates in reverse through the OSD And adjusts OSD scale settings.
- 3 + (Plus button) When the OSD is active, navigates through the OSD and adjusts OSD scale settings.
- 4 Power LED Fully powered = Green.  
Sleep mode = Amber.  
Sleep Timer mode = Flashing Amber.
- 5 Power Switch Powers the monitor on and off.Number Control Function

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Main manu
Brightness
Contrast
Image control
Color
Language
Management
OSD control
Factory reset
Exit

Pressing the Menu button (  ) the first time brings up the BASIC menu level. The + and buttons move up and down the menu, respectively. The selected menu function shall be highlighted in orange text for all menus. Pressing the Menu button again brings up the second menu level for the item selected. The selection will wrap around if the bottom item is selected and the button is pressed, the selection will move to the top item. Likewise, if the top item is selected and the + button is pressed, the selection will move to the bottom item. Selecting the “Advanced Menu” from the Basic Menu will result in the display of the ADVANCED OSD. The Advanced Menu will remain the default OSD upon subsequent power-ups of the monitor until the “Basic Menu” option is selected or until “factory reset” is selected.

### ADVANCED OSD MODE CONFIGURATION

Mode Menu			
Menu Level 1	Menu Level 2	Menu Level 3	Factory Reset
Brightness	ADJ Scale		Y (FD = 100)
Contrast	ADJ Scale		Y (FD = 50)
Image Control	Auto Adjustment	Show “Adjusting...” message	Y (no FD)
	Horizontal Position	ADJ Scale	Y (no FD)
	Vertical Position	ADJ Scale	Y (no FD)
	Clock	ADJ Scale	Y (no FD)
	Clock Phase	ADJ Scale	Y (no FD)
	Cancel		
	Save and Return		
Color	9300 K		
	6500 K-sRGB		Y (FD = 6500 K-sRGB )
	Custom Color	R/G/B Color ADJ	Y(FD =100)
	Cancel		
	Save and Return		
Language	Deutsch		
	English		N (FD=English)
	Español		
	Français		
	Italiano		
	Nederlands		
	Cancel		
	Save and Return		
Management	Power Saver	On / Off Selection	N (FD=ON)
	Power On Recall	On / Off Selection	N (FD=ON)
	Mode Display	On / Off Selection	N (FD=OFF)
	Sleep Timer	Timer Set Menu	N (FD=0;OFF)
	Cancel		
	Save and Return		
OSD Control	Horizontal OSD Position	ADJ Scale	N (FD=50)
	Vertical OSD Position	ADJ Scale	N (FD=50)
	OSD Timeout	ADJ Scale	N (FD=30)
	Cancel		
	Save and Return		
Factory Reset	Yes		
	No		
Exit			


## Warning message table

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## BASIC OSD MODE CONFIGURATION

Mode Menu			
Menu Level 1	Menu Level 2	Menu Level 3	Factory Reset
Brightness	ADJ Scale		Y (FD = 100)
Contrast	ADJ Scale		Y ( FD = 50)
Auto Adjustment	Show <input type="checkbox"/> Adjusting <input type="checkbox"/> message		Y (no FD)
Advanced Menu	Refer to table 8		
Exit			

## Warning message table

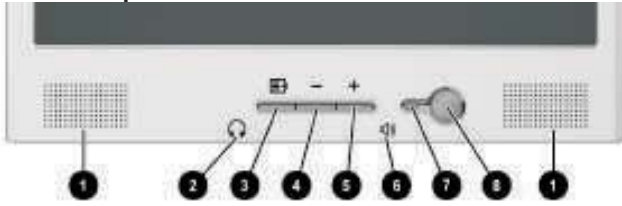
Item	Attention Signals	Display Time	Condition
1	Input Signal out of Range		see power saver table
2	No Input Signal		see power saver table
3	Going to Sleep		see power saver table
4	Adjusting <input type="checkbox"/> ..		The Minus ( " - " ) button shall be a hot-key for the Auto-Adjustment process. Menu button (  ), shall be hot-key for OSD Menu Exit
5	OSD Lockout	10secs	Push menu key for 10 sec then display 10 sec WM <input type="checkbox"/> OSD Lockout <input type="checkbox"/>
6	Check Video Cable		see power saver table

Power Saver table			
	Power Saver - On	Power Saver - Off	Note
Quit signal with cable	1. System blank and show WM "Going to Sleep" 3 sec then sleep.	1. System blank and show moving WM "No Input Signal" always.	
Disconnect cable	1. System blank and show WM <input type="checkbox"/> Check Video Cable <input type="checkbox"/> 10 sec then moving about 50 sec. 2. Show WM <input type="checkbox"/> Going to Sleep <input type="checkbox"/> 3 sec then sleep. 3. If push any key in sleep mode, then repeat item 1 to 2.	1. System blank and show WM <input type="checkbox"/> Check Video Cable <input type="checkbox"/> 10 sec then moving always.	
Out of range <input type="checkbox"/> 1	1. System blank and show moving WM <input type="checkbox"/> Input Signal out of Range <input type="checkbox"/> 60 secs. 2. Show WM <input type="checkbox"/> Going to Sleep <input type="checkbox"/> 3 sec then sleep. 3. If push any key in sleep mode, then repeat item 1 to 2.	1. System blank and show moving WM <input type="checkbox"/> Input Signal Out of Range <input type="checkbox"/> always.	H<29.5 or H>82.5 or V<49 or V>87 or Vtotal>=1200
Out of range <input type="checkbox"/> 2	1. Show moving WM "Input Signal out of Range" 60 sec. 2. Menu key can active during moving WM and operate OSD menu. 3. WM disappear if menu key push or after WM 60 sec.	1. Show moving WM <input type="checkbox"/> Input Signal out of Range <input type="checkbox"/> 60 sec. 2. Menu key can active during moving WM and operate OSD menu. 3. WM disappear if menu key push or after WM 60 sec.	DownScaling Ex. 1280x1024
Out of range <input type="checkbox"/> 3	1. Show moving WM "Input Signal out of Range" 60 sec. 2. After moving WM 60 sec then show WM <input type="checkbox"/> Going to Sleep <input type="checkbox"/> 3 sec then sleep. 3. If push any key in sleep mode, then repeat item 1 to 2.	1. Show moving WM <input type="checkbox"/> Input Signal out of Range <input type="checkbox"/> 60 sec. 2. After moving WM 60 sec then show WM <input type="checkbox"/> Going to Sleep <input type="checkbox"/> 3 sec then sleep. 3. If push any key in sleep mode, then repeat item 1 to 2.	85Hz

# OSD Lock/Unlock, Aging & , Enable/Disable "warning message"

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## Front control panel



L1502m, L1702m, f1523, f1723, FP5315, and FP7317 Monitors

Fig. 1

- 1 Speakers Audio feature for music,alarms,etc.(multimedia models only)
- 2 (Headphone jack)Connects a headphone set to the monitor.
- 3 Menu button Launches the On-Screen Display (OSD) menu and selects functions.
- 4 (Minus button) When OSD is inactive, auto-adjusts the screen Image. When OSD is active, navigates in reverse through the OSD and adjusts OSD scale settings.
- 5 + (Plus button) When the OSD is active, navigates through the OSD and adjusts OSD scale settings.
- 6(Volume control)Controls the volume level of the monitor speakers.
- 7 Power LED Fully powered = Green.  
Sleep mode = Amber.  
Sleep Timer mode = Flashing Amber.
- 8 Power Switch Powers the monitor on and off.  
No. Control Function  
No. Control Function

## To Lock/Unlock OSD function (User Mode)

The OSD function can be locked by pressing "Menu" button(3) for more than 10 seconds, the screen shows following windows for 3 seconds. Everytime when you press " - " or " + " button, this message appears on the fly screen automatically.

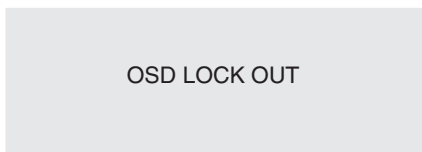


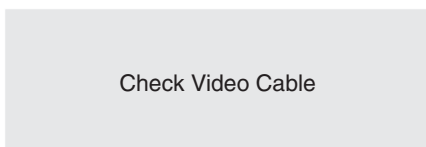
Fig. 2

### Unlock OSD function:

Locked OSD function can be released by pressing "Menu" button for more than 10 seconds again.

## To Enable/Disable "Warning message" on screen (in User Mode)

**Step 1:** Turn on LCD monitor, and disconnect Interface Cable between Monitor and PC. bring up



Status 1.: **Connect signal cable again  
=> go back to Windows screen.**

## Access Aging.. Mode

**Step 1:** Turn off LCD monitor, and disconnect Interface Cable between Monitor and PC.

### Step 2 :

[Push " & " + " buttons at the same time and hold it ] +  
[Press power " " button untill comes out "AGING screen"  
] => then release all buttons.

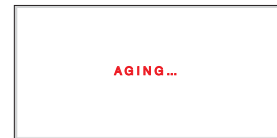
Bring up :



After 15 seconds, bring up :



After 15 seconds, bring up :



After 15 seconds, bring up :

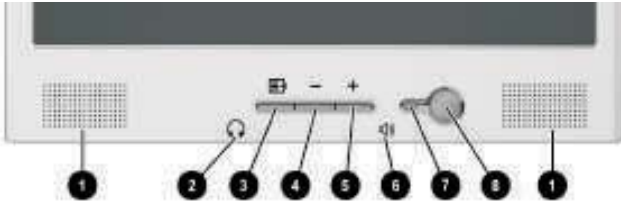


-----  
-----  
repealty

**Connect signal cable again => go back to normal display.**

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### Front control panel



L1502m, L1702m, f1523, f1723, FP5315, and FP7317 Monitors

Fig. 1

### Basic and simple instruction on the control keys.

When you press the button on the front control of your monitor, the On-Screen Display (OSD) Main Controls window will pop up and you can then start making adjustments to your monitor's various features.

### Access Factory Mode

How to Get into Factory Mode Menu

#### Step 1 :

Turn off monitor.

#### Step 2 :

[Push " " & " + " buttons at the same time and hold it ] +  
[Press power " " button until comes out "Windows screen"  
] => then release all buttons.

#### Step 3 :

Press OK " " button, bring up Factory mode indication as shown in Fig 2.



Fig. 2

### Factory menu

Cursor can move on gray color area

Hot key function: by pressing "UP" and "DOWN" key simultaneously at User mode (or Factory mode).

(PS: The Offset R G B function can be used on reduce or eliminate snowy noise on the background when the resolution of video signal is 1280 X 1024 vertical 60Hz. Slightly increase or decrease the value until snowy noise completely disappear.)

HPL1502 f1523 FP5315 V200 20030822											
BL :	0										
SUB - BRI :	165	255									
SUB - CON :	100	127	154								
9300K	R	Xxx	G	Xxx	B	xxx					
6500K	R	Xxx	G	Xxx	B	xxx					
SRGB	R	Xxx	G	Xxx	B	xxx	B	255	C	128	
OFFSET2	R	Xxx	G	Xxx	B	xxx					
GAIN	R	Xxx	G	Xxx	B	xxx	M	255	m	200	
AUTO-SUB		OK?		OSDTIMER		60					
VCOM		135	IDX :			76					
OFFSET1	R	Xxx	G	Xxx	B	xxx					
PanelType:		Xxx	LG:17	CPT:34	QDI:68		Other:auto				
SCALER.ADD:			VAL:		READ		WRITE				
NVRAM.ADD:			VAL:		READ		WRITE				
PANEL.ID:		LG	LS150	X08A4							
			1024x768	48.7KHz @60Hz							

Fig. 3

BL : Blacklevel value

SUB-BRI : Brightness value range(Min Max). Fix value for continue mode requirement.LG(Min=165, Max=255), CPT(Min=165, Max=230), QDI(Min=165, Max=225).

SUB-CON : Contrast value range(Min Mid Max)

SRGB-B : Brightness of sRGB(Reserved)

SRGB-C : Contrast of sRGB(Reserved)

Gain-m : Minimum value of User Gain

Gain-M : Maximum value of User Gain

AUTO-SUB: To do Auto color function when push "Up" key in White pattern

OSDTIMER : OSD time out control (sec) Unused in this project

VCOM : For LG panel control

IDX : Limit current of inverter(Fix value QDI: 76, CPT: 45, LG:5)

Panel Type: If set this to 17, 34 or 68 then system will force panel type to LG, CPT or QDI. Set to other value will auto detect panel based on panel hardware.

SCALER : Read/Write scaler register

NVRAM : Read/Write eeprom address

### SUB — CON:

Contrast adjustment (Sub-Contrast). Use this menu item to adjust the contrast gain of pre-amp ranges from 0 to 255.

9300K R G B

6500K R G B

Color temperature gain adjustment. Use these menu items to adjust the RGB gains of pre-amp for different color temperatures, ranges from 0 to 255.

OFFSET R G B

Sub-Brightness adjustment. Use this menu item to adjust the brightness level (DC-level) of pre-amp range from 0 to 255.(R/G/B ANALOG DC -level).

GAIN R G B

R/G/B GAIN adjustment. Use this menu item to adjust the R/G/B (GAIN) of Amp. range from 0 to 255.(R/G/B ANALOG GAIN Values).

AUTO — SUB: 

**Do not use this function here.**

It is for 1024x768/60Hz with special pattern only.



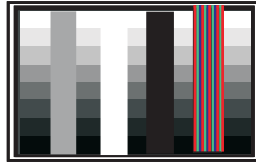
## Quick reference for failure mode of LCD panel

This page presents problems that could be made by LCD panel. It is not necessary to repair circuit board. Simply follow the **□Mechanical instruction□** on this manual to eliminate failure by replace LCD panel or backlight tubes.

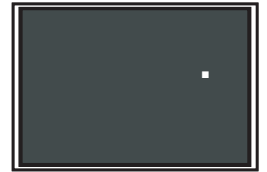
### Failure description

### Phenomenon

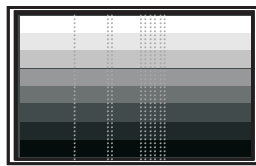
Vertical block defect



Polarizer has bubbles



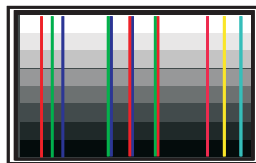
Vertical dim lines



Polarizer has bubbles



Vertical lines defect  
(Always bright or dark)



Foreign material inside polarizer. It shows linear or dot shape.



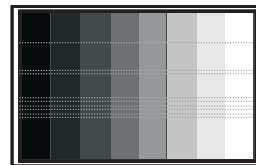
Horizontal block defect



Concentric circle formed



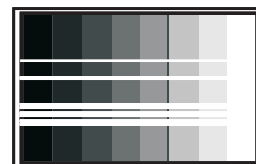
Horizontal dim lines



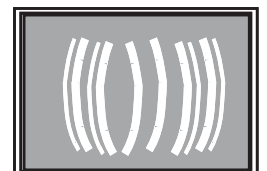
Bottom back light of LCD is brighter than normal



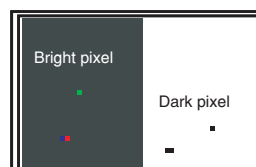
Horizontal lines defect  
(Always bright or dark)



Backlight un-uniformity



Has bright or dark pixel



Backlight has foreign material. Black or white color, linear or circular type



# Troubleshooting

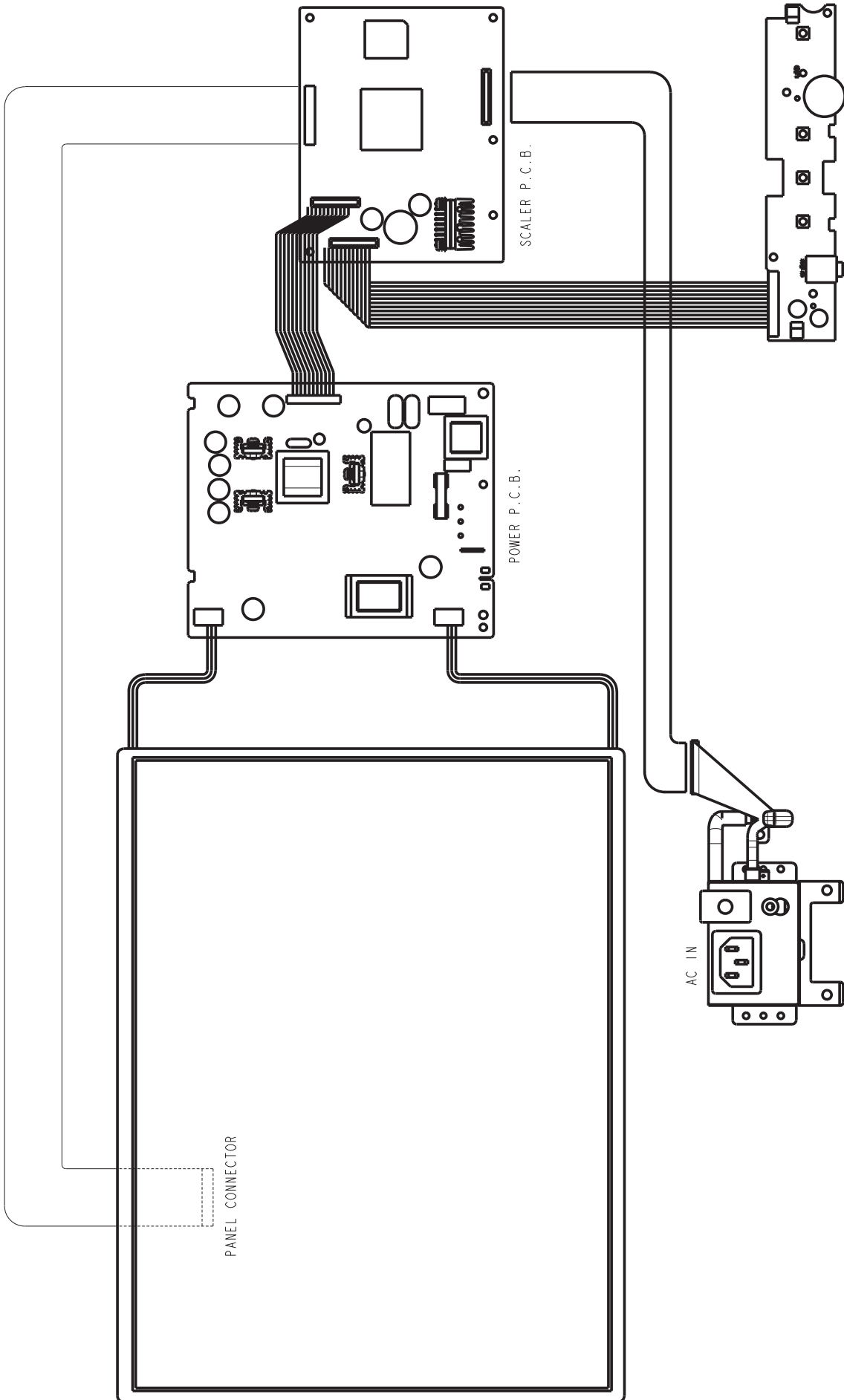
◀◀ Go to cover page

## Solving Common Problems

The following table lists possible problems, the possible cause of each problem, and the recommended solutions.

<b>Problem</b>	<b>Possible Cause</b>	<b>Solution</b>
Screen is blank.	Power cord is disconnected.	Connect the power cord.
	Power switch is turned Off.	Turn on the power.
	Video cable is improperly connected.	Connect the video cable properly.
	Screen blanking utility is active.	Depress any key on the keyboard or move the mouse to inactivate the screen blanking Utility.
Image appears blurred, indistinct, or Too dark.	Brightness and contrast are too low.	Press the Minus button on the monitor front panel to auto-adjust the screen. If that Does not work, press the Menu button to open the Basic OSD Menu, and adjust the brightness and contrast scales as needed.
Image is not Centered.	Position may need Adjustment.	When OSD is inactive, press-(minus button) to auto-adjust the screen image. Press the Menu button to access the Advanced OSD menu. Select Image Control/Horizontal Position or Vertical Position to adjust the horizontal or vertical position of the image.
Check Video Cable is displayed on screen.	Monitor video cable is disconnected.	Connect the 15-pin monitor video cable to the VGA connector on the computer. Be sure that the computer power is off while connecting the video Cable.
(Input Signal Out of Range) is displayed on screen.	Video resolution and/or refresh rate are set higher than what your monitor supports.	Restart your computer and enter Windows Safe Mode by pressing the F6 Function key when the computer starts to boot up. Change your settings to a supported setting. Restart your computer so that the new settings take effect.

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## Optimizing Performance

For best performance, ensure that your display settings are set at 1024x768@60Hz (for 14"/15") or 1280x1024, 60Hz (for 17"/18").

Note: You can check the current display settings by pressing the 'OK' button once. Go into the Product Information.

The current display mode is shown on the item called RESOLUTION.

You can also install the Flat Panel Adjust (FP Adjust) program, a program for getting the best performance out of your monitor. This included on this CD. Step-by-step instructions are provided to guide you through the installation process. Click on the link to know more about this program.

## Installing FPadjust Program

The FP Adjust program generates alignment patterns which will help you adjust monitor settings such as CONTRAST, BRIGHTNESS, HORIZONTAL & VERTICAL POSITION, PHASE and CLOCK.

System requirements:

PC running Windows 95, Windows 98, Windows 2000, Windows Me, Windows XP or later

To install FPadjust Program:

Click on the link or icon to install FPadjustment Program.

or

Click-and-hold your mouse over the icon. (Win95/98/2000/Me/XP users right-click)

Download FP\_setup04.exe

From the menu that appears, choose 'Save Link As...', 'Save Target As...' or 'Download Link to Disk'.

Choose where you would like to save the file; click 'Save' (if prompted to save as either 'text' or 'source', choose 'source'). Exit your browser and install the FPadjust Program. Read the "FP\_Readme04.txt" file before installing.

## LCD Monitor Quality and Pixel Policy

The TFT monitor uses high-precision technology, manufactured according to HP standards, to guarantee trouble-free performance. Nevertheless, the display may have cosmetic imperfections that appear as small bright or dark spots. This is common to all LCD displays used in products supplied by all vendors and is not specific to the HP LCD. These imperfections are caused by one or more defective pixels or sub-pixels.

1. A pixel consists of one red, one green, and one blue sub-pixel.
2. A defective whole pixel is always turned on (a bright spot on a dark background), or it is always off (a dark spot on a bright background). The first is the more visible of the two.
3. A defective sub-pixel (dot defect) is less visible than a defective whole pixel and is small and only visible on a specific background. The HP display does not have more than:
  4. 3 bright dots.
  5. 5 dark dots.
  6. 5 total bright and dark dots.
7. No more than two adjacent (less than 2.5 mm edge-to-edge) defective pixels.

To locate defective pixels, the monitor should be viewed under normal operating conditions, in normal operating mode at a supported resolution and refresh rate, from a distance of approximately 50 cm (16 in.).

HP expects that, over time, the industry will continue to improve its ability to produce LCDs with fewer cosmetic imperfections. And HP will adjust guidelines as improvements are made.

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Front view-HP L1523



Fig. 1

Back view



Fig. 2

Step 1. Remove the Base as Fig .3  
Remove the four screws of Back cover as Fig. 4.



Fig. 3

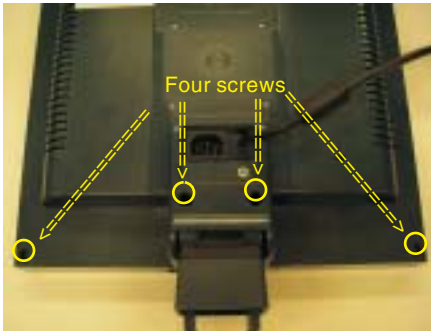
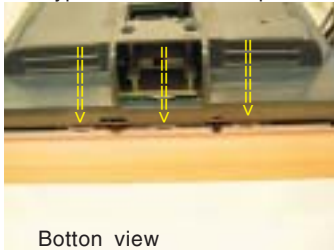
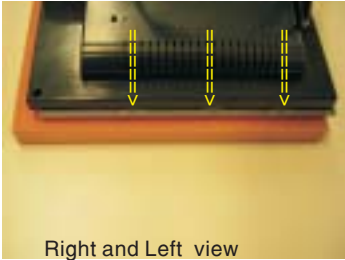


Fig. 4

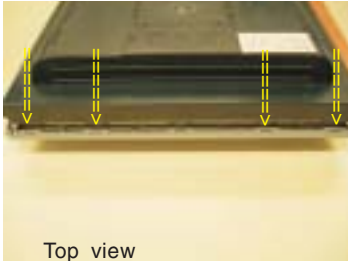
Step 2.Remove the back cover  
Use the thin "I" type screw driver to open the clicks as Fig.5~7.



Botton view Fig.5



Right and Left view Fig.6



Top view Fig.7

Step 3. Remove the 13 screws  
And Disconnect the 4 cables as Fig.8

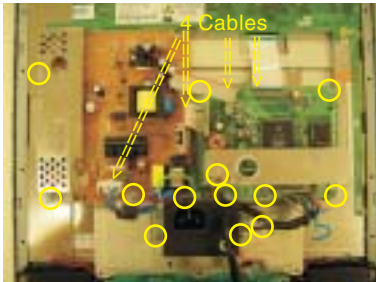


Fig.8

Step 4. Disconnect the 2 cables as Fig.9

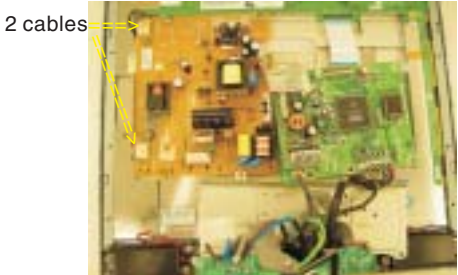


Fig.9

Remove the Scaler and Power board as Fig. 10.

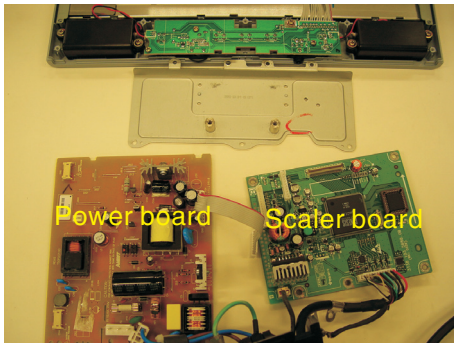


Fig. 10



Fig. 14

Step 5. Remove the control board  
Remove the seven screws and cable as Fig. 11 & 12.

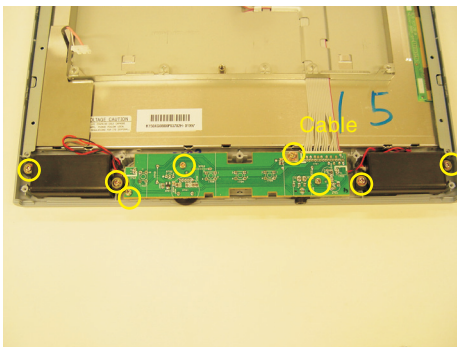


Fig. 11



Fig. 15

1050	9322 196 43682	TFT-LCD LS150X05 (LGPH)
1050	9322 195 10682	TFT-LCD CLAA150XG08 (CPT0)

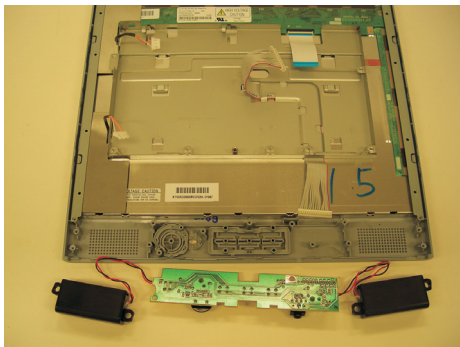


Fig. 12

\*\*\*\*\*  
In warranty, it is not allowed to disassembly the LCD panel, even the backlight unit defect.  
Out of warranty, the replacment of backlight unit is a correct way when the defect is cused by backlight (CCFL,Lamp).  
\*\*\*\*\*

Step 6. Remove the Front Bezel  
Use the thin "I" type screw driver to open the clicks as Fig.13 & 14.

