

Service  
Service  
Service



CJ6B5M/22

# Service Manual

Horizontal frequencies  
30 - 83 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

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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 the panel becomes dirty, please wipe it off with a soft material. (Cleaning with a dirty or rough cloth may damage the panel.)

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LCD panel

Type NR.

: LM170E01\_A5KE (LPL)

Number of Pixels. : 1280 (H) x 1024 (V)

Physical Size. : 358.5(W)\*296.5(H)\*17(D) mm

Pixel Pitch. : 0.264 x 0.264 mm

Color pixel arrangement. : RGB stripes arrangement

Support Color. : 16.2M Color

Display Mode. : Normally White

Backlight. : CCFL edge light system

Active area. (WXH). : 337.92 x 270.336mm (17 diagonal)

Viewing Angle. : Vertical 120 degree, Horizontal 140 degree (CR=10)

Contrast ratio. : 450:1

Luminance. : 250 cd/m² (Typ)

Scanning frequencies

H-Frequency. : 30K 83 K Hz

V-Frequency. : 56- 76 Hz

Power input. : AC 90-135Vrms and 170-265Vrms,50/60+/-2Hz

Power consumptio : < 50 W maximum (with audio)

The input signals can be applied in two different modes:

1). VESA Analog

The video input consists of red, green, and blue signals.

The video signals are analog levels, where 0V corresponds to black and 700mV is the maximum signal amplitude.

Input impedance of video pins is 75 ohm + 1%. The

capability of sync signal inputs shall include separate sync.

input impedance: 2k2 ohmsThe signals are defined as follow:

Separate sync 3.3V and 5 voltTTL level, Positive/Negative

2). Intel DVI Digital

Input signal: Four channel TMDS signalsThe digital interface shall be comprised of 2 electrical layer component: a TMDS interface for lowvoltage differential serial encoding of the digital display data(Panel Link compliant) and a DDC2B electrical interfaceRefer to the Digital Display Working Group(DDWG) document,Digital Visual Interface(DVI) Specification, Revision 1.0for the exact requirements.

Pin	Description	Pin	Description
1	T. M. D. S. data2-	13	No Connect
2	T. M. D. S. data2+	14	+5V Power
3	T. M. D. S. data2 shield	15	Ground (for +3.3V)-Cable detect
4	No Connect	16	Hot plug detect
5	No Connect	17	T. M. D. S. data0-
6	DDC clock	18	T. M. D. S. data0+
7	DDC data	19	T. M. D. S. data0 shield
8	No Connect	20	No Connect
9	T. M. D. S. data1-	21	No Connect
10	T. M. D. S. data1+	22	T. M. D. S clock shield
11	T. M. D. S. data1 shield	23	T. M. D. S. clock+
12	No Connect	24	T. M. D. S. clock-

Unit dimension / Weight

Set dimension (incl. pedestal): 380.4(W)\* 418.7(H)\* 210(D)

mm Net weight. : 6.4 kg

Basic base: tilt angle :5 to +25 ( operation )

swivel rotation : 170

Shipping dimension/Weight

Carton dimension. : 456(W) \* 435(D) \* 189(H) mm

Gross weight. : 7.65 Kg

Susceptibility of display to external environment

Operating

- Temperature. : 5 to 40 degree C

- Humidity. : 15 ~ 80% max

- Altitude. : 0 to 10,000 feet

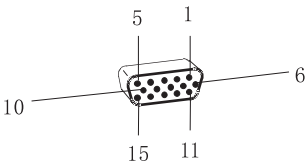
Storage

- Temperature. : -40 to 70 degree C

- Humidity. : 5~95% (< 40 )

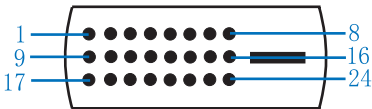
- Altitude.: 0 to 30,000 feet

Pin Assignment



Pin No.	Assignment	Pin No.	Assignment
1	Red video input	9	DDC +3.3V OR +5V
2	Green video input	10	GND
3	Blue video input	11	GND
4	GND	12	Serial data line (SDA)
5	Cable detect	13	H-sync
6	Red video GND	14	V-sync
7	Green video GND	15	Data clock line (SCL)
8	Blue video GND		

Input DVI-D connector pin



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Data Storage  
Factory preset modes:  
This monitor has 15 factory-preset modes as indicated in the

#	Resolution	H-Frequency (Hz)	Pixel rate (MHz)	V-Frequency (Hz)	Comment
1	640X480	31.469K	25.175	59.940	VGA
2	640X480	37.861K	31.5	72.809	VESA
3	640X480	37.5K	31.501	75	VESA
4	720X400	31.469K	28.322	70.087	VGA
5	800X600	37.879K	40	60.317	VESA
6	800X600	48.077K	50	72.188Hz	VESA
7	800X600	46.875K	49.498	75Hz	VESA
8	832X624	49.726K	57.284	74.551Hz	MAC
9	1024X768	48.363K	65	60.004Hz	VESA
10	1024X768	56.476K	75	70.069Hz	VESA
11	1024X768	60.023K	78.75	75.029Hz	VESA
12	1152X870	68.68K	100	75.06Hz	MAC
13	1152X900	71.71K	108	76.05Hz	SUN
14	1280X1024	63.98K	108	60.02Hz	VESA
15	1280X1024	79.97K	135	75.02Hz	VESA

This monitor is ENERGY STAR<sup>®</sup> compliant.

this product meets the ENERGY STAR<sup>®</sup> guidelines for energy Efficiency



ENERGY STAR<sup>®</sup> is a U.S. registered mark. AS AN ENERGY STAR PARTNER, DELL Computer Corporation HAS DETERMINED THAT THIS PRODUCT MEETS THE ENERGY STAR GUIDELINES FOR ENERGY EFFICIENCY.

Power management

The power consumption and the status indication of the set with power management function are as follows,

STATUS	H-sync	V-sync	Video	Power	LED
On	On	On	Active	<50W	Green LCD
Stand-by	Off	On	Blanked	<2W	Amber LCD
Suspend	On	Off	Blanked	<2W	Amber LCD
Off	Off	Off	Blanked	<2W	Amber LCD
DC Power off			N / A	<2W	LCD Off

According to VESA power saving signal.  
TCO99 power saving requirement EPA energy star requirement  
(Power Switch Off)  
For digital input power consumption is less 2W  
(In non-DMPM recoverable off mode)



Connecting to PC



The monitor has two video signal connectors on the rear panel: one analog (VGA) and one digital (DVI-D). This allows you to connect the monitor to up to two computers at the same time.

When two computers are connected, you will need to set the Video Input Select on the on-screen display (OSD) menu to specify which monitor input has priority.

1. Place the monitor in a convenient, well-ventilated location Near your computer.
2. Connect the monitor signal cable into the correct video connector (VGA or DVI-D) on the back of the monitor and into the corresponding video connector on the rear panel of the computer.

Your computer must have a DVI-compatible graphics card installed for use with the DVI-D cable. When connecting the DVI-D signal cable to the DVI connector on the monitor, connect the other end of the DVI-D cable to the DVI connector on 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.

- Warning:To reduce the risk of electric shock or damage to your equipment:
1. Do not disable the power cord grounding plug. The grounding plug is an important safety feature.
  2. Plug the power cord into a grounded (earthed) electrical outlet that is easily accessible at all times.
  3. Disconnect power from the monitor by unplugging the power cord from the electrical outlet.
  4. Do not place anything on power cords or cables. Arrange them so that no one may accidentally step on or trip over them. Do not pull on a cord or cable. When unplugging from the electrical outlet, grasp the cord by the plug.

Front control panel



Event	Invocation	
Power	1)	Pressing "Power" button.
	2)	If Power is turned on, then monitor will be switched off. Otherwise monitor will be switched on.
Input select/Plus	1)	Pressing " Input select/Plus" buttons.
	2)	The buttons work as Input select when OSD menu is turned off.
	3)	The buttons work as Up/Plus selection when OSD menu is turned on.
OSD menu	1)	Pressing "OSD menu" button.
	2)	If OSD menu is turned on, then the display screen will jump in the next menu or turn off. Otherwise OSD menu will be turned on.
Auto adjustment /Minus	1)	Pressing "Auto adjustment/Minus " buttons.
	2)	The buttons work as auto adjustment when OSD menu is turned off.
	3)	The buttons work as Down/Minus selection when OSD menu is turned on.

# On Screen Display

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Advanced osd service mode configuration



Mode Menu			
Menu Level 1	Menu Level 2	Menu Level 3	Factory Reset
Brightness	ADJ Scale		Y (FD=90)
Contrast	ADJ Scale		Y (FD=80)
Image Control (Analog only)	Auto Adjustment	( Adjusting message)	Y (no FD)
	Horizontal Position	ADJ Scale	N (no FD)
	Vertical Position	ADJ Scale	N (no FD)
	Clock	ADJ Scale	N (no FD)
	Clock Phase	ADJ Scale	N (no FD)
	Cancel		
	Save and Return		
Color	9300 K		
	6500 K sRGB		Y (FD)
	Custom Color	Custom Color ADJ	Y (FD for all Consumer models)
	Cancel		
	Save and Return		
Language	Deutsch		
	English		N (FD=English)
	Español		
	Français		
	Italiano		
	Japanese		
	S-Chinese		
	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)
	Serial Number		
	Sleep Timer	Timer Set Menu	N (FD=0;OFF)
	Basic menu		N (FD=Basic)
	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)
	OSD Transparency	ADJ Scale	Y (FD=0)
	Cancel		
	Save and Return		
Factory Reset	Yes		
	No		
Exit			

Basic osd service mode configuration



Mode Menu			
Menu Level 1	Menu Level 2	Menu Level 3	Factory Reset
Brightness	ADJ Scale		Y (FD=90)
Contrast	ADJ Scale		Y (FD=80)
Auto Adjustment	(Adjusting message)		Y (no FD)
Advanced Menu			
Exit			
Service	Display Hours		N
	Reset Total Hours	Confirm Reset	N
	Reset Backlight Hours	Confirm Reset	N
	Copy All Settings	Confirm Reset	N
	Recall All Settings	Confirm Reset	N
	Display White Block		N
	Cancel		N
	Save and Return		N
Firmware Rev / Date			
Panel Manufacturer			

# Warning Message

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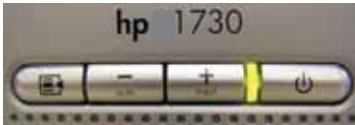
Warning Message Table		Display Time	Condition
Item	Warning Message		
1	Input Signal out of Range		See power saver table
2	No Input Signal		See power saver table
3	Going to Sleep		See power saver table
4	Adjusting		Auto hot key or OSD menu function
5	OSD Lock out	3secs	Push menu key for 10 sec then display 3 sec WM OSD Lock out
6	Input Not Available		DVI (Analog) switch to Analog (DVI) without sync
7	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 Check Video Cable 10 sec then moving about 50 sec. 2. Show WM Going to Sleep 3 sec then sleep. 3. If push any key in sleep mode, then repeat item 1 to 2.	1. System blank and show WM Check Video Cable 10 sec then moving always.	
Out of range 1	1. System blank and show moving WM Input Signal out of Range about 60 sec. 2. Show WM Going to Sleep 3 sec then sleep. 3. If push any key in sleep mode, then repeat item 1to 2.	1. System blank and show moving WM Input Signal out of Range always.	H<29.5 or H>92 or 90>H>82.5 or V<49 or V>87 or Vtotal>=1200
Out of range 2	1. Show moving WM Input Signal out of Range 60 sec. 2. WM disappear after WM 60 sec. 3. IF push any key then repeat 1-2.	1. Show moving WM Input Signal out of Range 60 sec. 2. WM disappear after WM 60 sec. 3. IF push any key then repeat 1-2.	DownScaling Ex. 1280x1024 (Only for HPL1530)
Out of range 3	1. Show moving WM Input Signal out of Range 60 sec. 2. After moving WM 60 sec then show WM Going to Sleep 3 sec then sleep. 3. If push any key in sleep mode, then repeat item 1 to 2.	1. Show moving WM Input Signal out of Range 60 sec. 2. After moving WM 60 sec then show WM Going to Sleep 3 sec then sleep. 3. If push any key in sleep mode, then repeat item 1 to 2.	85Hz

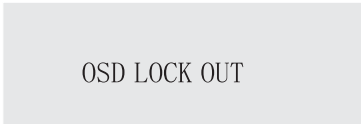
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Front control panel



To Lock/Unlock OSD function

The OSD function can be locked by pressing MANU button for more than 10 seconds, the screen shows following windows for 3 seconds. Everytime when you press MANU Or AUTO button, this message Appears On the screen automatically. The POWER & INPUT hotkey are still functional for POWER and INPUT expectively while OSD locked.



Locked OSD function can be released by pressing MANU button for more than 10 seconds. While press MANU button for OSD unlocked purpose, the screen will keep showing OSD LOCK OUT until OSD function unlocked and the windows screen automatically showed .

AGING MODE

No signal input ,power off -> on ,then Into the factory mode, , a full white pattern will be display on the screen as Fig.1 in stead of power saving mode. In other words, the power saving function will be disable in the factory mode.Supply one signal for leaving aging mode.

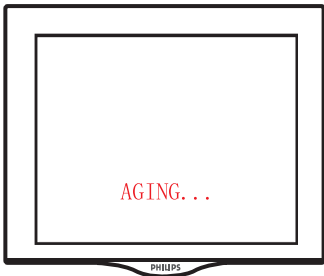


Fig.1

SERVICE MODE

Press and hold the Manu button ,power off -> on ,then Into the service mode. Press Manu button to bring up OSD menu for confirmation as below:



Access Factory Mode  
Power off on the monitor,  
To hold MANU And  
+ INPUT buttons at the  
same time ,  
And press POWER  
button to power on the monitor.  
Press MANU button to  
bring up OSD menu for  
confirmation



Factory menu  
Cursor can move on gray color area

- BL : Blacklevel value
- SUB-BRI : Brightness value range(Min Max)
- 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
- Panel Type: If set this to 1,2,3,4,5 then system  
will force panel type to LG(QDI), CPT orAU).
- Set to other value will auto detect panel based on  
panel hardware.
- SCALER : Read/Write scaler register
- NVRAM : Read/Write eeprom address

HPL1730R V200 20040301					
BL :	0				
SUB - BRI :	0 220				
SUB - CON :	88 128	168			
9300K	R Xxx	G xxx B	xxx		
6500K	R Xxx	G xxx B	xxx		
SRGB	R Xxx	G xxx B	xxx		
OFFSET2	R Xxx	G xxx B	xxx		
GAIN	R Xxx	G xxx B	xxx	M 255	m 0
AUTO-SUB					
OFFSET1	R Xxx	G xxx B	xxx		
SCALER:ADD:		VAL: READ	WRITE		
NVRAM:ADD:		VAL: READ	WRITE		
PANEL:	0				
EXIT	1024x768	48.3KHz	@60Hz		

## HP ADJUSTMENT PATTERN.EXE

VERSION: 2.00 Rev A

### OPERATING SYSTEM(S):

Microsoft Windows 98  
Microsoft Windows Millennium Edition (ME)  
Microsoft Windows 2000  
Microsoft Windows XP 32-bit Personal  
Microsoft Windows XP 32-bit Professional

**DESCRIPTION:** This CD contains the HP Auto-Adjustment utility, which is a single pattern program designed to help improve the picture quality of your HP flat panel monitor.

**Note:** Do not use the following procedure if your flat panel monitor is using a DVI connector option.

To use the Adjustment pattern with your flat panel monitor:

1. Execute the auto-adjust function from the OSD main menu.
2. If the result is not satisfactory, start the "Adjustment pattern.exe" program and repeat step 1.

Image quality characteristics that can be improved:

- Fuzzy or unclear focus
- Ghosting, streaking or shadowing effects
- Faint vertical bars
- Thin horizontal scrolling lines
- Centering the picture

**Note:** To achieve optimal picture performance, it is recommended that you always set the operating system display mode to your flat panel's native resolution. See list below for reference.

14in. and 15in. flat panels = 1024x768  
17in., 18in. and 19in. flat panels = 1280x1024  
20in. and 21in. flat panels = 1600x1200

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Front view



Fig.1

Back view



Fig.2

Step 1. Remove the four screws as Fig.3.4

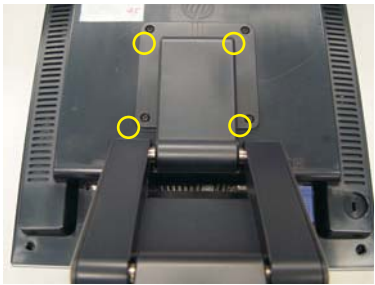


Fig.3

Remove the two screws as Fig.4



Fig.4

Step 3. Remove the Back cover as Fig.5~8.  
A. Use thin "I" type screwdriver to open 2 clicks on bottom side as Fig.5  
b .Use thin "I" type screwdriver to open 4 clicks on right side as Fig.6  
c. Use thin "I" type screwdriver to open 4 clicks on left side as Fig.7



Fig.5

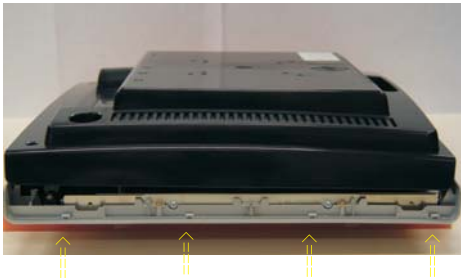


Fig.6



Fig.7



Fig.8



Step 4. Disconnect the control PCB,remove the five screws as Fig.9.10

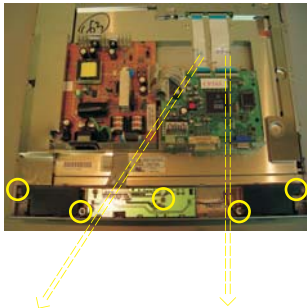


Fig.9

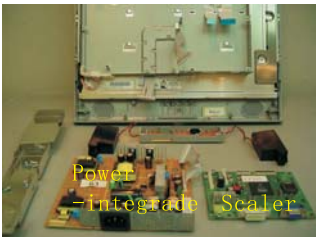


Fig.13



Fig.10

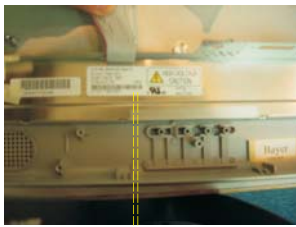


Fig.14

Step 5 Disconnect the scaler pcb and power pcb, remove the ten screws as FIG.11.12.13

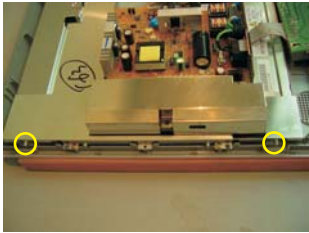


Fig.11

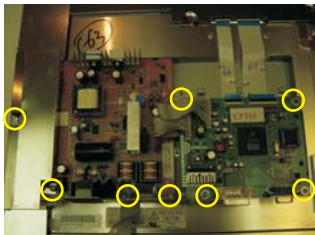


Fig.12

\*\*\*\*\*  
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).  
\*\*\*\*\*

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#### 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. bright dots.
  5. dark dots.
  6. 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.



## 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 - 265 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 these 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 sec.

## 2. Input signal

### 2.1 Signal type

#### 2.1.1 Video signal input

Signal source: pattern generator format as attachment.  
(Table 1 to 19) Reference generator: QuantumData 802G  
The input signals can be applied in two different modes:

- 1). VESA Analog The video input consists of red, green, and blue signals. The video signals are analog levels, where 0V corresponds to black and 700mV is The maximum signal amplitude. Input impedance of video pins is 75 ohm +/- 1%.
- 2). Intel DVI Digital  
Input signal: Four channel TMDS signals. The digital interface shall be comprised of 2 electrical layer component: a TMDS interface for low-voltage differential serial encoding of the digital display data (Panel Link compliant) and a DDC2B electrical interface. Refer to the Digital Display Working Group (DDWG) document, Digital Visual Interface (DVI) Specification, Revision 1.0 for the exact requirements.

#### 2.1.2 Sync signal input

The capability of sync signal inputs shall include separate sync, input impedance: 2k2 ohms The signals are defined as follow:  
Separate sync 3.3V and 5 volt TTL level ,  
Positive/Negative  
Signal source: pattern generator format as attachment (Table 1 to 19) Reference generator: QuantumData 802G

#### 2.2 Input signal mode Pre-set 15 modes

#### PRESET VIDEO RESOLUTION

#	Resolution	H-Frequency (Hz)	Pixel rate (MHz)	V-Frequency (Hz)	Comment
1	640X480	31.469K	25.175	59.940	VGA
2	640X480	37.861K	31.5	72.809	VESA
3	640X480	37.5K	31.501	75	VESA
4	720X400	31.469K	28.322	70.087	VGA
5	800X600	37.879K	40	60.317	VESA
6	800X600	48.077K	50	72.188Hz	VESA
7	800X600	46.875K	49.498	75Hz	VESA
8	832X624	49.726K	57.284	74.551Hz	MAC
9	1024X768	48.363K	65	60.004Hz	VESA
10	1024X768	56.476K	75	70.069Hz	VESA
11	1024X768	60.023K	78.75	75.029Hz	VESA
12	1152X870	68.68K	100	75.06Hz	MAC
13	1152X900	71.71K	108	76.05Hz	SUN
14	1280X1024	63.98K	108	60.02Hz	VESA
15	1280X1024	79.97K	135	75.02Hz	VESA

- 2.3 Allowed 85 Hz overscan signal mode specified Once the signal sync input of PC is 85Hz, this monitor is able to display at least for 60 seconds. An attention signal appears and shows Input Signal Out Of Range for 60 seconds ,change computer display input to 1280X1024 @ 60 Hz.

Dot rate (MHz)	H. Freq (KHz)	Mode	Resolution	V. Freq (Hz)
36.000	43.269	VESA	640 * 480	85.008
55.625	53.674	VESA	800 * 600	85.061
94.500	68.677	VESA	1024 * 768	84.997
157.5	91.146	VESA	1280 * 1024	85.024

### 2.4 Interface

#### 2.4.1 Analog signal

The input signals are applied to display through D-sub cable.  
Length: 1.8 M +/- 50 mm (fixed)  
Connector type: D-sub male.  
With DDC\_2B pin assignments.  
White connector thumb-operated jack screws

Go to cover page

2.4.2 Digital signal

The input signals are applied to display through DVI-D cable.  
Length: 1.8 M +/-50 mm (fixed)  
Connector type: DVI-D male  
With DDC\_2B pin assignments.  
White connector thumb-operated jack screws  
Panel Link T.M.D.S input.

Pin assignment:

Pin No.	Description
1	T.M.D.S data2 -
2	T.M.D.S data2+
3	T.M.D.S data2 shield
4	No connect
5	No connect
6	DDC clock
7	DDC data
8	No connect
9	T.M.D.S data1 -
10	T.M.D.S data1+
11	T.M.D.S data 1 shield
12	No connect
13	No connect
14	+5V power
15	Ground (for +3.3V) -cable detect
16	Hot plug detect
17	T.M.D.S data 0-
18	T.M.D.S data 0+
19	T.M.D.S data0 shield
20	No connect
21	No connect
22	T.M.D.S clock shield
23	T.M.D.S clock+
24	T.M.D.S clock-

4.5 EEPROM presetting (B)

After finishing all the adjustment, set:

- 1. Menu = Basic
- 2. Color = 6500K-sRGB
- 3. Language = English
- 4. Power Saver = ON
- 5. Power On Recall = ON
- 6. Mode Display = OFF
- 7. Horizontal OSD Position = 50%
- 8. Vertical OSD Position = 50%
- 9. OSD Timeout = 30
- 10. Sleep Timer = OFF
- 11. OSD Transparency = 0
- 12. Brightness = 90%
- 13. Contrast = 80%

4.6 When adjustment is finished, monitor should be set to 6500K-sRGB color.

4.7 The monitor shall leave the factory with the Power switch set to the OFF position

3.POWER SUPPLY

Set AC input at 264V / 90 V, add  
2.6A loading to 12V O/P and DC O/P voltage is 12V +/- 1.2V,  
1A loading to 3.3V O/P and DC O/P voltage is 3.3V +/- 0.165V,  
1.5A loading to 5V O/P and DC O/P voltage is 5V +/- 0.5V.