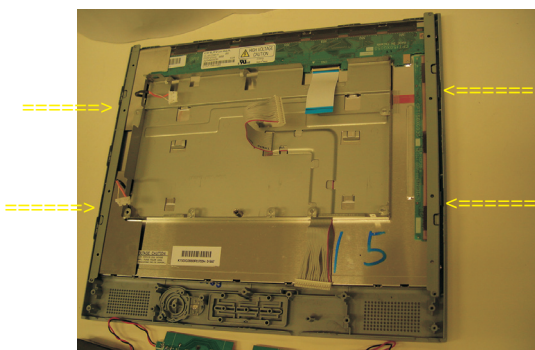


Fig. 13

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All units that are returned for service or repair must pass the original manufactures safety tests. Safety testing requires both *Hipot* and *Ground Continuity* testing.

## HI-POT TEST INSTRUCTION

### 1. Application requirements

- 1.1 All mains operated products must pass the Hi-Pot test as described in this instruction.
- 1.2 This test must be performed again after the covers have been refitted following the repair, inspection or modification of the product.

### 2. Test method

#### 2.1 Connecting conditions

- 2.1.1 The test specified must be applied between the parallel-blade plug of the mainscord and all accessible metal parts of the product.
- 2.1.2 Before carrying out the test, reliable conductive connections must be ensured and thereafter be maintained throughout the test period.
- 2.1.3 The mains switch(es) must be in the "ON" position.

#### 2.2 Test Requirements

All products should be HiPot and Ground Continuity tested as follows:

Condition	HiPot Test for products where the mains input range is Full range(or 220V AC)	HiPot Test for products where the mains input is 110V AC(USA type)	Ground Continuity Test requirement
Test voltage	2820VDC (2000VAC)	1700VDC (1200VAC)	Test current: 25A,AC Test time: 3 seconds(min.) Resistance required: $\leq 0.09 + R$ ohm, R is the resistance of the mains cord.
Test time (min.)	3 seconds	1 second	
Trip current (Tester)	set at 100 uA for Max. limitation; set at 0.1 uA for Min. limitation	5 mA	
Ramp time	set at 2 seconds		

- 2.2.1 The test with AC voltage is only for production purpose, **Service center shall use DC voltage.**
- 2.2.2 The minimum test duration for Quality Control Inspector must be 1 minute. No breakdown during the test.
- 2.2.3 The test voltage must be maintained within the specified voltage + 5%.
- 2.2.4 The grounding blade or pin of mains plug must be conducted with accessible metal parts.

### 3. Equipments and Connection

#### 3.1. Equipments

- For example :
- ChenHwa 9032 PROGRAMMABLE AUTO SAFETY TESTER
  - ChenHwa 510B Digital Grounding Continuity Tester
  - ChenHwa 901 (AC Hi-pot test), 902 (AC, DC Hi-pot test) Withstanding Tester

#### 3.2. Connection

- \* Turn on the power switch of monitor before Hipot and Ground Continuity testing.

(ChenHwa 9032 tester)

Connect the "video cable" or "grounding screw" to the CLIP on your tester.

Connect the power cord to the monitor.

(Rear view of monitor)

### 4. Recording

Hipot and Ground Continuity testing records have to be kept for a period of 10 years.



## 1. General points

- 1.1 During the test and measuring, supply a distortion free AC mains voltage To the apparatus via an isolated transformer with low internal resistance.
  - 1.2 All measurements mentioned hereafter are carried out at a normal mains voltage (90 - 132 VAC for USA version, 195 -264 VAC for EUROPEAN version, or 90 - 264 VAC for the model with full range power supply, unless otherwise stated.)
  - 1.3 All voltages are to be measured or applied with respect to ground, unless otherwise stated.
- Note: don't use heat-sink as ground.
- 1.4 The test has to be done on a complete set including LCD panel after 30 minutes warm-up at least in a room with temperature of 25 +/- 5 degree C.
  - 1.5 All values mentioned in this test instruction are only applicable of a well aligned apparatus, with correct signal.
  - 1.6 The letters symbols (B) and (S) placed behind the test instruction denotes (B): carried out 100% inspection at assembly line (S): carried out test by sampling
  - 1.7 The white balance (color temperature) has to be tested in subdued lighted room.
  - 1.8 Repetitive power on/off cycle are allowed except it should be avoided within 6 secretary.

## 2. Input signal

- 2.1 Signal type
  - Video: 0.7 Vpp linear, positive polarity
  - Sync. : TTL level, separate, positive or negative polarity
  - Reference generator: CHROMA 2200 or 2250
  - Allowed signal modes list: Table A

TABLE A  
FACTORY PRESET DISPLAY MODES

	Pixel Format	Horz Freq (KHz)	Horz Polarity	Vert Freq (Hz)	Vert Polarity	Pixel Clk (MHz)	
1	640 x 480	31.469	-	59.940	-	25.175	VGA
2	640 x 480	37.861	-	72.809	-	31.500	VESA
3	640 x 480	37.500	-	75.000	-	31.500	VESA
4	720 x 400	31.469	-	70.087	+	28.322	VGA
5	800 x 600	37.879	+	60.317	+	40.000	VESA
6	800 x 600	48.077	+	72.188	+	50.000	VESA
7	800 x 600	46.875	+	75.000	+	49.500	VESA
8	832 x 624	49.726	+/-	74.551	+/-	57.284	MAC
9	1024 x 768	48.363	-	60.004	-	65.000	VESA
10	1024 x 768	56.476	-	70.069	-	75.000	VESA
11	1024 x 768	60.023	+	75.029	+	78.750	VESA

## 3. Display Adjustment (B)

Access to factory mode. Check CPU version, if it is not right version, then ISP new one (7301). After pre-check, aging 1 hour at Least. Programming Analog DDC Data into Monitor.

- 3.1 Panel flicker adjustment (B)
  - Apply a 48kHz/60Hz signal with green pixel on/off at 128/256-level pattern for LG panel. Set brightness control at 100%, and contrast control at 50%, adjust GPIO1 of 7443 GM2116AA which is on scaler board to make panel's flicker minimum.
- 3.2 Auto color adjustment
  - Apply a 48.36kHz/60Hz signal with white pattern.
  - Set brightness at 100% and contrast at 80%.
  - Using auto color, let scaler calibrate offset1,offset2 and gain itself.
  - \*\* Check the 64-gray level is distinguishable.

- 3.3 Color temperature adjustment
  - Apply a 48.36kHz / 60Hz signal with white pattern.
  - Set brightness control at 100% and contrast control at 50%.
  - Adjust the R.G.B gain to reach special color temperature on center of screen. Keep one color fixed gain to maximum at least.
  - The 1931 CIE chromaticity (x, y) coordinates shall be:

	9300°K	6500°K-sRGB
x (center)	0.283 ± 0.005	0.313 ± 0.005
y (center)	0.297 ± 0.005	0.329 ± 0.005

Use Minolta CA-110 for color coordinates and luminance check.

## 3.4 NVRAM(24C16) Default Values

Sub\_Bri: 165 255/LG 230/CPT 225/QDI  
 Sub\_Con: 100 127 154  
 VCOM: 152

## 3.5 Factory Reset

After finishing all the adjustment, select Factory Reset function to recall:

- Do an automatic Auto-Adjustment
- Set Brightness = 100
- Set Contrast = 50
- Set Color = 6500K-sRGB
- Set Custom Color (R.G.B) = 100


## 3.6 Main Menu Factory Default Values

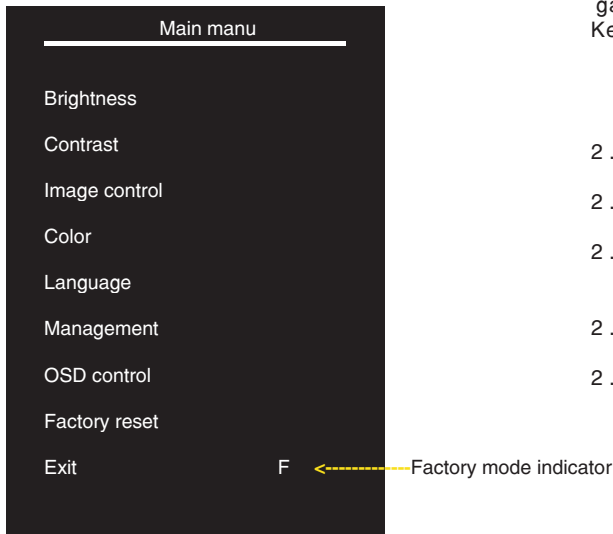
The OSD shall have the following factory default values:

- Language = English
- OSD Cotrol:
- Horizontal OSD position = 50
- Vertical OSD position = 50
- OSD timeout = 30s
- Management:
- Power Saver = ON
- Power On Recall = ON
- Mode display = OFF
- Sleep Timer = OFF
- Menu = BASIC

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## Display Adjustment:

Press  and + button simultaneously while power ON. Adjust OSD menu to lower position of screen (i.g. adjust OSD H-Position and OSD V-Position to 0 at OSD setup sub-menu. Then press **Down** or **Up** button to move the cursor to **Factory Entrance** item ( see yellow circle on table 1). Press **Menu** button to access to factory mode (see table2.). Check the code of CPU version if it is not right version, then ISP new one (7301). After pre-check, aging 1 hour at least. Programming Analog DDC data into Monitor. Check # serial number to meet bar code label.



**Table 2. The content of Factory setting.** see table 2. Cursor can move on gray color area

HPL1502 P1523 FP5315 V200		20030822		Version of code indicator	
BL:	0				
SUB - BRI :	165	255			
SUB - CON :	100	127	154		
9300K	R	Xxx	G	Nxx	B xxx
6500K	R	Xxx	G	Nxx	B xxx
SRGB	R	Xxx	G	Nxx	B xxx B 255 C 128
OFFSET2	R	Xxx	G	Nxx	B xxx
GAIN	R	Xxx	G	Nxx	B xxx M 255 m 200
<b>AUTO-SUB</b>	<b>OK!</b>				
OSDTIMER				60	
VCOM		135		IDX :	76
OFFSET1	R	Xxx	G	Nxx	B xxx
PanelType:		Xxx	LG:17	CPT:34	QDI: 68 Other: auto
SCALER-ADD:			VAL:	READ	WRITE
NVRAM-ADD:			VAL:	READ	WRITE
PANEL ID:		LG	LS150	N06A4	
	1024x768		48	3KHz @60Hz	

**Table 2.**

## 1. Auto color adjustment:

Apply a 48.36kHz/60Hz signal with white pattern. Set brightness at 100% and contrast at 50%. Move the cursor by pressing **Up** or **Down** button to **AutoColor**( see red circle on table 2 ), press OK button to do auto color, scaler would calibrate offset1,offset2 and gain itself then display OK. Check the 64-gray level is distinguishable.

## 2. Color temperature adjustment:

Apply a 48.36kHz / 60Hz signal with white pattern. Set brightness control at 100% and contrast control at 50%. Adjust the R.G.B gain to reach special color temperature on center of screen. Keep one color fixed gain to maximum at least.

- 2 .1 Aim the probe CA-A30 at the center of screen as Fig. 1
- 2 .2 Remove the lens protective cover of probe CA-A30.
- 2 .3 Set Measuring/viewing selector to Measuring position for reset analyzer. (Zero calibration) as Fig. 2
- 2 .4 Turn on the colour analyzer (CA-110).
- 2 .5 Press 0-CAL button to start reset analyzer. See Fig.3



Fig. 1

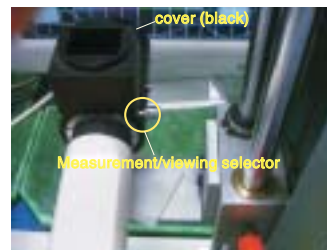


Fig. 2



Fig. 3

- 2.6 Switch light probe to Viewing position.
- 2.7 Move the Lens barrel forward or backward to get clear image as shown in Fig. 4
- 2.8 Switch light probe to Measuring position. It should be able to indicate colour value on the CA-110.

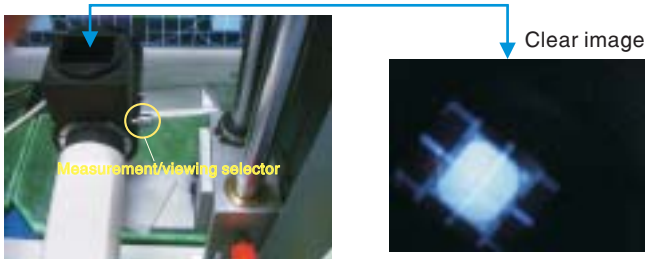


Fig. 4

- 2.9 Press **Menu** buttons to select R G B of 9300 and 6500. Increase / decrease value by press **Up** or **Down** buttons until the 1931 CIE chromaticity ( x, y ) as below.

	9300°K	6500°K
x (center)	0.283 ± 0.020	0.313 ± 0.020
y (center)	0.297 ± 0.020	0.329 ± 0.020

Alignment hits:

1. R for x value , G for y value, B for Y value on the colour analyzer.
2. Must to select 9300 in user mode, then 9300 is available in factory Mode.
3. Must to select 6500 in user mode, then 6500 is available in factory Mode.

### 3. NVRAM(24C16) Default Values:

Sub\_Bri: 165 255/LG 230/CPT 225/QDI

Sub\_Con: 100 127 154

VCOM: 152

### 4. Factory Reset:

After finishing all the adjustment, select Factory Reset function to recall:

- Do an automatic Auto-Adjustment
- Set Brightness = 100
- Set Contrast = 50
- Set Color = 6500K-sRGB
- Set Custom Color (R.G.B) = 100

To leave factory mode by restart the monitor.

### 5. EEPROM Presetting:

After finishing all the adjustment,Set:

- Brightness control to 100%
- Contrast control to 50%
- OSD position at middle of screen.
- Color Adjust to 6500K color.
- When adjustment is finished,monitor should be set to 6500K.

### 6.Main Menu Factory Default Values

The OSD shall have the following factory default values:

Language = English

OSD Cotrol:

- Horizontal OSD position = 50
- Vertical OSD position = 50
- OSD timeout = 30s

Management:

- Power Saver = ON
- Power On Recall = ON
- Mode display = OFF
- Sleep Timer = OFF

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## 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 "Analog DDC IC, & EEPROM".

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.

### 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 95/98 .  
You have to Install the EDID\_PORT\_Tool under Win2000/XP . As Fig. 1 .

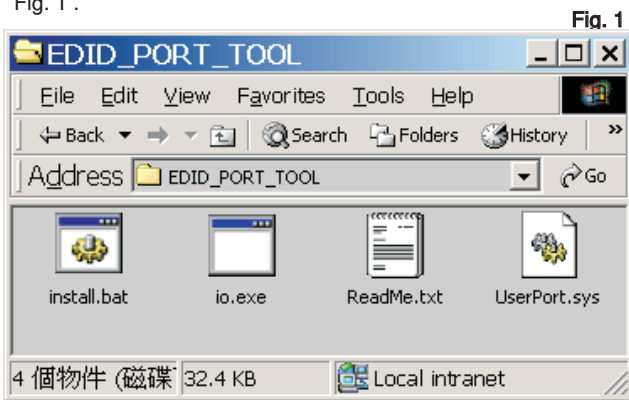


Fig. 1

A. Copy the "UserPort.sys" to C:\WINNT\system32\drivers(win2000)

C:\WINDOWS\system32\drivers(winXP)

B. Running "io.exe" everytime, Before you start to programming edid data .

3. EDID45.EXE program .
4. A/D Alignment kits (3138 106 10079):  
inclusion : a. Alignment box x1 (as Fig. 2)

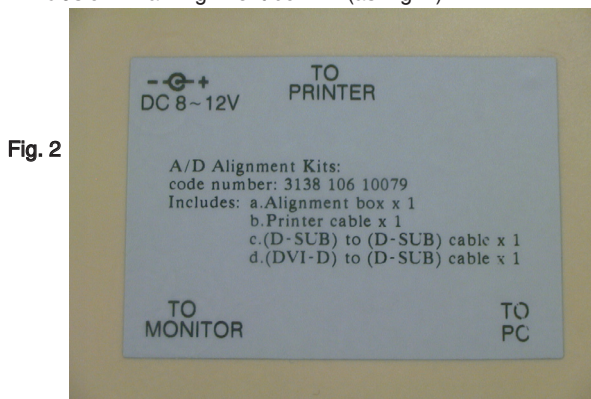


Fig. 2

- b. Printer cable x1  
c. (D-Sub) to (D-Sub) cable x1

Note: The alignment box has already build-in a batteries socket for using **batteries (5V)** as power source. Pull out the socket by remove four screws at the rear of box. Please do not forget that remove batteries after programming. The energy of batteries can only drive circuits for a short period of time.

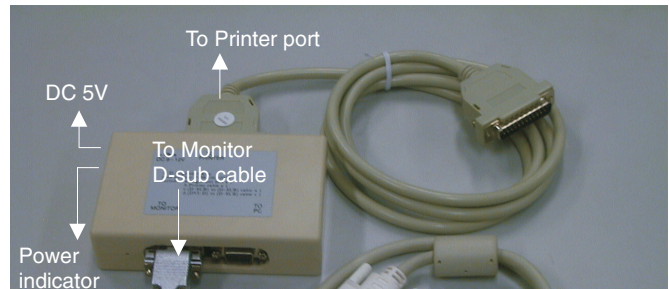
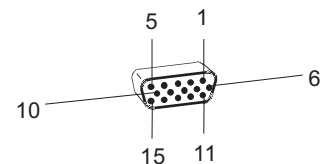


Fig. 3

## Pin assignment

### A. 15-pin D-Sub Connector



PIN	MNEMONIC	SIGNAL
1	RV	Red Video
2	GV	Green Video/Sync on Green
3	BV	Blue Video
4	NC	None
5	GND	Ground (DDC Return) or Cable detect
6	RG	Red GND
7	GG	Green GND
8	BG	Blue GND
9	+5 V	+5 V
10	SG	Sync GND or Cable detect
11	NC	None
12	SDA	DDC Data
13	HS	Horizontal Sync
14	VS	Vertical Sync
15	SCL	DDC Clock

Note: The EDID45.EXE is a windows-based program, which cannot be run in MS-DOS.

## Configuration and procedure

There are 2 chips contained OSD string, serial number...etc on the circuit board, main EEPROM which storage all factory settings, OSD string. DDC IC which storage 128byte EDID data(serial number ..etc.). Following descriptions are the connection and procedure for Analog and main EEPROM can be re-programmed along with Analog/Digital IC by enable factory memory data write function on the DDC program (EDID45.EXE).

### Initialize alignment box

In order to avoid that monitor entering power saving mode due to sync will cut off by alignment box, it is necessary to initialize alignment box before running programming software (EDID45.EXE). Following steps show you the procedures and connection.

- Step 1: Supply 5V DC power source to the Alignment box by plugging a DC power cord or using batteries.
- Step 2: Connecting printer cable and D-Sub cable of monitor as Fig. 3

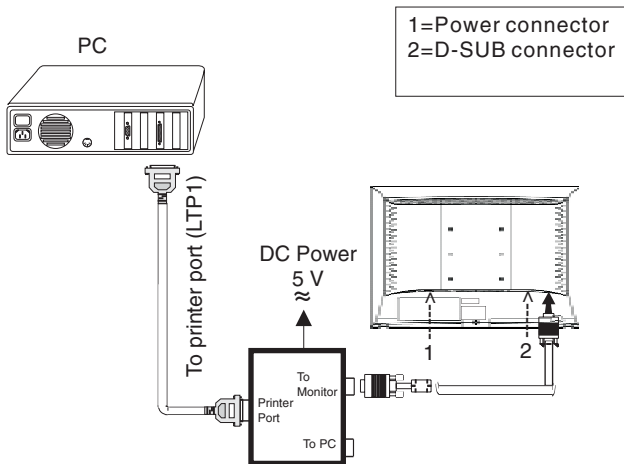


Fig. 3

### Step 3: Installation of EDID45.EXE

#### Method 1: Start on DDC program

Start Microsoft Windows.

1. The Program "EDID45.EXE" in service manual cd-rom be copied to C:\.
2. Click **Start**, choose Run at start menu of Windows as shown in Fig. 4.



Fig. 4

3. At the submenu, type the letter of your computer's hard disk drive followed by :EDID45 (for example, C:\EDID45, as shown in Fig. 5).

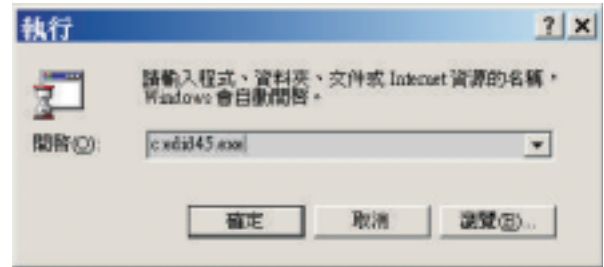


Fig. 5

4. Click **OK** button. The main menu appears (as shown in Fig. 6). **This is for initialize alignment box.**



Fig. 6

Note 1: If the connection is improper, you will see the following error message (as shown in Fig. 7) before entering the main menu. Meanwhile, the (read EDID) function will be disable. At this time, please make sure all cables are connected correctly and fixedly, and the procedure has been performed properly.



Fig. 7

#### Method 2: After create a shortcut of EDID45.EXE

- : Double click EDID45 icon (as shown in Fig. 8) which is on the screen of Windows Wallpaper. Bring up main menu of EDID45 as shown in Fig. 9.
- This is for initialize alignment box.**



Fig. 8

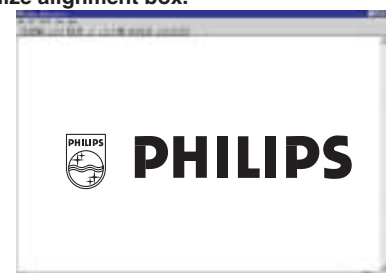


Fig. 9

Note 2: During the loading, EDID45 will verify the EDID data which just loaded from monitor before proceed any further function, once the data structure of EDID can not be recognized, the following error message will appear on the screen as below. Please confirm following steps to avoid this message.

1. The data structure of EDID was incorrect.
2. DDC IC that you are trying to load data is empty.
3. Wrong communication channel has set at configuration setup windows.
4. Cables loosed or poor contact of connection.



Fig. 10

# DDC Instructions

Go to cover page

## Re-programming Analog DDC IC

Step 1: After initialize alignment box, connecting all cables and box as shown in Fig. 11

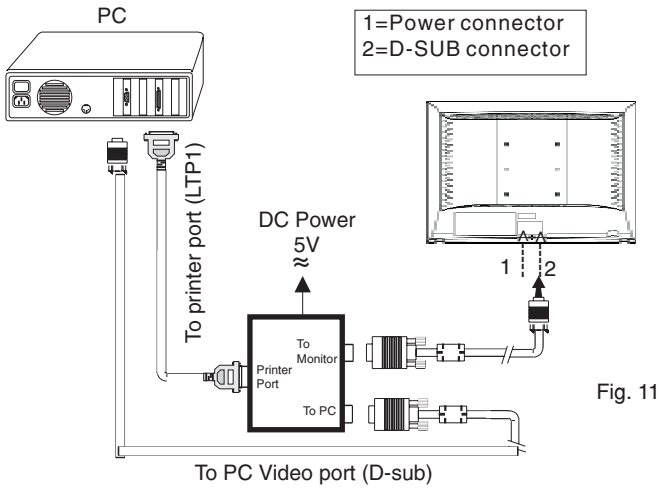


Fig. 11

### Step 2: Read DDC data from monitor

- Click icon as shown in Fig. 12 from the tool bar to bring up the Channels "Configuration Setup" windows as shown in Fig. 13.

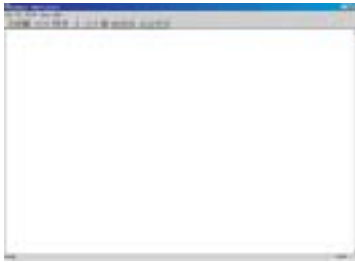


Fig. 12

- Select the DDC2Bi as the communication channel. As shown in Fig. 13.



Fig. 13

- Click OK button to confirm your selection.
- Click icon (Read EDID function) to read DDC EDID data from monitor. The EDID codes will display on screen as shown in Fig. 14.

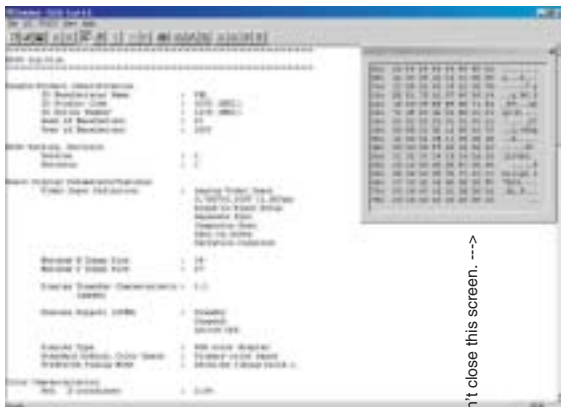


Fig. 14

Don't close this screen. -->

### Step 3: Modify DDC data (verify EDID version, week, year)

- Click (new function) icon from the tool bar, bring up Step 1 of 9 as shown in Fig. 15. EDID45 DDC application provides the function selection and text change (select & fill out) from Step 1 to Step 9.

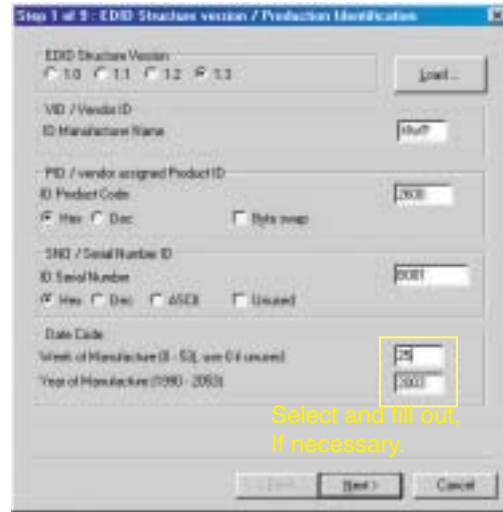


Fig. 15

### Step 4: Modify DDC data (Monitor Serial No.)

- Click Next, bring up Fig. 16.



Fig. 16

- Click Next, bring up Fig. 17.



Fig. 17

3. Click **Next** , bring up Fig. 18.

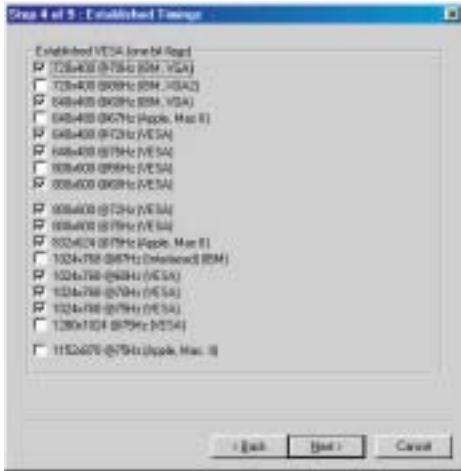


Fig. 18

6. Click **Next** , bring up Fig. 21.

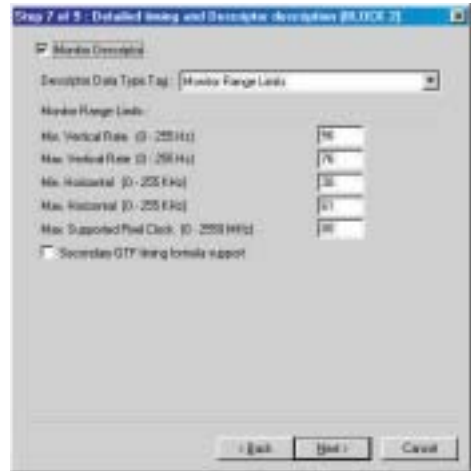


Fig. 21

4. Click **Next** , bring up Fig. 19.



Fig. 19

7. Click **Next** , bring up Fig. 22.



Fig. 22

5. Click **Next** , bring up Fig. 20.



Fig. 20

8. Click **Next** , bring up Fig. 23.

- Serial number can be filled up or be changed at this moment.
- Click **Finish** to exit the Step window.

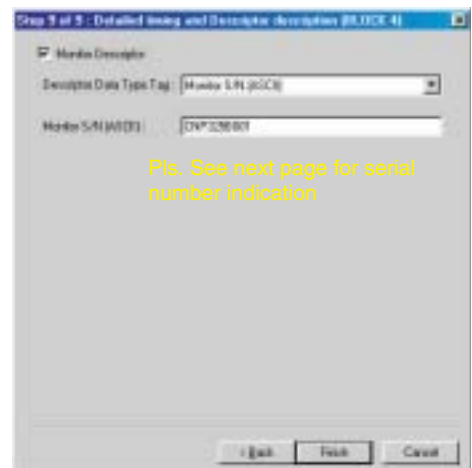


Fig. 23

Go to cover page

### PSG Serial number for HP system

The format for the serial number is as follows:

```

C C P Y W W N N N N
 \ / | | \ / \ / / /
  A B C D E
    
```

#### A: Country of Manufacture Code

The country of manufacture code is based on the ISO International country code standard (ISO # 3166, Alpha-2 code) and is used to designate the specific country of manufacture. The same product can be manufactured in more than one country.

**TW: TAIWAN**  
**CN: CHINA**

#### B: Manufacturer Code

This code corresponds to the type of panel being used for the units. This digit as the following value :

**P: PHILIPS**

#### C: Year

Corresponds to year of manufacture. For example, year 1998, use the least significant digit 2 to designate Year of manufacture.

#### D: Week

Corresponds to 01 - 52 week of manufacture.

#### E: Combine alphabets with digits depended on panel

For **LPL** panel : B000~BZZZ, C000~CZZZ, D000~DZZZ

For **CPT** panel: F000~FZZZ, G000~GZZZ, H000~HZZZ

For **HSD** panel: J000~JZZZ, K000~KZZZ, L000~LZZZ

For **QDI** panel: M000~MZZZ, N000~NZZZ, P000~PZZZ

#### Reset counter each week.

Skip 5 letters A, E, I, O AND U.

### Step 6: Write DDC data

1. Configuration should be as Fig. 24. And press OK.



Fig. 24

- Click (Write EDID) icon from the tool bar to write DDC data. Bring up "Writing 0%~100%, ready" a progressing bar on the left down corner.
- Click (Read EDID) to confirm it.
- Press the OK button to bring up the osd main manu.
- Press the DOWN button to select PRODUCTION INFORMATION press the OK button to confirm our selection.
- Re-confirm the serial Number is updated.

### Step 7: Save DDC data

Sometimes, you may need to save DDC data as a text file for using in other IC chip. To save DDC data, follow the steps below:

- Click (Save) icon (or click "file"-> "save as") from the tool bar And give a file name as shown in Fig. 25. The file type is EDID45 file (\*.ddc) which can be open in WordPad. By using WordPad, the texts of DDC data & table (128 bytes, hex code) can be modified. If DDC TEXTS & HEX Table are completely correct, it can be saved as .ddc file to re-load it into DDC IC for DDC Data application.

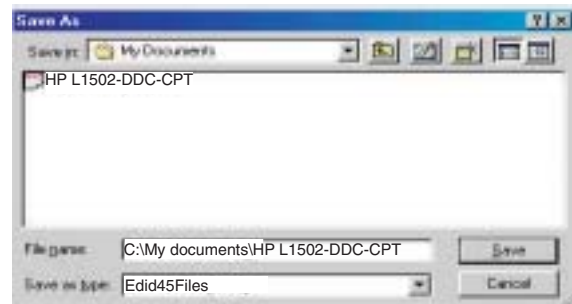


Fig. 25

- Click **Save**.

### Step 8: Exit DDC program

Pull down the File menu and select Exit as shown in Fig. 26.

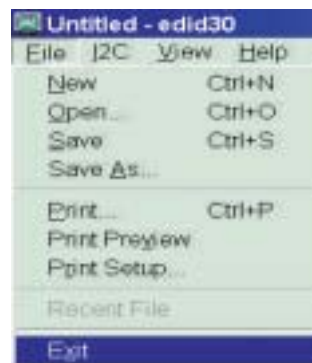


Fig. 26



**THE DISPLAY DATA CHANNEL ( DDC ) 2B CONTENT  
(FOR analog)**

## Vendor/Product Identification

ID Manufacturer Name : HWP  
 ID Product Code : 2600 (HEX.)  
 ID Serial Number : B001 (HEX.)  
 Week of Manufacture : 25  
 Year of Manufacture : 2003

## EDID Version, Revision

Version : 1  
 Revision : 3

## Basic Display Parameters/Features

Video Input Definition : Analog Video Input  
 0.700V/0.000V (0.70Vpp)  
 without Blank-to-Black Setup  
 Separate Sync  
 without Composite Sync  
 without Sync on Green  
 no Serration required

Maximum H Image Size : 30

Maximum V Image Size : 22

Display Transfer Characteristic : 2.2  
 (gamma)

Feature Support (DPMS) : Standby  
 Suspend  
 Active Off

Display Type : RGB color display

Preferred Timing Mode : Detailed timing block 1

## Color Characteristics

Red X coordinate : 0.635  
 Red Y coordinate : 0.343  
 Green X coordinate : 0.302  
 Green Y coordinate : 0.581  
 Blue X coordinate : 0.145  
 Blue Y coordinate : 0.096  
 White X coordinate : 0.313  
 White Y coordinate : 0.329

## Established Timings

Established Timings I : 720 x 400 @70Hz (IBM,VGA)  
 640 x 480 @60Hz (IBM,VGA)  
 640 x 480 @72Hz (VESA)  
 640 x 480 @75Hz (VESA)  
 800 x 600 @60Hz (VESA)

Established Timings II : 800 x 600 @72Hz (VESA)  
 800 x 600 @75Hz (VESA)  
 832 x 624 @75Hz (Apple,Mac II)  
 1024 x 768 @60Hz (VESA)  
 1024 x 768 @70Hz (VESA)  
 1024 x 768 @75Hz (VESA)

Manufacturer's timings :

## Standard Timing Identification #1

Horizontal active pixels : 1024

Aspect Ratio : 4:3

Refresh Rate : 60

## Detailed Timing #1

Pixel Clock (MHz) : 65  
 H Active (pixels) : 1024  
 H Blanking (pixels) : 320  
 V Active (lines) : 768  
 V Blanking (lines) : 38  
 H Sync Offset (F Porch) (pixels) : 24  
 H Sync Pulse Width (pixels) : 136  
 V Sync Offset (F Porch) (lines) : 3  
 V Sync Pulse Width (lines) : 6  
 H Image Size (mm) : 300  
 V Image Size (mm) : 220  
 H Border (pixels) : 0  
 V Border (lines) : 0

Flags : Non-interlaced  
 : Normal Display, No stereo  
 : Digital Separate sync.  
 : Negative Vertical Sync.  
 : Negative Horizontal Sync.

## Monitor Descriptor #2

Monitor Range Limits  
 Min. Vt rate Hz : 56  
 Max. Vt rate Hz : 76  
 Min. Horiz. rate kHz : 30  
 Max. Horiz. rate kHz : 61  
 Max. Supported Pixel : 80

No secondary GTF timing formula supported.

## Monitor Descriptor #3

Monitor Name : hp L1502

## Monitor Descriptor #4

Serial Number : CNP325B001

Extension Flag : 0

Check sum : E3 (HEX.)

\*\*\*\*\*  
 EDID data (128 bytes)  
 \*\*\*\*\*

0: 00 1: ff 2: ff 3: ff 4: ff 5: ff 6: ff 7: 00  
 8: 22 9: f0 10: 00 11: 26 12: 01 13: b0 14: 00 15: 00  
 16: 19 17: 0d 18: 01 19: 03 20: 68 21: 1e 22: 16 23: 78  
 24: ea 25: b7 26: 25 27: a2 28: 57 29: 4d 30: 94 31: 25  
 32: 18 33: 50 34: 54 35: ad 36: ee 37: 00 38: 61 39: 40  
 40: 01 41: 01 42: 01 43: 01 44: 01 45: 01 46: 01 47: 01  
 48: 01 49: 01 50: 01 51: 01 52: 01 53: 01 54: 64 55: 19  
 56: 00 57: 40 58: 41 59: 00 60: 26 61: 30 62: 18 63: 88  
 64: 36 65: 00 66: 2c 67: dc 68: 10 69: 00 70: 00 71: 18  
 72: 00 73: 00 74: 00 75: fd 76: 00 77: 38 78: 4c 79: 1e  
 80: 3d 81: 08 82: 00 83: 0a 84: 20 85: 20 86: 20 87: 20  
 88: 20 89: 20 90: 00 91: 00 92: 00 93: fc 94: 00 95: 68  
 96: 70 97: 20 98: 4c 99: 31 100: 35 101: 30 102: 32 103: 0a  
 104: 20 105: 20 106: 20 107: 20 108: 00 109: 00 110: 00 111: ff  
 112: 00 113: 43 114: 4e 115: 50 116: 33 117: 32 118: 35 119: 42  
 120: 30 121: 30 122: 31 123: 0a 124: 20 125: 20 126: 00 127: e3

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## Configuration and procedure

**ISP (In System Program) software** is provided by Motorola to upgrade the firmware of CPU.

It is a DOS-based program, which cannot be run in MS-Windows.

**ISP cable** is for the interface between "Parallel Port of PC" and "15 pin-D-SUB connector of Monitor".

## System and equipment requirements

1. An i486 (or above) personal computer or compatible.
2. Microsoft operation system Windows 95/98  
=> **DOS environment.**
3. ISP Software
4. ISP Cable (3138 106 10148) as shown in Fig. 1

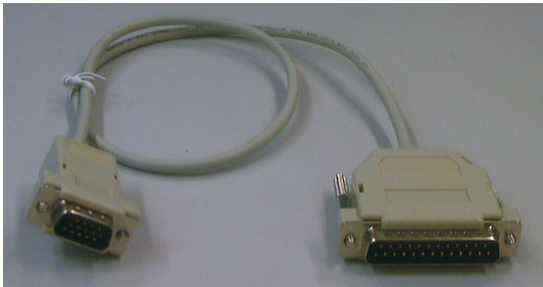


Fig. 1

Fig. 1 => ISP CABLE : 12nc is "3138 106 10148".

- Step 1 : Make a folder in your PC as shown in Fig. 2.  
For example : C:\HPL1502.
- Step 2 : Copy ISP Software (HPL1502..zip) into your folder as shown in Fig.2.
- Step 3 : Unzip isp.zip into your folder as shown in Fig. 2.

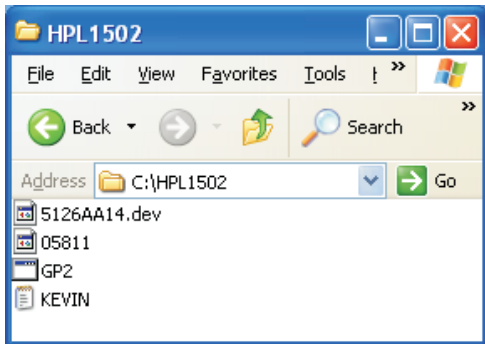


Fig. 2

- Step 4 : Connect ISP cable and Mains cord to Monitor as shown in Fig. 3.

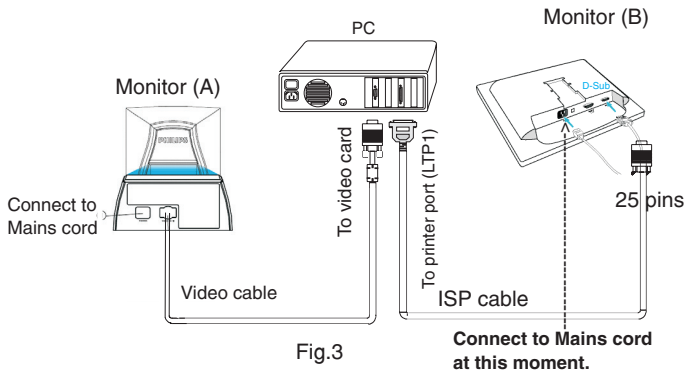


Fig.3

Connect to Mains cord at this moment.

- Step 5 : Execute ISP Software in Monitor (A) on MS-DOS mode as shown in Fig. 4.
  - Step 5-1=> C:\cd hpl1502 ( as shown in Fig. 4-1).  
Press "Enter" key on keyboard, bring up Fig. 4-2.
  - Step 5-2=> Key in "Gp2", Press"Enter" key on keyboard, bring up Fig. 4-3.
  - Step 5-3=> Key in "Batch Kevin.txt",Press "Enter" key on keyboard again, bring up Fig.4-4.
  - Step 5-4=> Key in "exit",Press "Enter" key on keyboard again, bring up Fig.4-5.and successful will be bring up Fig.4-6.

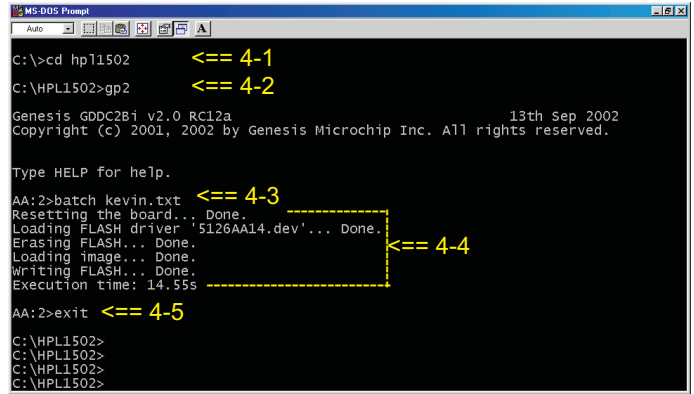
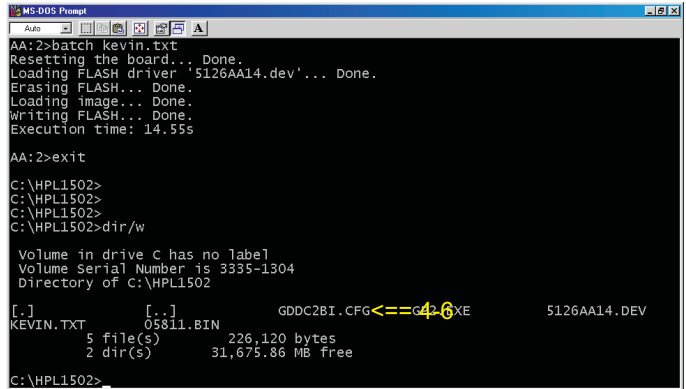


Fig. 4



- Step 6 : Power off, (Press " " and " + " and "POWER KNOB" at the same time to access Factory mode.)  
After finished,entering factory mode to check CPU version as shown in Fig. 5.

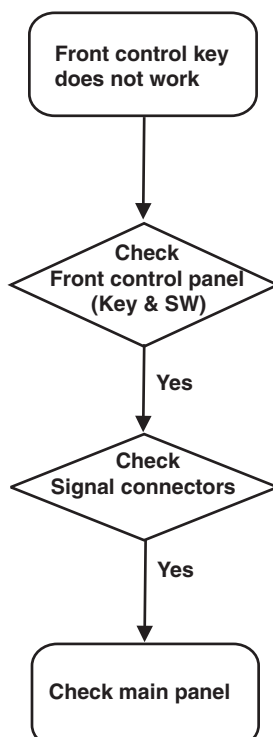
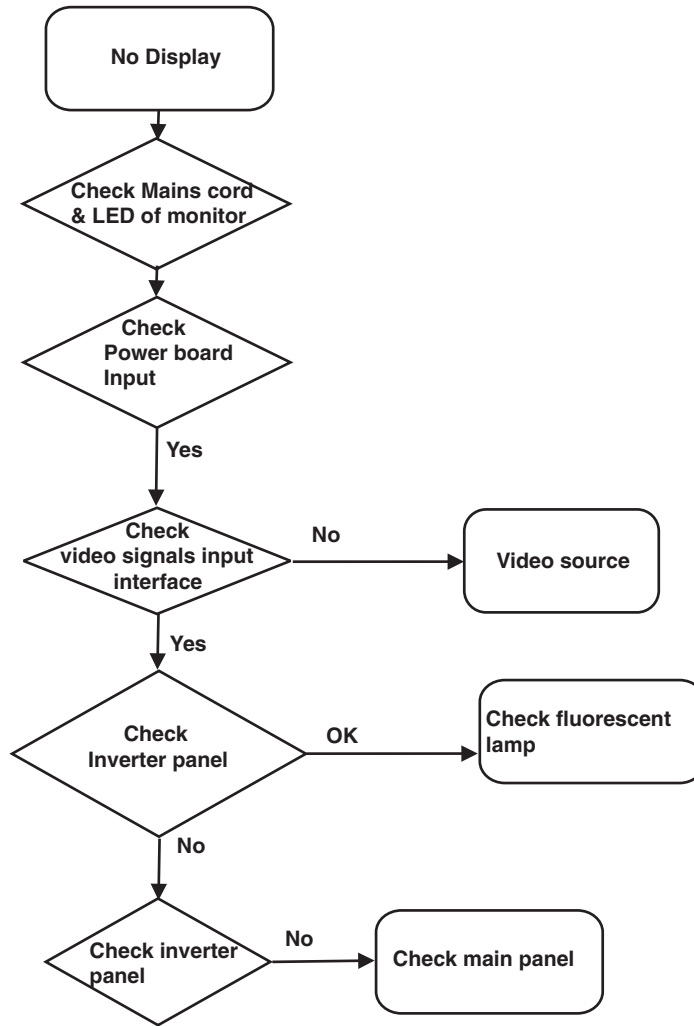
HPL1502 f1523 FP5315 V200 20030822											
BL:	0										
SUB - BRI :	165	255									
SUB - CON :	100	127	154								
9300K	R	Xxx	G	Xxx	B	xxx					
6500K	R	Xxx	G	Xxx	B	xxx					
SRGB	R	Xxx	G	Xxx	B	xxx	B	255	C	128	
OFFSET2	R	Xxx	G	Xxx	B	xxx					
GAIN	R	Xxx	G	Xxx	B	xxx	M	255	m	200	
AUTO-SUB		OK!	OSDTIMER			60					
VCOM		135	IDX :			76					
OFFSET1	R	Xxx	G	Xxx	B	xxx					
PanelType:		Xxx	LG:17	CPT:34	QDI:68	Other:auto					
SCALER.ADD:		VAL:		READ		WRITE					
NVRAM.ADD:		VAL:		READ		WRITE					
PANEL ID:		LG	LS150	X05A4							
		1024x768		48.3KHz @60Hz							

Fig. 5

### Troubleshooting :

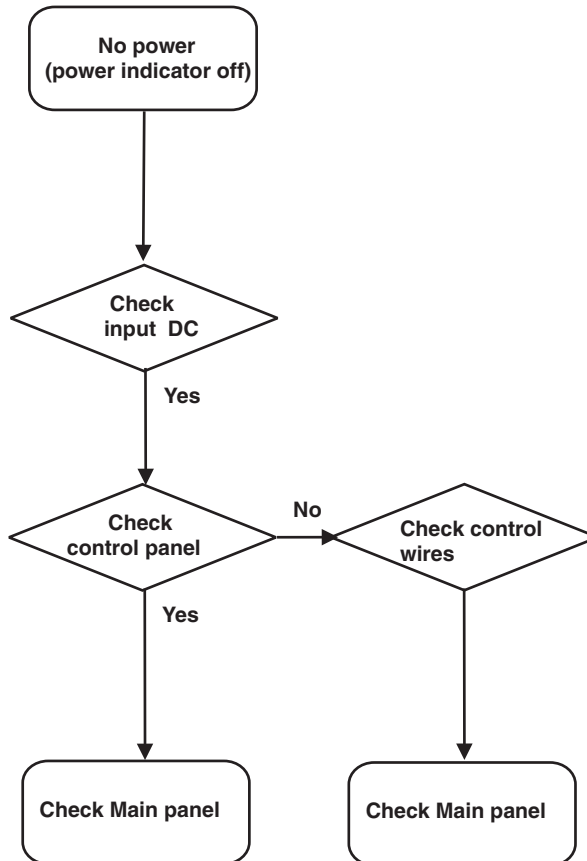
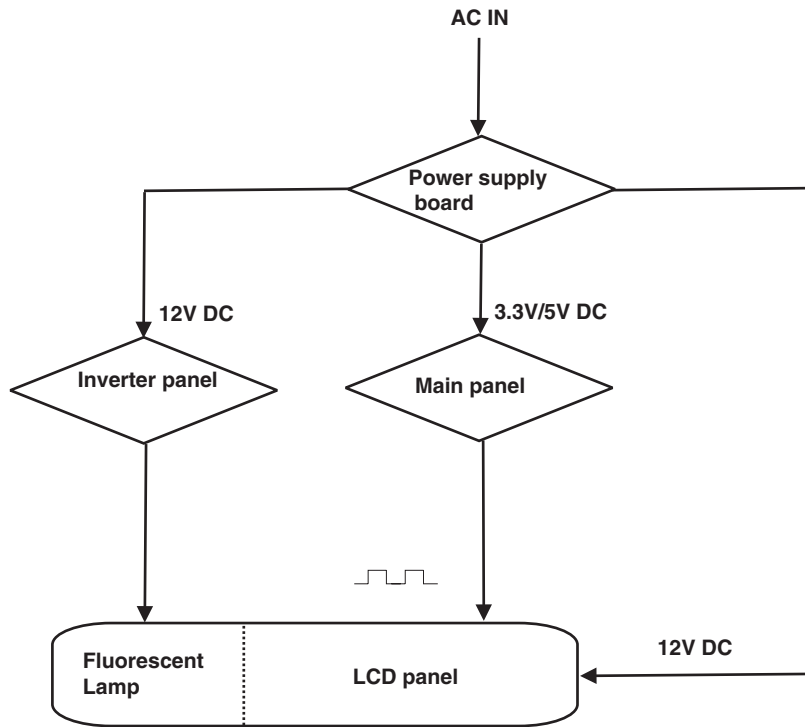
**Monitor : Monitor is on (LED is green.), or off, but no display (black)**

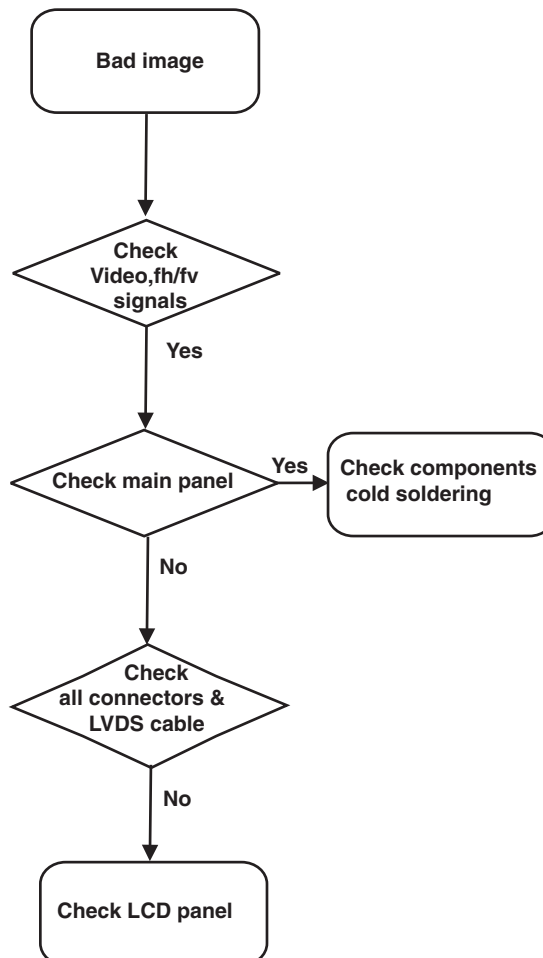
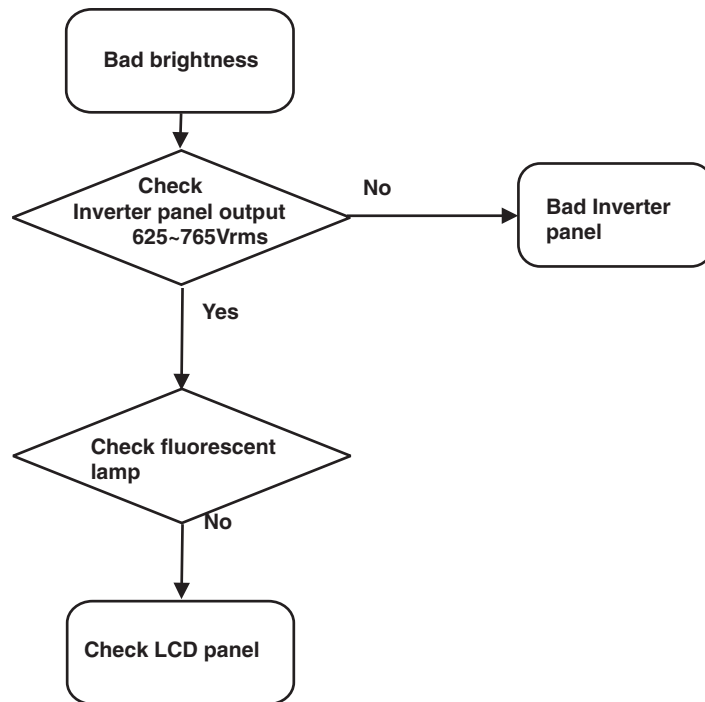
1. Make sure to disconnect the mains cord at Monitor , then connect it again.
2. EEPROM size may be not correct.



# Repair Flow Chart (Continued)

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## 0. Warning

All ICs and many other semi-conductors are susceptible to electrostatic discharges (ESD). Careless handling during repair can reduce life drastically. When repairing, make sure that you are connected with the same potential as the mass of the unit via a wrist wrap with resistance. Keep components and tools also at the same potential !