4. DISPLAY aDJUSTMENT

4.1Access to factory mode (RS232) in auto-alignment system  
The communication protocol switch to RS232 .

4.2 Auto color adjustment (B)  
Apply a 640\*480/31.47kHz/60Hz.signal with 16-gray level pattern, set brightness control at 90%, and contrast control at 80%. Then, adjust the R. G. B offset, and gain to calibrate the color smoothly and 64-gray level distinguishable at 1280\*1024/63.98kHz/60Hz.

4.3 Adjustment of WHITE-D (B)

Apply a 1280\*1024 / 60Hz signal with white pattern, set brightness control at 90%, and contrast control at 80%.  
Adjust the R, G, B Sub-Gain, for the screen center, the 1931 CIE chromaticity (X, Y) co -ordinates shall be;

	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

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

Luminance is > 200 Nits in the center of the screen when brightness at 100% and contrast set to 100% at custom color (R,G,B=100%).

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, Digital 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.

DDC EDID structure

- For Analog interface: Standard Version 3.0  
Structure Version 1.2
- For Digital interface: Standard Version 3.0  
Structure Version 1.3

System and equipment requirements

1. An i486 (or above) personal computer or compatible.
2. Microsoft operation system Windows 95/98.
3. edid46Release For writing block 4 , as shown in Fig. 1
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
- d. (DVI-D) to (D-Sub) cable x1 (as Fig. 3)



Fig.1

Diskette with  
edid46Release For writing block 4



Fig.3

(DVI-D) to (D-Sub) cable



Fig.4

Note: The alignment box has already build-in a batteries socket for Using batteries (9V) 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.

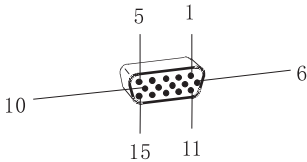


Fig.5

A/D Alignment Kits - Digital connection

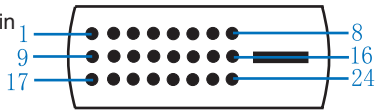
Pin assignment

A. 15-pin D-Sub Connector



Pin No.	Assignment	Pin No.	Assignment
1	R in	9	DDC +5V or +3. 3V
2	G in , Syne. on green	10	Ground
3	B in	11	Ground
4	Ground	12	Serial data line (SDA)
5	Cable Detect	13	H. Sync
6	Red video ground	14	V. Sync
7	Green video ground	15	Data clock line (SCL)
8	Blue video ground		

B. Input DVI -D Connector pin



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

Go to cover page

### 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 Digital DDC application, the main EEPROM can be re-programmed along with Analog/Digital IC by enable factory memory data write function on the DDC program (EDID4.6 .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 edid46Release For (writing block 4 . Following steps show you the procedures and connection.

Step 1: Supply 8~12V DC power source to the Alignment box by plugging a DC power cord or using batteries.

Step 2: Connecting printer cable and video cable of monitor as Fig. 6

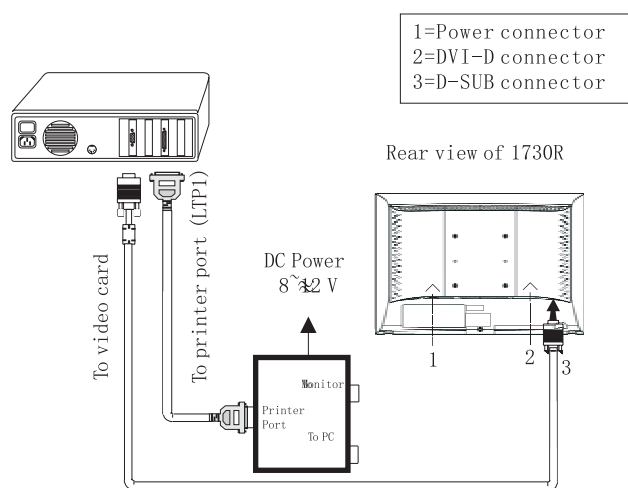


Fig.6

#### Step 3: Installation of EDID4.6 .EXE

Method 1: Start on DDC program

Start Microsoft Windows.

1. Insert the disk containing EDID4.6 .EXE program into floppy disk drive.

2. Click **Start**, choose Run at start menu of Windows 95/98 as shown in Fig. 7.

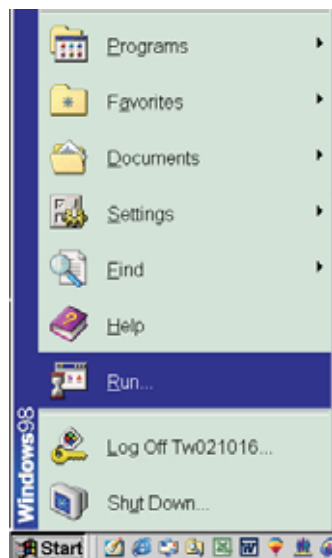


Fig.7

3. At the submenu, type the letter of your computer's floppy disk drive followed by :EDID 4 6 (for example, A:\EDID 4 6, as shown in Fig. 8).

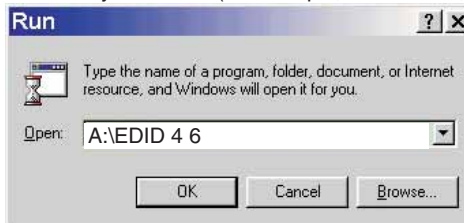


Fig.8

4. Click OK button. The main menu appears (as shown in Fig. 9).

This is for initialize alignment box.

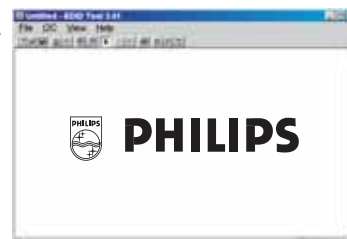


Fig.9

Note 1: If the connection is improper, you will see the following error message (as shown in Fig. 10) 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.10

Method 2: After create a shortcut of EDID4 6 .EXE

This is for initialize alignment box.

: Double click EDID 4.6 icon (as shown in Fig. 11) which is on the screen of Windows Wallpaper.

Bring up main menu of EDID 4 6 as shown in Fig. 12.

This is for initialize alignment box.



Fig.11



Fig.12

Note 2: During the loading, EDID4 6 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.

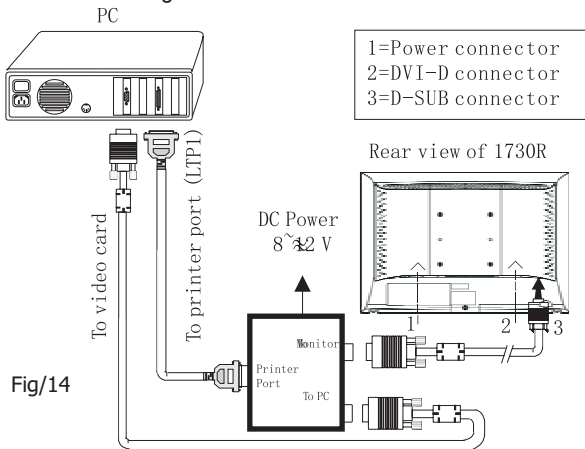
1. The data structure of EDID was incorrect.
2. DDC IC that you are trying to load data is empty.
3. Wrong communication channel has set at configuration setup windows.
4. Cables loosed or poor contact of connection.

Fig.13



Re-programming Analog DDC IC

Step 1: After initialize alignment box, connecting all cables and box as shown in Fig. 14



Step 2: Read DDC data from monitor

1. Click icon as shown in Fig. 15 from the tool bar to bring up the Channels "Configuration Setup" windows as shown in Fig. 16.

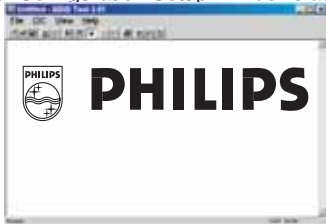


Fig.15

2. Select the DDC2BI as the communication channel. and "Enable Factory mode" As shown in Fig. 16.



Fig.16

3. Click OK button to confirm your selection.
4. Click icon (Read EDID function) to read DDC EDID data from monitor. The EDID codes will display on screen as shown in Fig. 17.

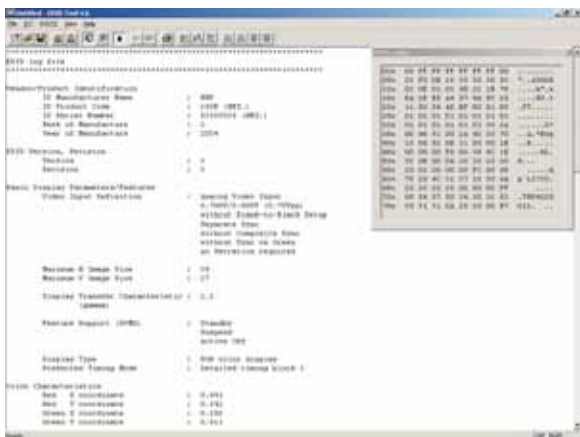


Fig.17

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

1. Click (new function) icon from the tool bar, bring up Step 1 of 9 as shown in Fig. 18 .

EDID 4.6 DDC application provides the function selection and text change (select & fill out) from Step 1 to Step 9.

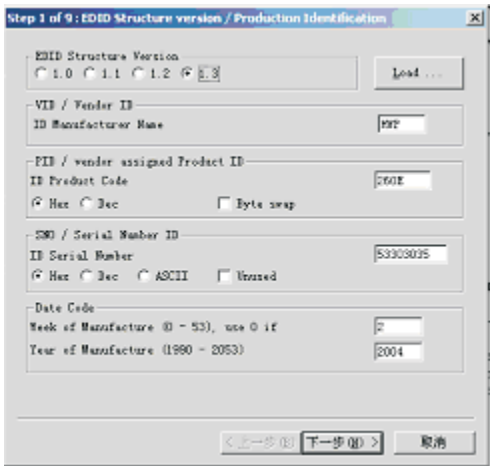


Fig.18

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

1. Click Next , bring up Fig. 19.



Fig.19

2. Click Next , bring up Fig. 20.

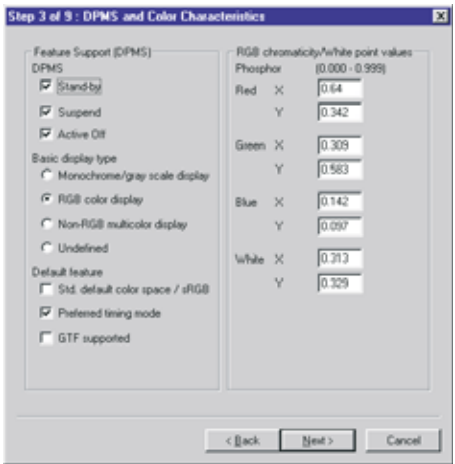


Fig.20



# DDC Instructions

3. Click Next , bring up Fig. 21.

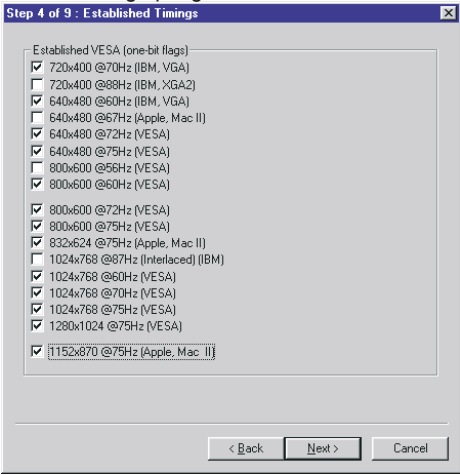


Fig.21

4. Click Next , bring up Fig. 22

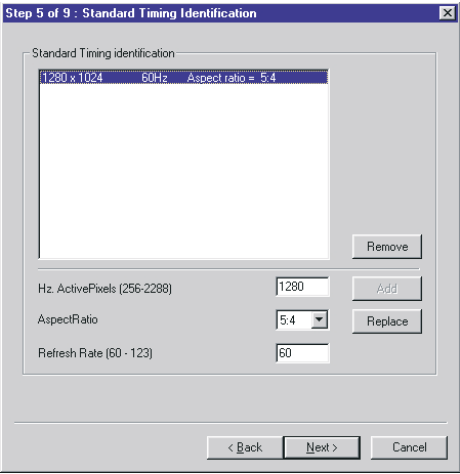


Fig.22

5. Click Next , bring up Fig. 23

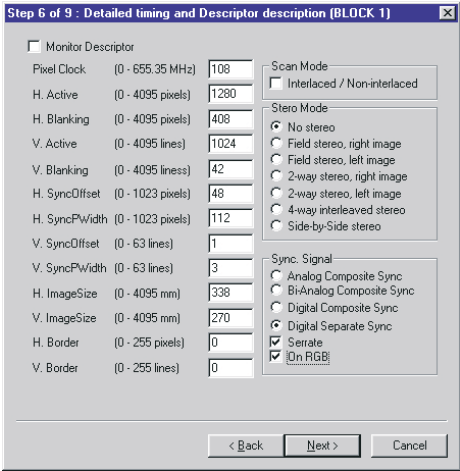


Fig.23

6. Click Next , bring up Fig. 24

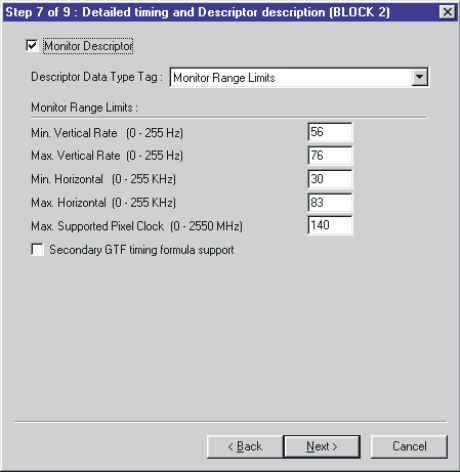


Fig.24

7. Click Next , bring up Fig. 25

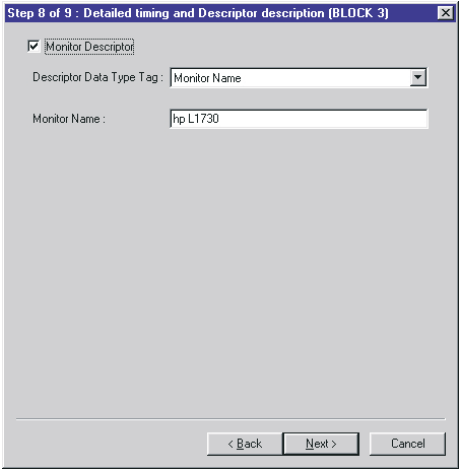


Fig.25

8. Click Next , bring up Fig. 26.

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

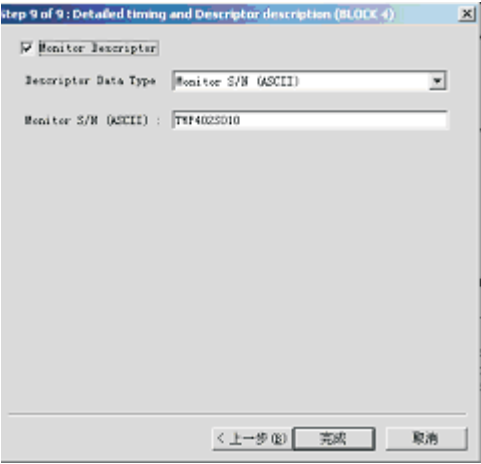


Fig.26

Step 5: Write DDC data

1. Configuration should be as Fig. 27.

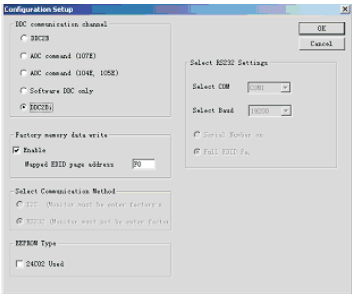


Fig.27

2. Access Factory mode  
Access Factory Mode  
How to Get into Factory Mode Menu

Step 1 :

Turn off monitor.

Step 2 :

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

Step 3 :

Press Manu " " button, bring up Factory mode indication as shown in Fig 28.



Fig.28

3. 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.
4. Click (Read EDID) to confirm it.
5. If writing is successful, a messagebox will show "SWDDC write OK".

Step 6: 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:  
1. Click (Save) icon (or click "file"-> "save as") from the tool bar And give a file name as shown in Fig. 29.  
The file type is EDID 4.6 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.

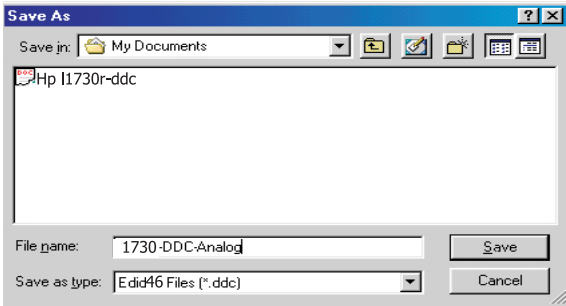


Fig.29

2. Click . Save

Step 8: Exit DDC program

Pull down the File menu and select Exit as shown in Fig. 30.

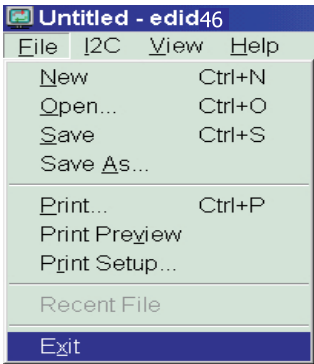


Fig.30

NOTE: If the edid46Release For writing block 4 run in Win 95/98with some problem, try to run it in win 2000, but you should install the EDID\_PORT\_TOOL first. The other step is the same as describe above.

DDC Instructions

Re-programming Digital DDC IC

Step 1:Connecting all cables and alignment box as shown in

Fig. 31.

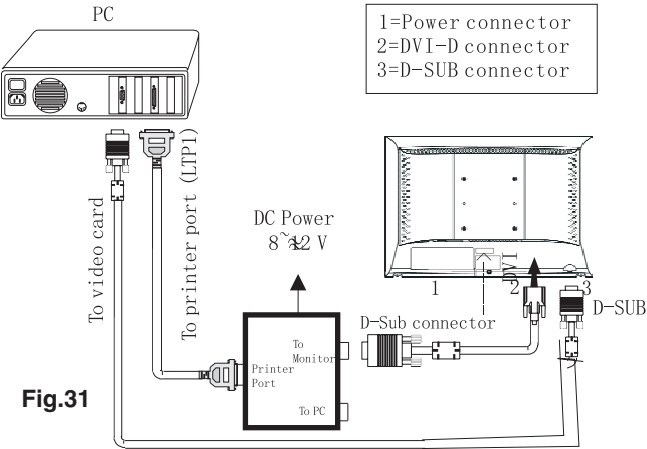


Fig.31

Step 2: Initialize alignment box

(Shortcut of EDID4.6 .EXE on Windows Wallpaper already.)

Double click EDID 4.6 icon (as shown in Fig. 32) which is on the screen of Windows Wallpaper.

Bring up main menu of EDID4.6 as shown in Fig. 33.



Fig.32

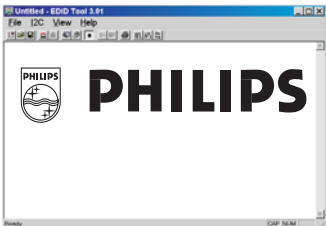


Fig.33

Step 3: Read DDC data from monitor

1. Click icon from the tool bar to bring up the Channels Configuration Setup windows as shown in Fig. 34.

2. Select the DDC2Blas the communication channel. and "Enable Factory mode"

3. Click OK button to confirm your selection.

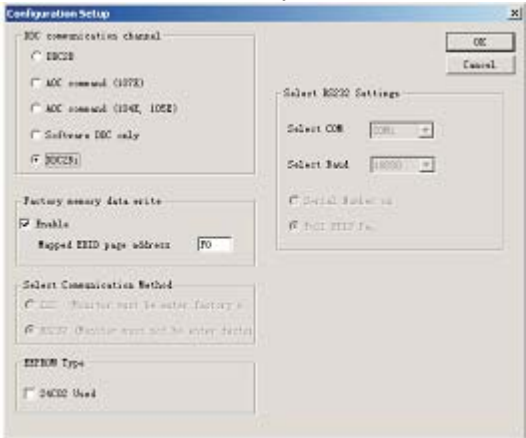


Fig.34

4. Click icon (Read EDID function) to read DDC EDID data from monitor. The EDID codes will display on screen as shown in Fig. 35.

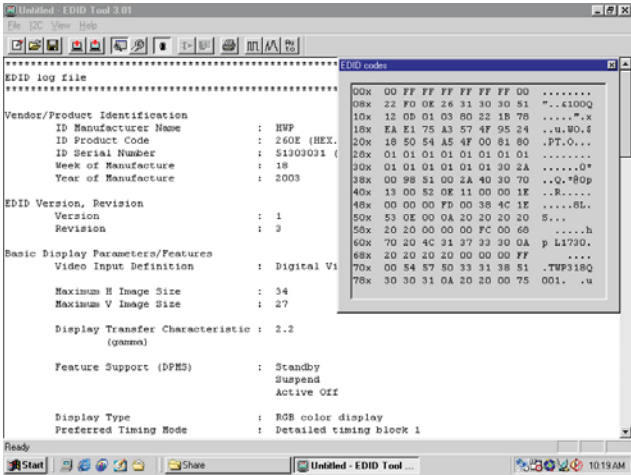


Fig.35

Step 4: Modify DDC data (verify EDID version, week, year)

1. Click icon (new function) from the tool bar, bring up

Step 1 of 9 (Digital) as shown in Fig. 36 .

EDID4.6 DDC application provides the function selection and text change (select & fill out) from Step 1 to Step 9.

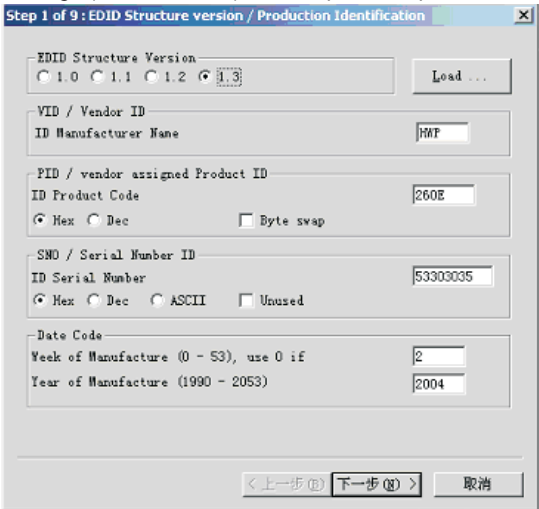


Fig.36

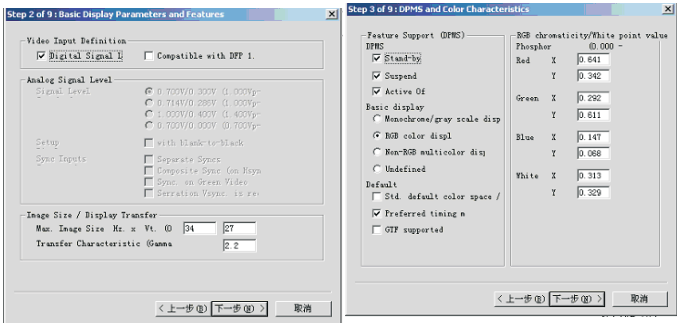


Fig.37

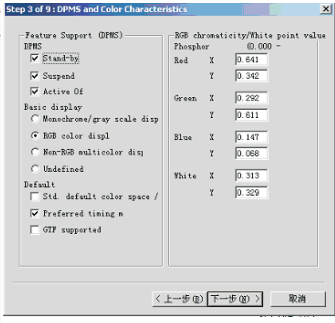


Fig.38



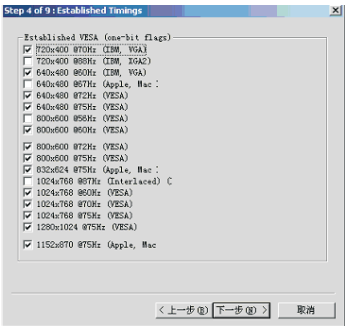


Fig.39

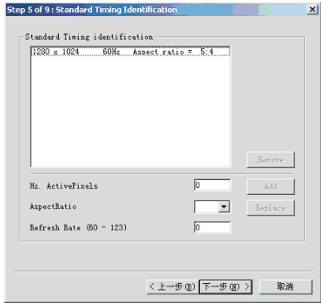


Fig.40

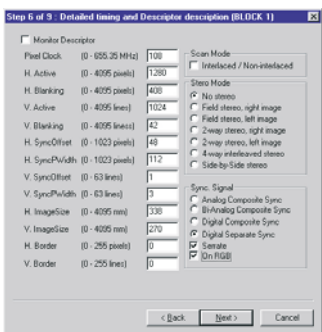


Fig.41

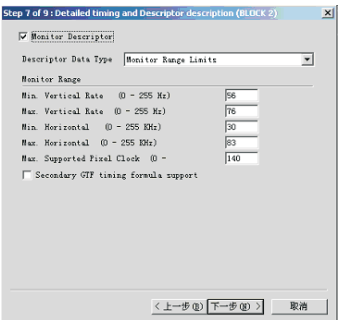


Fig.42

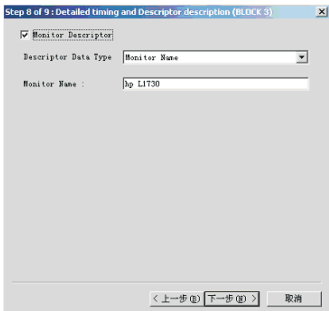


Fig.43

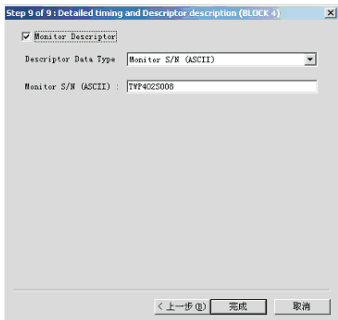




Fig.44

Step 5: Modify DDC data (Monitor Serial No.)