## 1. Servicing of SMDs (Surface Mounted Devices)

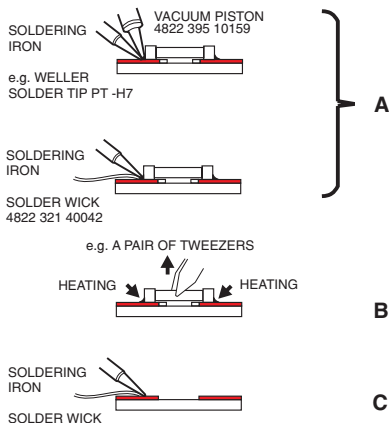
### 1.1 General cautions on handling and storage

- Oxidation on the terminals of SMDs results in poor soldering. Do not handle SMDs with bare hands.
- Avoid using storage places that are sensitive to oxidation such as places with sulphur or chlorine gas, direct sunlight, high temperatures or a high degree of humidity. The capacitance or resistance value of the SMDs may be affected by this.
- Rough handling of circuit boards containing SMDs may cause damage to the components as well as the circuit boards. Circuit boards containing SMDs should never be bent or flexed. Different circuit board materials expand and contract at different rates when heated or cooled and the components and/or solder connections may be damaged due to the stress. Never rub or scrape chip components as this may cause the value of the component to change. Similarly, do not slide the circuit board across any surface.

### 1.2 Removal of SMDs

- Heat the solder (for 2-3 seconds) at each terminal of the chip. By means of litz wire and a slight horizontal force, small components can be removed with the soldering iron. They can also be removed with a solder sucker (see Fig. 1A)

Fig. 1 DISMOUNTING



- While holding the SMD with a pair of tweezers, take it off gently using the soldering iron's heat applied to each terminal (see Fig. 1 B).
- Remove the excess solder on the solder lands by means of litz wire or a solder sucker (see Fig. 1C).

### 1.3 Caution on removal

- When handling the soldering iron, use suitable pressure and be careful.
- When removing the chip, do not use undue force with the pair of tweezers.
- The soldering iron to be used (approx. 30 W) should

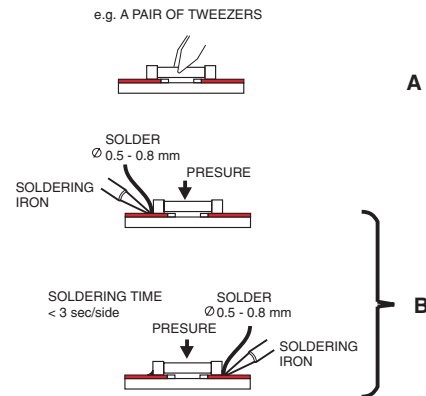
preferably be equipped with a thermal control (soldering temperature: 225 to 250 °C).

- The chip, once removed, must never be reused.

### 1.4 Attachment of SMDs

- Locate the SMD on the solder lands by means of tweezers and solder the component on one side. Ensure that the component is positioned correctly on the solder lands (see Fig.2A).
- Next complete the soldering of the terminals of the component (see Fig. 2B).

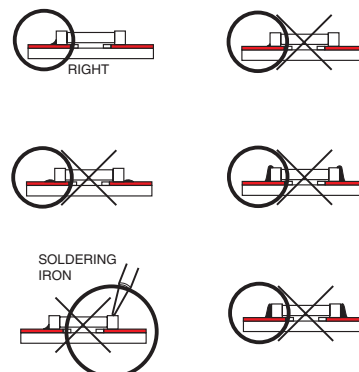
Fig. 2 MOUNTING



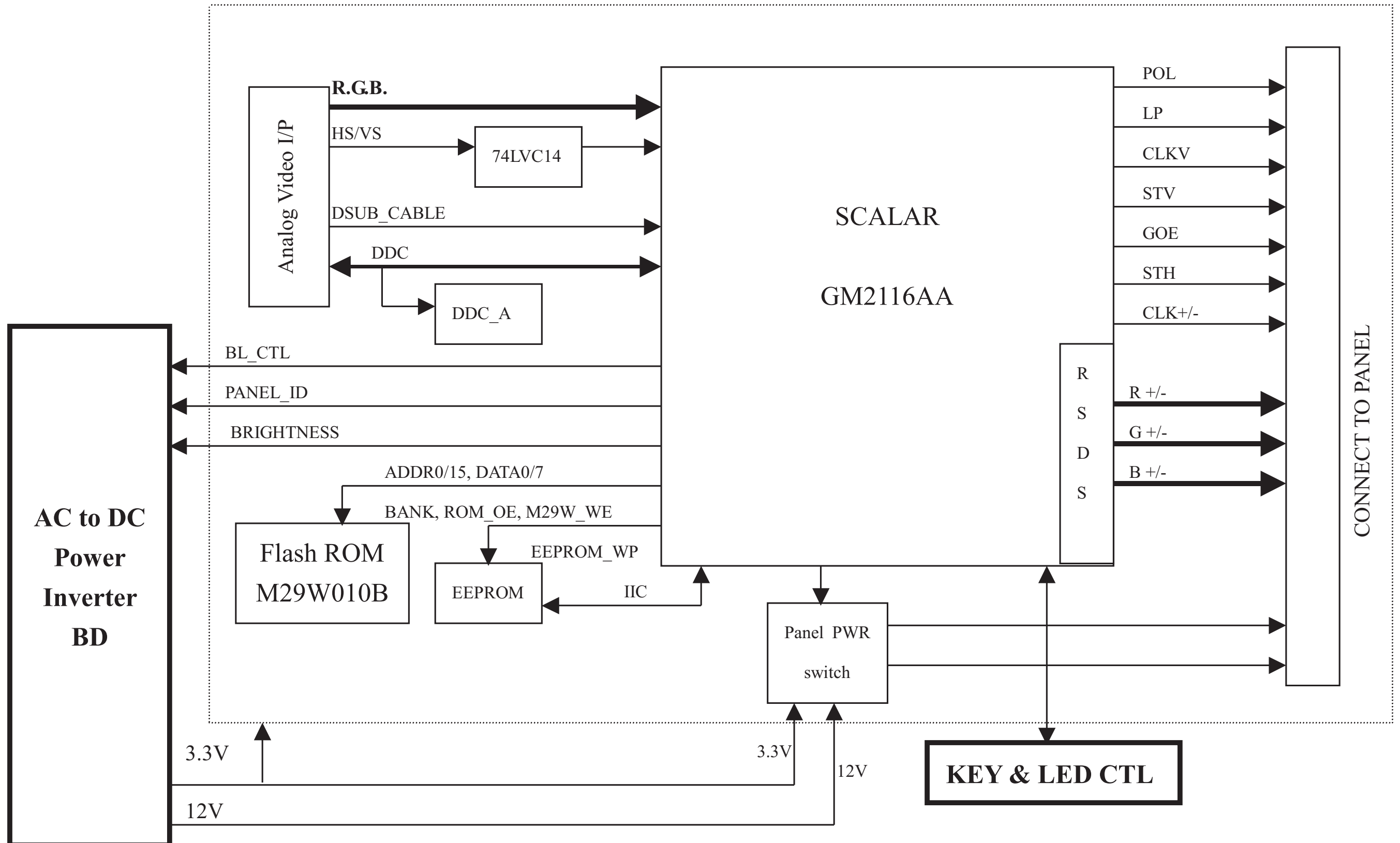
## 2. Caution when attaching SMDs

- When soldering the SMD terminals, do not touch them directly with the soldering iron. The soldering should be done as quickly as possible, care must be taken to avoid damage to the terminals of the SMDs themselves.
- Keep the SMD's body in contact with the printed board when soldering.
- The soldering iron to be used (approx. 30 W) should preferably be equipped with a thermal control (soldering temperature: 225 to 250 °C).
- Soldering should not be done outside the solder land.
- Soldering flux (of rosin) may be used, but should not be acidic.
- After soldering, let the SMD cool down gradually at room temperature.
- The quantity of solder must be proportional to the size of the solder land. If the quantity is too great, the SMD might crack or the solder lands might be torn loose from the printed board (see Fig. 3).

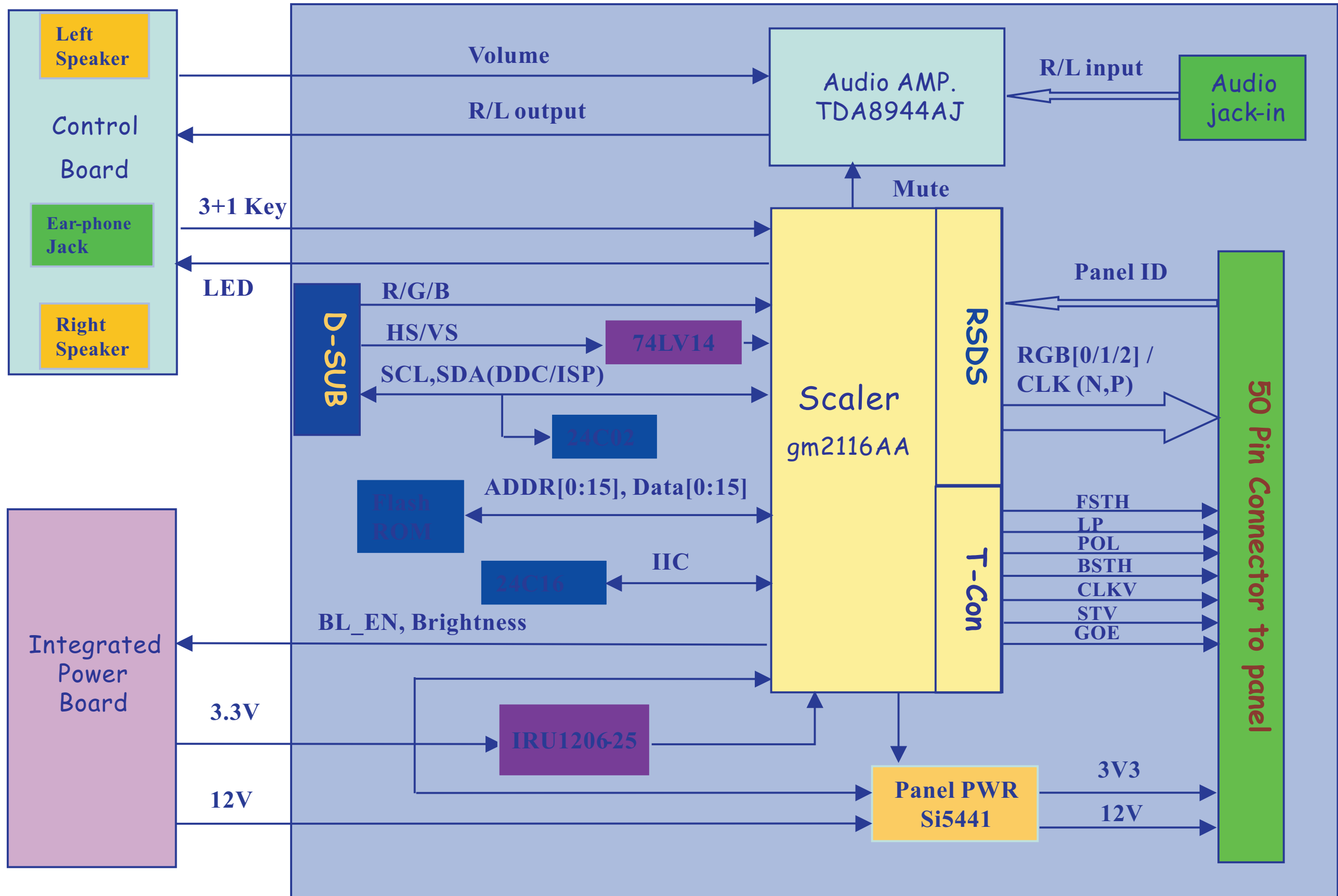
Fig. 3 Examples



# HP L1502 Function Block Diagram



# hp L1523 & 5315 Elec. FunctionBlock

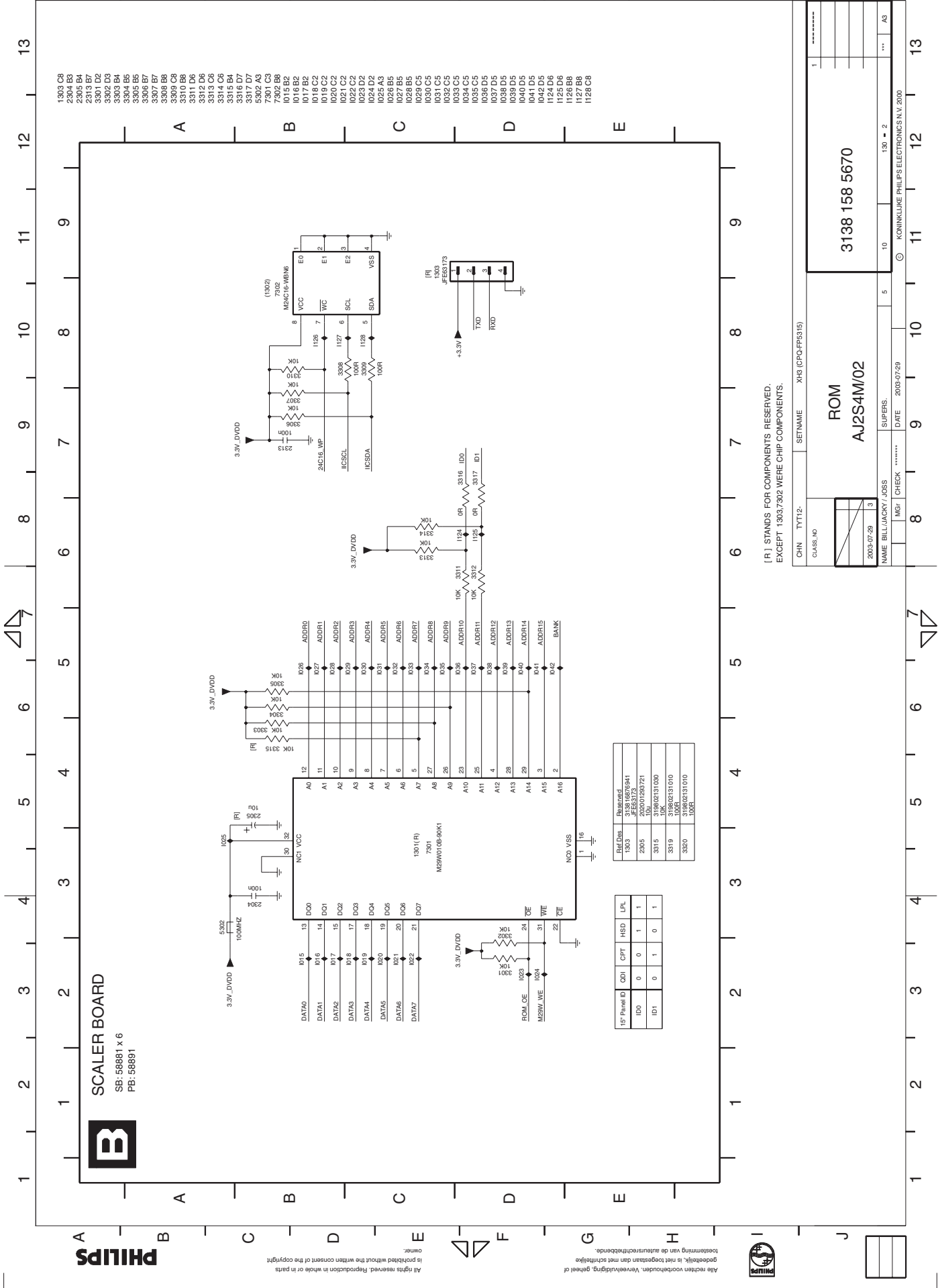
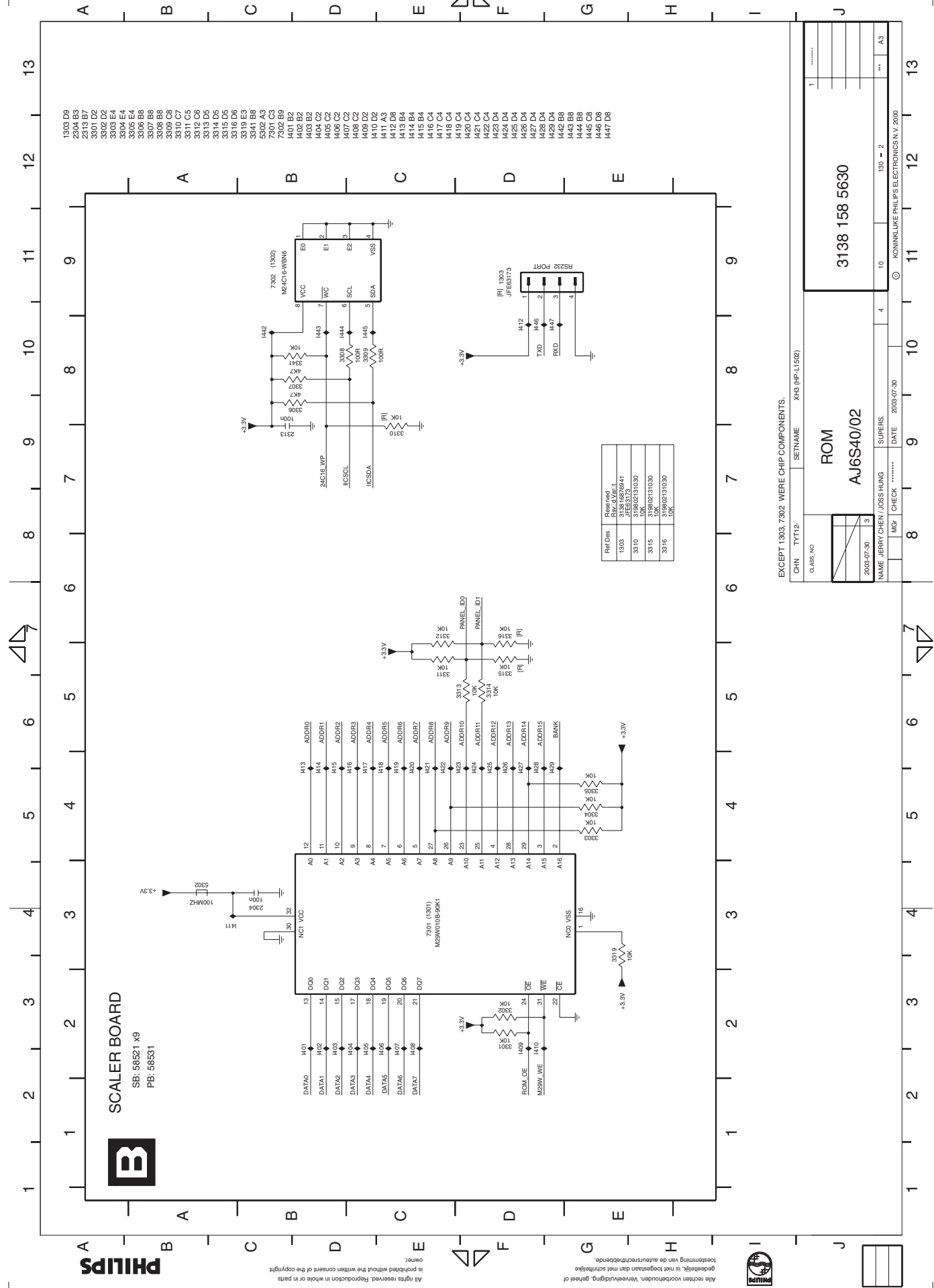






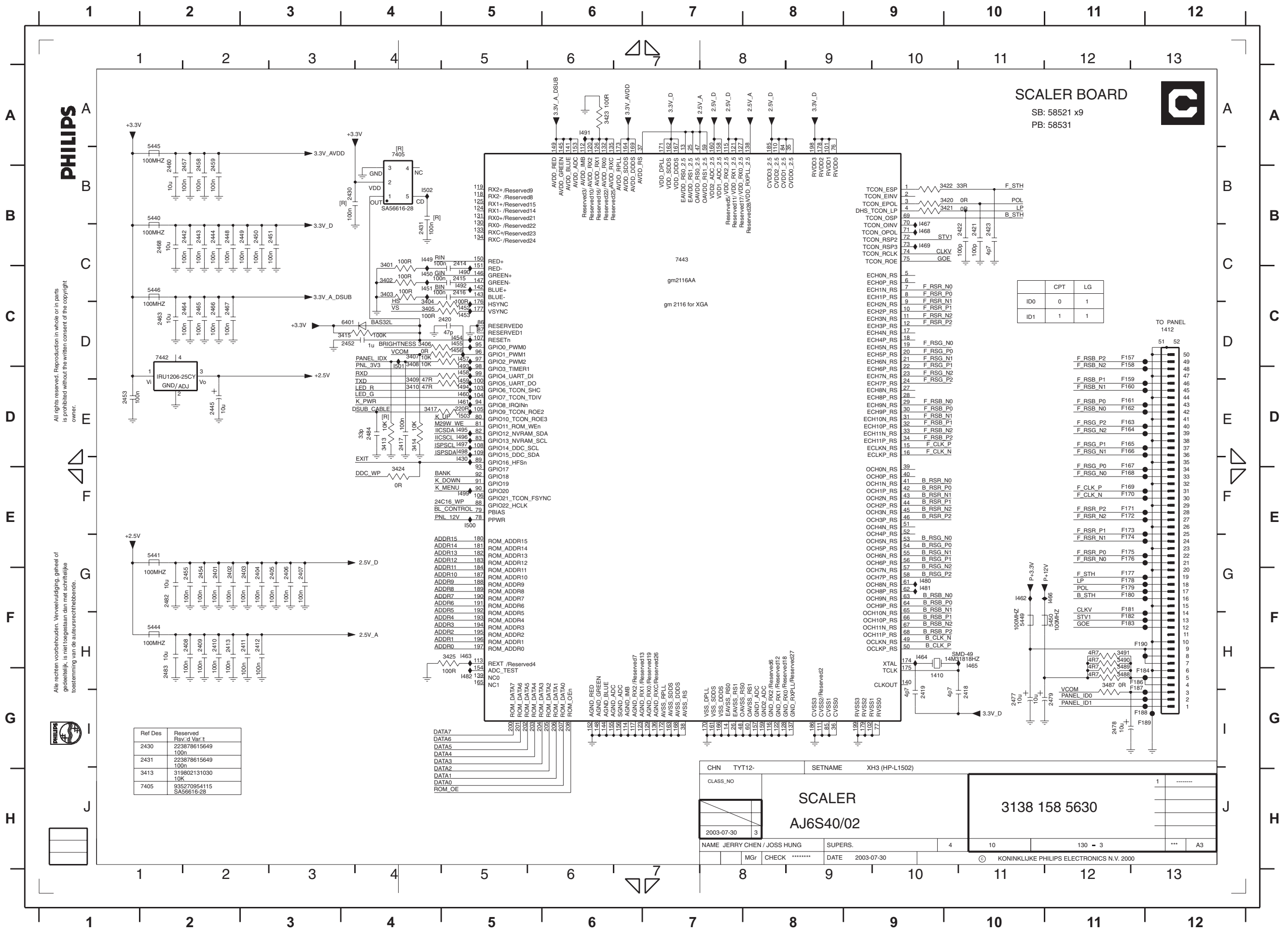
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ROM Schematic Diagram



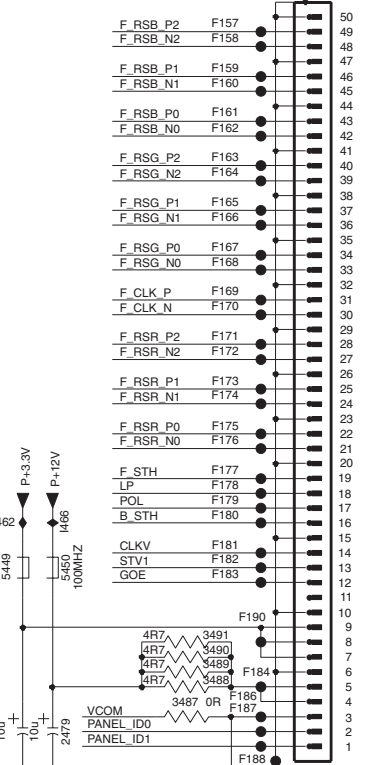
# Scaler Schematic Diagram

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**SCALER BOARD**  
 SB: 58521 x9  
 PB: 58531

	CPT	LG
ID0	0	1
ID1	1	1



Ref Des	Reserved
2430	223878615649 100n
2431	223878615649 100n
3413	319902131030 10K
7405	935270954115 SA56616-28

CHN	TYT12-	SETNAME	XH3 (HP-L1502)	
CLASS_NO				
SCALER		3138 158 5630		
AJ6S40/02				
NAME	JERRY CHEN / JOSS HUNG	SUPERS.	4	10
DATE	2003-07-30		130 - 3	A3
© KONINKLUKE PHILIPS ELECTRONICS N.V. 2000				

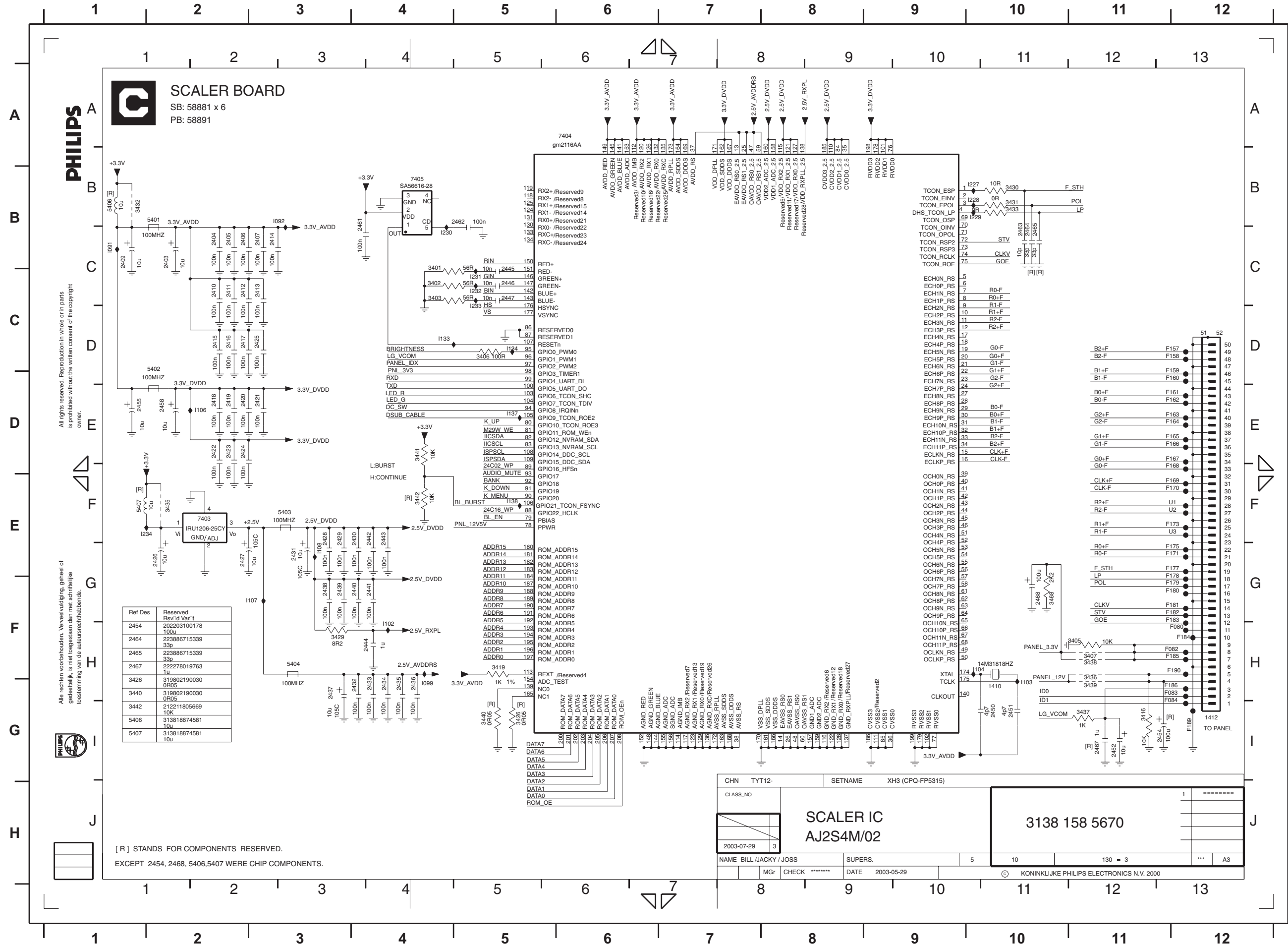
- 1410 G9
- 1412 G12
- 2401 F2
- 2402 F2
- 2403 F3
- 2404 F3
- 2405 F3
- 2406 F3
- 2407 F3
- 2408 F2
- 2409 F2
- 2410 F2
- 2411 F3
- 2412 F3
- 2413 F2
- 2414 B5
- 2415 C5
- 2416 C5
- 2417 D4
- 2418 G10
- 2419 G9
- 2420 C5
- 2421 B10
- 2422 B10
- 2423 B10
- 2430 B4
- 2431 B4
- 2442 B2
- 2443 B2
- 2444 B2
- 2445 D2
- 2448 B2
- 2449 B2
- 2450 B3
- 2451 B3
- 2452 C4
- 2453 D1
- 2454 F2
- 2455 F2
- 2457 B2
- 2458 B2
- 2459 B2
- 2460 B2
- 2463 C2
- 2464 C2
- 2465 C2
- 2466 C2
- 2467 C2
- 2468 B2
- 2477 G10
- 2478 G11
- 2479 G11
- 2482 F2
- 2483 F2
- 2484 D4
- 3401 C4
- 3402 C4
- 3403 C4
- 3404 C4
- 3405 C4
- 3406 C4
- 3407 C4
- 3408 C4
- 3409 D4
- 3410 D4
- 3413 D4
- 3414 D4
- 3415 C4
- 3417 D4
- 3420 B0
- 3421 B10
- 3422 B10
- 3423 A6
- 3424 E4
- 3425 F5
- 3487 G11
- 3488 G11
- 3489 F11
- 3490 F11
- 3491 F11
- 5440 B2
- 5441 E2
- 5444 F2
- 5445 A2
- 5446 C2
- 5449 F10
- 5450 F11
- 6401 C4
- 7405 A4
- 7442 C2
- 7443 B7
- F157 C11
- F158 D11
- F159 D11
- F160 D11
- F161 D11
- F162 D11
- F163 D11
- F164 D11
- F165 D11
- F166 D11
- F167 E11
- F168 E11
- F169 E11
- F170 E11
- F171 E11
- F172 E11
- F173 E11
- F174 E11
- F175 E11
- F176 E11
- F177 F11
- F178 F11
- F179 F11
- F180 F11
- F181 F11
- F182 F11
- F183 F11
- F184 G11
- F185 G11
- F186 G11
- F187 G11
- F188 G11
- F189 G11
- F190 F11
- I430 D5
- I439 B4
- I450 C4
- I451 C4
- I452 C5
- I453 C5
- I454 C5
- I455 C5
- I456 C5
- I457 C5
- I458 D5
- I459 D5
- I460 D5
- I461 D5
- I462 F10
- I463 F5
- I464 F9
- I465 F10
- I466 F11
- I467 B9
- I468 B9
- I469 B9
- I480 F9
- I481 F9
- I482 G5
- I483 G5
- I490 C5
- I491 A6
- I492 C5
- I493 D5
- I494 D5
- I495 D5
- I496 D5
- I497 D5
- I498 D5
- I499 E5
- I500 E5
- I501 D4
- I502 B4
- I503 D5

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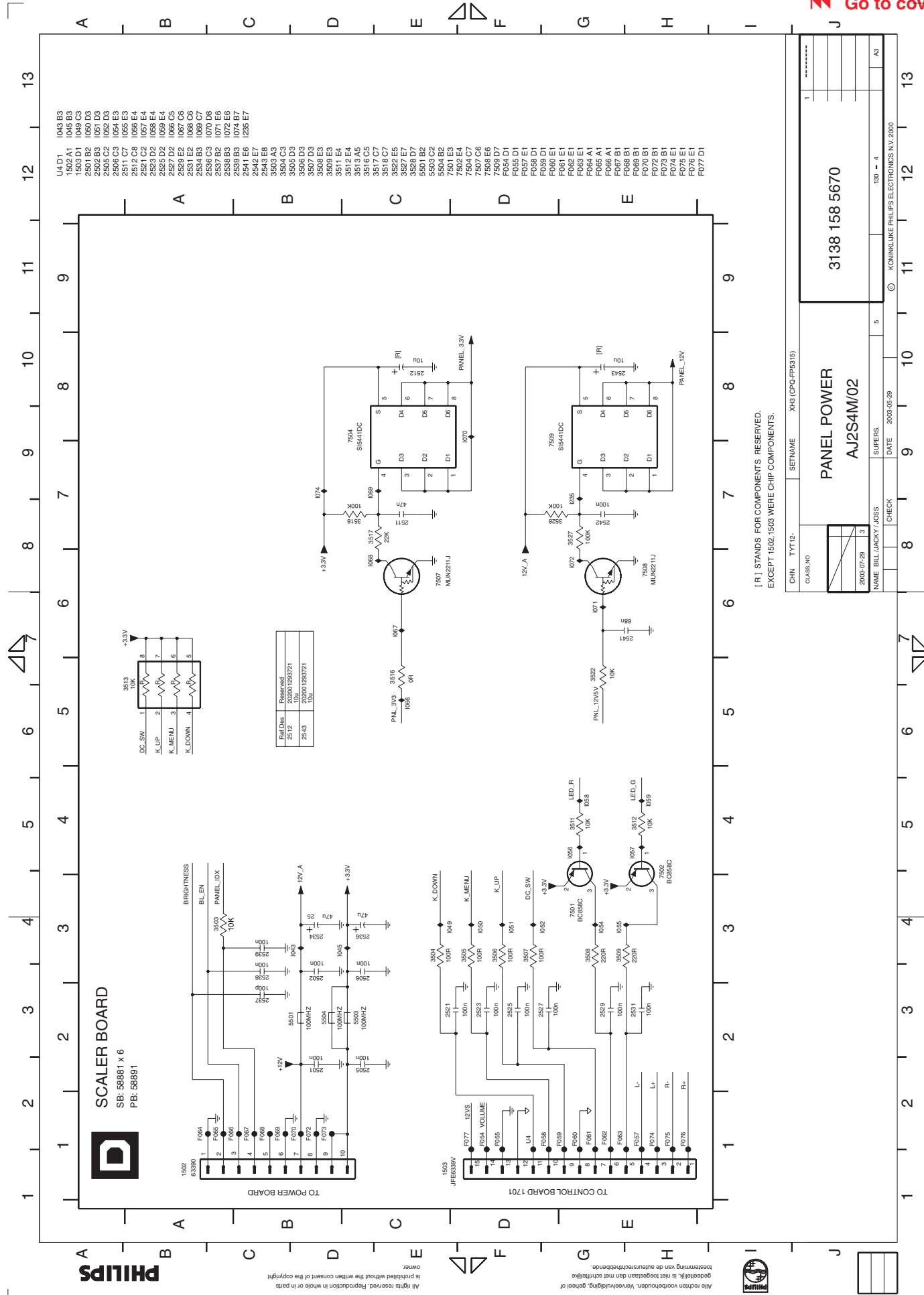
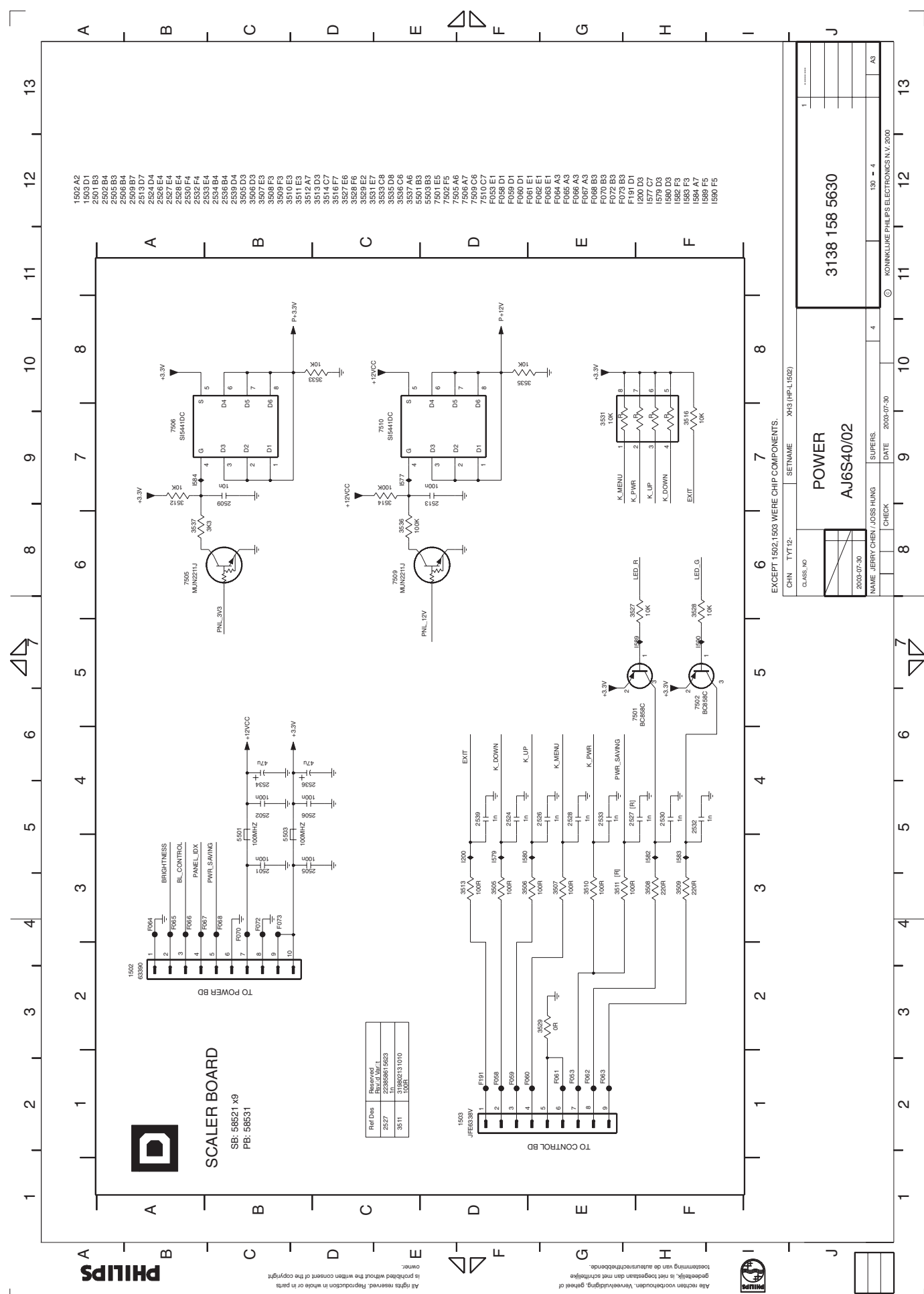


# Scaler Schematic Diagram



# Power Schematic Diagram

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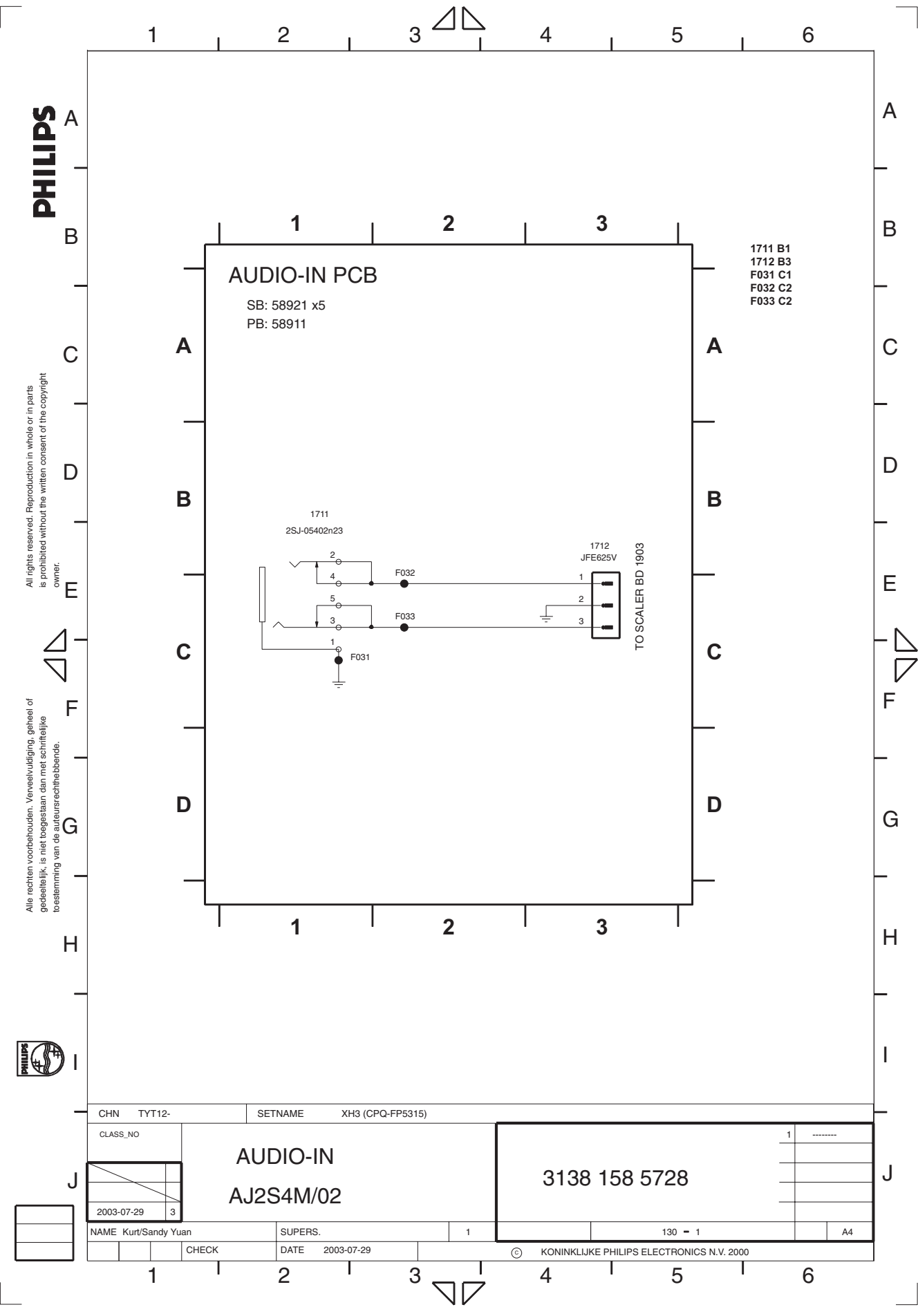
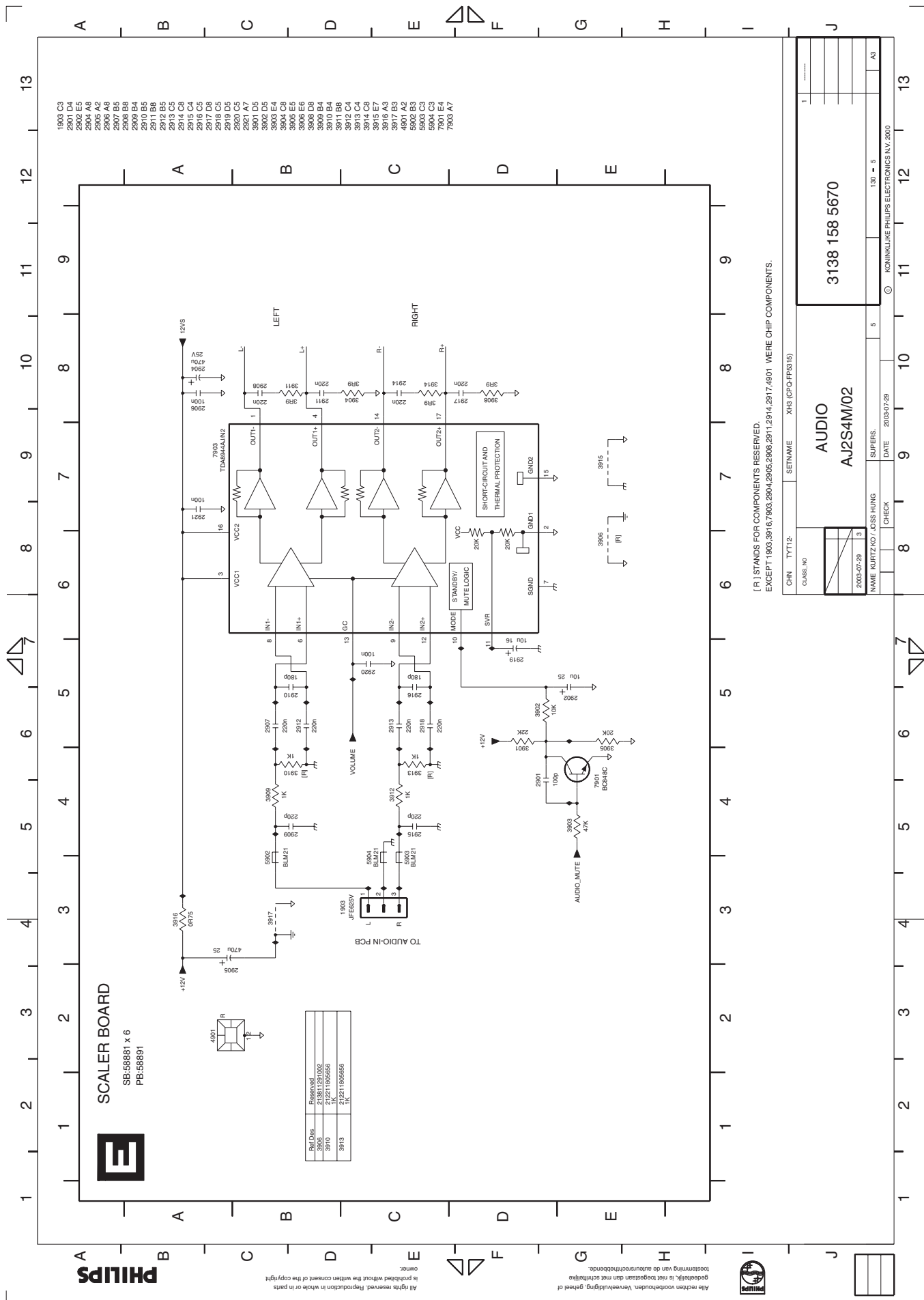


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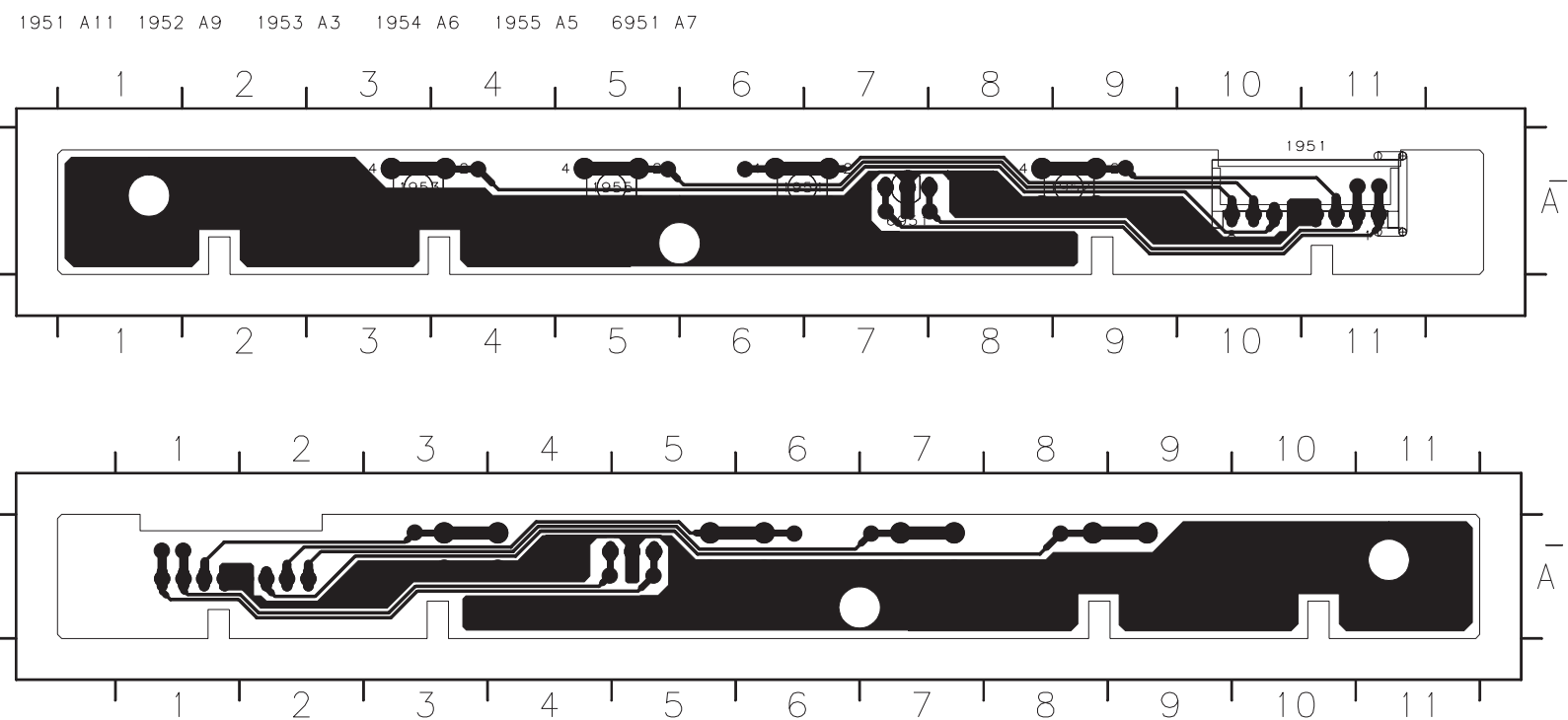
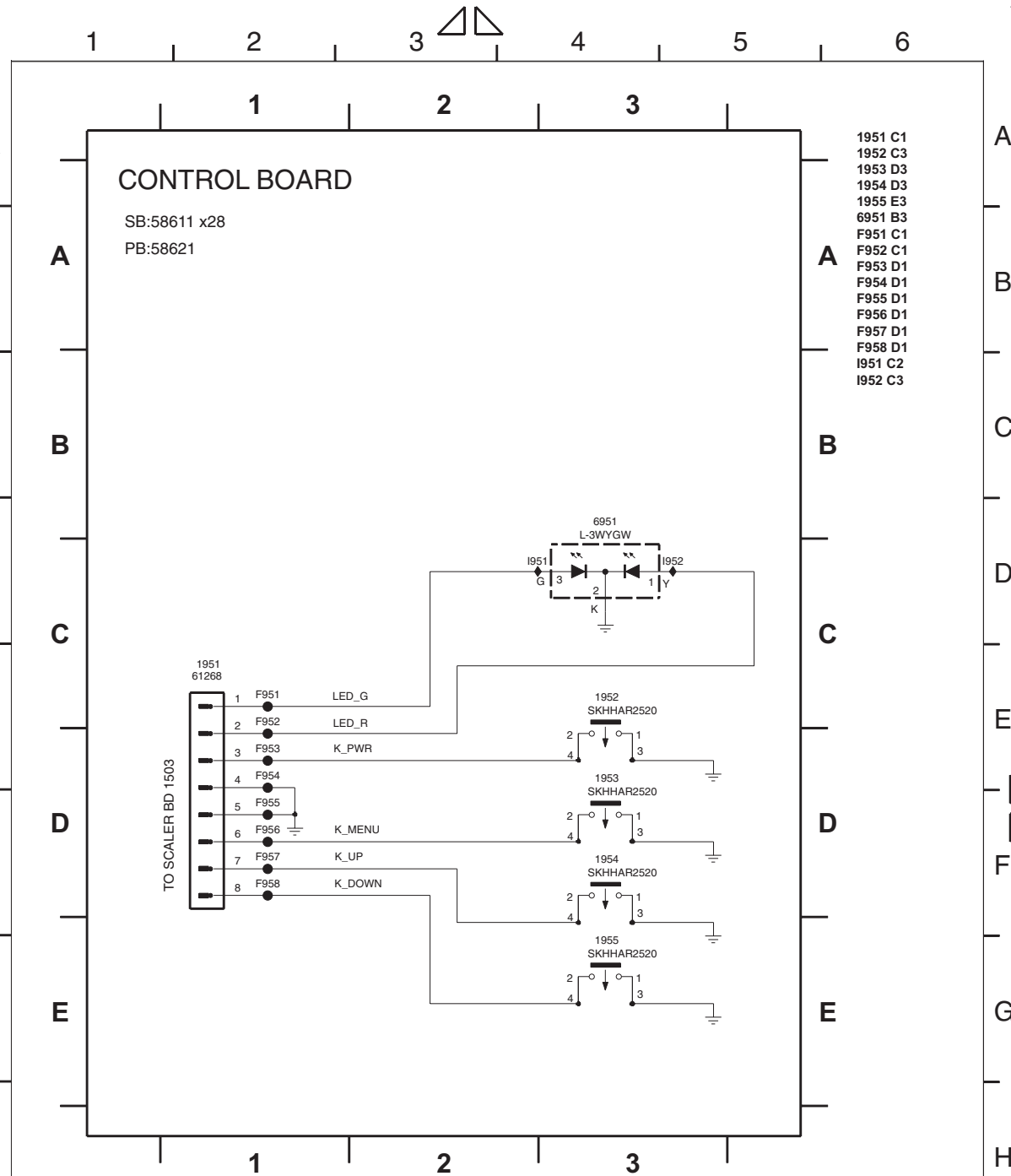
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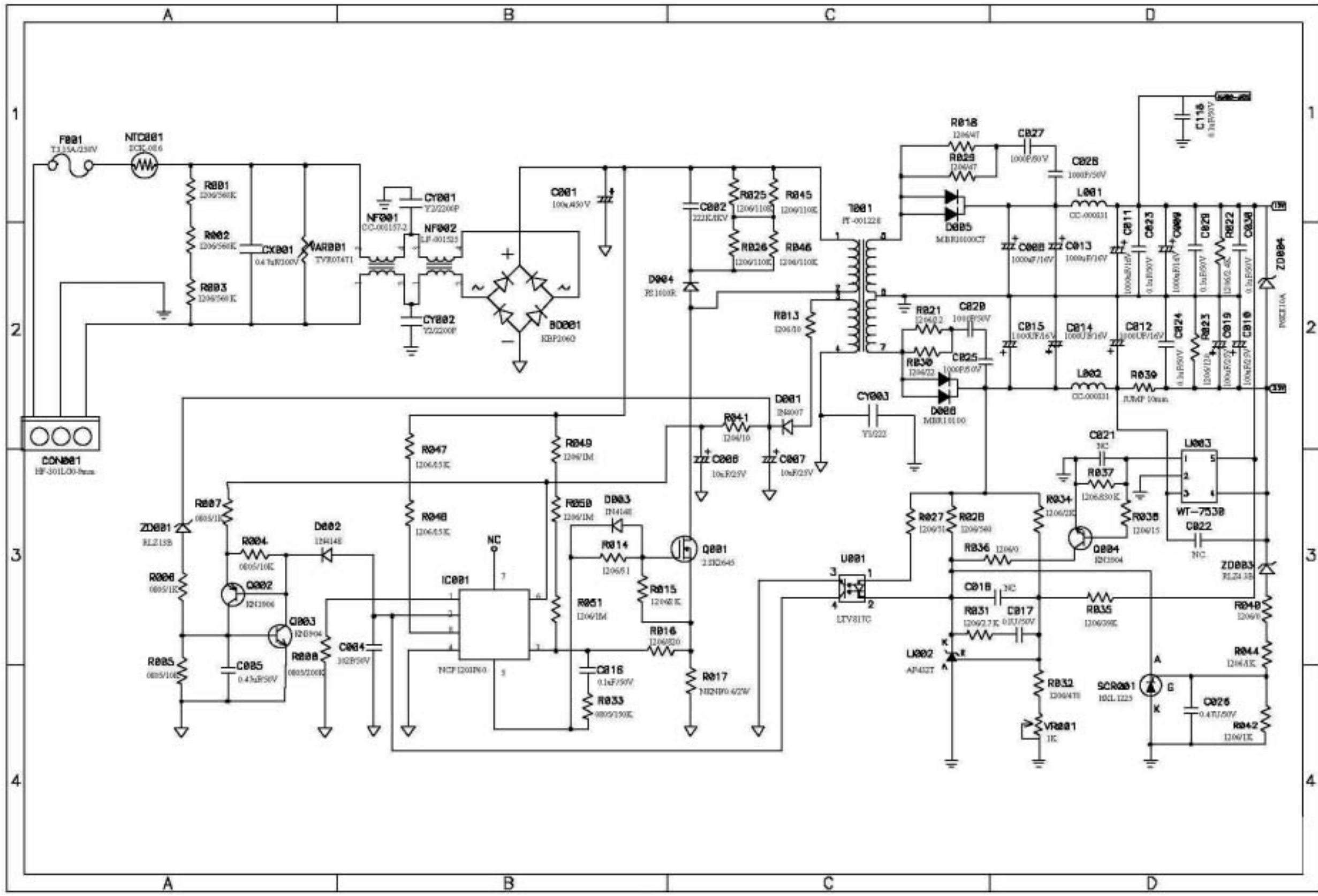
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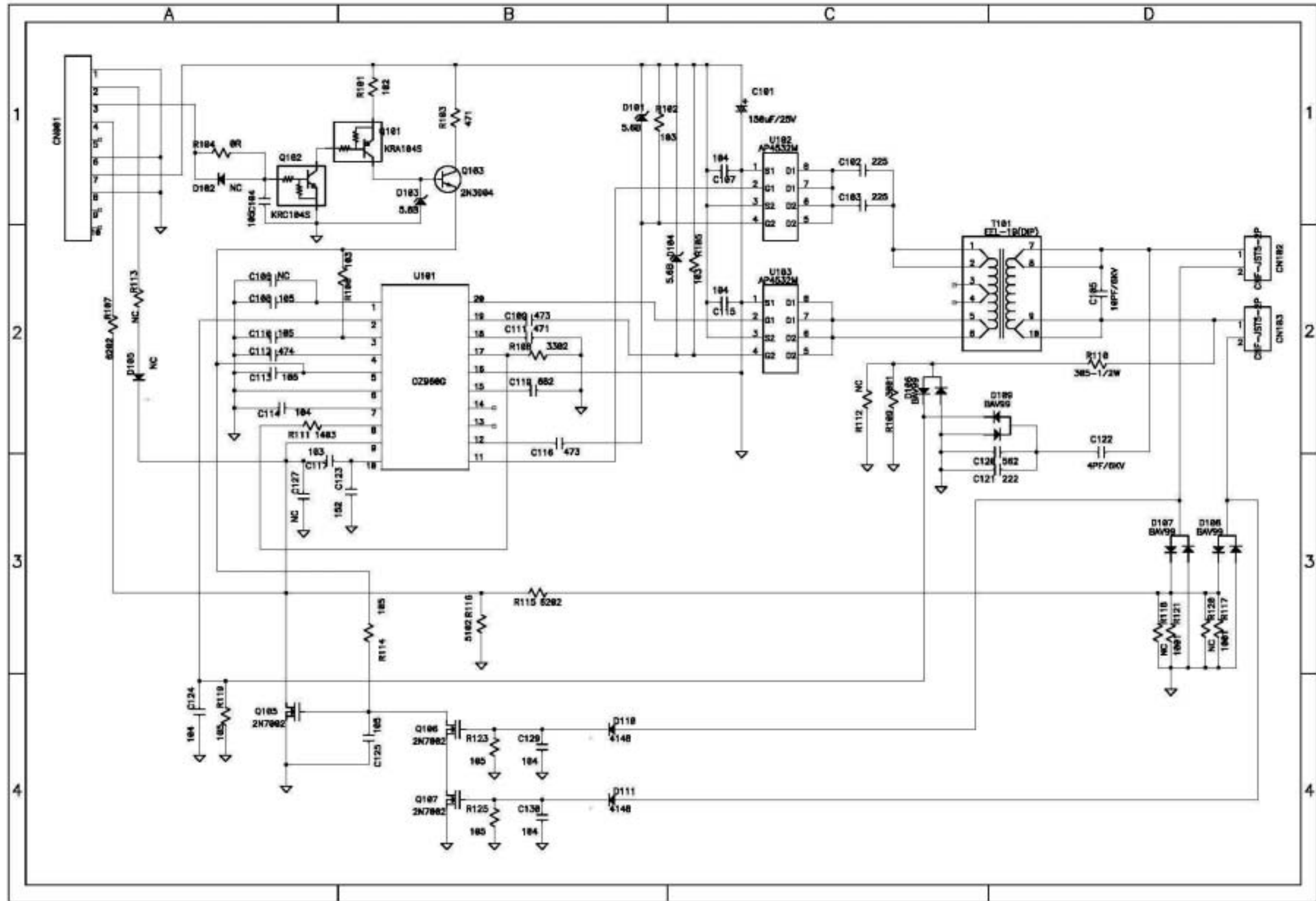
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CLASS_NO				1
<b>CONTROL BOARD</b>		3138 158 5629		
AJ6S40/02				
NAME	HP WU / JOSS HUNG	SUPERS.	1	130 - 1
CHECK		DATE	2003-07-30	A4
© KONINKLIJKE PHILIPS ELECTRONICS N.V. 2000				