Monitor serial No. can be filled up or be changed as shown in Fig. 44

Click Finish to exit the Step window


Step 6: Write DDC data

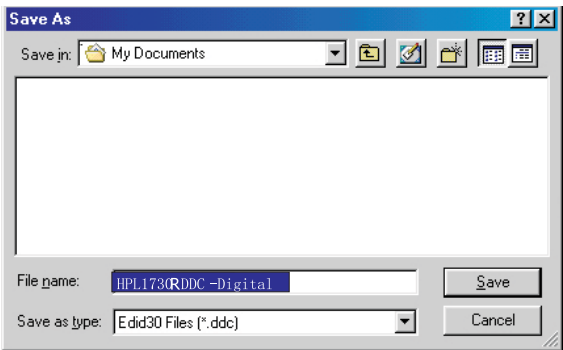
1. Click  (Write EDID) icon from the tool bar to write DDC data.
2. Click  (Read EDID) to re-confirm (check contents) it.

The 128bytes DDC data which had been written into DDC IC of Digital Mode.


Step 7: Save DDC data

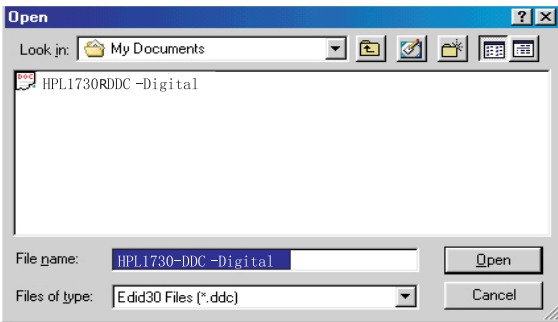
Sometimes, you may need to save DDC data as a text file for using in other IC chip. To save DDC data, follow the steps below:

1. Click  (Save) icon (or click "file"-> "save as") from the tool bar and give a file name as shown in Fig. 45.
2. Click . Save



Step 8: Load DDC data

1. Click  from the tool bar.
2. Select the file you want to open as shown in Fig 46.
3. Click Open



Step 9: Exit DDC program

Pull down the File menu and select Exit

NOTE: If the edid46Release For writing block 4 run in Win 95/98with some problem, try to run it in win 2000, but you should install the EDID\_PORT\_TOOL first. The other step is the same as describe above.

# Failure Mode Of Panel

Go to cover page

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.

Failure description	Phenomenon		
		Polarizer has bubbles	
Vertical block defect		Polarizer has bubbles	
Vertical dim lines			
Vertical lines defect (Always bright or dark)		Foreign material inside polarizer. It shows liner or dot shape.	
		Concentric circle formed	
Horizontal block defect			
		Bottom back light of LCD is brighter than normal	
Horizontal dim lines			
Horizontal lines defect (Always bright or dark)		Back light un-uniformity	
Has bright or dark pixel		Backlight has foreign material. Black or white color, liner or circular type	

Go to cover page

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 mains cord 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: <=0.09+Rohm, 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 (Tester)	set at 2 seconds		

- 2.2.1 The minimum test duration for Quality Control Inspector must be 1 minute.
- 2.2.2 The test voltage must be maintained within the specified voltage + 5%.
- 2.2.3 There must be no breakdown during the test.
- 2.2.4 The grounding blade or pin of mains plug must be conducted with accessible metal parts.

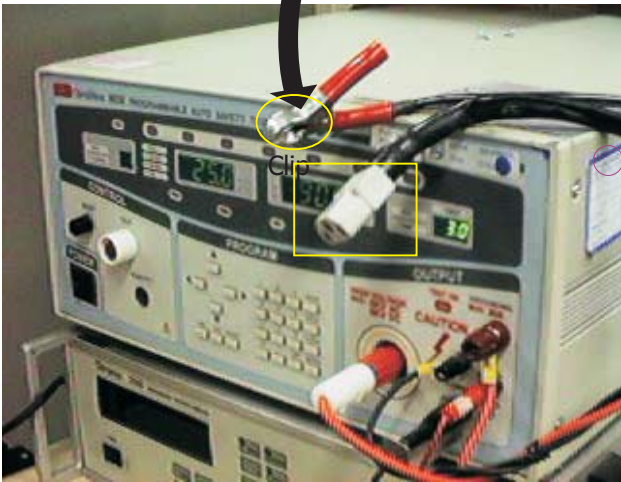
3. Equipments and Connection

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.




Clip

Clip


(ChenHwa 9032 tester)

Video cable




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

Grounding screw



Connect the power cord to the monitor.

Power outlet



(Rear view of monitor)

4. Recording

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

Go to cover page

Configuration and procedure

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

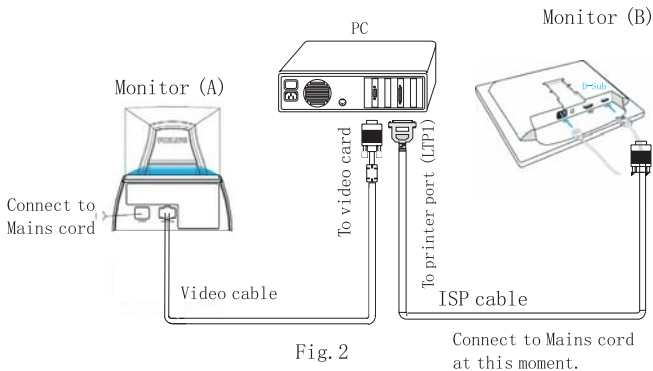
ISP cable is for the interface between "Parallel port of PC" and "15 pin-D-SUB connector of monitor.

- System and equipment requirements:
- 1. An i386 (or above ) personal computer or compatible.
  - 2. Microsoft operation system Win 95/98 or Win 2000
  - 3. ISP software
  - 4. ISP cable (3138 106 10148) as shown in Fig.1



Fig.1 ISP CABLE :12NC IS "3138 106 10148".

5.Connect ISP cable and main cord to monitor as shown in Fig.2.



6. Install and setup the Gprobe 4.5.0.5.exe program

- step 1. Create a folder in your PC .for example: D:\1730R
- step 2.Copy ISP software 1730R software .Zip into your folder
- step 3.Unzip ISP.ZIP into your folder as shpwn in Fig.3
- step 4.Double click the Gprobe4.5.0.5.exe icon to install the application as shown Fig.4

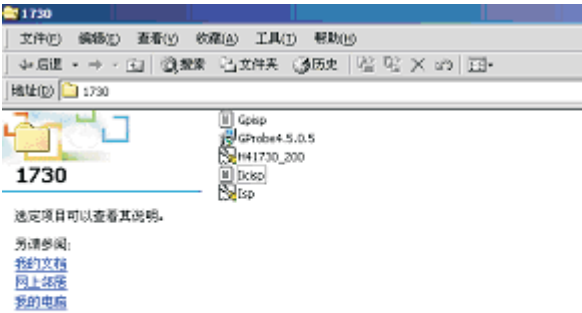


Fig.3

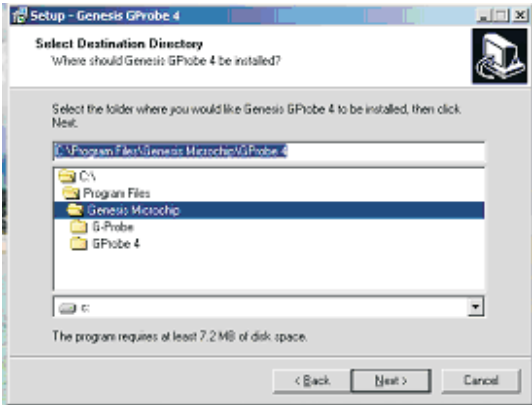


Fig.4

Step 5 . Click the next till the setup finished. And creat a short cut on the desktop.

Update the firmware

- 1. Double click the Gprobe.exe icon ,then appears window as shown in Fig.5
- 2. Press the options then choose configure Pin as shown in Fig.5
- 3. From the menu that appears, choose the number 17 in "output pin" and the number 12 in "input pin" as shown in Fig.6

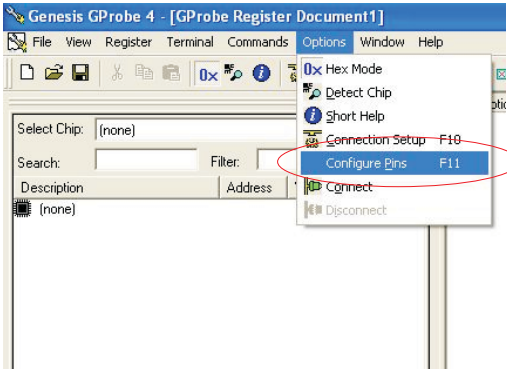


Fig.5

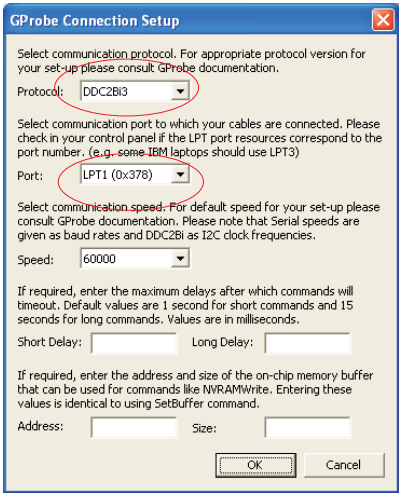


Fig.8

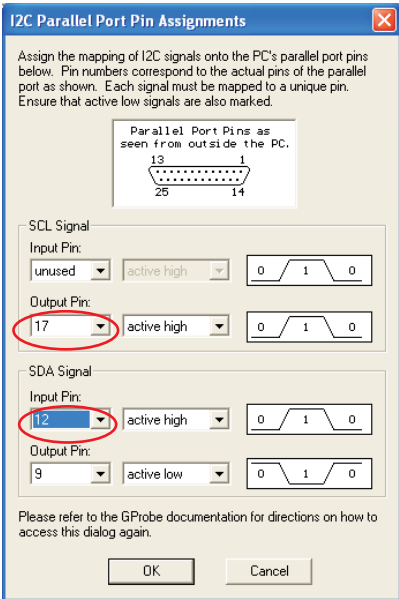


Fig.6

Update the firmware  
click the commands and select the Batch, as shown in Fig.9, Fig.10

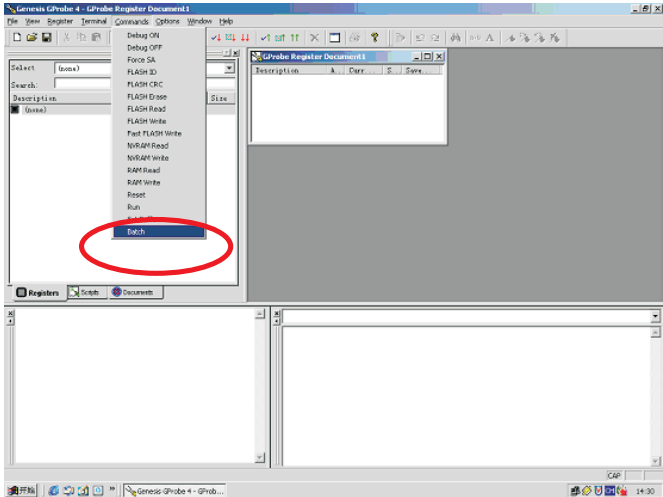


Fig.9

- 4. Press the options then choose connection setup as shown in Fig.7
- 5. From the menu that appears , choose the DDC2Bi3 in "protocol" and the LPT (0x378) in "port" as shown in Fig.8

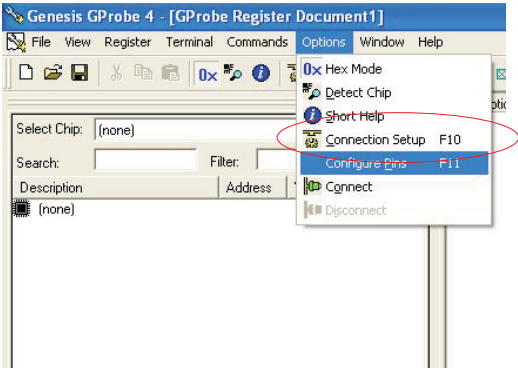


Fig.7

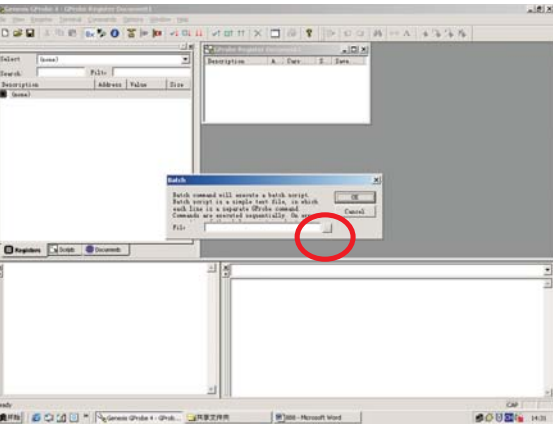


Fig.10

Click the button as shown in Fig.10 to browse the Iicisp.txt file in the folder that you create.

Note: you should pay attention to the path in the Iicisp.txt file. It is the same as the folder's path that you create.

Go to cover page

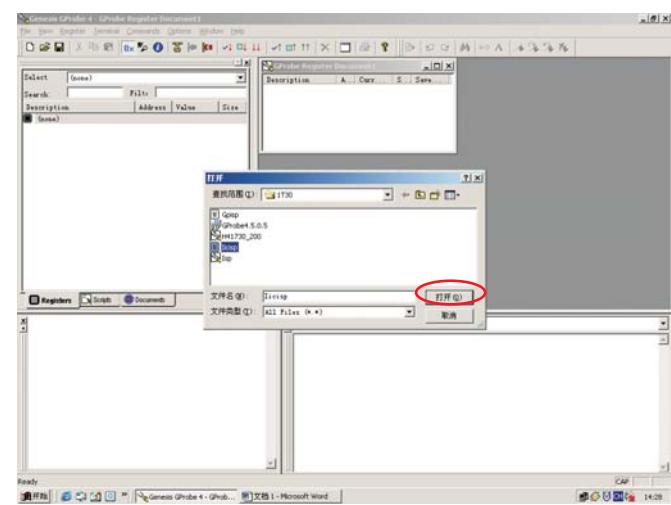
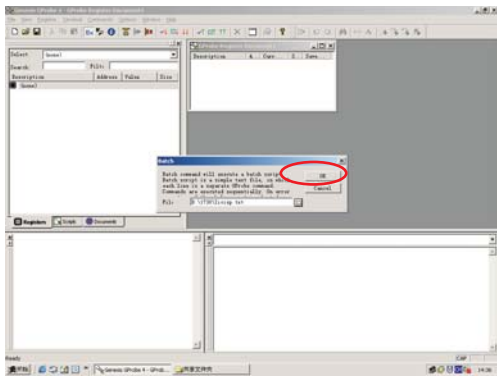
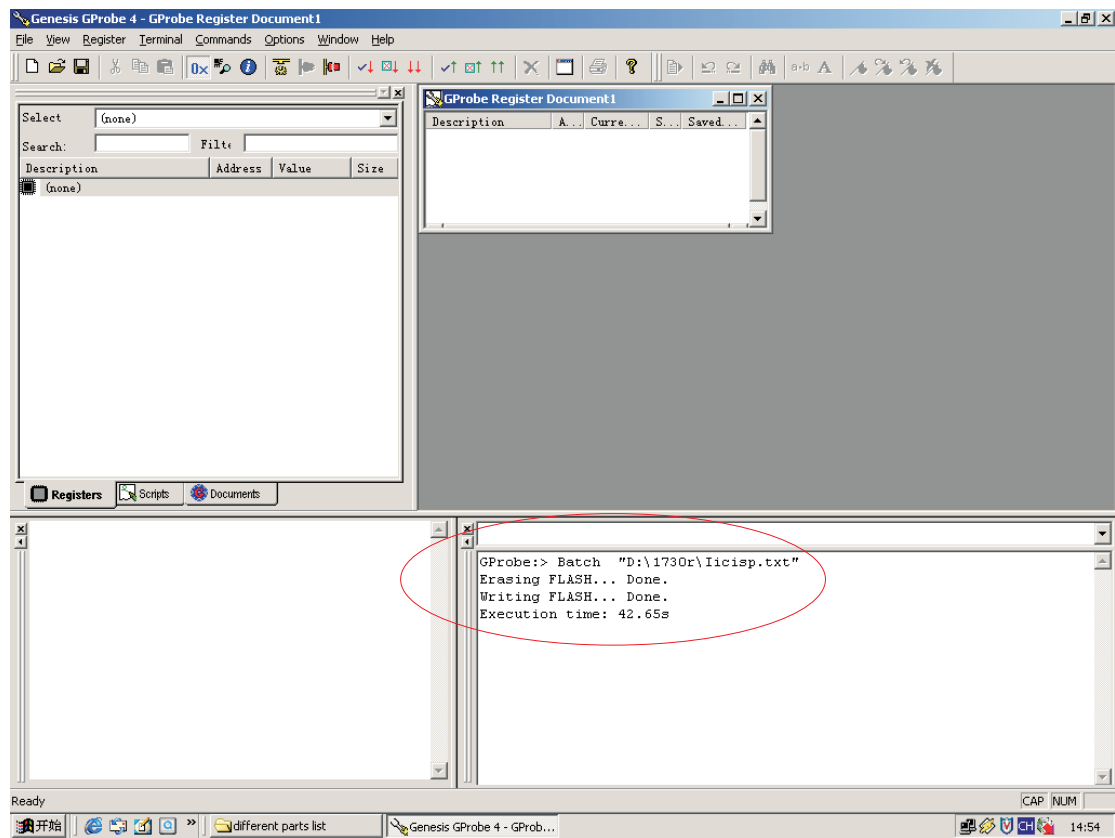


Fig.11 click "OPEN"



Shut of the AC power  
Click the "OK" button and then open the AC power, after the follow window appears, the update is completed.





## 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.

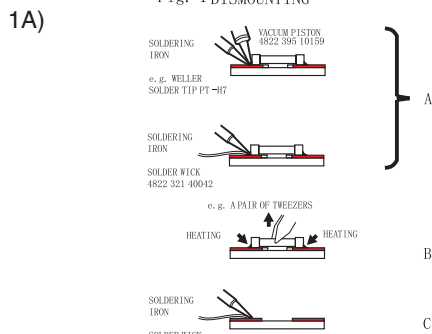
- Avoid using storage places that are sensitive to oxidation such as places with sulphur or chlorine gas, direct sunlight, high temperatures or a high degree of humidity. The capacitance or resistance value of the SMDs may be affected by this.

- 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

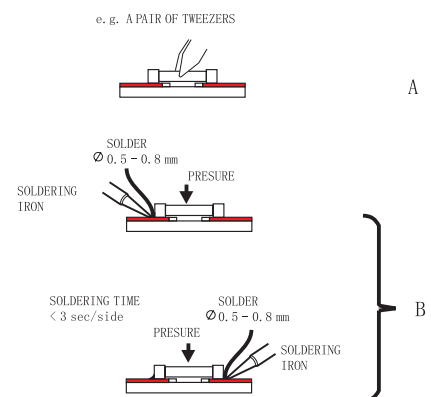
preferably be equipped with a thermal control (soldering temperature: 225 to 250 C).

- 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

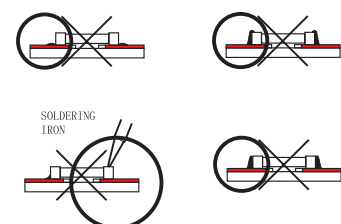


## 2. Caution when attaching SMDs

- 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



# Color Adjustment

## White Balance Adjustment

### Alignment procedure

1. Turn on HP L1730 LCD monitor.
2. Turn on the Timing/Pattern generator. See Fig. 1  
Setting generator to provide CROSS-Hatch pattern at  
Resolution : 1024 x 768  
Timing : H= 48,36 KHz V= 60 Hz
3. Preset LCD colour Analyzer CA-110
  - Remove the lens protective cover of probe CA-A30.
  - Set Measuring/viewing selector to Measuring position for reset analyzer. (Zero calibration) as Fig. 2
  - Turn on the colour analyzer (CA-110).
  - Press 0-CAL button to starting reset analyzer. See Fig. 3



Fig. 1

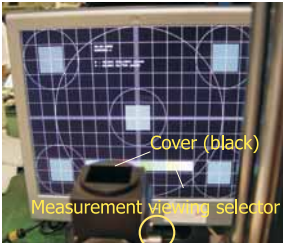
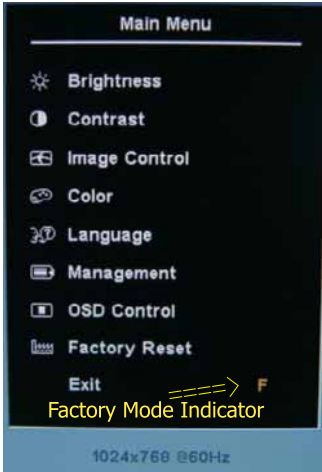


Fig. 2



Fig. 3

4. Entering factory adjustment mode of LCD Monitor.
  - Power off on the monitor, To hold MENU and +INPUT buttons at the same time , And press POWER button to power on the monitor. Press MENU button to bring up OSD MENU for confirmation.



- Note: after alignment, please reset OSD to user s mode for normal operation. Otherwise, the monitor won t entering power saving mode and showing full white picture all the time as no video signal supplied. To leave factory mode by restart the monitor.
5. Adjust OSD menu to lower position of screen (i.g. adjust V-position to value " 0 " at submenu of OSD Setting.
6. Setting Brightness and Contrast
  - Adjust Brightness to value " 90".
  - Adjust Contrast to value " 80".
7. Switch light probe to Viewing position.
8. Move the Lens barrel forward or backward to get clear image as shown in Fig. 4
9. Switch light probe to Measuring position. It should be able to indicate

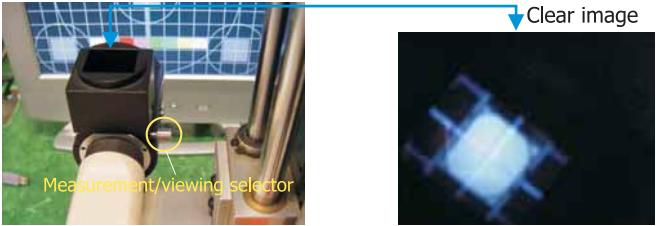


Fig. 4

10. Setting pattern to full white picture.
11. Press menu then select F, by button.
12. Press menu to bring up submenu as following windows.



- 9300° K
13. Press MENU buttons to select R G B. Increase/decrease value by press or buttons until the X, Y co-ordinates as below:  
X= 0.283+/- 0.020  
Y= 0.297 +/-0.020  
Y>= 200 nits
- 6500 °K
14. Setting X, Y value listed as below:  
X= 0.313 +/-0.020  
Y= 0.329 +/-0.020  
Y>= 200 nits
- Alignment hits: 1. R for x value, G for y value, B for Y value on the colour analyzer.  
2. If the colour analyzer has been calibrated and preset colour temperature in it. Please switch to correct setting in accordance with colour settings.
15. Gray scale checking
  - Switch Timing/pattern generator to  
Pattern: 64 gray scale  
Timing: 1024 X 768 60Hz 48.36KHz
  - Setting both Brightness 90% and Contrast to 80% (Value).
  - Check black and white scale are visible clearly across the screen.

See Fig. 5

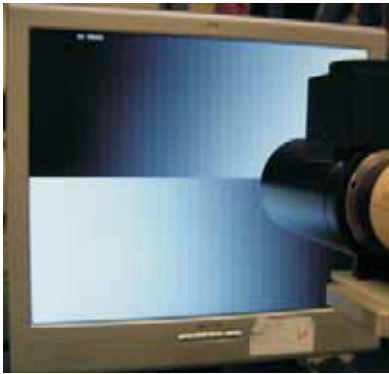


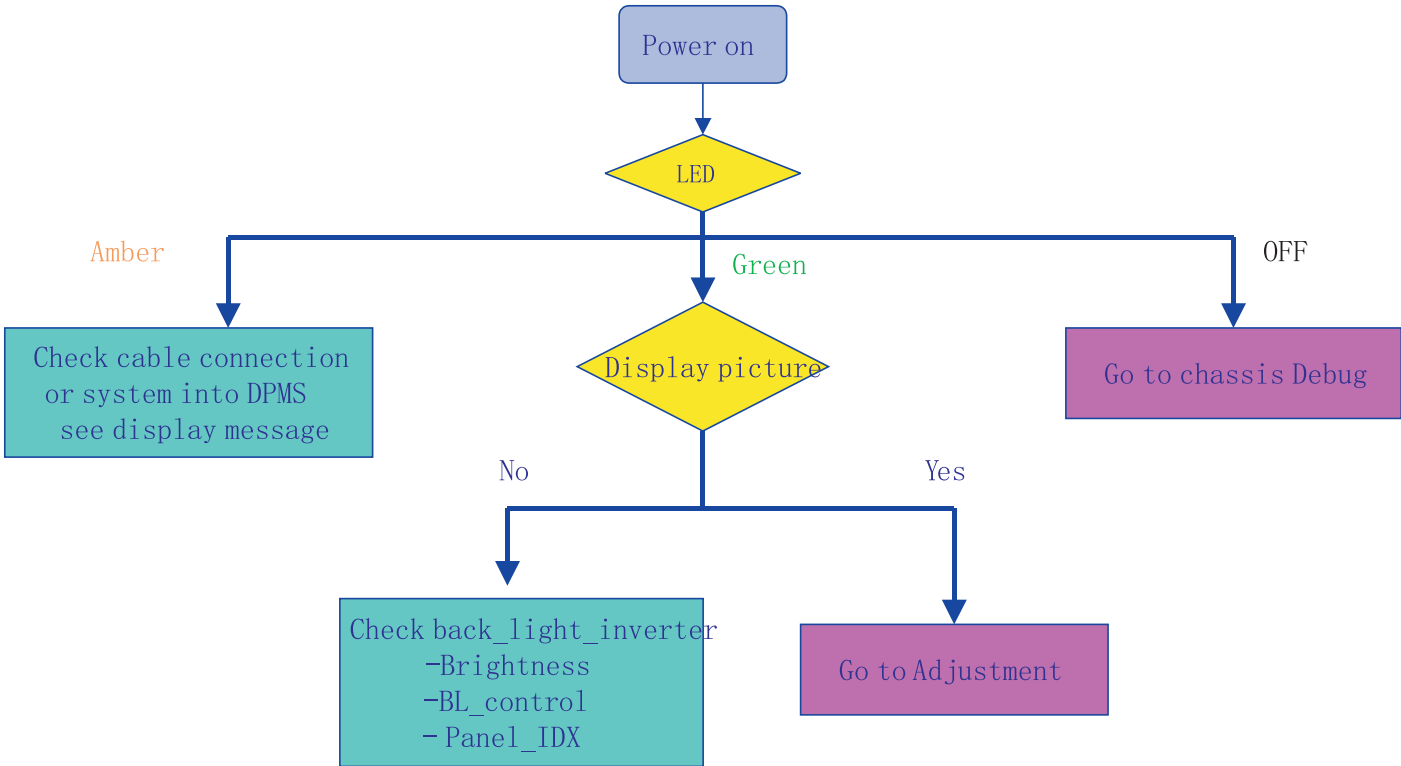
Fig. 5

Note: The bright scale will be saturated, if Y is too large. The dark scale will be invisible, if Y is too small. Re-alignment or review procedure again to correct this.

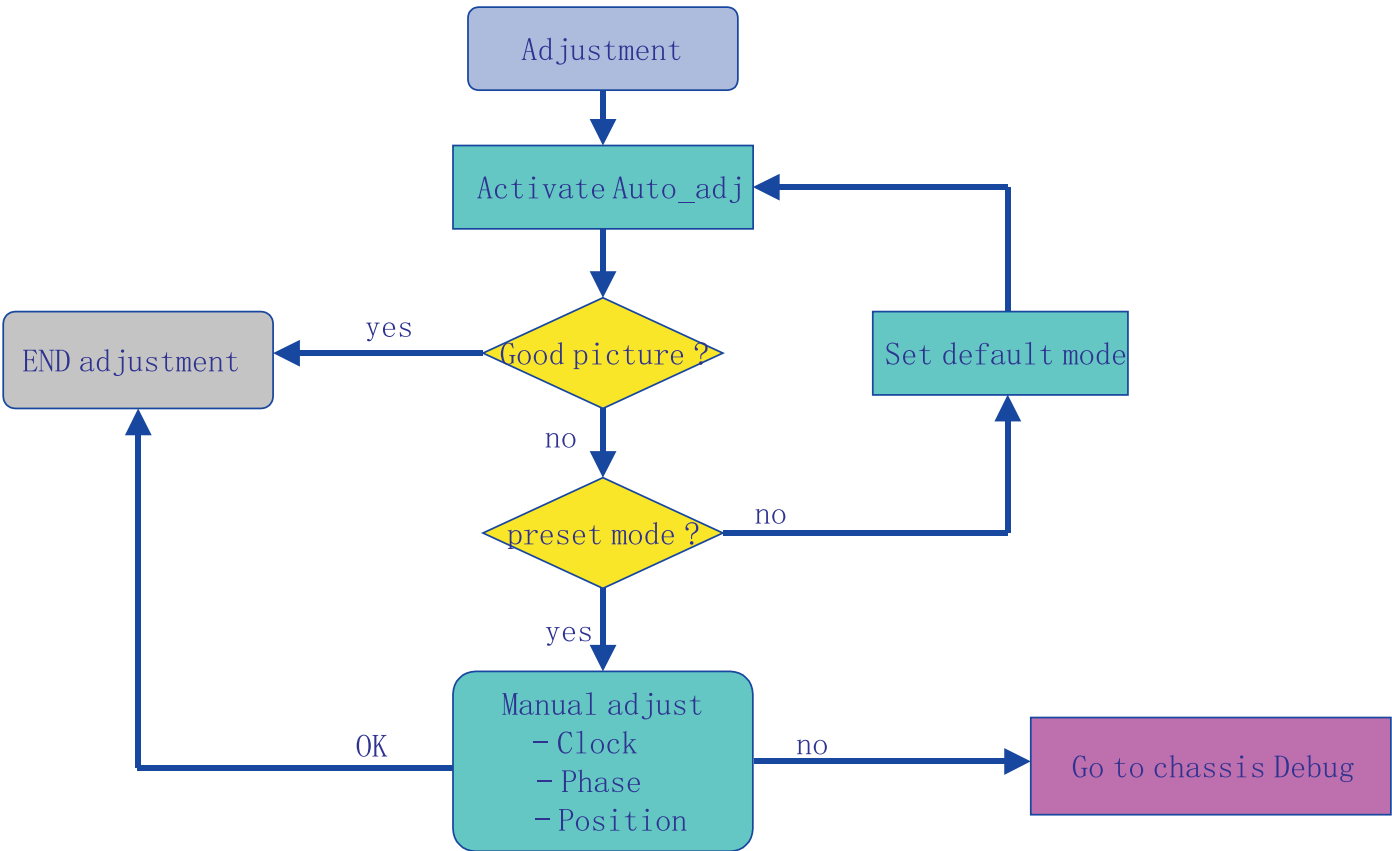


# Repair Flow Chart

Preparation : make sure mains supply and video signal are well settled

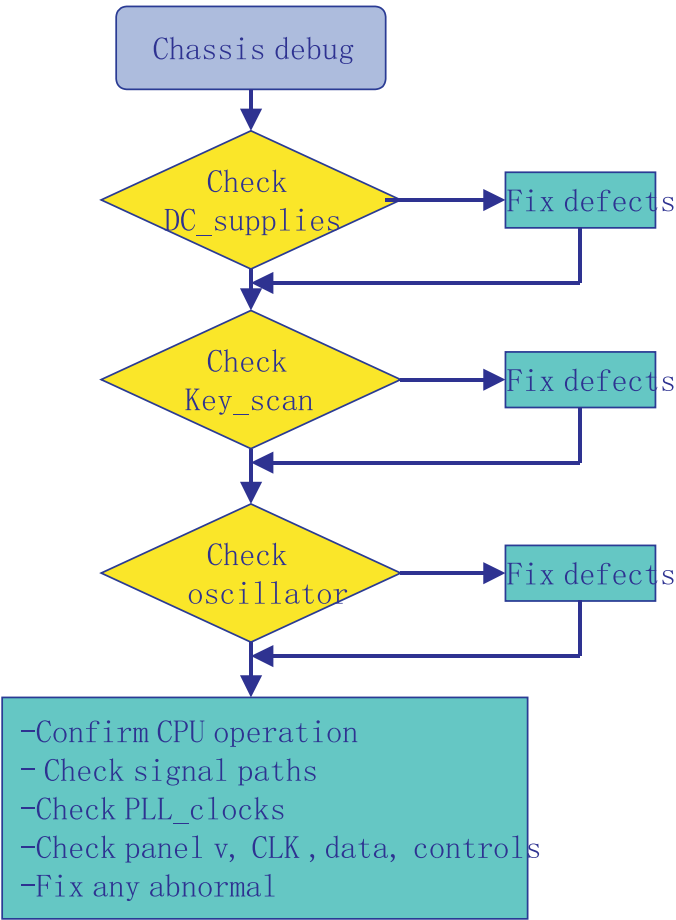


Preparation : dot alternation pattern or windows background.

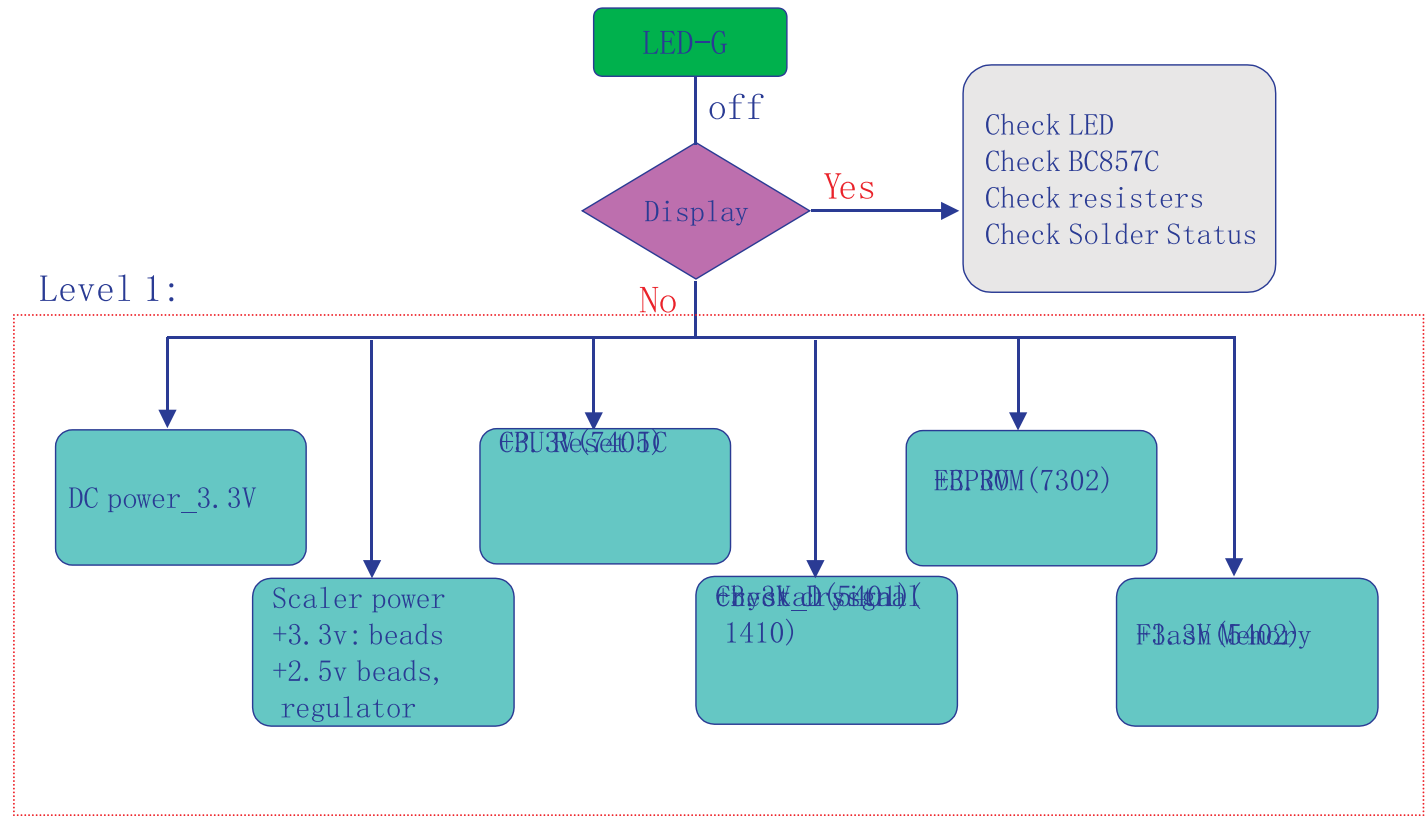


# Repair Flow Chat

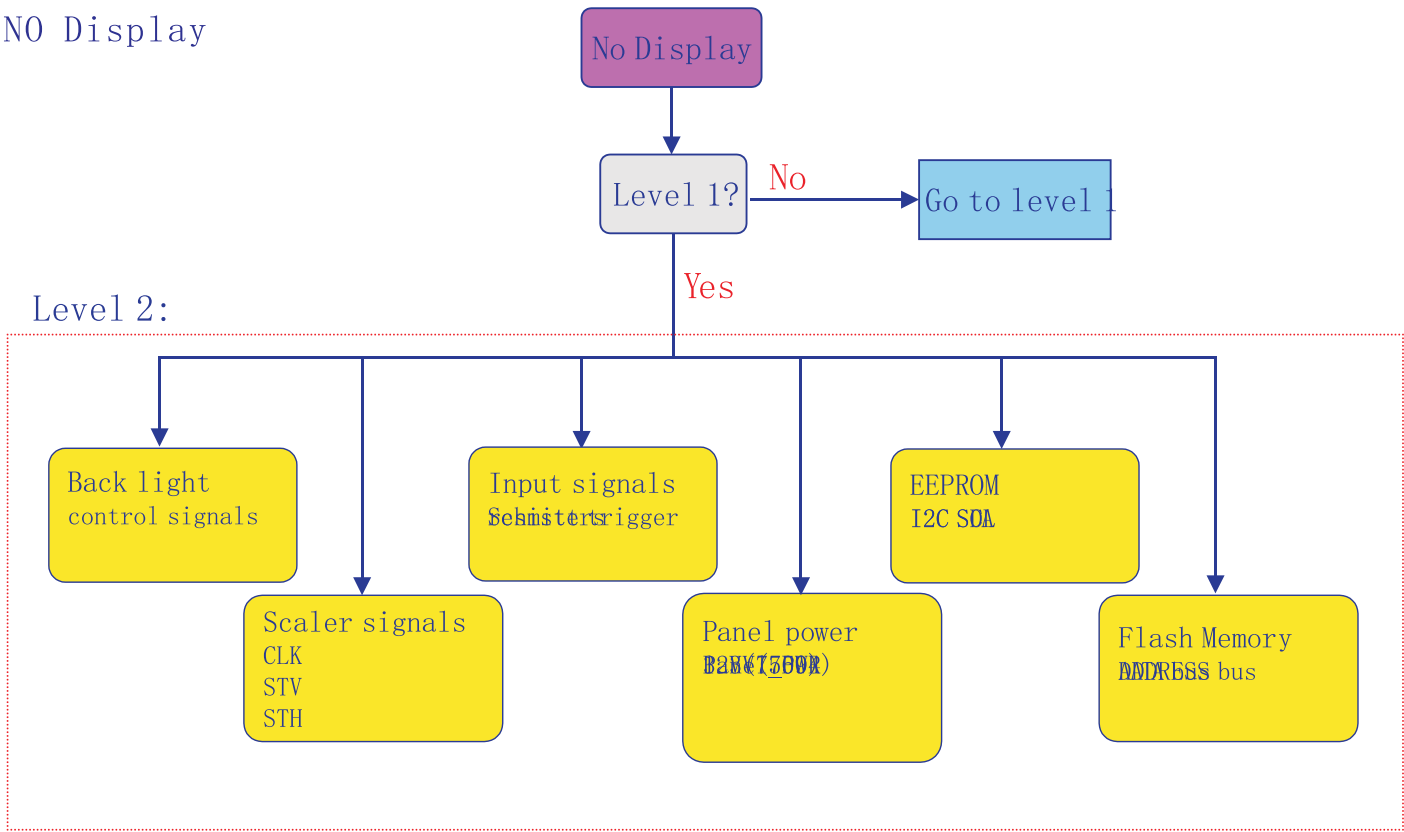
Preparation : before chassis debugging, first check all wire harness, remove intrusions, and find errors by visual