### AI- 0021CSPEC-Power Diagram

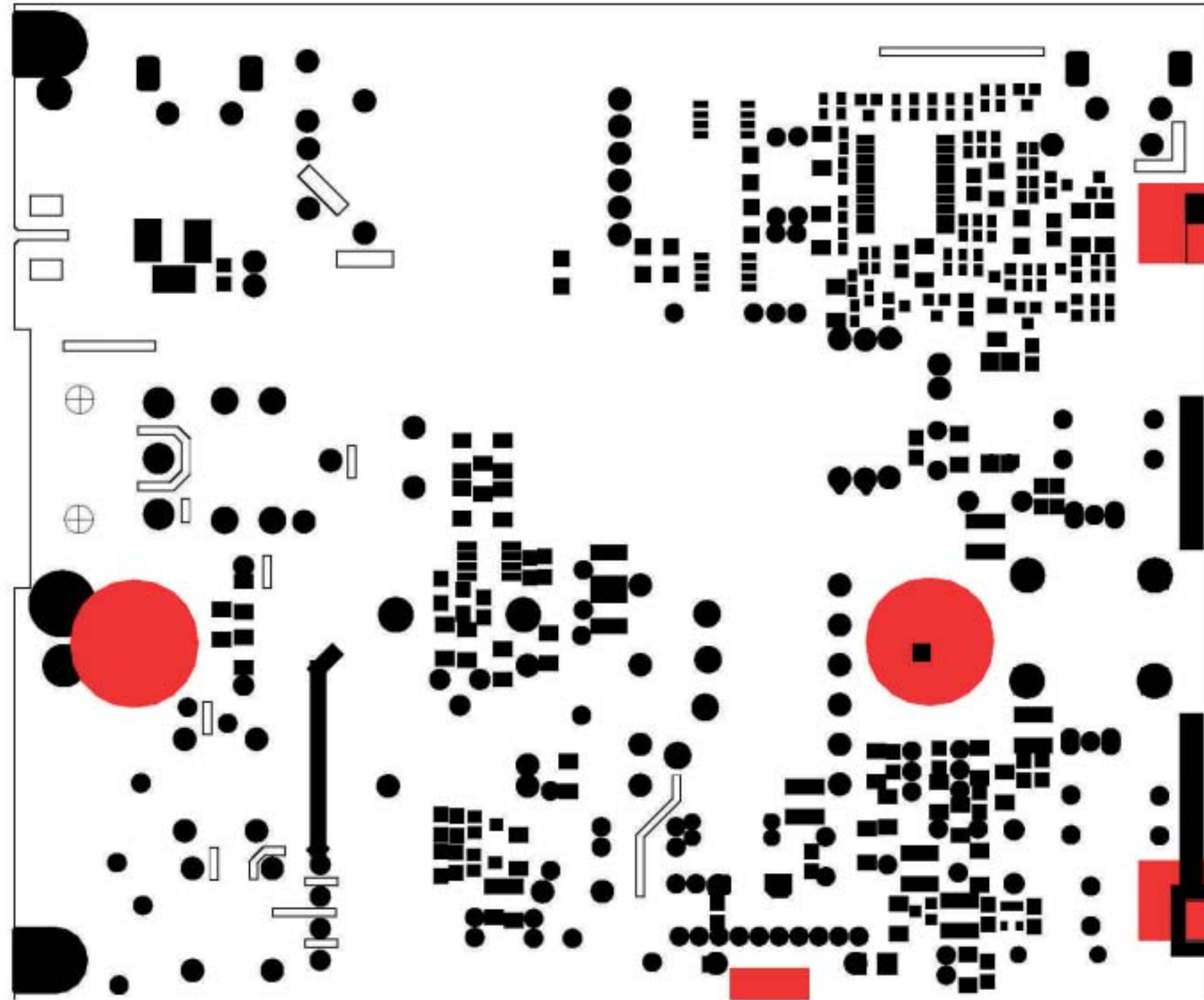
Go to cover page





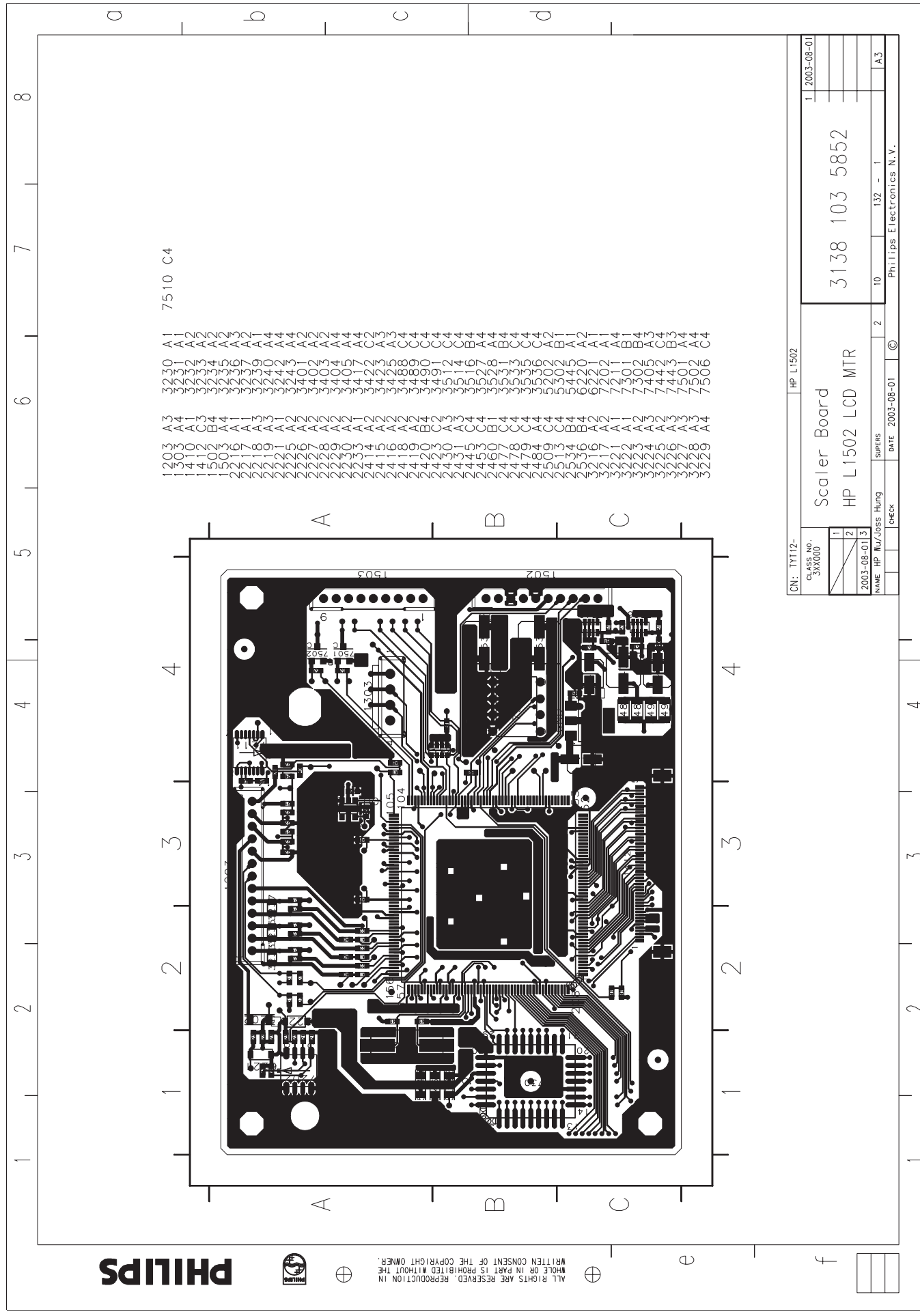
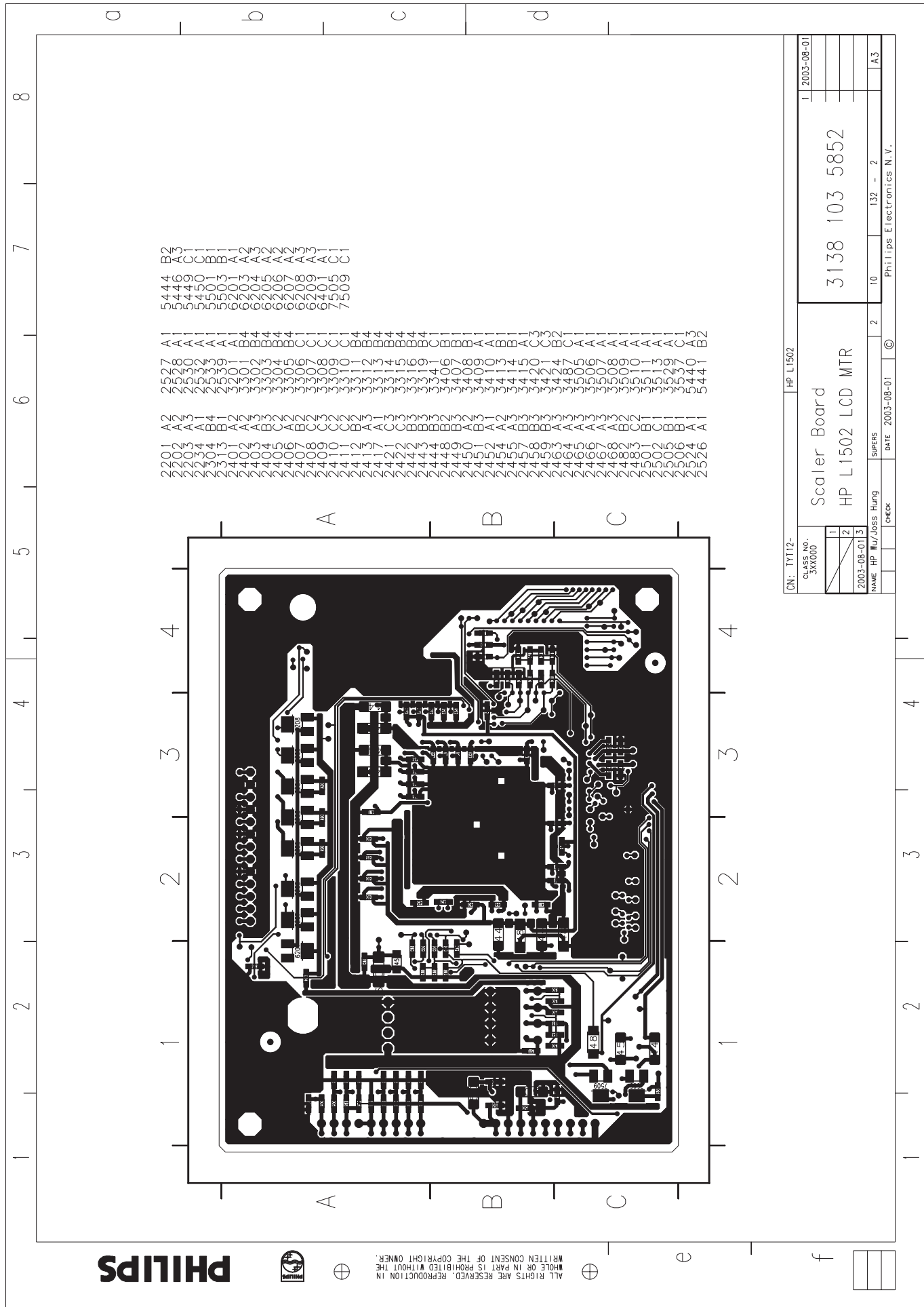






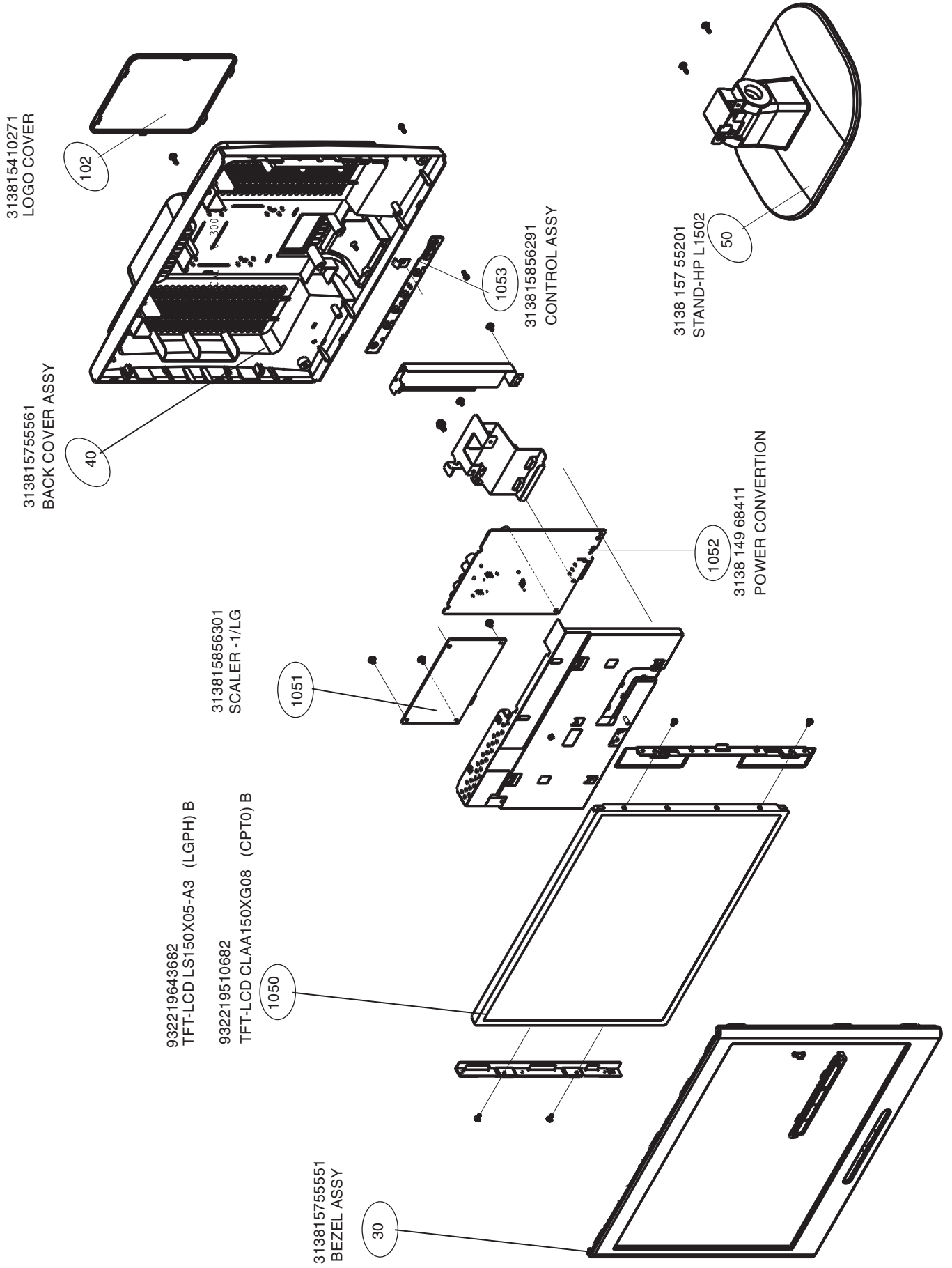
# Scaler board and P. C. B. Layout

Go to cover page



# Exploded View

Go to cover page



## Recommended Parts List

◀◀ Go to cover page

CTV: HP L1502 AJ6S40/02

Mechanical parts

30	313815755551	BEZEL ASSY
40	313815755561	BACK COVER ASSY
50	313815755201	STAND-HP L1502
102	313815410271	LOGO COVER

Packing

129	313810659671	PE BAG
450	313815635921	CARTON-L1502
451	313815635931	CUSHION-R
452	313815635941	CUSHION-L
453	313815621481	P.E.BAG
520	313815635921	CARTON-L1502

Accessory

601	313811705821	HP CD-ROM INF.
1073	313812874931	MAINSKORD

Key components

291	313815560761	LABEL
295	313815560761	LABEL
615	313811705811	HEX CODE OF F/W
1086	313818875651	FFC 50/90/50 61509
1083	8238 277 13491	LIPS(AI-0021C)
1083	8238 277 13501	LIPS(T50P037 01)
1302	243803100435	SOC IC V 8P F 2.54 DIL L
1410	243854300093	RES XTL SM 14M31818 7P SMD49 R
7202	932214526668	IC SM M24C02-WMN6 (ST00) R
7211	935260739118	IC SM 74LVC14APW (PHSE) R
7301	932217946682	IC SM M29W010B-90K1 (ST00) L
7302	932214725682	IC M24C16-WBN6 (ST00) L
7442	932218206685	IC SM IRU1206-25CY (INR0) R
7443	932219322671	IC SM GM2116-AA (GEMI) Y
7501	933967380685	TRA SIG SM BC858C (ONSE) R
7505	932209265685	TRA SIG SM MUN2211J (ONSE) R
7506	932216638668	FET POW SM SI5441DC (VISH) R

Spare Parts List

CTV: HP L1502 AJ6S40/02

Mechanical parts

30	313815755551	BEZEL ASSY
32	313815410281	LENS - POWER
33	313815410261	BUTTON CONTROL
40	313815755561	BACK COVER ASSY
90	313810440571	HOUSING COVER
99	313815560501	FRONT COVER
102	313815410271	LOGO COVER
129	313810659671	PE BAG

LCD -Panel

1050	932219643682	TFT-LCD LS150X05-A3 (LGPH) B
1050	932219510682	TFT-LCD CLAA150XG08 (CPT0) B

Packing

450	313815635921	CARTON-L1502
451	313815635931	CUSHION-R
452	313815635941	CUSHION-L
453	313815621481	P.E.BAG
520	313815635921	CARTON-L1502

Accessory

601	313811705821	HP CD-ROM INF.
1073	313812874931	MAINSKORD

PCB assy

1051	313815856301	SCALER -1/LG
1053	313815856291	CONTROL ASSY

Miscellanea

291	313815560761	LABEL
295	313815560761	LABEL
615	313811705811	HEX CODE OF F/W
1081	823827713611	POWER+VIDEO INPUT ASSEMBLY(L1
1086	313818875651	FFC 50/90/50 61509
1090	313815856801	FRAME+ WIRE ASSY
1410	243854300093	RES XTL SM 14M31818 7P SMD49 R
8061	313818879181	CBLE330019 9/230/8-388AWG28

PCB assy(LG)

1051	313815856301	SCALER -1/LG
2201	223878615649	CER2 0603 X7R 16V 100N PM10 R
2202	223878615649	CER2 0603 X7R 16V 100N PM10 R
2203	223878615649	CER2 0603 X7R 16V 100N PM10 R
2218	223886715339	CER1 0603 NP0 50V 33P PM5 R
2219	223886715221	CER1 0603 NP0 50V 220P PM5 R
2221	223878615649	CER2 0603 X7R 16V 100N PM10 R
2225	223878615649	CER2 0603 X7R 16V 100N PM10 R
2227	223878615649	CER2 0603 X7R 16V 100N PM10 R
2229	223878615649	CER2 0603 X7R 16V 100N PM10 R
2233	223878615649	CER2 0603 X7R 16V 100N PM10 R
2234	223878615649	CER2 0603 X7R 16V 100N PM10 R
2304	223878615649	CER2 0603 X7R 16V 100N PM10 R
2313	223878615649	CER2 0603 X7R 16V 100N PM10 R
2401	223878615649	CER2 0603 X7R 16V 100N PM10 R
2402	223878615649	CER2 0603 X7R 16V 100N PM10 R
2403	223878615649	CER2 0603 X7R 16V 100N PM10 R
2404	223878615649	CER2 0603 X7R 16V 100N PM10 R
2405	223878615649	CER2 0603 X7R 16V 100N PM10 R
2406	223878615649	CER2 0603 X7R 16V 100N PM10 R
2407	223878615649	CER2 0603 X7R 16V 100N PM10 R
2408	223878615649	CER2 0603 X7R 16V 100N PM10 R
2409	223878615649	CER2 0603 X7R 16V 100N PM10 R
2410	223878615649	CER2 0603 X7R 16V 100N PM10 R