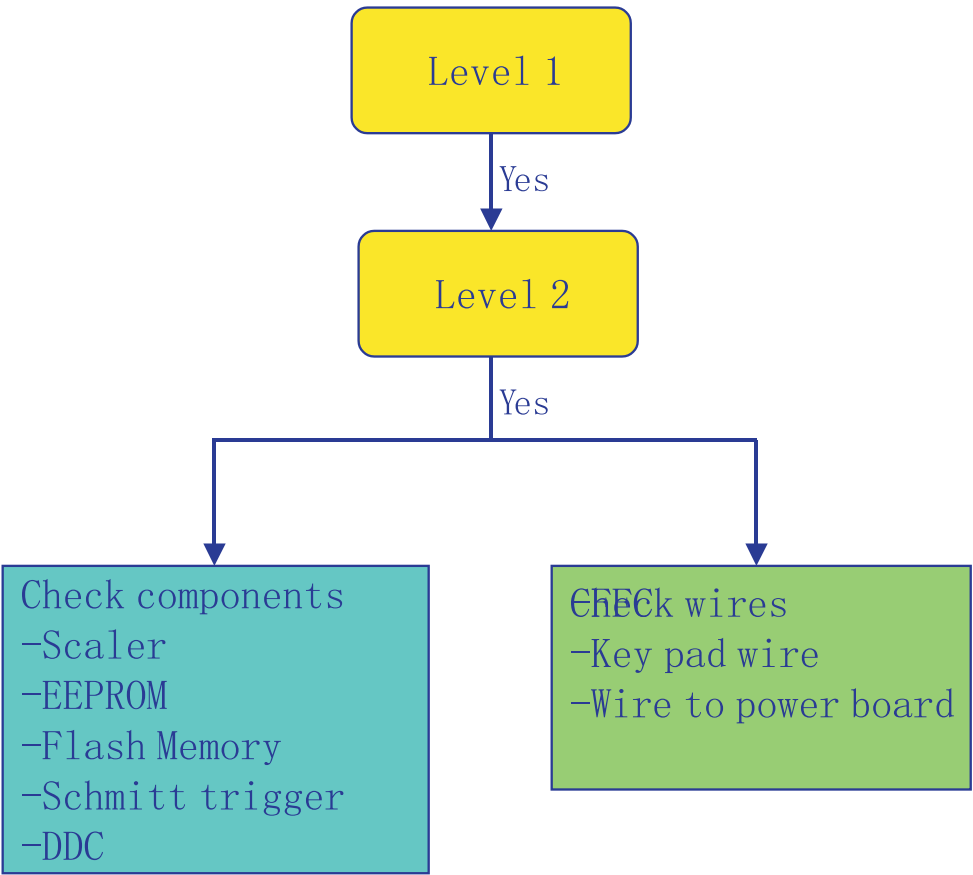
LED -G OFF



NO Display



Other Defects



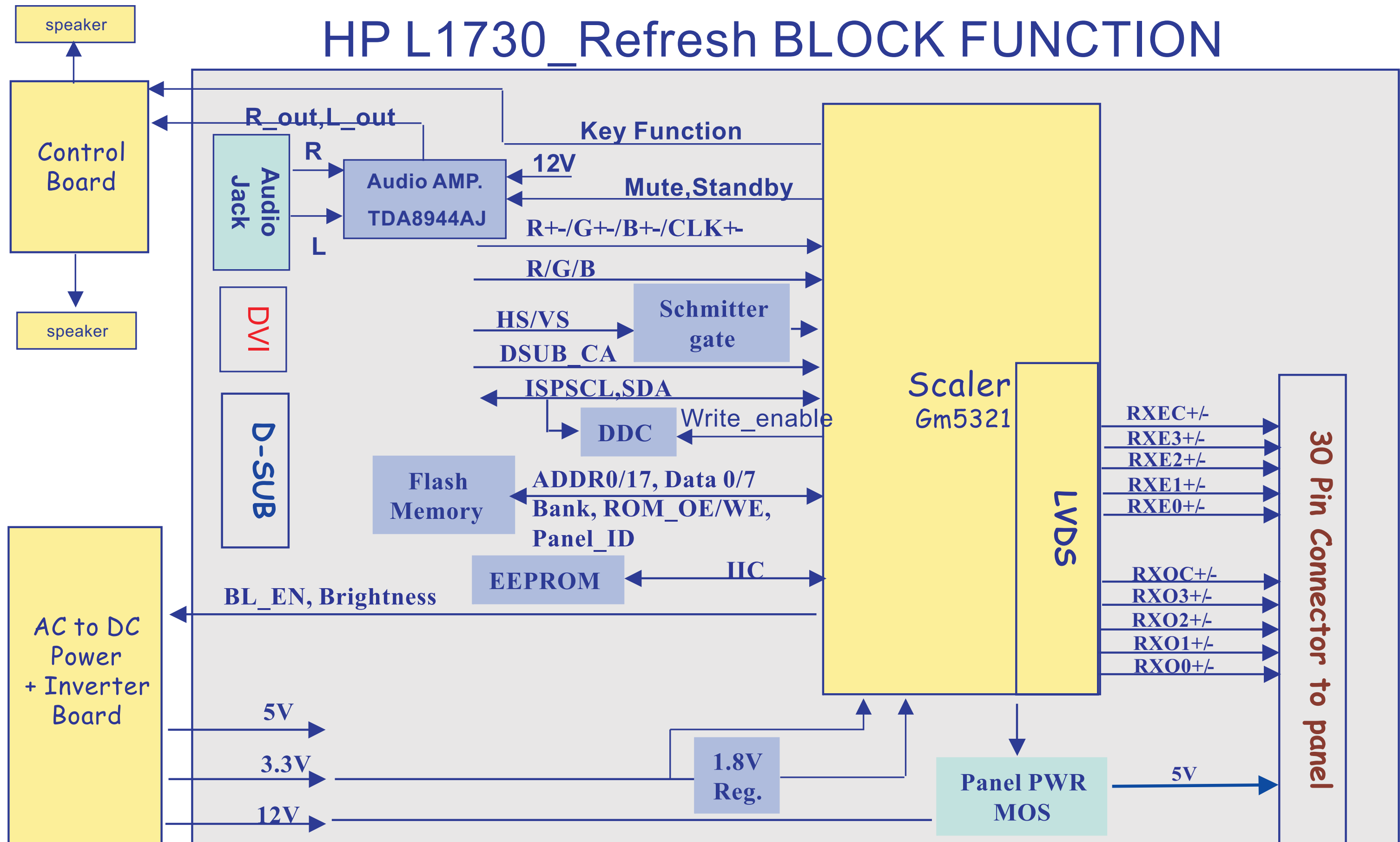
# Trouble shooting

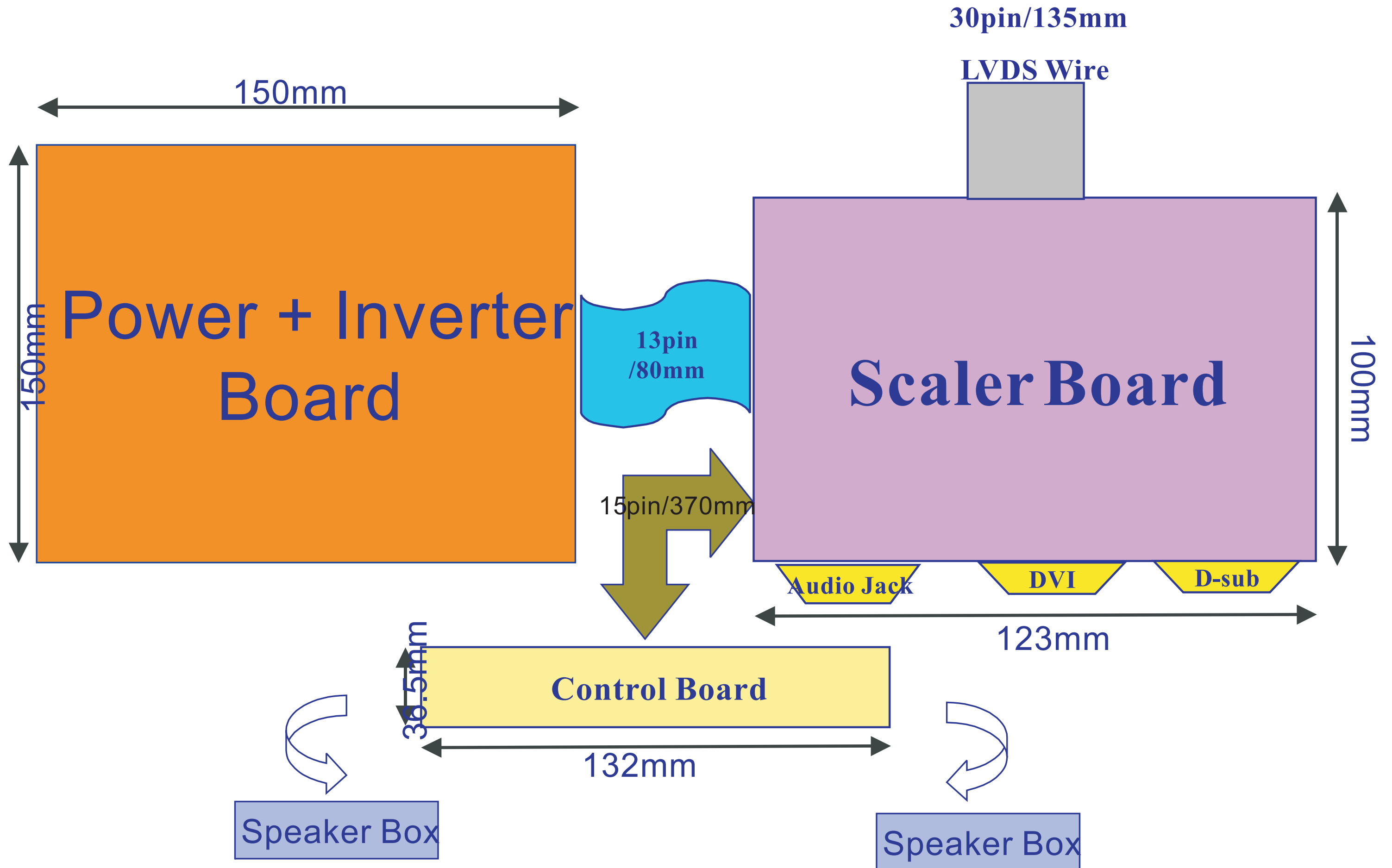
## Solving Common Problems

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

Problem	Possible Cause	Solution
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 cableproperly.
	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.

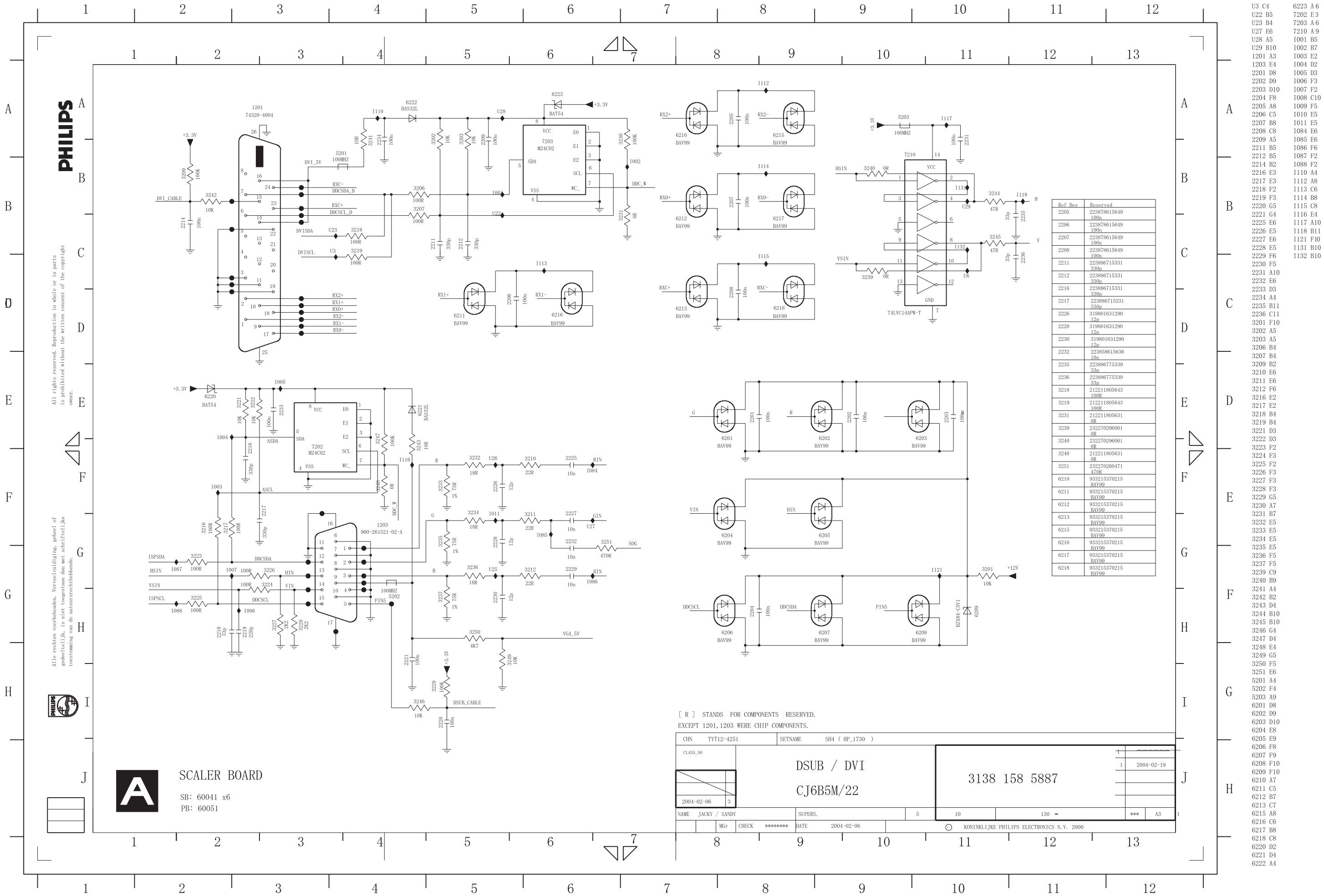
# HP L1730\_Refresh BLOCK FUNCTION





Scaler Diagram-1

Go to cover page



Scaler Diagram-2

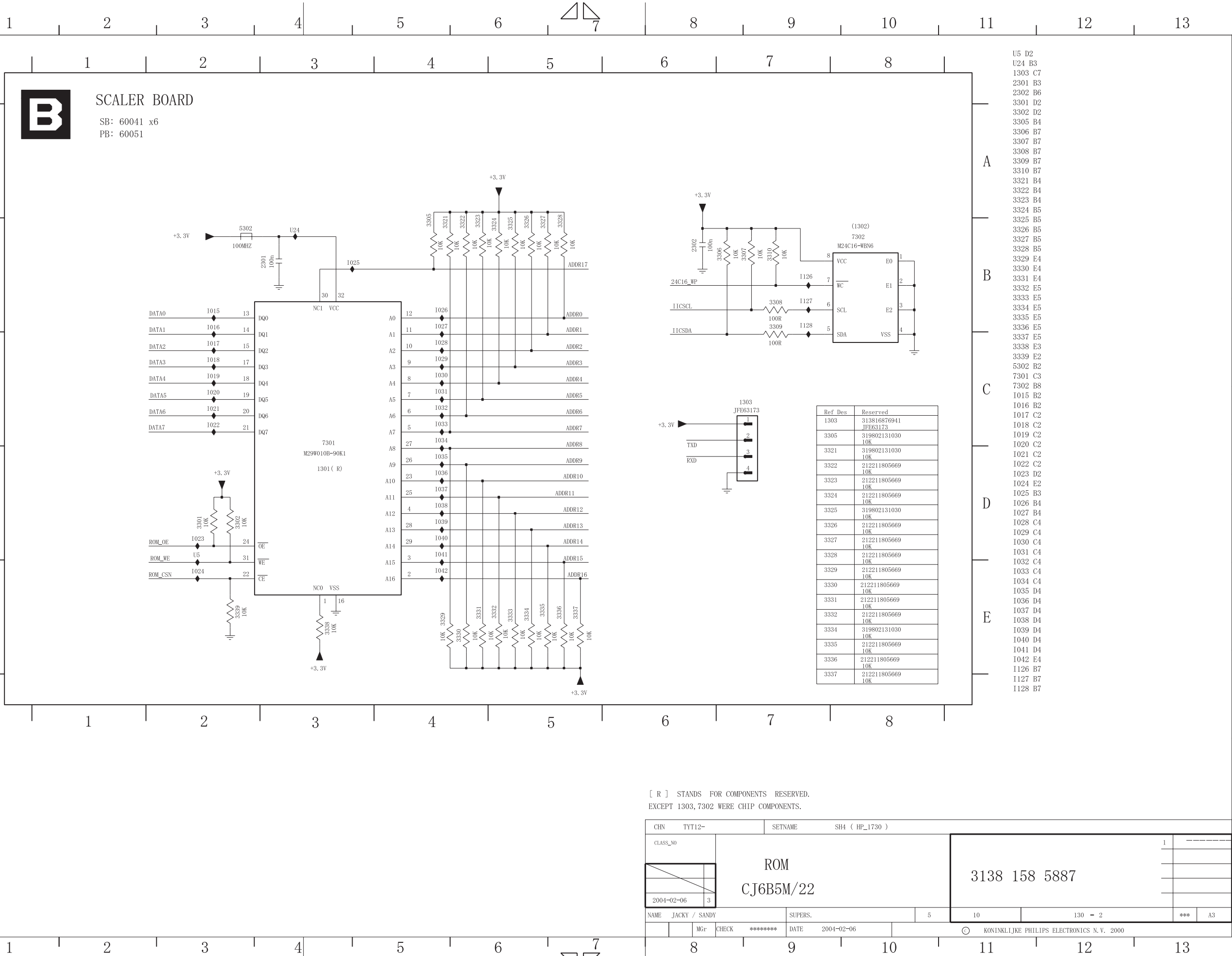
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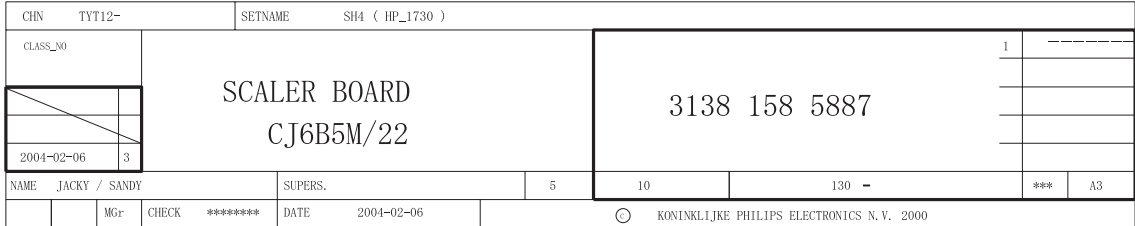
[ R ] STANDS FOR COMPONENTS RESERVED.  
EXCEPT 1303, 7302 WERE CHIP COMPONENTS.

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CLASS_NO		ROM  CJ6B5M/22										3138 158 5887		1		-----			
2004-02-06														3					
NAME JACKY / SANDY				SUPERS.				5		10		130 - 2				***		A3	
				MGr		CHECK		*****		DATE		2004-02-06		© KONINKLIJKE PHILIPS ELECTRONICS N.V. 2000					



## HP L1730R 37

U1 C5	5410 E1 D1
U2 D10	6401 B4
U2 D10	7401 B7
U2 D10	7403 E2
U2 E10	7404 B4
U2 E9	F001 B1 E1
U7 D3	F002 B1 E1
U9 E9	F003 B1 E1
U10 E9	F004 B1 E1
U11 E9	F005 B1 E1
U12 F9	F006 B1 E1
U13 F9	F008 C1 E1
U14 A3	F009 C1 E1
U15 B4	F011 C1 E1
U16 A6	F012 C1 E1
U17 C5	F013 C1 E1
U18 A6	F014 C1 E1
U19 B5	F015 D1 E1
U20 B5	F016 D1 E1
U21 B5	F017 D1 E1
F27 E2	F018 D1 E1
U38 F2	F021 D1 E1
U39 G2	F022 D1 E1
1410 A5	F023 E1 E1
1411 A11	F024 E1 E1
1412 A12	F025 E1 E1
2401 A1	F026 E1 E1
2402 B2	F027 F1 E2
2403 B2	F028 E1 E2
2404 B2	1091 B2
2405 B2	1092 F9
2406 B3	1099 G3
2407 B3	1106 C3
2408 B2	1107 F2
2409 B2	1108 F5
2410 B2	1XXX C3
2411 B2	
2412 B3	
2413 B3	
2414 B3	
2415 B3	
2416 B3	
2417 C2	
2418 C2	
2419 D2	
2420 D2	
2421 D2	
2422 D2	
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2424 D3	
2425 E2	
2426 E2	
2427 C2	
2428 C2	
2430 F2	
2431 F2	
2432 F2	
2433 F3	
2434 F3	
2435 F2	
2436 F2	
2437 G2	
2438 G2	
2439 H2	
2440 G2	
2441 G2	
2442 G3	
2443 G3	
2444 G3	
2445 G3	
2446 G3	
2447 A4	
2448 B4	
2450 A5	
2451 A6	
2452 B5	
2453 B5	
2454 B5	
2455 C5	
2460 F11	
2461 F11	
3401 B5	
3402 B5	
3403 B5	
3404 B5	
3405 C5	
3406 C5	
3407 C5	
3408 D5	
3409 G5	
3410 E11	
3411 F12	
3412 B5	
3413 B5	
3414 F11	
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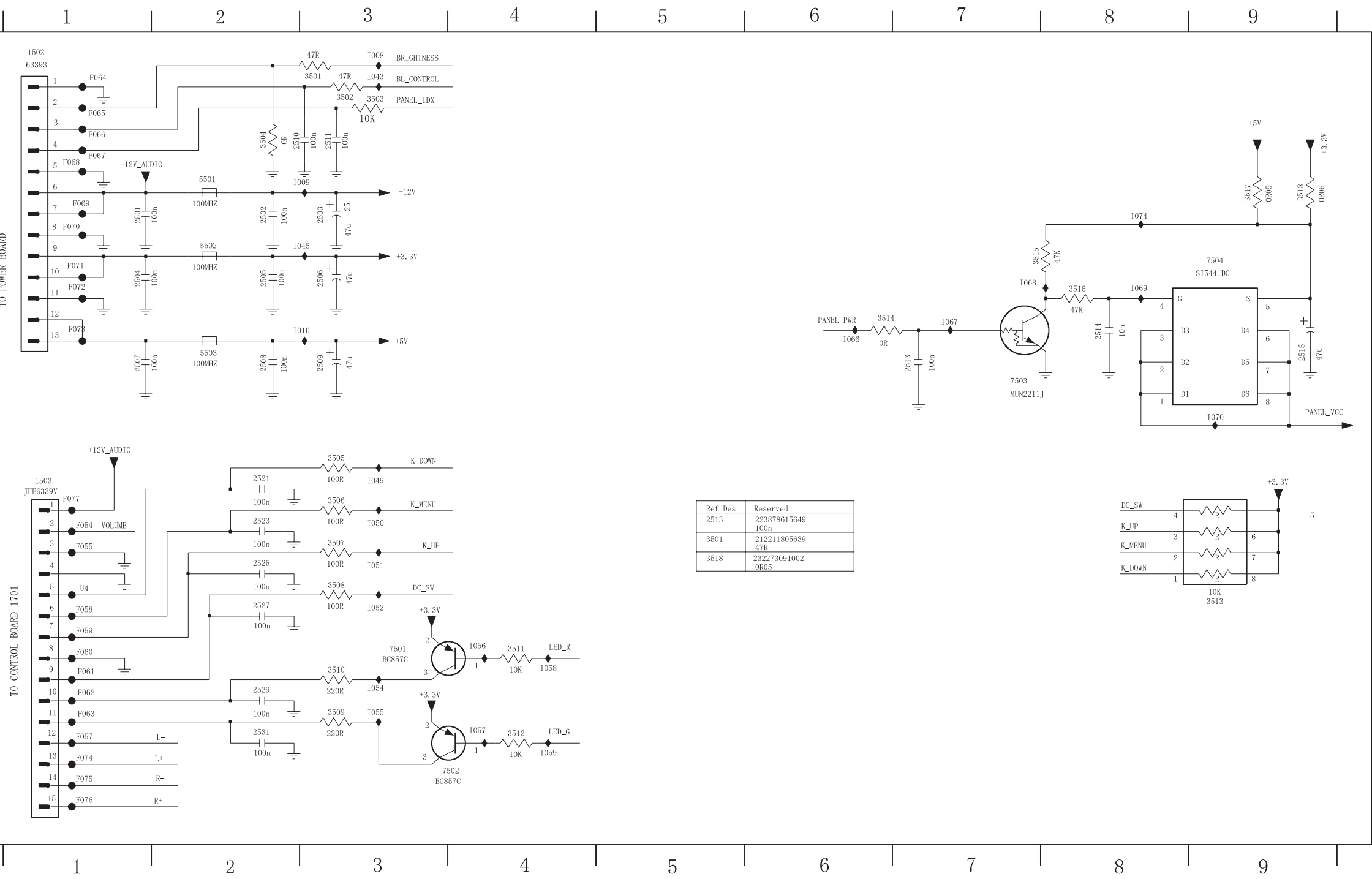


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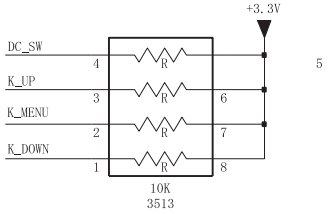
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- U4 D1 F073 B1
- 1502 A1 F074 E1
- 1503 C1 F075 E1
- 2501 A1 F076 E1
- 2502 A2 F077 C1
- 2503 A3 I008 A3
- 2504 B1 I009 A3
- 2505 B2 I010 B3
- 2506 B3 I043 A3
- 2507 B1 I045 B3
- 2508 B2 I049 C3
- 2509 B3 I050 D3
- 2510 A2 I051 D3
- 2511 A3 I052 D3
- 2513 B7 I054 E3
- 2514 B8 I055 E3
- 2515 B9 I056 D4
- 2521 C2 I057 E4
- 2523 D2 I058 E4
- 2525 D2 I059 E4
- 2527 D2 I066 B6
- 2529 E2 I067 B7
- 2531 E2 I068 B7
- 3501 A3 I069 B8
- 3502 A3 I070 C9
- 3503 A3 I074 A8
- 3504 A2
- 3505 C3
- 3506 C3
- 3507 D3
- 3508 D3
- 3509 E3
- 3510 E3
- 3511 D4
- 3512 E4
- 3513 D9
- 3514 B6
- 3515 B7
- 3516 B8
- 3517 A9
- 3518 A9
- 5501 A2
- 5502 B2
- 5503 B2
- 7501 D3
- 7502 E4
- 7503 C7
- 7504 B9
- F054 D1
- F055 D1
- F057 E1
- F058 D1
- F059 D1
- F060 D1
- F061 E1
- F062 E1
- F063 E1
- F064 A1
- F065 A1
- F066 A1
- F067 A1
- F068 A1
- F069 A1
- F070 B1
- F071 B1
- F072 B1

Ref	Des	Reserved
2513	223878615649 100n	
3501	212211805639 47R	
3518	232273091002 0R05	



[ R ] STANDS FOR COMPONENTS RESERVED.  
EXCEPT 1502, 1503 WERE CHIP COMPONENTS.

CHN	TYT12-	SETNAME	SH4 ( HP_1730 )
CLASS_NO			1
		POWER	
		CJ6B5M/22	
		3138 158 5887	
NAME	JACKY / SANDY	SUPERS.	5
CHECK		DATE	2004-02-06
			130 - 4
			A3

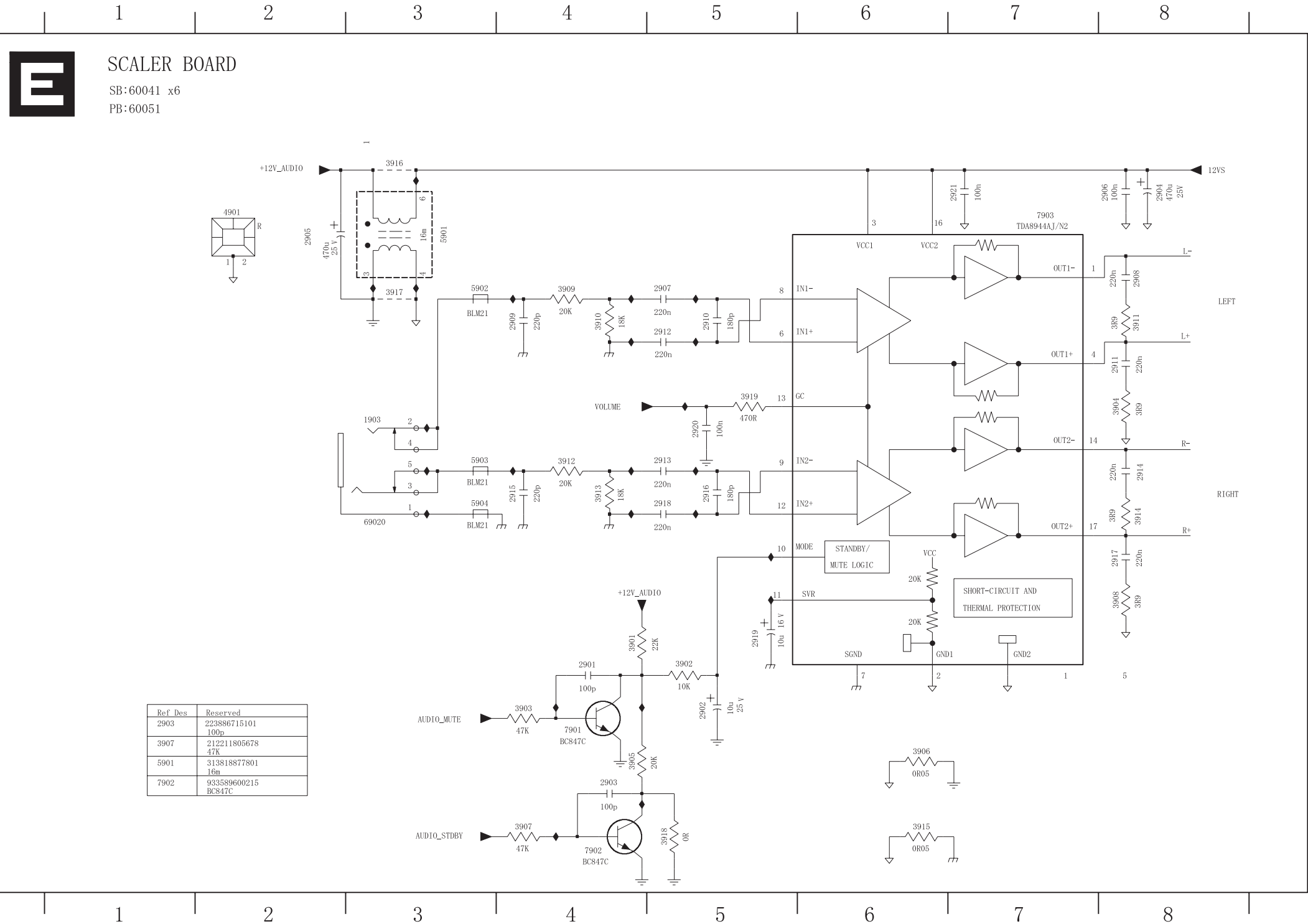
Scaler Diagram-5

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- 1903 C3
- 2901 D4
- 2902 E5
- 2903 E4
- 2904 A8
- 2905 A2
- 2906 A8
- 2907 B5
- 2908 B8
- 2909 B4
- 2910 B5
- 2911 B8
- 2912 B5
- 2913 C5
- 2914 C8
- 2915 C4
- 2916 C5
- 2917 D8
- 2918 C5
- 2919 D5
- 2920 C5
- 2921 A7
- 3901 D4
- 3902 D5
- 3903 E4
- 3904 C8
- 3905 E4
- 3906 E6
- 3907 E4
- 3908 D8
- 3909 B4
- 3910 B4
- 3911 B8
- 3912 C4
- 3913 C4
- 3914 C8
- 3915 E6
- 3916 A3
- 3917 B3
- 3918 E5
- 3919 C5
- 4901 A2
- 5901 A3
- 5902 B3
- 5903 C3
- 5904 C3
- 7901 E4
- 7902 E4
- 7903 A7

[ R ] STANDS FOR COMPONENTS RESERVED.  
EXCEPT 1903, 5901, 7903, 2904, 2905, 2908, 2911, 2914, 2917, 4901 WERE CHIP COMPONENTS.

CHN	TYT12-	SETNAME	SH4 ( HP_1730 )	
CLASS_NO			1	
		AUDIO		3138 158 5887
		CJ6B5M/22		
2004-02-06		3		
NAME	JACKY/SANDY	SUPERS.	5	
CHECK	DATE	2004-02-06	130 - A3 5	
© KONINKLIJKE PHILIPS ELECTRONICS N.V. 2000				

# SAITIHd

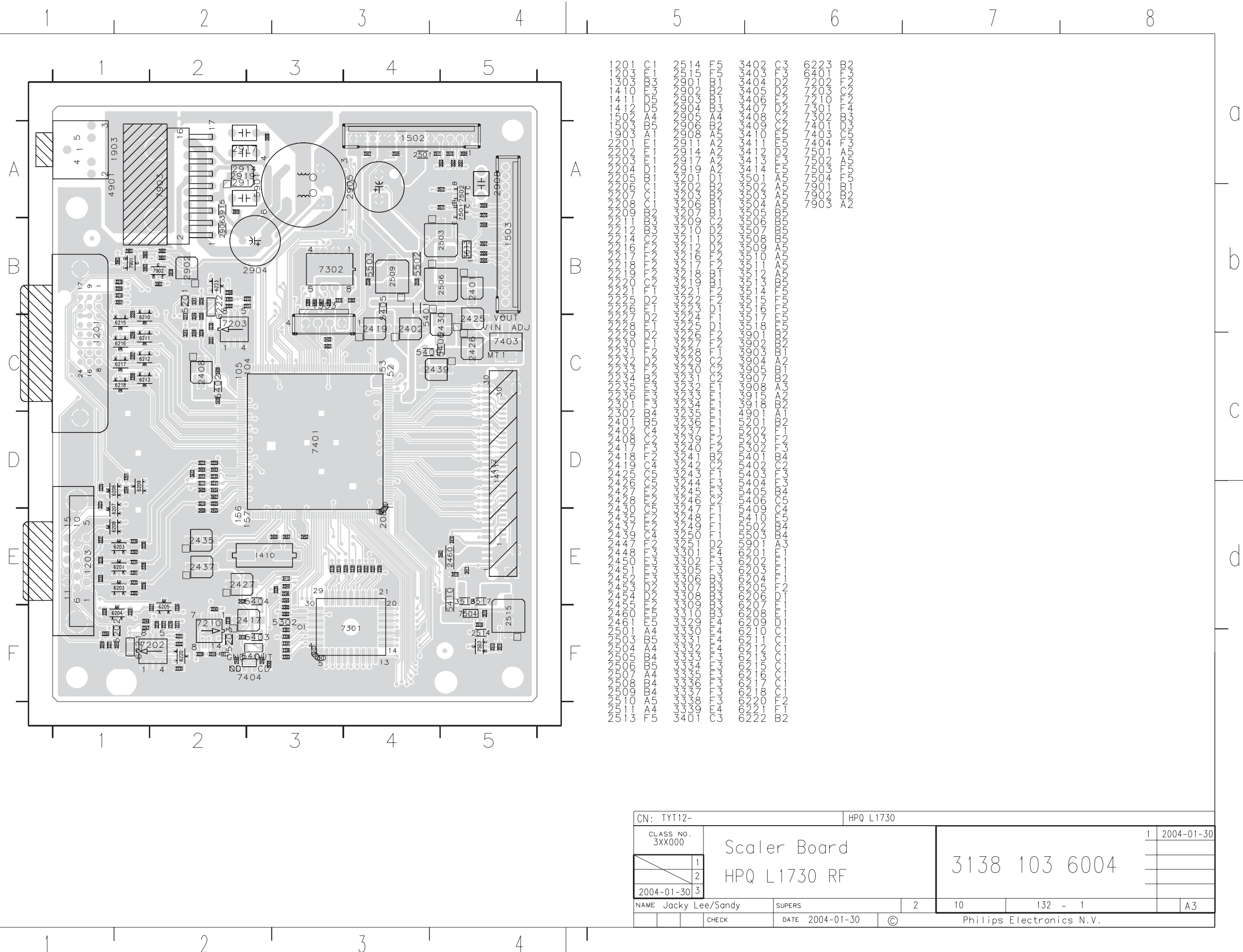


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e

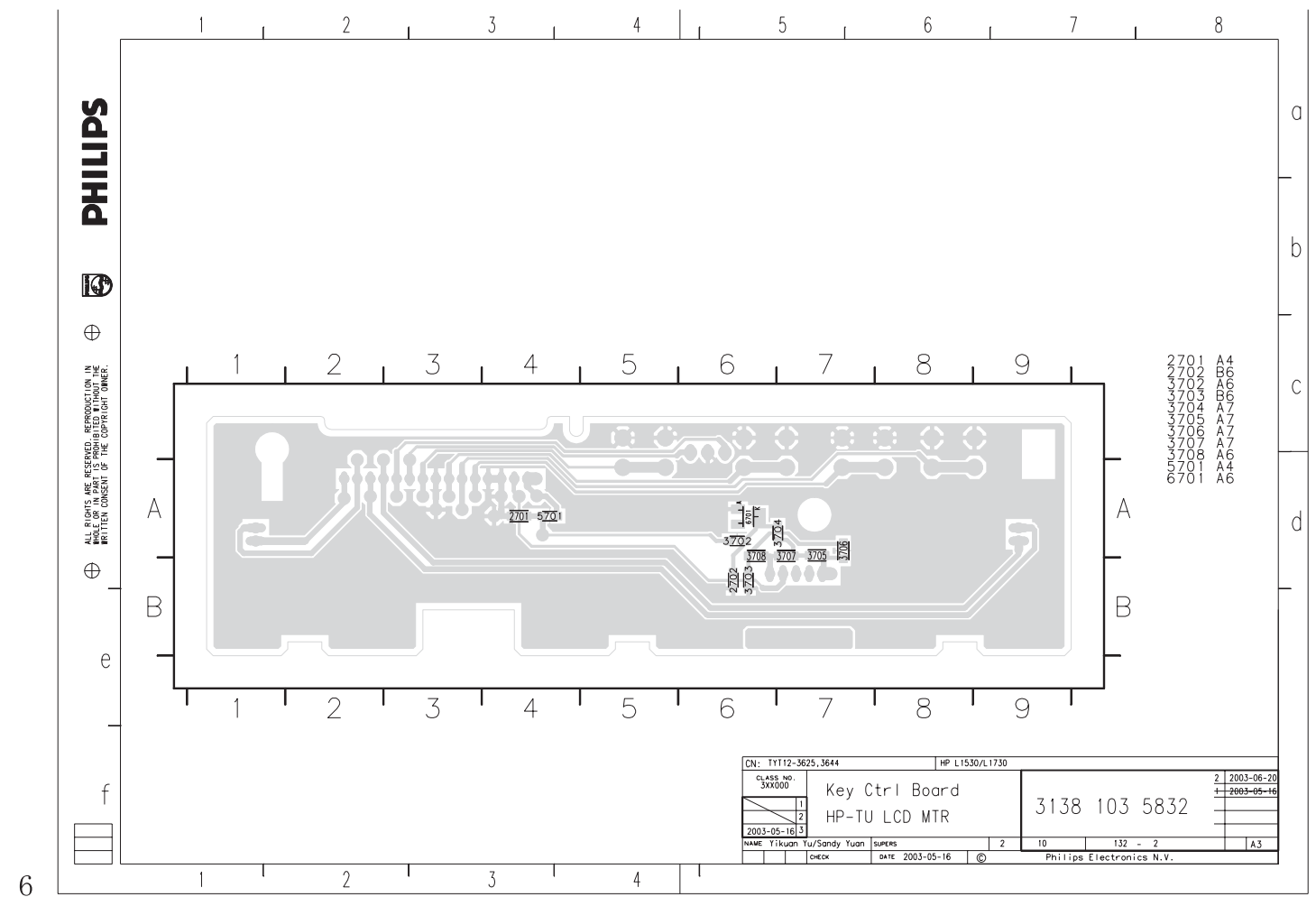
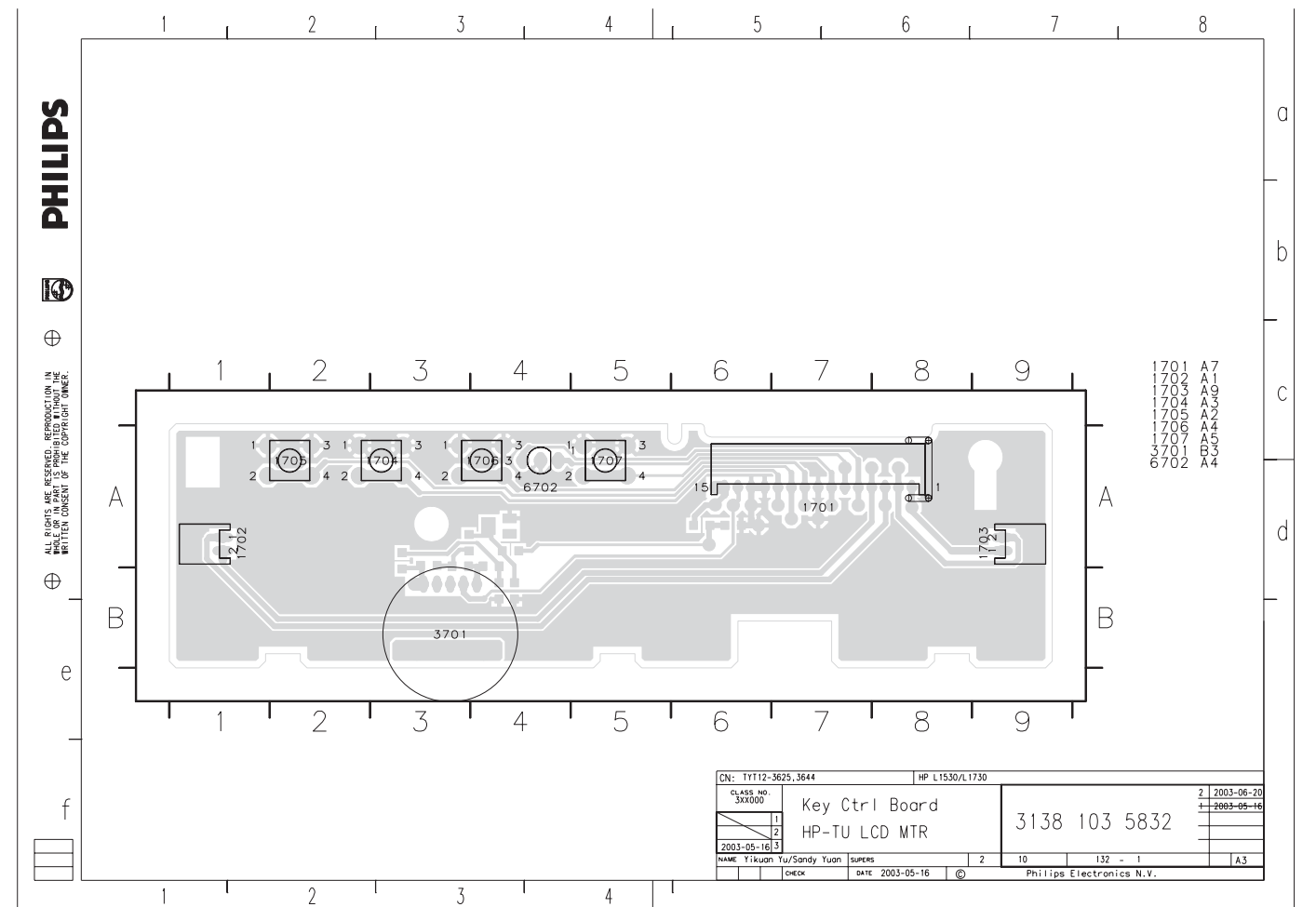
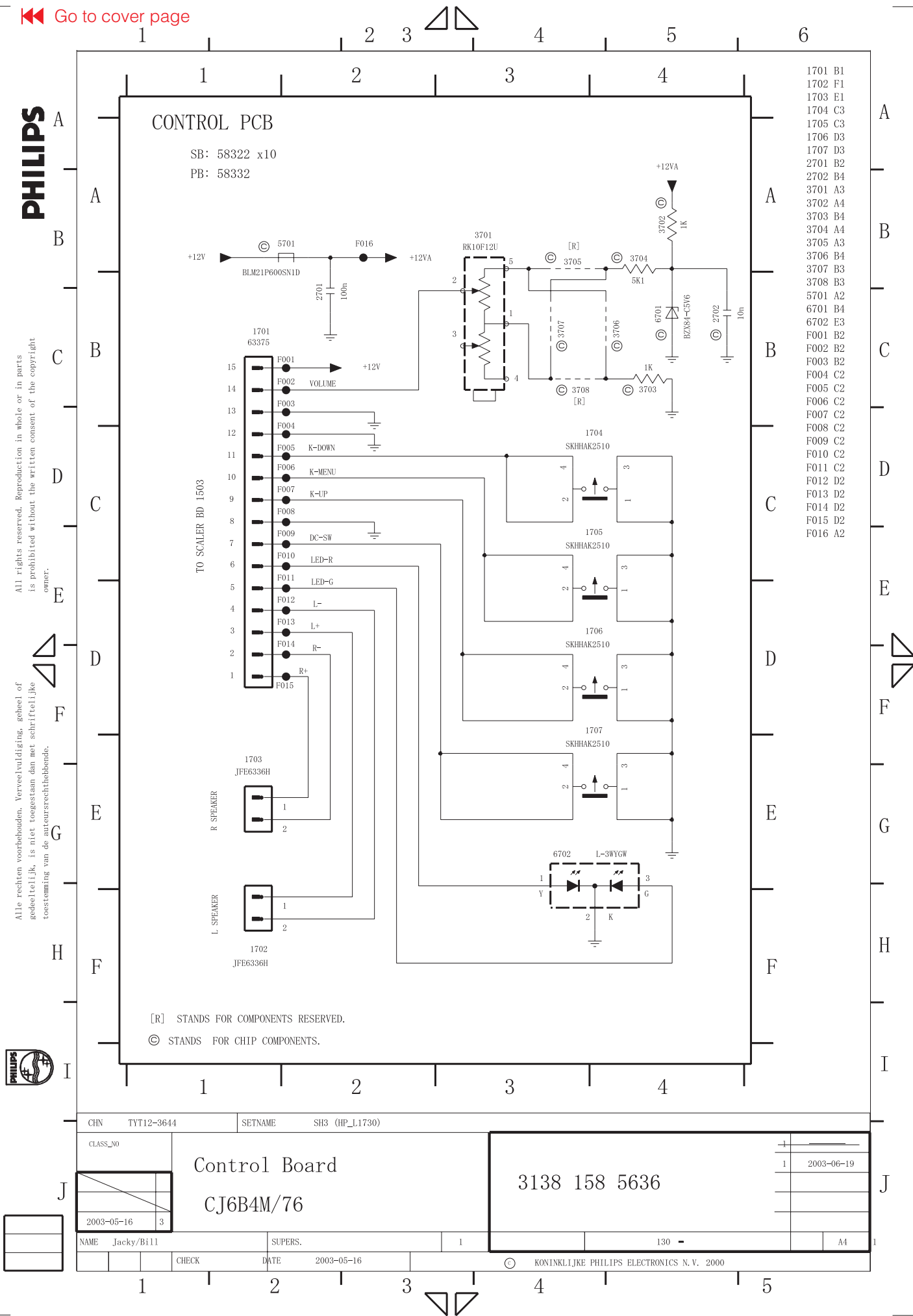
f



CN: TYT12-				HPQ L1730							
CLASS NO. 3XX000		Scaler Board HPQ L1730 RF				1		2004-01-30			
<div><div></div><div>1</div><div>2</div><div>3</div></div>											
						2004-01-30					
NAME Jacky Lee/Sandy		SUPERS		2		10		132 - 1		A3	
CHECK		DATE 2004-01-30		©		Philips Electronics N.V.					