2411	223878615649	CER2 0603 X7R 16V 100N PM10 R	3233	232273467509	RST SM 0805 RC12H 75R PM1 R	6201	933137390215	DIO REG SM BZX84-C5V1 (PHSE) R
2412	223878615649	CER2 0603 X7R 16V 100N PM10 R	3234	232270260101	RST SM 0603 RC21 100R PM5 R	6203	933215370215	DIO SIG SM BAV99 (PHSE) R
2413	223878615649	CER2 0603 X7R 16V 100N PM10 R	3235	232273467509	RST SM 0805 RC12H 75R PM1 R	6204	933215370215	DIO SIG SM BAV99 (PHSE) R
2414	223878615649	CER2 0603 X7R 16V 100N PM10 R	3236	232270260101	RST SM 0603 RC21 100R PM5 R	6205	933215370215	DIO SIG SM BAV99 (PHSE) R
2415	223878615649	CER2 0603 X7R 16V 100N PM10 R	3237	232273467509	RST SM 0805 RC12H 75R PM1 R	6206	933215370215	DIO SIG SM BAV99 (PHSE) R
2416	223878615649	CER2 0603 X7R 16V 100N PM10 R	3239	232270260103	RST SM 0603 RC21 10K PM5 R	6207	933215370215	DIO SIG SM BAV99 (PHSE) R
2417	223878615649	CER2 0603 X7R 16V 100N PM10 R	3242	232270260479	RST SM 0603 RC21 47R PM5 R	6208	933215370215	DIO SIG SM BAV99 (PHSE) R
2418	223886715478	CER1 0603 NP0 50V 4P7 PM0P25 R	3301	232270260103	RST SM 0603 RC21 10K PM5 R	6209	933215370215	DIO SIG SM BAV99 (PHSE) R
2419	223886715478	CER1 0603 NP0 50V 4P7 PM0P25 R	3302	232270260103	RST SM 0603 RC21 10K PM5 R	6220	932217973668	DIO REC SM BAT42W (PAJL) R
2420	223886715479	CER1 0603 NP0 50V 47P PM5 R	3303	232270260103	RST SM 0603 RC21 10K PM5 R	6221	933913910115	DIO SIG SM BAS32L (PHSE) R
2421	223886715101	CER1 0603 NP0 50V 100P PM5 R	3304	232270260103	RST SM 0603 RC21 10K PM5 R	6401	933913910115	DIO SIG SM BAS32L (PHSE) R
2422	223886715101	CER1 0603 NP0 50V 100P PM5 R	3305	232270260103	RST SM 0603 RC21 10K PM5 R			
2423	223886715478	CER1 0603 NP0 50V 4P7 PM0P25 R	3306	232270260472	RST SM 0603 RC21 4K7 PM5 R			
2442	223878615649	CER2 0603 X7R 16V 100N PM10 R	3307	232270260472	RST SM 0603 RC21 4K7 PM5 R			
2443	223878615649	CER2 0603 X7R 16V 100N PM10 R	3308	232270260101	RST SM 0603 RC21 100R PM5 R			
2444	223878615649	CER2 0603 X7R 16V 100N PM10 R	3309	232270260101	RST SM 0603 RC21 100R PM5 R			
2445	202001293721	ELCAP SM RV2 16V 10U PM20 R	3311	232270260103	RST SM 0603 RC21 10K PM5 R			
2448	223878615649	CER2 0603 X7R 16V 100N PM10 R	3312	232270260103	RST SM 0603 RC21 10K PM5 R			
2449	223878615649	CER2 0603 X7R 16V 100N PM10 R	3313	232270260103	RST SM 0603 RC21 10K PM5 R			
2450	223878615649	CER2 0603 X7R 16V 100N PM10 R	3314	232270260103	RST SM 0603 RC21 10K PM5 R			
2451	223878615649	CER2 0603 X7R 16V 100N PM10 R	3319	232270260103	RST SM 0603 RC21 10K PM5 R			
2452	222278019763	CER2 0805 Y5V 16V 1U PM20 R	3341	232270260103	RST SM 0603 RC21 10K PM5 R			
2453	223878615649	CER2 0603 X7R 16V 100N PM10 R	3401	232270260101	RST SM 0603 RC21 100R PM5 R			
2454	223878615649	CER2 0603 X7R 16V 100N PM10 R	3402	232270260101	RST SM 0603 RC21 100R PM5 R			
2455	223878615649	CER2 0603 X7R 16V 100N PM10 R	3403	232270260101	RST SM 0603 RC21 100R PM5 R			
2457	223878615649	CER2 0603 X7R 16V 100N PM10 R	3404	232270260101	RST SM 0603 RC21 100R PM5 R			
2458	223878615649	CER2 0603 X7R 16V 100N PM10 R	3405	232270260101	RST SM 0603 RC21 100R PM5 R			
2459	223878615649	CER2 0603 X7R 16V 100N PM10 R	3406	232270296001	RST SM 0603 JUMP. MAX 0R05 R			
2460	222224119876	CER2 1206 Y5V 10V 10U P8020 R	3407	232270260103	RST SM 0603 RC21 10K PM5 R			
2463	222224119876	CER2 1206 Y5V 10V 10U P8020 R	3408	232270260103	RST SM 0603 RC21 10K PM5 R			
2464	223878615649	CER2 0603 X7R 16V 100N PM10 R	3409	232270260479	RST SM 0603 RC21 47R PM5 R			
2465	223878615649	CER2 0603 X7R 16V 100N PM10 R	3410	232270260479	RST SM 0603 RC21 47R PM5 R			
2466	223878615649	CER2 0603 X7R 16V 100N PM10 R	3414	232270260103	RST SM 0603 RC21 10K PM5 R			
2467	223878615649	CER2 0603 X7R 16V 100N PM10 R	3415	232270260104	RST SM 0603 RC21 100K PM5 R			
2468	222224119876	CER2 1206 Y5V 10V 10U P8020 R	3417	232270260221	RST SM 0603 RC21 220R PM5 R			
2477	202001293721	ELCAP SM RV2 16V 10U PM20 R	3420	232270296001	RST SM 0603 JUMP. MAX 0R05 R			
2478	202001293721	ELCAP SM RV2 16V 10U PM20 R	3421	232270296001	RST SM 0603 JUMP. MAX 0R05 R			
2479	202001293782	ELCAP SM RV2 25V 10U PM20 R	3422	232270260339	RST SM 0603 RC21 33R PM5 R			
2482	222224119876	CER2 1206 Y5V 10V 10U P8020 R	3423	232270260101	RST SM 0603 RC21 100R PM5 R			
2483	222224119876	CER2 1206 Y5V 10V 10U P8020 R	3424	232270296001	RST SM 0603 JUMP. MAX 0R05 R			
2484	223886715339	CER1 0603 NP0 50V 33P PM5 R	3425	232270260101	RST SM 0603 RC21 100R PM5 R			
2501	223878615649	CER2 0603 X7R 16V 100N PM10 R	3487	232271191032	RST SM 1206 JUMP. MAX 0R05 R			
2502	223878615649	CER2 0603 X7R 16V 100N PM10 R	3488	232271161478	RST SM 1206 RC01 4R7 PM5 R			
2505	223878615649	CER2 0603 X7R 16V 100N PM10 R	3489	232271161478	RST SM 1206 RC01 4R7 PM5 R			
2506	223878615649	CER2 0603 X7R 16V 100N PM10 R	3490	232271161478	RST SM 1206 RC01 4R7 PM5 R			
2509	223858615636	CER2 0603 X7R 50V 10N PM10 R	3491	232271161478	RST SM 1206 RC01 4R7 PM5 R			
2513	223878615649	CER2 0603 X7R 16V 100N PM10 R	3505	232270260101	RST SM 0603 RC21 100R PM5 R			
2524	223858615623	CER2 0603 X7R 50V 1N PM10 R	3506	232270260101	RST SM 0603 RC21 100R PM5 R			
2526	223858615623	CER2 0603 X7R 50V 1N PM10 R	3507	232270260101	RST SM 0603 RC21 100R PM5 R			
2528	223858615623	CER2 0603 X7R 50V 1N PM10 R	3508	232270260221	RST SM 0603 RC21 220R PM5 R			
2530	223858615623	CER2 0603 X7R 50V 1N PM10 R	3509	232270260221	RST SM 0603 RC21 220R PM5 R			
2532	223858615623	CER2 0603 X7R 50V 1N PM10 R	3510	232270260101	RST SM 0603 RC21 100R PM5 R			
2533	223858615623	CER2 0603 X7R 50V 1N PM10 R	3512	232270260103	RST SM 0603 RC21 10K PM5 R			
2534	202001293747	ELCAP SM RV2 25V 47U PM20 R	3513	232270260101	RST SM 0603 RC21 100R PM5 R			
2536	202001293747	ELCAP SM RV2 25V 47U PM20 R	3514	232270260104	RST SM 0603 RC21 100K PM5 R			
2539	223858615623	CER2 0603 X7R 50V 1N PM10 R	3516	232270260103	RST SM 0603 RC21 10K PM5 R			
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			3528	232270260103	RST SM 0603 RC21 10K PM5 R			
			3529	232270296001	RST SM 0603 JUMP. MAX 0R05 R			
			3531	235003510103	RST NETW SM ARV24 4X 10K PM5 R			
3201	232270260103	RST SM 0603 RC21 10K PM5 R	3533	232270260103	RST SM 0603 RC21 10K PM5 R			
3216	232270260101	RST SM 0603 RC21 100R PM5 R	3535	232270260103	RST SM 0603 RC21 10K PM5 R			
3217	232270260101	RST SM 0603 RC21 100R PM5 R	3536	232270260104	RST SM 0603 RC21 100K PM5 R			
3221	232270260223	RST SM 0603 RC21 22K PM5 R	3537	232270260332	RST SM 0603 RC21 3K3 PM5 R			
3222	232270260223	RST SM 0603 RC21 22K PM5 R						
3223	232270260101	RST SM 0603 RC21 100R PM5 R						
3224	232270260101	RST SM 0603 RC21 100R PM5 R						
3225	232270260101	RST SM 0603 RC21 100R PM5 R						
3226	232270260101	RST SM 0603 RC21 100R PM5 R						
3227	232270260222	RST SM 0603 RC21 2K2 PM5 R						
3228	232270260222	RST SM 0603 RC21 2K2 PM5 R						
3229	232270260473	RST SM 0603 RC21 47K PM5 R						
3231	232270260109	RST SM 0603 RC21 10R PM5 R						
3232	232270260101	RST SM 0603 RC21 100R PM5 R						
			5202	313816874261	TI321611G800-SMD			
			5302	313816874261	TI321611G800-SMD			
			5440	313816874261	TI321611G800-SMD			
			5441	313816874261	TI321611G800-SMD			
			5444	313816874261	TI321611G800-SMD			
			5445	313816874261	TI321611G800-SMD			
			5446	313816874261	TI321611G800-SMD			
			5449	313816874261	TI321611G800-SMD			



Control assy

1053	313815856291	CONTROL ASSY
1302	243803100435	SOC IC V 8P F 2.54 DIL L
1952	243812800196	SWI TACT H=5 GY 160G SKHHAM B
1953	243812800196	SWI TACT H=5 GY 160G SKHHAM B
1954	243812800196	SWI TACT H=5 GY 160G SKHHAM B
1955	243812800196	SWI TACT H=5 GY 160G SKHHAM B
6951	932214603682	LED VS L-3WYGW (KIEL) B

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**PHILIPS**



HP L1502  
General  
Product  
Specification

This specification describes a 15" multi-scan TFT LCD color monitor

Contents

1. Product profile
2. Electrical characteristics
3. DDC and EDID
4. User control functions via OSD
5. FOS characteristics
6. Audio
7. Mechanical characteristics
8. Environmental characteristics
9. Reliability
10. Quality assurance requirements
11. Serviceability
12. Agency Approvals

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CLASS NO.	<b>15" TFT XGA LCD CMTR</b>								
	<b>TYPE : AJ6S40/02</b>		<b>8639 000 14754</b>						
	<b>BRAND : HP (L1502)</b>								
2003-08-11	NAME	HP Wu	SUPERS.	18	590	—	1	<b>10</b>	<b>A4</b>
	<b>TY</b>	CHECK	DATE	2003-08-11		Property of <b>PHILIPS ELECTRONICS INDUSTRIES (TAIWAN) LTD.-C.E.</b>			



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- 1. Product Profile
  - Monitor name : HP L1502
  - Style : Integrated tilt base
  - Scanning frequencies : 30 □ 61KHz (Horizontal), 56 □ 76 Hz (Vertical)
  - Video resolution : XGA,1024x768
  - Video dot rate : 80 MHz
- 1.1 User controls and indicators:
  - Front:
    - DC on/off switch
    - Power LED
    - OSD function 3 keys
  - Rear:
    - D-sub cable
    - AC inlet
- 1.2 Approved Controller ASICs  
Genesis 2116 RSDS

CLASS NO.		<b>15 □ TFT XGA LCD CMTR</b>			
		<b>TYPE : AJ6S40/02</b>		<b>8639 000 14754</b>	
		<b>BRAND : HP (L1502)</b>			
2003-08-11					
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## 1.3 Approved Panel Specification

Table 1.

Vendor	LGPL	CPT	QDI
Updated date	2002-Aug-30	2002-Dec.-13	2003-June-02
Physical Dimension (mm)			
Model Number	LS150X05	CLAA150XG08	QD15Xr01
Diagonal Size --- inch	15.0"	15.0"	15.0"
Active Area (W x H)	304.1x228.1	304.1x228.1	304.1x228.1
Display Pixels (W x H)	1024(x3) x 768	1024(x3) x 768	1024(x3) x 768
Pixel Pitch	(0.099x3) x 0.297	(0.099x3) x 0.297	(0.099x3) x 0.297
Display Outline (W x H x T)	326.0x254.0x11.5	326.0x251.0x12	321x249x11
Weight	995g	1100g	1200g
Optical Characteristics			
Number of Colors	6 bits (262K)	6 bits (262K)	6 bits(262K)
Contrast Ratio	400(typ),250(min)	400(typ),300(min)	400(typ)
Viewing Angle (L/R) --- C/R>10	60/60(typ)	60/60(typ)	75/75(typ)
Viewing Angle (U/D) --- C/R>10	45/45(typ)	45/55(typ)	60/65(typ)
Luminance --- nits	250(typ),200(min)	250(typ),200(min)	250(typ),200(min)
White ( x , y )	313 , 329	312 , 318	313,329
Red ( x , y )	626 , 347	643,344	637,340
Green ( x , y )	308 , 588	304,566	302,582
Blue ( x , y )	146 , 119	141 , 85	146,97
Color Gamut -- %	59.5%	63%	62%
Luminance Uniformity (min)	75%	75%	75%
Backlight Life (min)	40Khrs	35Khrs	30Khrs
Crosstalk (max)	1.20%	1.5%	1.5%
Electrical Characteristics			
Supply Voltage	3.3V	3.3V ; 12V	3.3V
Operating Ambient Temp	0 ~ 50C	0 ~ 55C	0 ~ 50C
Power Consumption (max)	10.4W	10.8W	11W
Main Clock (Typ~Max)	50~79MHz	50~79MHz	50~80MHz
Response time (Tr+Tf)	25ms(typ)	25ms(typ)	25ms(typ)

CLASS NO.

15 TFT XGA LCD CMTR

 TYPE : AJ6S40/02  
 BRAND : HP (L1502)

8639 000 14754

2003-08-11

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2. Electrical characteristics

Windows 2000 and XP certification are required for the monitor.  
The monitor shall meet all PC2001 design guidelines.

2.1 Interface Requirements

2.1.1 Applied Two Different Modes

(1) Analog Input

- Video Signal Amplitudes: 0.7 Vp-p,
- Video Signal Termination impedance: 75 Ω ± 1%
- Sync Signal Termination impedance: 2K2 Ω ± 5%
- Sync Signal Levels: 3.3 and 5 volt TTL level, +/- polarity
- Sync Format Compatibility: Separate sync

(2) Check Video Cable

When the Monitor determines the VGA cable is not connected, the Monitor shall display a flicker free message, "Check Video Cable" for 60 seconds, to alert the user that the video cable is not be plugged into the CPU or a Monitor signal connector. The monitor shall use a method of a pull-up resistor on a ground pin to determine if the video cable is connected to the PC. Following the 60 second period, the Monitor shall display the Going to Sleep message for 3 seconds, then enter the reduced power state, per the following sequence of events:

- Signal cable is removed or Monitor is powered ON with no signal cable attached
- Monitor displays "Check Video Cable" message.
- After 60 seconds, the "Going to Sleep" message is displayed for 3 seconds.
- After 3 seconds, Monitor enters the Sleep mode; Power LED is Amber

If the monitor is in Sleep mode, pressing any OSD button shall cause the OSD message to be displayed for another 60 seconds. If the Power Saver feature is set to off, then the "Check Video Cable" shall be continuously displayed with a moving OSD box to prevent image retention on the LCD panel.

2.1.2 Signal Connector and Cable

All models shall include one analog video signal input.  
The connector and cable requirements are specified below.

D-sub Connector and VGA I/F Cable

A signal cable shall be provided with the monitor and shall be black and 1.5 ± .05 meters long. One end shall have a molded-over, shielded, triple row, 15 position, subminiature D connector. The D connection shall have captive screw locks, which will be adequate for hand tightening. If a ferrite bead is required on the video cable at the point it plugs into the PC, the bead can be no closer than 2.60" (66mm) from the VGA connector. The VGA connector cannot be any deeper than 2.0" (51mm).

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		<b>TYPE : AJ6S40/02</b>		<b>8639 000 14754</b>	
		<b>BRAND : HP (L1502)</b>			
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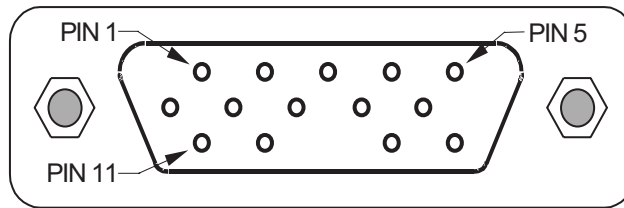


### 2.1.3 Video Signal Pin Assignments

TABLE 1  
ANALOG CONNECTOR PINOUT

PIN	MNEMONIC	SIGNAL
1	RV	Red Video
2	GV	Green Video/Sync on Green
3	BV	Blue Video
4	NC	None
5	GND	Ground (DDC Return) or Cable detect
6	RG	Red GND
7	GG	Green GND
8	BG	Blue GND
9	+5 V	+5 V
10	SG	Sync GND or Cable detect
11	NC	None
12	SDA	DDC Data
13	HS	Horizontal Sync
14	VS	Vertical Sync
15	SCL	DDC Clock

FIGURE 1  
VGA CONNECTOR LAYOUT



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### 2.2 Power Supply Requirements

#### 2.2.1 power supply specifications

The power supply for the monitor shall be internal and shall have a standard receptacle for mains power input, and shall provide sufficient DC power for both the monitor and the backlight assembly, and shall meet all requirements specified in the following.

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		<b>TYPE : AJ6S40/02</b>		<b>8639 000 14754</b>	
		<b>BRAND : HP (L1502)</b>			
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TABLE 4  
POWER SUPPLY SPECIFICATIONS

Input Voltage Range	90 to 265 VAC sinusoidal for all models
Input Frequency Range	47 to 63 Hz over the specified input voltage range
Power Consumption	Refer to Table 5 for details.
Line Fuse	The AC input shall be fused and become electrically open as a result on an unsafe current level. The fuse may not be user replaceable.
Initial Cold Start	The power supply shall start and function properly when under full load, with worst case conditions of input voltage, input frequency, operating temperature, and cold backlight lamps.
Inrush Current	< 30 A when operated at 120 VAC, < 50 A when operated at 220 VAC.
Hot Start Cycle	The power supply shall not be damaged when switched ON for one second and OFF for one second for seven consecutive times after operating for one hour at full load, 25°C, and nominal input line voltage.
Under Voltage	The power supply shall contain protection circuitry such that the application of an input voltage below the minimum specified value shall not cause damage to the power supply unit nor cause failure of the input fuse.
Line Transient	The power supply shall operate within IEC 801-4 (□ 1 kV) and IEC 801-5 (□ 2 kV) for the domestic U.S. version. The UPS power supply shall operate and comply with CE mark regulations for all international versions.
Leakage Current	Maximum leakage current is 500mA at 120VAC input.

**2.2.2 Power Cord**

IEC C-13/C-14 (Standard) type male power receptacle for connection to mains power. The □Mickey Mouse□ C-5/C-6 type of connector is not allowed. The power cord, exact type to be supplied in the appropriate Option Kit, shall be black and have length of 1.8 ± 0.05 meters.

**2.2.3 Power Management Onset**

When the CPU signals the monitor to enter a reduced power state (the monitor shall blank the video within 200 milliseconds, display the OSD message □Going to Sleep□, and then enter the reduced power state approximately 3 seconds after the OSD message appears. If the Power Saver feature is set to Off, then the □No Input Signal□ OSD message shall be continuously displayed with a moving OSD box to prevent image retention on the LCD panel. The monitor shall recover from sleep mode within 3 seconds as measured by stable syncs and Video On and Backlight On.

TABLE 5  
POWER CONSUMPTION

CPU State	Monitor State	Maximum Power (Watts)	Power Switch LED Color
Full Power	Full Power	25	Green
Sleep	Sleep	2	Amber
-	Switch Off	2	(LED off)

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#### 2.2.4 Power ON/OFF Switch

The monitor shall have a power control switch visible and accessible on the front of the monitor. The switch shall be marked with icons per IEC 417, #5009. The switch shall have no effect on the operation of the AC/DC converter. Instead, it shall interrupt the DC supply to the monitor. The monitor shall leave the factory with the power switch set to the Off position.

#### 2.2.5 Power Indicator LED

The monitor shall make use of an LED type indicator located on the front of the monitor. The LED color shall indicate the power states as given in Table 5.

### 2.3 Monitor Modes and Timing Capability

#### 2.3.1 Format and Timing

The monitor shall synchronize with any stable format signal used in the industry with a vertical frequency from 56 Hz to 76 Hz and with a horizontal frequency from 30 kHz to 61 kHz. If the input frequency is out of this specified range, the monitor shall display a warning screen indicating that the input frequency is out of range. Under no circumstances shall any combination of input signals cause any damage to the monitor.

#### 2.3.2 Factory Assigned Display Modes

There are 11 required factory pre-set video modes (refer to Table 6). These modes have a factory pre-set for all characteristics affecting front-of-screen performance. When the system is powered-on, previously stored screen parameters for a pre-defined mode will be recalled if the operating mode is one of those stored in memory. If the operating mode is not one of those stored in memory, the monitor CPU will automatically start the Auto-Adjustment process. The screen parameters may be adjusted by the use of the front bezel controls and then may be saved as a user defined mode. The monitor shall include the following preset video timings

#### 2.3.3 Mode Recognition Pull-in

The monitor shall recognize preset modes within a range of  $\pm 1\%$  or  $\pm 500$  Hz whichever is less for horizontal; and within  $\pm 1$  Hz for vertical.

TABLE 6  
FACTORY PRESET DISPLAY MODES

Preset	Pixel Format	Horz Freq (KHz)	Horz Polarity	Vert Freq (Hz)	Vert Polarity	Pixel Clk (MHz)	Source
1	640 x 480	31.469	-	59.940	-	25.175	VGA
2	640 x 480	37.861	-	72.809	-	31.500	VESA
3	640 x 480	37.500	-	75.000	-	31.500	VESA
4	720 x 400	31.469	-	70.087	+	28.322	VGA
5	800 x 600	37.879	+	60.317	+	40.000	VESA
6	800 x 600	48.077	+	72.188	+	50.000	VESA
7	800 x 600	46.875	+	75.000	+	49.500	VESA
8	832 x 624	49.726	+/-	74.551	+/-	57.284	MAC
9	1024 x 768	48.363	-	60.004	-	65.000	VESA
10	1024 x 768	56.476	-	70.069	-	75.000	VESA
11	1024 x 768	60.023	+	75.029	+	78.750	VESA

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CLASS NO.

15" TFT XGA LCD CMTR

TYPE : AJ6S40/02  
BRAND : HP (L1502)

8639 000 14754

2003-08-11

NAME HP Wt

SUPERS.

18

590

7

10

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TY

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### 2.3.4 Fail-Safe Modes

For support of Fail-Safe modes, the monitor shall display video for all preset modes at 85 Hz. In the Fail-Safe mode, the "Out of Range" OSD message shall be displayed for 60 seconds. This Fail-Safe mode is to allow the customer to adjust the refresh rate. In the Fail-Safe mode, the video does NOT have to be high quality, properly centered and sized, and in full color.

### 3. DDC and EDID

Product Number: HWP2600  
Version : EDID 3.0 structure 1.3  
Protocols : DDC2B (DDC-1 support is prohibited)

The monitor shall provide a display communications channel (DDC) that conforms to VESA Enhanced-DDC and PC2001 hardware requirements. The monitor shall only respond to the I2C address of "A0". In addition, the monitor shall support both 3.3V and 5.0V DDC signaling. The monitor shall support a minimum DDC clock speed of 100 kHz. The monitor may support DDC wait-state or clock-stretching by holding the DDC clock line low, but the maximum length of the wait-state is 500 ms. The monitor must accept +5 VDC through pin 9 of the VGA connector. This is to be used to power the monitor's DDC and EDID electronics, assuring that the EDID may be read by the host regardless of the monitor's power condition. The monitor shall consume less than 50mA through pin 9. The monitor must only receive power through the pin 9 connection, and shall not feed any current into the attached computer if the monitor is on and the computer is off. The monitor shall contain the 128 byte EDID file as specified by the VESA Enhanced-EDID and PC2001 specifications. The monitor shall be designed so that there is some means to rewrite the complete DDC file content without setting internal jumper

### 4. User control functions via OSD

#### 4.1 Bezel OSD Buttons

The monitor bezel shall have the OSD buttons (from left to right) Menu, Minus (M-), and Plus (M+).

#### 4.1.1 Menu Key

Pressing the Menu button (M) the first time brings up the BASIC menu level. The + and - buttons move up and down the menu, respectively. The selected menu function shall be highlighted in orange text for all menus. Pressing the Menu button again brings up the second menu level for the item selected. The selection will wrap around if the bottom item is selected and the - button is pressed, the selection will move to the top item. Likewise, if the top item is selected and the + button is pressed, the selection will move to the bottom item. Selecting the "Advanced Menu" from the Basic Menu will result in the display of the ADVANCED OSD, described in Table 8. The Advanced Menu will remain the default OSD upon subsequent power-ups of the monitor until the "Basic Menu" option is selected or until "factory reset" is selected.

#### 4.1.2 Bezel OSD Button Hot Keys

Menu button (M), shall be hot-key for OSD Menu Exit  
The Minus (M-) button shall be a hot-key for the Auto-Adjustment process.