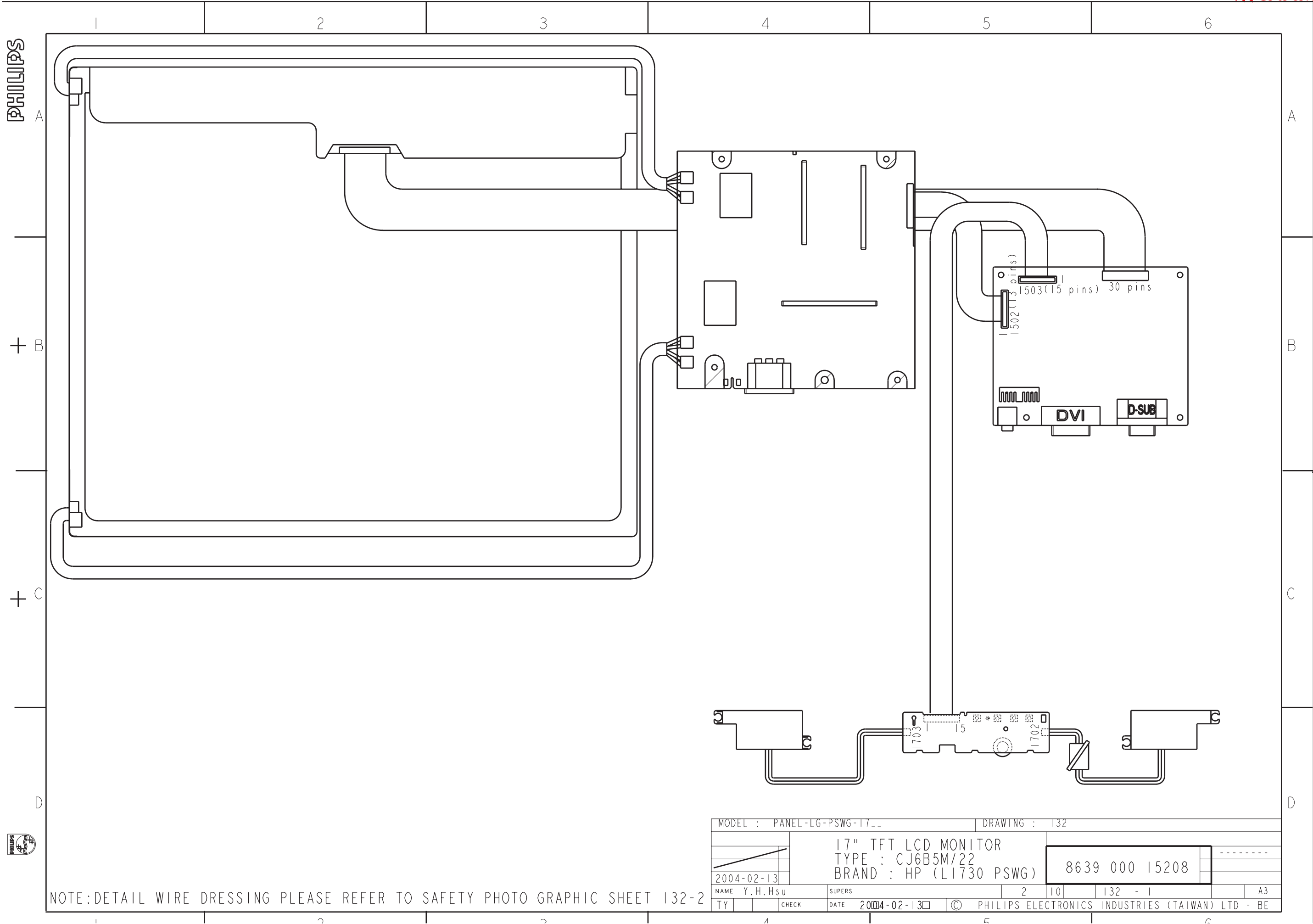






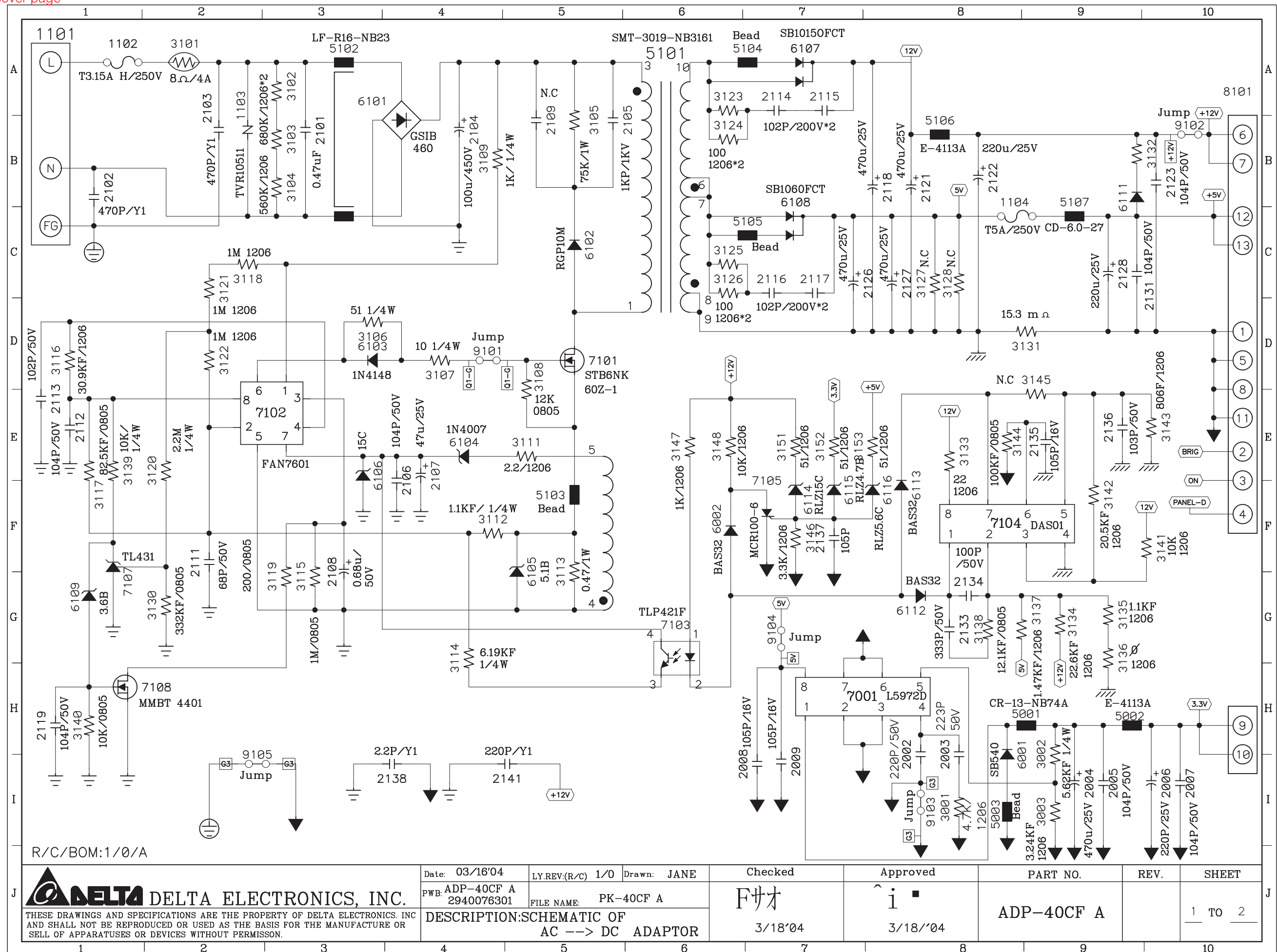


Wiring Diagram

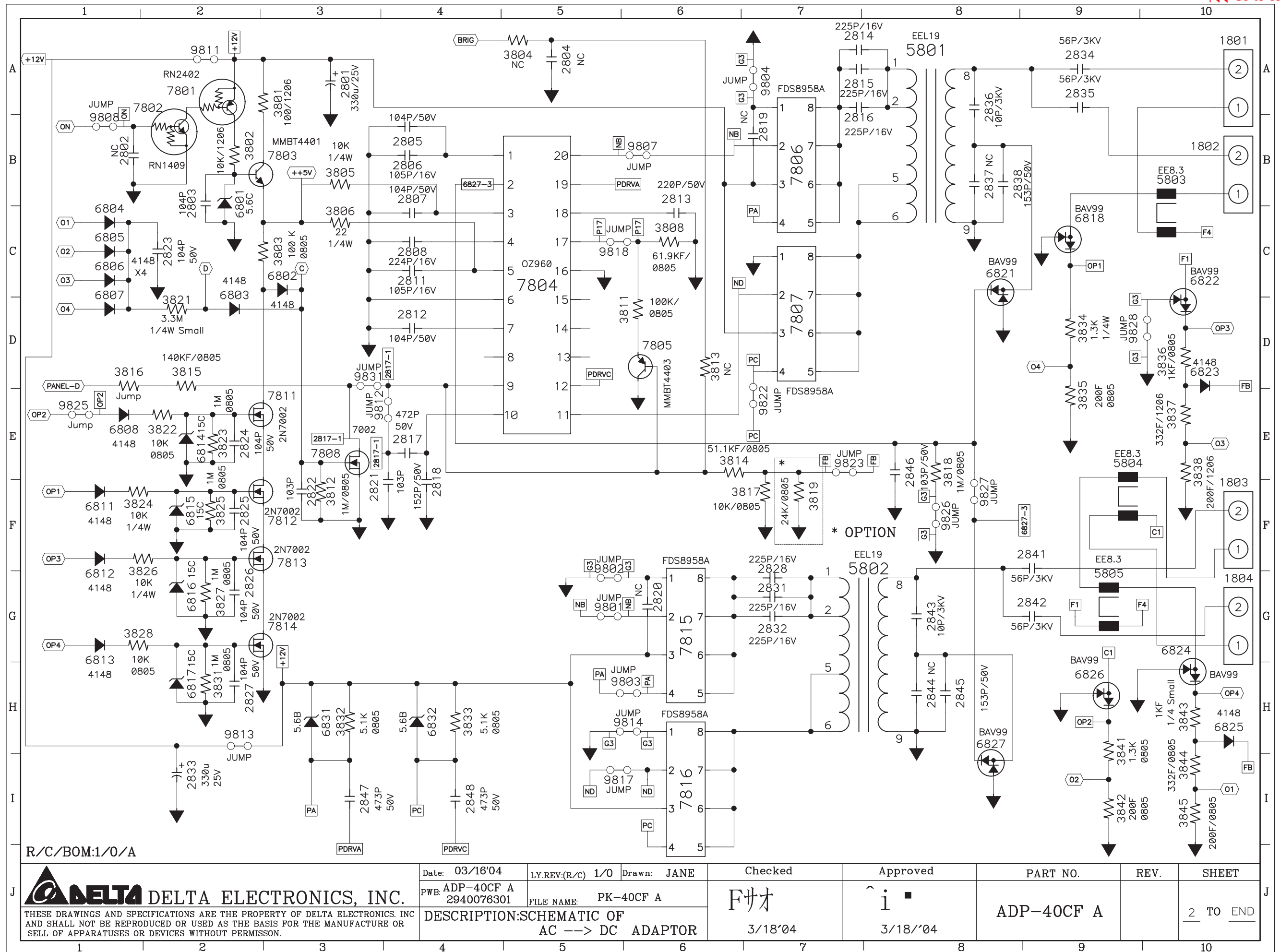


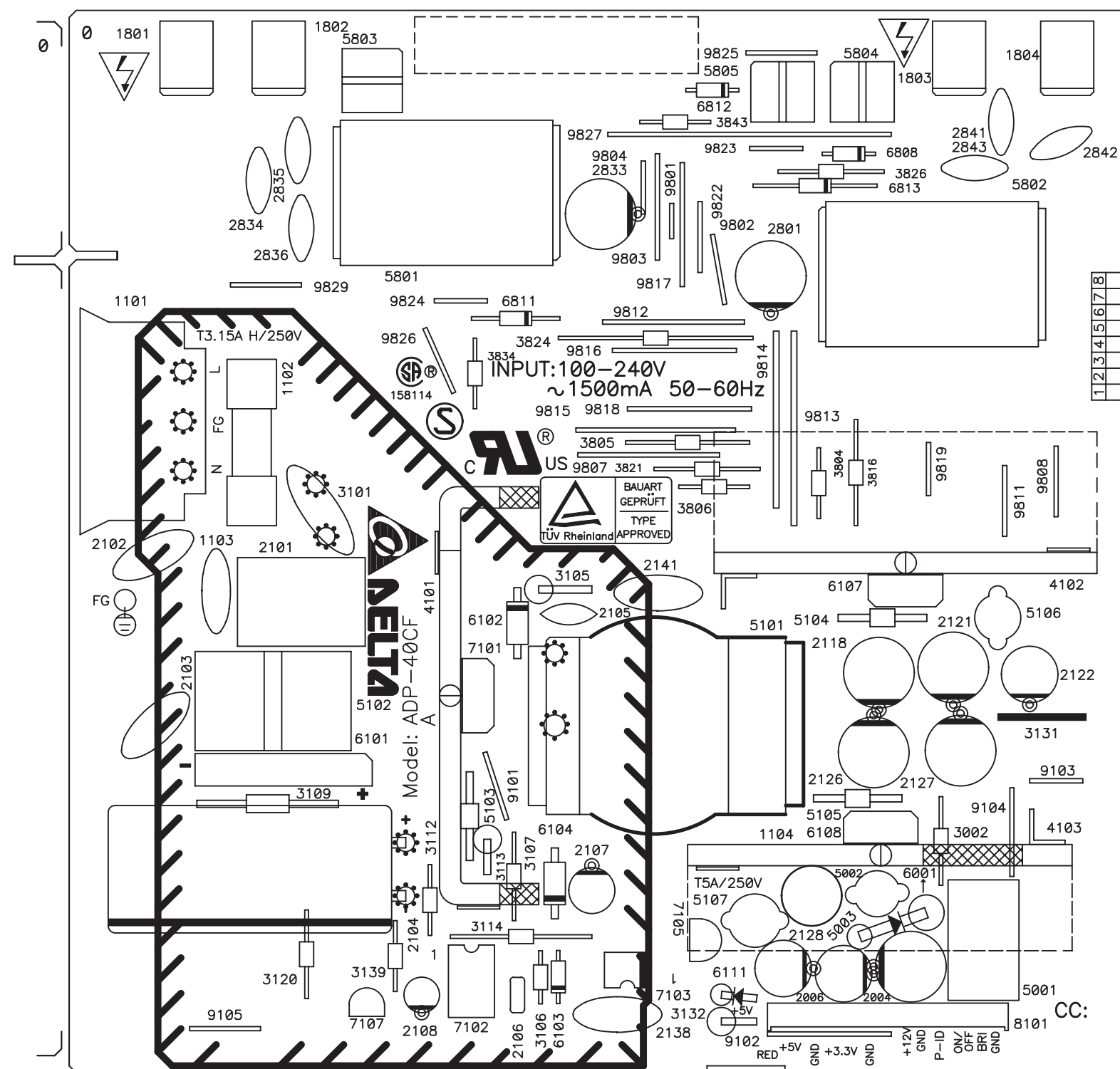
NOTE:DETAIL WIRE DRESSING PLEASE REFER TO SAFETY PHOTO GRAPHIC SHEET 132-2

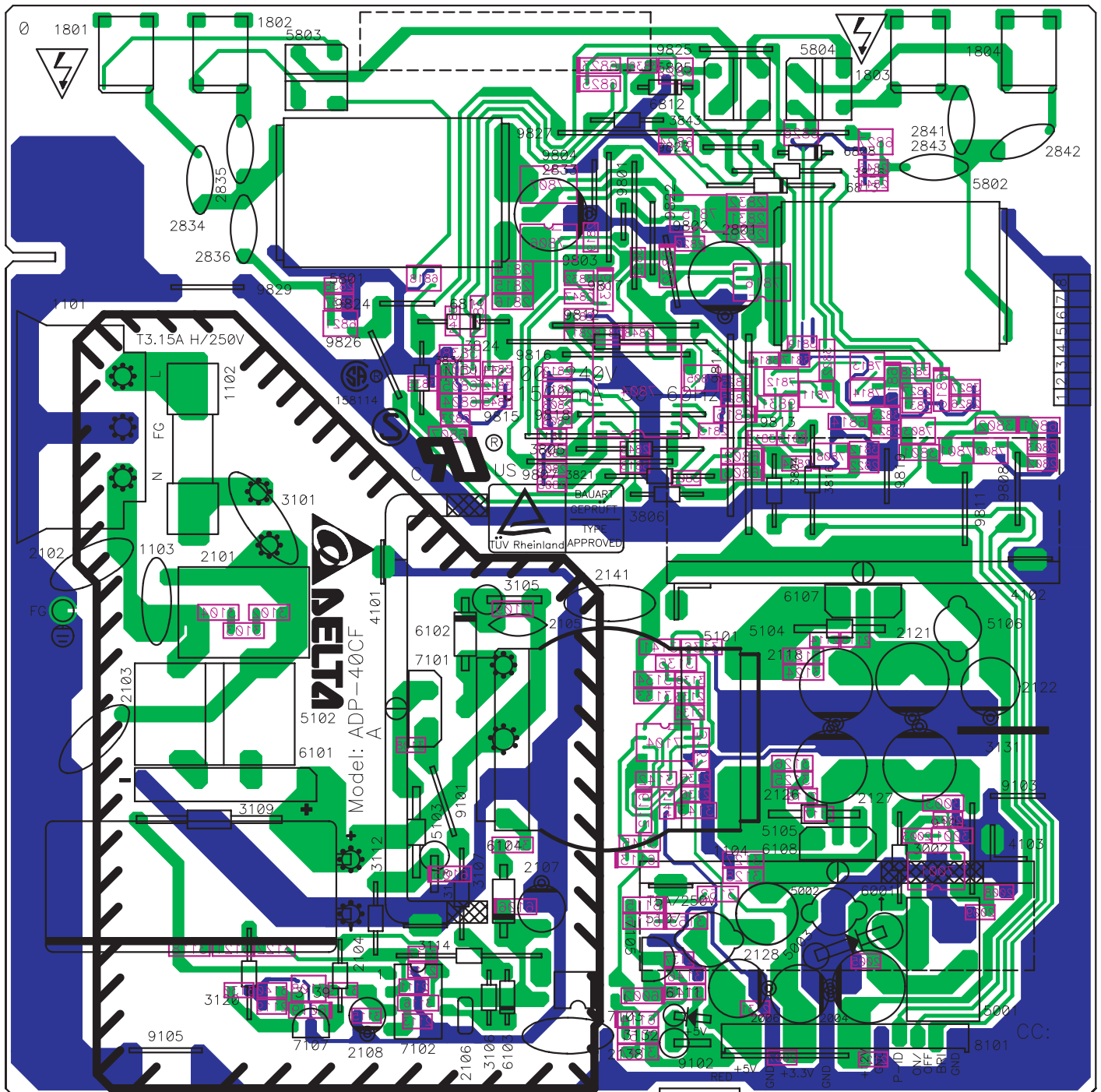
## Power Diagram-1

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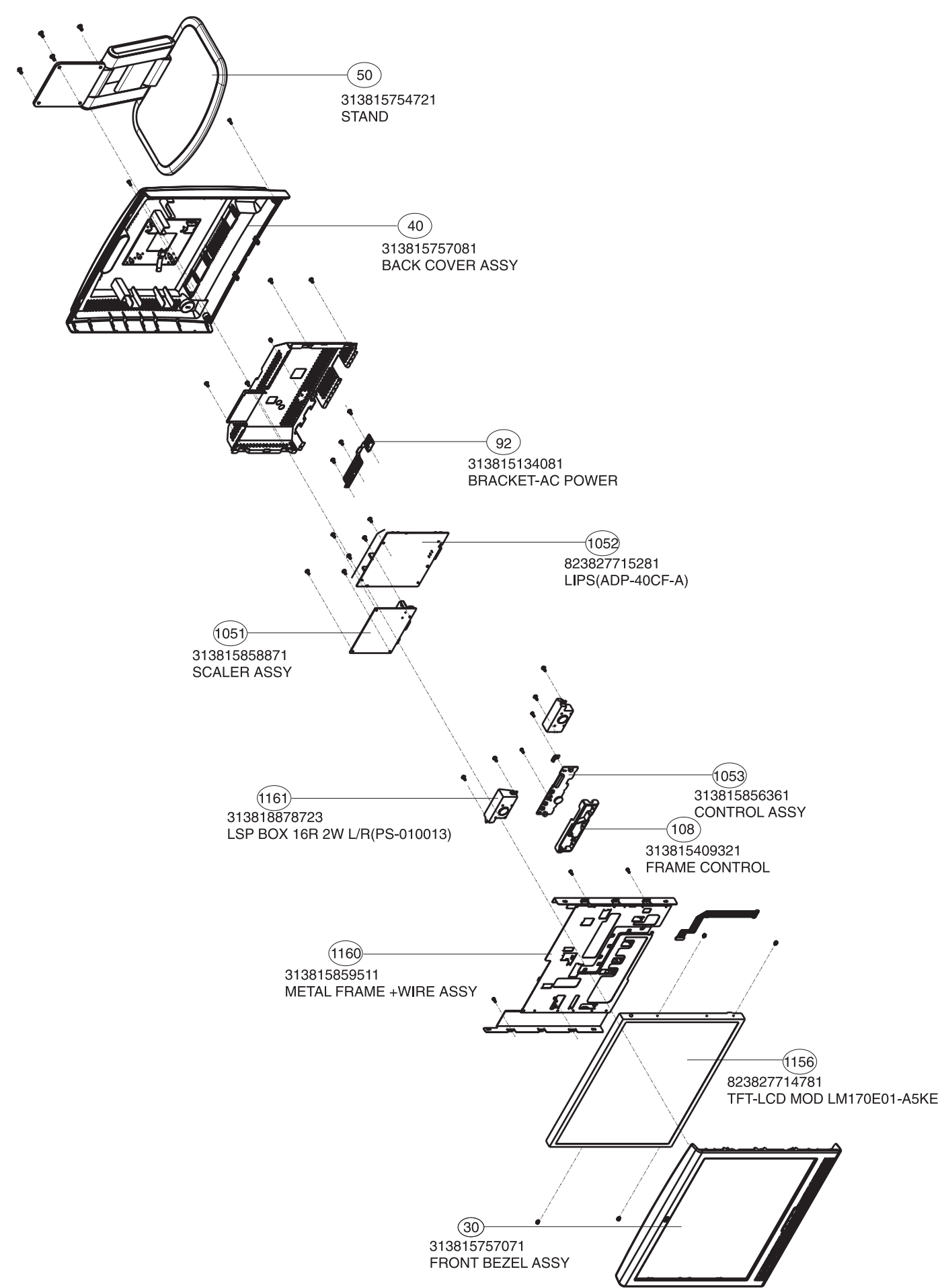








Exploded view





Spare Parts List

HP L1730R

49

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Model: HP L1730R								
Mechanical Parts								
0030	313815757071	FRONT BEZEL ASSY						
0031	313815412381	BEZEL						
0032	313815409311	LENS-POWER						
0033	313815409301	BUTTON-CONTROL						
0036	313815410751	RUBBER BUMPWE-L1730						
0040	313815757081	BACK COVER ASSY						
0041	313815412391	BACK COVER						
0042	313815134051	VESA PLATE						
0050	313815754721	STAND-HPL1730						
0092	313815134081	BRACKET-AC POWER						
0102	313810440571	HOUSING COVER						
0103	313815560194	FRONT COVER						
0108	313815409321	FRAME CONTROL						
1160	313815859511	METAL FRAME+WIRE ASSY						
LCD Panel								
1156	823827714781	TFT-LCD MOD LM170E01-A5KE						
Packing								
0450	313815636641	CARTON						
0451	313815635652	CUSHION-R						
0452	313815635662	CUSHION-L						
0453	313815620801	PE BAG						
Accessory								
0601	313811705541	HP CD-ROM INF.						
1157	313812874931	MAINS CORD						
1161	313818878723	LSP BOX 16R 2W L/R (PS-010013)						
1162	313818875051	SPEAKER CABLE(BLACK)						
PCB Assy								
1051	313815858871	SCALER ASSY						
1052	823827715281	LIPS(ADP-40CF A)						
1053	313815856361	CONTROL ASSY						
1901	313815856651	AUDIO IC ASSY						
Miscellanea								
0291	313815563141	LABEL						
0295	313815563141	LABEL						
0615	313811706921	HEX CODE OF F/W-LPL						
1158	313819871181	CORD SUB-D 15/1M8/SUB-D 15 BK						
1302	243803100435	SOC IC V 8P F 2.54 DIL L						
4444	313810610361	CD ROM - SERVICE MANUAL						
4444	313810610362	SERVICE MANUAL						
8161	823827715291	WIRE HARNESS 15/370MM/15						
8163	313819871401	CBLE-030 30/135/30-012 AWG28						
PCB Assy								
1053	313815856361	CONTROL ASSY						
1704	243812800225	SWI TACT H=5 100G SKHHA B						
1705	243812800225	SWI TACT H=5 100G SKHHA B						
1706	243812800225	SWI TACT H=5 100G SKHHA B						
1707	243812800225	SWI TACT H=5 100G SKHHA B						
2701	223891015649	CER2 0805 X7R 25V 100N PM10 R				2515	202001293747	ELCAP SM RV2 25V 47U PM20 R
2702	223858015636	CER2 0805 X7R 50V 10N PM10 R				2521	223878615649	CER2 0603 X7R 16V 100N PM10 R
						2523	223878615649	CER2 0603 X7R 16V 100N PM10 R
						2525	223878615649	CER2 0603 X7R 16V 100N PM10 R
						2527	223878615649	CER2 0603 X7R 16V 100N PM10 R
						2529	223878615649	CER2 0603 X7R 16V 100N PM10 R
						2531	223878615649	CER2 0603 X7R 16V 100N PM10 R
						2901	223886715101	CER1 0603 NP0 50V 100P PM5 R
						2902	202203100179	ELCAP SM HV 25V 10U PM20 R
						2904	202203100173	ELCAP EB 25V S 470U PM20 B
						2905	202203100173	ELCAP EB 25V S 470U PM20 B
						2906	223891015649	CER2 0805 X7R 25V 100N PM10 R
						2907	223824615654	CER2 0603 X7R 10V 220N PM10 R
						2908	225232526224	CER2 ML X7R 50V S 220N PM10 A
						2909	223886715221	CER1 0603 NP0 50V 220P PM5 R
						2910	223886715181	CER1 0603 NP0 50V 180P PM5 R
						2911	225232526224	CER2 ML X7R 50V S 220N PM10 A
						2912	223824615654	CER2 0603 X7R 10V 220N PM10 R
						2913	223824615654	CER2 0603 X7R 10V 220N PM10 R
						2914	225232526224	CER2 ML X7R 50V S 220N PM10 A
						2915	223886715221	CER1 0603 NP0 50V 220P PM5 R
						2916	223886715181	CER1 0603 NP0 50V 180P PM5 R
						2917	225232526224	CER2 ML X7R 50V S 220N PM10 A
						2918	223824615654	CER2 0603 X7R 10V 220N PM10 R
						2919	202002191725	ELCAP SM RVS 16V 10U PM20 R
						2920	223878615649	CER2 0603 X7R 16V 100N PM10 R
						2921	223891015649	CER2 0805 X7R 25V 100N PM10 R