### 4.2 Factory Reset

This function, when selected and confirmed, shall replace previously saved user settings with the factory preset values, but just for the mode in operation at the time. If the current mode is a user mode (not one of the presets), a Factory Reset will delete all user settings for this mode, but will not change any user settings for other presets, nor will any other user modes be affected. The functions which are reset are indicated in the menu tables. Upon reset, the basic menu mode shall be selected. Note that the Factory Reset control will also set Brightness, Contrast, and Color Temperature to their factory default values.

The monitor shall do an automatic Auto-Adjustment after a Factory Reset. If the Horizontal / Vertical image Pos and Clock /Phase adjustments are different from Factory Reset, these values will be stored in new user mode."

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		<b>BRAND : HP (L1502)</b>			
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### 4.3 OSD Definitions

Philips follow HP's requirement to create OSD, and HP approved the OSD sample, if any deviation between specification and sample, should follow up the MP sample as standard.

The OSD menu structures are given below. Factory defaults and which items are affected by the factory reset function are indicated in the Advanced OSD Menu table.

TABLE 7  
BASIC OSD MODE CONFIGURATION

Mode Menu			
Menu Level 1	Menu Level 2	Menu Level 3	Factory Reset
Brightness	ADJ Scale		Y (FD = 100)
Contrast	ADJ Scale		Y (FD = 50)
Auto Adjustment	Show <input type="checkbox"/> Adjusting <input type="checkbox"/> message		Y (no FD)
Advanced Menu	Refer to table 8		
Exit			

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TABLE 8  
ADVANCED OSD MODE CONFIGURATION

Mode Menu			
Menu Level 1	Menu Level 2	Menu Level 3	Factory Reset
Brightness	ADJ Scale		Y (FD = 100)
Contrast	ADJ Scale		Y (FD = 50)
Image Control	Auto Adjustment	Show <input type="checkbox"/> Adjusting <input type="checkbox"/> message	Y (no FD)
	Horizontal Position	ADJ Scale	Y (no FD)
	Vertical Position	ADJ Scale	Y (no FD)
	Clock	ADJ Scale	Y (no FD)
	Clock Phase	ADJ Scale	Y (no FD)
	Cancel		
	Save and Return		
Color	9300 K		
	6500 K-sRGB		Y (FD = 6500 K-sRGB)
	Custom Color	R/G/B Color ADJ	Y(FD=100)
	Cancel		
	Save and Return		
Language	Deutsch		
	English		N (FD=English)
	Español		
	Français		
	Italiano		
	Nederlands		
	Cancel		
	Save and Return		
Management	Power Saver	On / Off Selection	N (FD=ON)
	Power On Recall	On / Off Selection	N (FD=ON)
	Mode Display	On / Off Selection	N (FD=OFF)
	Sleep Timer	Timer Set Menu	N (FD=0;OFF)
	Cancel		
	Save and Return		
OSD Control	Horizontal OSD Position	ADJ Scale	N (FD=50)
	Vertical OSD Position	ADJ Scale	N (FD=50)
	OSD Timeout	ADJ Scale	N (FD=30)
	Cancel		
	Save and Return		
Factory Reset	Yes		
	No		
Exit			

- 5. FOS characteristics
- 5.1 Test conditions
  - This specification is defined under the following conditions.
  - Input mode: 1024 x 768/60Hz mode (48.3 KHz)
  - Warm-up: more than 30 minutes.
  - Ambient light: 400 -- 600 lux.
  - Ambient temperature: 25 ± 5 °C.
- 5.2 Check of WHITE-D
  - Use Minolta CA-110 for color coordinates and luminance check.
  - Apply a white pattern (pattern 1),
  - Set brightness = 100%, and contrast = 50%.
  - Adjust the R, G, B gain, at the screen center area, to meet specification (1931 CIE chromaticity (X, Y) coordinates).

	9300°K	6500°K-sRGB
x (center)	0.283 ± 0.020	0.313 ± 0.020
y (center)	0.297 ± 0.020	0.329 ± 0.020

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5.3 Panel Luminance  
Set to Custom Color, user R.G.B gain at 100%  
Measured at center point as pattern1

Brightness control	Contrast control	Light output
100	100	>= 200 nits

5.4 Check brightness uniformity  
Set brightness and contrast =100%  
Ser color temperature = custom color  
Apply the pattern 1.  
It should comply with the following formula:

$$\frac{\text{Minimum luminance of 9 points}}{\text{Maximum luminance of 9 points}} \geq 0.75$$

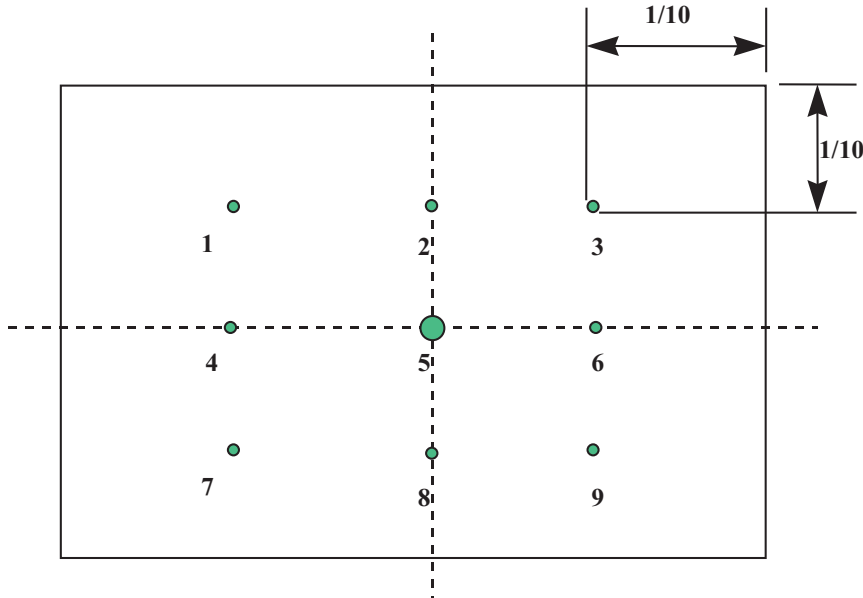
5.5 Back Light Dimming Range  
Set the contrast at 100 %,  
Set color temperature = custom color  
Measure brightness at 0% and 100%  
The light output of center (pattern 1) should be comply with

$$\frac{\text{Luminance at brightness 100\%} - \text{Luminance at brightness 0\%}}{\text{Luminance at brightness 100\%}} * 100\% \geq 25 \%$$

5.6 Check Cross talk  
Set contrast at 50 % and brightness at 100 %.  
Apply Pattern 2 and measure A.  
Apply Pattern 3 and measure A'

$$\frac{\text{ABS} (A - A')}{A} * 100 \% \leq 1.5 \%$$

Pattern 1: Brightness and Uniformity (9 points)



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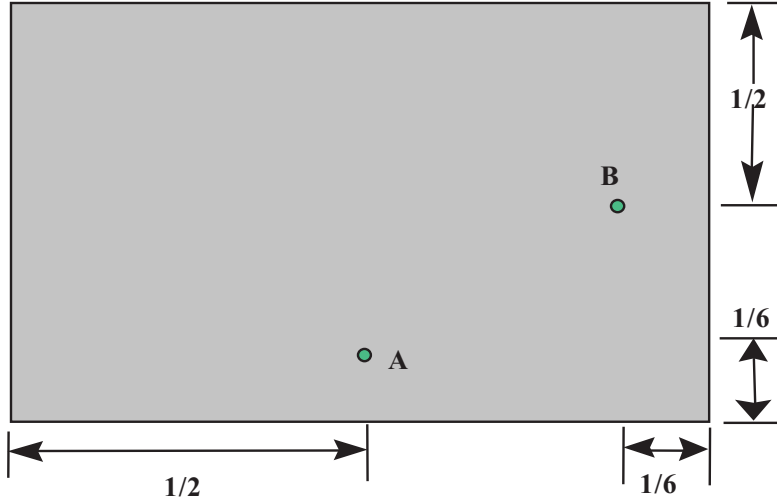
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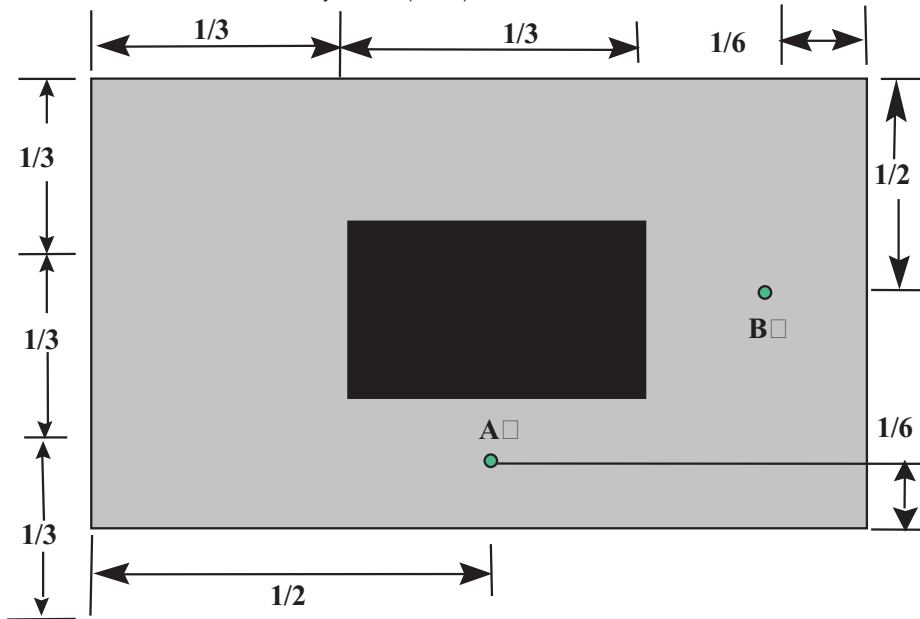
Patern 2: Cross talk pattern

Gray level 184 (256 Gray level)



Pattern 3: Cross talk Pattern

Center at Gray level 0 (Black)



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## 5.7 Panel Defect Limits

This is general specification from HP, if any deviation, HP agree to follow up panel specification.

Table 9 lists the countable and rejectable sizes for each type of commonly found defects. Defects within the countable size are allowed; however, the total number of countable defects shall not exceed the maximum number of all countable defects noted in the table. Any defect with dimensions greater than the countable defect shall be sufficient cause for rejecting the display.

The symbols used are: D = Diameter, L = Length (longest dimension), W = Width (perpendicular to the length), N = Number or Count, Spot = Contamination, S = Separation from Edge to Edge, Dot = Sub-pixel stuck on/off (electrical).

TABLE 9  
OPTO-MECHANICAL DEFECTS

VISUAL DEFECTS: (See Notes)	COUNT	REJECT
Dark/White Spot	$0.25 < D \leq 0.40, N \leq 3$	$D > 0.40$ or $N > 3$
Bright Line (Light Lint)	$0.03 < W \leq 0.152, L \leq 2.03, N \leq 4$	$W > 0.152$ or $L > 2.03$ or $N > 4$
Dark Line (Dark Lint/Hair)	$0.03 < W \leq 0.10, 0.3 < L \leq 1.0, N \leq 4$	$W > 0.10$ or $L > 1.0$ or $N > 4$
Polarizer Scratch	$0.01 < W \leq 0.07, 1.0 < L \leq 10.0, N \leq 3$	$W > 0.07$ or $L > 10.0$ or $N > 3$
Polarizer Dents	$0.15 < D \leq 0.4, N \leq 3$	$D > 0.4$ or $N > 3$
Polarizer Bubble	$0.254 < D \leq 0.40, N \leq 3$	$D > 0.40$ or $N > 3$
Rubbing Defects		Not Allowed
Newton Rings		Not Allowed
Mottling		Not Allowed
ELECTRICAL DEFECTS: (See Notes)		
Bright Dot (Electrical):		
High and Low Level (Total)	$N \leq 3$	$N > 3$
Dark Dot (Electrical)	$N \leq 5$	$N > 5$
<i>Minimum Distance Between Electrical Defects</i>		
High Level Green to High Level Green	$S \geq 25.4$	$S < 25.4$
Bright Dots: High Level to High Level	$S \geq 15$	$S < 15$
Bright Dots: High Level to Low Level and Low Level to Low Level	$S \geq 5$	$S < 5$
Bright Dots: Two Adjacent Low Level and Low Level (Any Plane)	$N \leq 2$	$N > 2$
Bright Dots	Three or More Adjacent High or Low Level (Horizontal Plane)	Not Allowed
Dark Dots	$S \geq 15$	$S < 15$
Dark Dots: Two Adjacent (Horizontal Plane Only)	$N \leq 2$	$N > 2$
Dim Lines		Not Allowed
Cross Line(s) On/Off		Not Allowed
Horizontal Line(s) On/Off		Not Allowed
Vertical Line(s) On/Off		Not Allowed
Minimum Distance Between ANY Allowable Defects	$S \geq 25$ (Unless Otherwise Specified)	$S < 25$
Maximum No. of Allowable Defects	$N \leq 5$ (all types)	$N > 5$

6. Audio  
No audio function for HP L1502.

7. Mechanical characteristics

7.1 Tilt base  
Tilt angle:  $-5^\circ$  to  $+30^\circ$

CLASS NO.

15 TFT XGA LCD CMTR

TYPE : AJ6S40/02  
BRAND : HP (L1502)

8639 000 14754

2003-08-11

NAME	HP Wu	SUPERS.	18	590	—	13	10	A4
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7.2 Shipping and Packing

Packaging and wrapping shall be sufficient to protect the product against damage or loss during shipment from the supplier to the destination specified in the purchase order.

7.2.1 Unit Dimension / Weight

Set Dimension (incl. Pedestal): W340mm x D185.3mm x H338mm.  
New weight: 3.6 Kg

7.2.2 Shipping Dimension / Weight

Carton Dimension: W400mm x D123mm x H414mm.  
Gross Weight: 4 Kg

7.2.3 Pallet / Block Unit

It use two kind of pallets, which mixed into container (see sheet 560 for the detail).

The size is,  
A type pallet: 1135 x 820 x 120 mm.

For see shipments,  
A type pallet: 90 packages per pallet (18 layers x 5 packages per layer).

The package count for sea shipping container shall be:  
40 Ft Container:  
90 packages per pallet x 28 Pallets = 2520 packages.  
Total packagers: 1080+720=1800 packages.

20 Ft Container:  
90 packages per pallet x 14 Pallets = 1260 packages.  
Total packagers: 1260 packages

TABLE 10. Shipping and Packing Dimensions

HP L1502	
Drop specs level 2 (36" height)	2C+2E+6F
Attached base	
<b>Monitor Dimensions (mm)</b>	
Width	340
Depth	185.3
Height	338
<b>Packaging Dimensions (mm)</b>	
B flute, 3mm	
Width	400
Depth	123
Height	414
<b>Pallet Dimensions (mm)</b>	
Width	1135
Depth	820
Height	120
40 container QTY Slip Sheet	2610
40 container QTY Wood Pallet	2610

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CLASS NO.	15" TFT XGA LCD CMTR		8639 000 14754				
	TYPE : AJ6S40/02						
	BRAND : HP (L1502)						
2003-08-11	NAME HP Wu	SUPERS.	18	590	14	10	A4
TY	CHECK	DATE	2003-08-11	Property of PHILIPS ELECTRONICS INDUSTRIES (TAIWAN) LTD.-C.E.			

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7.3 HP Monitor Test Summary

7.3.1 Transportation tests

Swept-sine vibration, transportation profile random vibration, and drop tests shall be performed sequentially on each sample. Packaging or test unit may not be changed at any point in the test. and a minimum of 3 units must be tests.

Standard		HP Drawing No. 109291
Singal container resonance	Sequence	5-150 Hz, 0.5 G 30 min. Dwell at lowest natural freq. Each axis, 3 axes.
	Test Result	Electrical function ok Mechanical function ok No serious damage on set appearance
Random Vibration	Sequence	Frist 0.5 Grms, Truck spectrum, Then followed 1.0 Grms Air spectrum 30 Min @ each axis/profile, total 3 axes
	Test Result	Electrical function ok Mechanical function ok No serious damage on set appearance
Drop Test	Height	91.4 cm
	Sequence	2 corners                      remark:filter is use 200 hz 2 edges 6 faces
	Test Result	Electrical function ok Mechanical function ok No serious damage on set appearance (Room temp./-10 degreeC, humidity 70 %)

8. Environmental characteristics

8.1 Environmental Requirements

8.1.1 Temperature Ranges

Operating Temperature (Independent of altitude) ..... 5 to 35 degreeC.  
Non-Operating Temperature (Independent of altitude)..... -20 to 60 degreeC.

8.1.2 Humidity

Operating (non-condensing).....20% to 80%  
Non-Operating (38.7 degreeC maximum wet bulb temperature)..... 5% to 90%

8.1.3 Altitude

Operating ..... 0 to 12,000 feet [3,658 m]. Equivalent to 14.7 to 10.1 psia.  
Non-Operating..... 0 to 40,000 feet [12,192 m]. Equivalent to 14.7 to 4.4 psia.

9. Reliability

9.1 Mean Time between Failure

The demonstrated MTBF shall be 80,000 hours excluding the backlight.  
The backlight shall have minimum 30k hour life (50% brightness).

10. Quality assurance requirements

10.1 Lot Acceptance

According to MIL-STD-105D Control II level  
AQL : 0% (critical ); 0.65% (major); 1.5% (minor)  
(Please also refer to annual quality agreement)

CLASS NO.	<b>15 TFT XGA LCD CMTR</b>			
	<b>TYPE : AJ6S40/02</b>	<b>8639 000 14754</b>		
	<b>BRAND : HP (L1502)</b>			
2003-08-11				
NAME HP Wu	SUPERS.	18	590	15
			<b>10</b>	<b>A4</b>
TY	CHECK	DATE 2003-08-11	Property of <b>PHILIPS ELECTRONICS INDUSTRIES (TAIWAN) LTD.-C.E.</b>	

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- 11. Serviceability  
The serviceability of this monitor should fulfill the requirements which are prescribed in UAW-0346 and must be checked with the check list UAT-0361.
- 12. Agency Approvals  
CCC (China), CE (Europe), CSA (Canada), IEC950 CB Report, NOMNYCE (Mexico), PSB (Singapore), SEMKO (Nordic), IRMA ( Argentina ) TUV (Germany), UL (USA) GOST (Russia), B-MARK (Poland), DEMKO (Nordic), FIMKO (Nordic), SISIR, CPA (Singapore), EZU (Czech) , MIC ( Korea )
- 12.1 Product Safety Requirements and Approvals  
  - EN 60950 (IEC 950):
  - CB SCHEME CERTIFICATION:
  - UL APPROVAL:
  - CSA APPROVAL:
  - VDE / TUV APPROVAL:
  - NORDIC SAFETY APPROVAL:
  - MEXICAN SAFETY COMPLIANCE:
  - POLAND COMPLIANCE (PCBC):
  - RUSSIAN COMPLIANCE (GOST):
  - SLOVENIAN APPROVAL (SIQ):
  - SLOVAK REPUBLIC APPROVAL (EVPU):
  - CROATIA APPROVAL (KONKAR):
  - CHINA APPROVAL (CCC):
  - CONSUMER PROTECTION REGISTRATION SCHEME OF SINGAPORE ( SISIR ):
  - UKRAINE APPROVAL (UKRSERTCOMPUTER):
  - SAUDI ARABIA APPROVAL (SASO):
  - BELARUS APPROVAL (BNCI):
  - LITHUANIA APPROVAL (INFOSTRUKTURA):
  - ARGENTINA CERTIFICATION (IRAM):
- 12.2 Ergonomic Requirements and Approvals  
  - ISO ERGONOMICS: ISO13406-2 (Class II is required for pixel defects )(TUV/ERG )
  - SWEDISH ERGONOMICS AND EMISSIONS: MPRII, TCO99, Nutek
  - GERMAN ERGONOMIC APPROVAL: EK1-ITB2000 ( TUV/GS )
  - TCO 2003 APPROVAL: (in feature)
- 12.3 EMC Requirements and Approvals  
  - FCC APPROVAL (USA): Part 15 class B
  - C.I.S.P.R. REQUIREMENTS: C.I.S.P.R. Publication 22 Class B.
  - V.C.C.I. APPROVAL (Japan): Class B.
  - MINISTRY OF COMMERCE REQUIREMENTS (New Zealand): Class B.
  - CANADIAN REQUIREMENTS: ICES-003 Class B
  - AUSTRALIAN ACA APPROVAL: ACA AS/NZS 3548, Class B
  - TAIWAN BSMI APPROVAL: (CNS) 13438 (CISPR 22), Class B
  - CHINA CCC APPROVAL:
  - KOREA MIC APPROVAL: MIC Korea "EMC Registration Regulation" Class B
  - HARMONIC CURRENT EMISSIONS : IEC 61000-3-2 (EN 61000-3-3 )
  - VOLTAGE FLUCTUATIONS FLICKER REQUIREMENTS: IEC 61000-3-3 ( EN 61000-3-2 )
  - EN 55022:1998
  - EN 55024 consisting of: IEC 61000-4-2 / -3 /-4/ -5 / -6 / -8 / -11

CLASS NO.		<b>15 TFT XGA LCD CMTR</b>			
		<b>TYPE : AJ6S40/02</b>		<b>8639 000 14754</b>	
		<b>BRAND : HP (L1502)</b>			
2003-08-11					
NAME	HP Wu	SUPERS.	18	590	16
TY	CHECK	DATE	2003-08-11	10	A4
Property of <b>PHILIPS ELECTRONICS INDUSTRIES (TAIWAN) LTD.-C.E.</b>					

## Difference parts list

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Diversity of AJ6S40/76 comparing with AJ6S40/02		
Item	12NC	Description
	863900014753	AJ6S40/76
130	313815522421	GUIDE QUICK USERS D/B-WW
131	313815522281	GDE AGENCY SAFETY WARNING-NA/LA
132	313815522271	WARRANTY COM. DISPLAY-AMER
520	313815635922	CARTON-L1502
1073	313812874901	MAINSCORD
1073	313818870491	MAINSCORD UL 10A 1M8 DET BK
Diversity of AJ6S4M/02 comparing with AJ6S40/02		
Item	12NC	Description
	863900014749	AJ6S4M/02
30	313815755261	BEZEL ASSY
31	313815409921	BEZEL
32	313815409961	LENS-POWER
33	313815409941	BUTTON CONTROL
34	313815409971	POWER HOUSING
35	313815409951	POWER BUTTON
40	313815755271	BACK COVER ASSY
41	313815409931	BACK COVER
50	313815755211	STAND-HP F1523
93	313815134441	SHIELD INVERTER
101	313815134521	BRACKET-AC-SUPPORT LG
101	313815134381	BRACKET-AC-SUPPORT CPT
121	313815320071	EXSICCATOR
130	313815522361	GUIDE QUICK USERS D/B-EMEA
132	313815522391	WARRANTY HP CONSUMER-EU
450	313815636171	CARTON-FP5315
520	313815635851	CARTON-F1523
1051	313815856701	SCALER-1 ASSY(LPL)
1053	313815856751	CONTROL ASSY
1054	313815857281	AUDIO IN
1081	823827713631	POWER+VIDEO+AUDIO INPUT ASSY
1086	313818876831	FFC 50/60/5061406
1089	313818875051	SPEAKER CABLE(BLACK)
1708	313816877251	EARPHONE JACK

Diversity of AJ6S4M/76 comparing with AJ6S40/02		
Item	12NC	Description
	863900014748	AJ6S4M/76
30	313815755261	BEZEL ASSY
31	313815409921	BEZEL
32	313815409961	LENS-POWER
33	313815409941	BUTTON CONTROL
34	313815409971	POWER HOUSING
35	313815409951	POWER BUTTON
40	313815755271	BACK COVER ASSY
41	313815409931	BACK COVER
50	313815755211	STAND-HP F1523
93	313815134441	SHIELD INVERTER
101	313815134521	BRACKET-AC-SUPPORT LG
101	313815134381	BRACKET-AC-SUPPORT CPT
121	313815320071	EXSICCATOR
130	313815522441	GUIDE QUICK USERS D/B-WW
131	313815522401	GUIDE SAFETY INFORMATION
132	313815522451	WARRANTY HP CONSUMER-NA/LA
450	313815636171	CARTON-FP5315
520	313815635851	CARTON-F1523
1051	313815856701	SCALER-1 ASSY(LPL)
1053	313815856751	CONTROL ASSY
1054	313815857281	AUDIO IN
1073	313812874901	MAINSCORD
1073	313818870491	MAINSCORD UL 10A 1M8 DET BK
1081	823827713631	POWER+VIDEO+AUDIO INPUT ASSY
1086	313818876831	FFC 50/60/5061406
1089	313818875051	SPEAKER CABLE(BLACK)
Diversity of AJ2S4M/02 comparing with AJ6S40/02		
Item	12NC	Description
	863900014752	AJ2S4M/02
30	313815755571	BEZEL ASSY
31	313815410551	BEZEL
32	313815409961	LENS-POWER
33	313815410571	BUTTON CONTROL
34	313815410591	POWER HOUSING
40	313815755581	BACK COVER ASSY
41	313815410561	BACK COVER
50	313815755221	STAND-HP FP5315
93	313815134441	SHIELD INVERTER
101	313815134381	BRACKET-AC-SUPPORT CPT
101	313815134521	BRACKET-AC-SUPPORT LG
121	313815320071	EXSICCATOR
130	313815522361	GUIDE QUICK USERS D/B-EMEA
131	313815522381	GUIDE AGENCY SAFETY INF.-CPQ-W
132	313815522371	WARRANTY COMPAQ CONSUMER-WW
450	313815636171	CARTON-FP5315
520	313815636171	CARTON-FP5315
1051	313815856701	SCALER-1 ASSY(LPL)
1053	313815856751	CONTROL ASSY
1054	313815857281	AUDIO IN
1081	823827713631	POWER+VIDEO+AUDIO INPUT ASSY
1086	313818876831	FFC 50/60/5061406
1089	313818875051	SPEAKER CABLE(BLACK)



# Difference parts list

Diversity of AJ2S4M/76 comparing with AJ6S40/02		
Item	12NC	Description
	863900014751	AJ2S4M/76
30	313815755571	BEZEL ASSY
31	313815410551	BEZEL
32	313815409961	LENS-POWER
33	313815410571	BUTTON CONTROL
34	313815410591	POWER HOUSING
40	313815755581	BACK COVER ASSY
41	313815410561	BACK COVER
50	313815755221	STAND-HP FP5315
93	313815134441	SHIELD INVERTER
101	313815134521	BRACKET-AC-SUPPORT LG
101	313815134381	BRACKET-AC-SUPPORT CPT
121	313815320071	EXSICCATOR
130	313815522441	GUIDE QUICK USERS D/B-WW
131	313815522381	GUIDE AGENCY SAFETY INF.-CPQ-W
132	313815522431	WARRANTY COMPAQ CONSUMER-NA/L
450	313815636171	CARTON-FP5315
520	313815636171	CARTON-FP5315
1051	313815856701	SCALER-1 ASSY(LPL)
1053	313815856751	CONTROL ASSY
1054	313815857281	AUDIO IN
1073	313812874901	MAINSCORD
1073	313818870491	MAINSCORD UL 10A 1M8 DET BK
1081	823827713631	POWER+VIDEO+AUDIO INPUT ASSY
1086	313818876831	FFC 50/60/5061406
1089	313818875051	SPEAKER CABLE(BLACK)
1708	313816877251	EARPHONE JACK