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3503	212211805669	RST SM 0603 RC0603 10K PM5 R	<div>Recommended Parts List</div> <div>Model: HP L1730R</div> <div><div>0030</div><div>313815757071</div><div>FRONT BEZEL ASSY</div></div> <div><div>0031</div><div>313815412381</div><div>BEZEL</div></div> <div><div>0032</div><div>313815409311</div><div>LENS-POWER</div></div> <div><div>0033</div><div>313815409301</div><div>BUTTON-CONTROL</div></div> <div><div>0040</div><div>313815757081</div><div>BACK COVER ASSY</div></div> <div><div>0041</div><div>313815412391</div><div>BACK COVER</div></div> <div><div>0050</div><div>313815754721</div><div>STAND-HPL1730</div></div> <div><div>0102</div><div>313810440571</div><div>HOUSING COVER</div></div> <div><div>0103</div><div>313815560194</div><div>FRONT COVER</div></div> <div><div>0450</div><div>313815636641</div><div>CARTON</div></div> <div><div>0451</div><div>313815635652</div><div>CUSHION-R</div></div> <div><div>0452</div><div>313815635662</div><div>CUSHION-L</div></div> <div><div>0453</div><div>313815620801</div><div>PE BAG</div></div> <div><div>0601</div><div>313811705541</div><div>HP CD-ROM INF.</div></div> <div><div>0615</div><div>313811706921</div><div>HEX CODE OF F/W-LPL</div></div> <div><div>1157</div><div>313812874931</div><div>MAINSKORD</div></div> <div><div>1158</div><div>313819871181</div><div>CORD SUB-D 15/1M8/SUB-D 15 BK</div></div> <div><div>1162</div><div>313818875051</div><div>SPEAKER CABLE(BLACK)</div></div> <div><div>1901</div><div>313815856651</div><div>AUDIO IC ASSY</div></div> <div><div>6201</div><div>933215370215</div><div>DIO SIG SM BAV99 (PHSE) R</div></div> <div><div>6209</div><div>933137390215</div><div>DIO REG SM BZX84-C5V1 (PHSE) R</div></div> <div><div>6220</div><div>933742280215</div><div>DIO SIG SM BAT54 (PHSE) R</div></div> <div><div>6222</div><div>933913910115</div><div>DIO SIG SM BAS32L (PHSE) R</div></div> <div><div>6223</div><div>933742280215</div><div>DIO SIG SM BAT54 (PHSE) R</div></div> <div><div>6701</div><div>933137400215</div><div>DIO REG SM BZX84-C5V6 (PHSE) R</div></div> <div><div>6702</div><div>932214603682</div><div>LED VS L-3WYGW (KIEL) B</div></div> <div><div>7203</div><div>932214526668</div><div>IC SM M24C02-WMN6 (ST00) R</div></div> <div><div>7210</div><div>935260739118</div><div>IC SM 74LVC14APW (PHSE) R</div></div> <div><div>7302</div><div>932214725682</div><div>IC M24C16-WBN6 (ST00) L</div></div> <div><div>7401</div><div>932220818671</div><div>IC SM GM5321-BC (GEMI) Y</div></div> <div><div>7503</div><div>932209265685</div><div>TRA SIG SM MUN2211J (ONSE) R</div></div> <div><div>7504</div><div>932216638668</div><div>FET POW SM SI5441DC (VISH) R</div></div> <div><div>7901</div><div>932217438685</div><div>TRA SIG SM BC847C (KEC0) R</div></div> <div><div>7903</div><div>935270284112</div><div>IC TDA8944AJ/N2 (PHSE) L</div></div> <div><div>8161</div><div>823827715291</div><div>WIRE HARNESS 15/370MM/15</div></div> <div><div>8163</div><div>313819871401</div><div>CBLE-030 30/135/30-012 AWG28</div></div>
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HP L1730
GENERAL PRODUCT
SPECIFICATION

- . ANALOG AND DIGITAL DUAL INPUT
- . AUTO PICTURE ADJUSTMENT
- . 15 FACTORY PRESET MODES WHICH CAN BE RECOVERED TO PRESET MODES
- . USER FRIENDLY OSD DISPLAY FOR MODE IDENTIFICATION /ADJUSTMENT
- . DDC 2B COMMUNICATION CAPABILITY
- . MAX. RESOLUTION 1280\*1024 NON-INTERLACED AT 76 HZ
- . 17 " COLOR TFT LCD FLAT PANEL
- . EASY TILT & SWIVEL BASE
- . FULL RANGE POWER SUPPLY 90 - 265 VAC
- . CE ENVIRONMENTAL POLICY
- . ANTI-GLARE TO REDUCE LIGHT REFLECTION
- . POWER MANAGEMENT CAPABILITY
- . TCO 99/TCO2003
- . AUDIO SUPPORT

CLASS NO.		17 inch LCD Monitor		8639 000 15208	
		TYPE :CJ6B5M/22			
		BRAND : HP L1730			
2004-02-02					
NAME	Jacky Lee	SUPERS.	28	590 — 1	10
TY		CHECK	DATE 2004-02-02	A4	
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CLASS NO.		17 inch LCD Monitor		8639 000 15208	
		TYPE : CJ6B5M/22			
		BRAND : HP L1730			
2004-02-02					
NAME Jacky Lee		SUPERS.		28	590 — 2 10 A4
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7.1	Mean time between failures
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9.0	Serviceability
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11.0	Audio

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		BRAND : HP L1730			
2004-02-02					
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1.0 FOREWORD

This specification describes a 17" SXGA multi-scan color TFT LCD monitor with max resolution up to 1280\*1024 /76 Hz non-interlaced.

2.0 PRODUCT PROFILE

This display monitor unit is a color display monitor enclosed in HP styling cabinet, which has an integrated tilt and swivel base.

2.1 LCD

- 2.1.1
- Type NR. : LM170E01\_A5KE (LPL)  
Number of Pixels. : 1280 (H) x 1024 (V)  
Physical Size. : 358.5(W)\*296.5(H)\*17(D) mm  
Pixel Pitch. : 0.264 x 0.264 mm  
Color pixel arrangement: RGB stripes arrangement  
Support Color. : 16.2M Color  
Display Mode. : Normally White  
Backlight. : CCFL edge light system  
Active area. (WXH). : 337.92 x 270.336mm (17 " diagonal)  
Viewing Angle. : Vertical 120 degree, Horizontal 140 degree (CR=10)  
Contrast ratio. : 450:1  
Luminance. : 250 cd/m<sup>2</sup> (Typ)

2.2 Scanning frequencies

- H-Frequency. : 30K - 83 K Hz  
V-Frequency. : 56 - 76 Hz

2.3 Video dot rate. : < 140 MHz

2.4 Power input. : 90-265 V AC, 50/60 +/-2 Hz

2.5 Power consumption. : < 50 W maximum (with audio)

2.6 Dimensions. : 380.4(W) \* 418.7(H) \* 210(D) mm

2.7 Net Weight. : 6.75 kg  
Net Weight (All-in-two base). : 8.15 kg

2.8 Functions:

- (1) D-Sub analog R/G/B separate inputs, H/V sync separated  
(2) DVI-D digital Panel Link TMDS input

CLASS NO.		17 inch LCD Monitor		8639 000 15208	
		TYPE : CJ6B5M/22			
		BRAND : HP L1730			
2004-02-02					
NAME	Jacky Lee	SUPERS.	28	590 — 4	10 A4
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2.9 Ambient temperature: 5 Degree C - 35 Degree C

2.10 Regulatory compliance:

Safety	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): SINGAPORE CONSUMER PROTECTION REGISTRATION SCHEME OF SINGAPORE ( SISIR ): UKRAINE APPROVAL (UKRSERTCOMPUTER): SAUDI ARABIA APPROVAL (SASO): BELARUS APPROVAL (BNCI): LITHUANIA APPROVAL (INFOSTRUKTURA): ARGENTINA CERTIFICATION (IRAM):
EMC	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
Ergonomics	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)
Agency	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)
Compatibility	PC2001, Windows 2000, Windows 98/Me, Windows XP, NSTL

CLASS NO.		17 inch LCD Monitor		8639 000 15208	
		TYPE :CJ6B5M/22			
		BRAND : HP L1730			
2004-02-02					
NAME	Jacky Lee	SUPERS.	28	590	— 5
TY	CHECK	DATE	2004-02-02	10	A4
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3.0Electrical characteristics

3.1Interface signals

The input signals can be applied in two different modes:

1). D-shell Analog

Input signal: Video, H-sync, V-sync,

Video: 0.7 V p-p, input impedance, 75 ohm

Sync. : Separate sync TTL level, input impedance 2k2 ohm terminate

H-syncPositive/Negative

V-syncPositive/Negative

2). Intel DVI Digital

Input signal: Four channel TMDS signals. The digital interface shall be comprised of 2 electrical layer component: a TMDS interface for low-voltage differential serial encoding of the digital display data(Panel Link compliant) and a DDC2B electrical interface. Refer to the Digital Display Working Group(DDWG) document, " Digital Visual Interface(DVI) Specification, Revision 1.0 " for the exact requirements.

3.2Interface

3.2.1D-Sub Cable

Length: 1.8 M +/- 50 mm (fixed)

Connector type: D-sub male with DDC-2B pin assignments.

Blue connector thumb-operated jack screws

Pin Assignment:

PIN No.	SIGNAL
1	Red video input
2	Green video input / sync on green
3	Blue video input
4	GND
5	Cable detect
6	Red video GND
7	Green video GND
8	Blue video GND
9	DDC +3.3V or +5V
10	GND
11	GND
12	Serial data line (SDA)
13	H-sync
14	V-sync
15	Data clock line (SCL)

CLASS NO.		17 inch LCD Monitor		8639 000 15208	
		TYPE : CJ6B5M/22			
		BRAND : HP L1730			
2004-02-02					
NAME Jacky Lee		SUPERS.	28	590 — 6	10 A4
TY	CHECK	DATE 2004-02-02	Property of PHILIPS ELECTRONICS INDUSTRIES (TAIWAN) LTD.-B.E.		



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3.2.2 DVI Cable  
The input signals are applied to the display through DVI-D cable.  
Length : 1.8 M +/- 50 mm (fixed)  
Connector type : DVI-D male with DDC-2B pin assignments  
White connector thumb-operated jack screws

Pin Assignment:

Pin No.	Description
1	T.M.D.S. data2-
2	T.M.D.S. data2+
3	T.M.D.S. data2 shield
4	No Connect
5	No Connect
6	DDC clock
7	DDC data
8	No Connect
9	T.M.D.S. data1-
10	T.M.D.S. data1+
11	T.M.D.S. data1 shield
12	No Connect
13	No Connect
14	+5V Power
15	Ground (for +3.3V) - Cable detect
16	Hot plug detect
17	T.M.D.S. data0-
18	T.M.D.S. data0+
19	T.M.D.S. data0 shield
20	No Connect
21	No Connect
22	T.M.D.S clock shield
23	T.M.D.S. clock+
24	T.M.D.S. clock-

3.2.3Software control functions via OSD/control

Philips follow up HP ' s requirement to create OSD function and HP approve the OSD function. If any deviation between SHT590/ customer specification and really product, production should follow up really product.

CLASS NO.		17 inch LCD Monitor		8639 000 15208	
		TYPE :CJ6B5M/22			
		BRAND : HP L1730			
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OSD (On Screen Display) function

- (1) Analog interface OSD:  
a. Basic OSD Menu Levels

Menu LEVEL 1	Menu LEVEL 2
Brightness	ADJ Scale
Contrast	ADJ Scale
Auto Adjustment	
Advanced Menu	
Exit	

Brightness & Contrast : brightness and contrast adjustment  
Auto Adjustment : Auto Adjustment Function  
Advanced Menu : Enter Advanced Menu Levels

- a. Advanced OSD Menu Levels

Menu Level 1	Menu Level 2	Menu Level 3
Brightness	ADJ Scale	
Contrast	ADJ Scale	
Image Control	Auto Adjustment	
	Horizontal Position	ADJ Scale
	Vertical Position	ADJ Scale
	Clock	ADJ Scale
	Clock Phase	ADJ Scale
	Cancel	
	Save and Return	
Color	9300 K	
	6500 K-sRGB	
	Custom Color	Custom Color ADJ
	Cancel	
	Save and Return	
Language	Deutsch	
	English	
	Espanol	
	Francais	
	Italiano	
	Japanese	
	S-Chinese	
	Cancel	
	Save and Return	
Management	Power Saver	On / Off Selection
	Power On Recall	On / Off Selection
	Mode Display	On / Off Selection

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		TYPE : CJ6B5M/22			
		BRAND : HP L1730			
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	Sleep Timer	Timer Set Menu
	Basic Menu	
	Cancel	
	Save and Return	
OSD Control	Horizontal OSD Position	ADJ Scale
	Vertical OSD Position	ADJ Scale
	OSD Timeout	ADJ Scale
	OSD Transparency	ADJ Scale
	Cancel	
	Save and Return	
Factory Reset	Yes	
	No	
Exit		

a. Basic OSD Service Mode Menu  
( Remark: Depressing the Menu button when powering up )

Menu Level 1	Menu Level 2	Menu Level 3
Brightness	ADJ Scale	
Contrast	ADJ Scale	
Auto Adjustment		
Exit		
Service	Display Hours	
	Reset Total Hours	Confirm Reset
	Reset Backlight Hours	Confirm Reset
	Copy All Settings	Confirm Reset
	Recall All Settings	Confirm Reset
	Display White Block	
	Cancel	
	Save and Return	
Firmware Rev/Date		
Panel Manufacturer		

b. Advanced OSD Service Mode Menu

Menu Level 1	Menu Level 2	Menu Level 3
Brightness	ADJ Scale	
Contrast	ADJ Scale	
Image Control	Auto Adjustment	
	Horizontal Position	ADJ Scale
	Vertical Position	ADJ Scale
	Clock	ADJ Scale
	Clock Phase	ADJ Scale
	Cancel	
	Save and Return	

CLASS NO.		17 inch LCD Monitor		8639 000 15208	
		TYPE :CJ6B5M/22			
		BRAND : HP L1730			
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Color	9300 K	
	6500 K-sRGB	
	Custom Color	Custom Color ADJ
	Cancel	
	Save and Return	
Language	Deutsch	
	English	
	Espanol	
	Francais	
	Italiano	
	Japanese	
	S-Chinese	
	Cancel	
	Save and Return	
Management	Power Saver	On / Off Selection
	Power On Recall	On / Off Selection
	Mode Display	On / Off Selection
	Sleep Timer	Timer Set Menu
	Basic Menu	
	Cancel	
	Save and Return	
OSD Control	Horizontal OSD Position	ADJ Scale
	Vertical OSD Position	ADJ Scale
	OSD Timeout	ADJ Scale
	OSD Transparency	ADJ Scale
	Cancel	
	Save and Return	
Factory Reset	Yes	
	No	
Exit		

(2) DVI interface OSD:  
a. Basic OSD Menu Levels

Menu LEVEL 1	Menu LEVEL 2
Brightness	ADJ Scale
Contrast	ADJ Scale
Auto Adjustment	
Advanced Menu	
Exit	

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		TYPE : CJ6B5M/22			
		BRAND : HP L1730			
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b. Advanced OSD Menu Levels

Menu Level 1	Menu Level 2	Menu Level 3
Brightness	ADJ Scale	
Contrast	ADJ Scale	
Image Control	Auto Adjustment	
	Horizontal Position	ADJ Scale
	Vertical Position	ADJ Scale
	Clock	ADJ Scale
	Clock Phase	ADJ Scale
	Cancel	
	Save and Return	
Color	9300 K	
	6500 K-sRGB	
	Custom Color	Custom Color ADJ
	Cancel	
	Save and Return	
Language	Deutsch	
	English	
	Espanol	
	Francais	
	Italiano	
	Japanese	
	S-Chinese	
	Cancel	
	Save and Return	
Management	Power Saver	On / Off Selection
	Power On Recall	On / Off Selection
	Mode Display	On / Off Selection
	Sleep Timer	Timer Set Menu
	Basic Menu	
	Cancel	
	Save and Return	
OSD Control	Horizontal OSD Position	ADJ Scale
	Vertical OSD Position	ADJ Scale
	OSD Timeout	ADJ Scale
	OSD Transparency	ADJ Scale
	Cancel	
	Save and Return	
Factory Reset	Yes	
	No	
Exit		

CLASS NO.		17 inch LCD Monitor		8639 000 15208	
		TYPE :CJ6B5M/22			
		BRAND : HP L1730			
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c. Basic OSD Service Mode Menu

Menu Level 1	Menu Level 2	Menu Level 3
Brightness	ADJ Scale	
Contrast	ADJ Scale	
Auto Adjustment		
Exit		
Service	Display Hours	
	Reset Total Hours	Confirm Reset
	Reset Backlight Hours	Confirm Reset
	Copy All Settings	Confirm Reset
	Recall All Settings	Confirm Reset
	Display White Block	
	Cancel	
	Save and Return	
Firmware Rev/Date		
Panel Manufacturer		

d. Advanced OSD Service Mode Menu

Menu Level 1	Menu Level 2	Menu Level 3
Brightness	ADJ Scale	
Contrast	ADJ Scale	
Image Control	Auto Adjustment	
	Horizontal Position	ADJ Scale
	Vertical Position	ADJ Scale
	Clock	ADJ Scale
	Clock Phase	ADJ Scale
	Cancel	
	Save and Return	
Color	9300 K	
	6500 K-sRGB	
	Custom Color	Custom Color ADJ
	Cancel	
	Save and Return	
Language	Deutsch	
	English	
	Espanol	
	Francais	
	Italiano	
	Japanese	
	S-Chinese	
	Cancel	

CLASS NO.		17 inch LCD Monitor		8639 000 15208	
		TYPE : CJ6B5M/22			
		BRAND : HP L1730			
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	Save and Return	
Management	Power Saver	On / Off Selection
	Power On Recall	On / Off Selection
	Mode Display	On / Off Selection
	Sleep Timer	Timer Set Menu
	Basic Menu	
	Cancel	
	Save and Return	
OSD Control	Horizontal OSD Position	ADJ Scale
	Vertical OSD Position	ADJ Scale
	OSD Timeout	ADJ Scale
	OSD Transparency	ADJ Scale
	Cancel	
	Save and Return	
Factory Reset	Yes	
	No	
Exit		

3.3 Timing requirement

3.3.1 Mode storing capacity

(1) Factory preset modes: 15

3.3.2 Factory preset timings

The factory settings of size and centering are according to the reference timing charts  
(See fig-4, fig-5)

MODE NO.	1	2	3	4
RESOLUTION	640 x 480	640 x 480	640 x 480	720 x 400
Dot clock(MHz)	25.175	31.500	31.501	28.321
f h	31.5kHz	37.861kHz	37.5kHz	31.468kHz
A ( us )	31.778(800 dots)	26.413(832 dots)	26.667 (840 dots)	31.78(900dots)
B ( us )	3.813( 96 dots)	1.270(40 dots)	2.032 ( 54 dots)	3.813(108dots)
C ( us )	1.907( 48 dots)	3.810(120 dots)	3.81 ( 120 dots)	1.907(54dots)
D ( us )	25.422( 640 dots)	20.317(640 dots)	20.317 (640 dots)	25.42(720dots)
E ( us )	0.636( 16 dots)	1.016(32 dots)	0.508 ( 26 dots)	0.636(18dots)
f v	60Hz	72.809Hz	75Hz	70Hz(70.085)
O (ms )	16.683 (525 lines)	13.735(520 lines)	13.333(500 lines )	14.27(449 lines)
P ( ms )	0.064 ( 2 lines)	0.079(3 lines)	0.08 ( 3 lines )	0.064(2 lines)
Q (ms )	1.049 ( 33 lines)	0.528(20 lines)	0.427 ( 16 lines )	1.112(34 lines)
R ( ms )	15.253 (480 lines)	12.678(480 lines)	12.8 (480 lines )	12.71(400 lines)
S ( ms )	0.317 ( 10 line )	0.45(17 lines)	0.026 ( 1 lines)	0.381(13 lines)
SYNC. H/V	- / -	-/-	- / -	-/+
POLARITY				
SEP . SYNC	Y	Y	Y	Y

CLASS NO.

17 inch LCD Monitor

TYPE :CJ6B5M/22

BRAND : HP L1730

8639 000 15208

2004-02-02

NAME Jacky Lee

SUPERS.

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MODE NO.	5	6	7	8
RESOLUTION	800 x 600	800 x 600	800 x 600	832 x 624
Dot clock(MHz)	40	50	49.498	57.28
f h	37.9kHz	48.077kHz	46.9kHz	49.7kHz
A ( us )	26.4 (1056 dots)	20.80 (1040dots)	21.333 (1056 dots)	20.11(1152 dots)
B ( us )	3.2 ( 128 dots)	2.400 ( 120 dots)	1.616 ( 80 dots)	1.117(64 dots)
C ( us )	2.2 ( 88 dots)	1.280 ( 64 dots)	3.232 ( 160 dots)	3.91(224 dots)
D ( us )	20 ( 800 dots)	16.00 ( 800 dots)	16.162 ( 800 dots)	14.52(832 dots)
E ( us )	1 ( 40 dots)	1.120 ( 56 dots)	0.323 ( 16 dots)	0.563(32 dots)
f v	60Hz	72Hz ( 72.188)	75Hz	75Hz
O (ms )	16.579 (628 lines)	13.85 (666 lines)	13.333 (625 lines)	13.41(667 lines)
P ( ms )	0.106 ( 4 lines)	0.125 ( 6 lines)	0.064 ( 3 lines)	0.06(3 lines)
Q (ms )	0.607 ( 23 lines)	0.478 ( 23 lines)	0.448 ( 21 lines)	0.784(39 lines)
R ( ms )	15.84 (600lines)	12.48 (600 lines)	12.8 (600 lines)	12.55(624 lines)
S ( ms )	0.026 ( 1 line )	0.770 ( 37 line )	0.021 ( 1 line )	0.016(1 lines)
SYNC. H/V	+ / +	+ / +	+ / +	+ / +
POLARITY				
SEP . SYNC	Y	Y	Y	Y

MODE NO.	9	10	11	12
RESOLUTION	1024 x 768	1024 x 768	1024 x 768	1152 x 870
Dot clock(MHz)	65	75	78.75	100
f h	48.363kHz	56.5kHz	60kHz	68.7kHz
A ( us )	20.677(1344 dots)	17.707(1328 dots)	16.66 (1312dots)	14.56 (1456 dots)
B ( us )	2.092(136 dots)	1.813(136 dots)	1.219 ( 96 dots)	1.28 ( 128 dots)
C ( us )	2.462(160 dots)	1.920(144 dots)	2.235 (176 dots)	1.44( 144 dots)
D ( us )	15.754(1024 dots)	13.653(1024 dots)	13.003(1024 dots)	11.52 ( 1152 dots)
E ( us )	0.369(24 dots)	0.321 (24 dots)	0.203 ( 16 dots)	0.32 ( 32 dots)
f v	60.004Hz	70.004Hz	75Hz (75.000)	75Hz
O (ms )	16.666(806 lines)	14.272(806 lines)	13.328 (800 lines)	13.322 (915 lines)
P ( ms )	0.124(6 lines)	0.106(6 lines)	0.05(3 lines)	0.044 ( 3 lines)
Q (ms )	0.600(29 lines)	0.514(29 lines)	0.446 (28 lines)	0.568( 39 lines)
R ( ms )	15.880(768 lines)	13.599(768 lines)	12.80 (768 lines)	12.678 (870 lines)
S ( ms )	0.062(3 lines)	0.053(3 lines)	0.017 (1 line )	0.043 ( 4 line )
SYNC. H/V	- / -	- / -	+ / +	- / -
POLARITY				
SEP . SYNC	Y	Y	Y	Y

CLASS NO.		17 inch LCD Monitor		8639 000 15208	
		TYPE : CJ6B5M/22			
		BRAND : HP L1730			
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NAME Jacky Lee		SUPERS.	28	590	14
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MODE NO.	13	14	15	
RESOLUTION	1152 x 900	1280 x 1024	1280 x 1024	
Dot clock(MHz)	105.56	108	117	
f h	71.713kHz	64kHz	71.7kHz	
A ( us )	13.945 (1472dots)	15.63 (1688 dots)	13.949 1632 dots)	
B ( us )	0.909 ( 96 dots)	1.037 ( 112 dots)	0.957 (112 dots)	
C ( us )	1.970 ( 208 dots)	2.296 ( 248 dots)	1.915 (224 dots)	
D ( us )	10.913(1152 dots)	11.852 ( 1280 dots)	10.94 (1280 dots)	
E ( us )	0.152 ( 16 dots)	0.445 ( 48 dots)	0.137 (16 dots)	
f v	76Hz	60Hz	67Hz	
O (ms )	13.15 (943 lines)	16.661 (1066 lines)	14.883 (1067lines)	
P ( ms )	0.112 ( 8 lines)	0.047 ( 3 lines)	0.112 ( 8 lines)	
Q (ms )	0.46 ( 33 lines)	0.594 ( 38 lines)	0.46 ( 33 lines)	
R ( ms )	12.55 (900 lines)	16.005 (1024 lines)	14.283(1024 lines)	
S ( ms )	0.028 ( 2 lines)	0.015 ( 1 line)	0.028 (2 lines )	
SYNC. H/V	- / -	+ / +	+ / +	
POLARITY				
SEP . SYNC	Y	Y	Y	

A	: H-Total	O	: V-Total
B	: H- Sync width	P	: V- Sync width
C	: H- Back porch	Q	: V- Back porch
D	: H- Video width	R	: V- Video width
E	: H- Front porch	S	: V- Front porch

3.3.3Horizontal scanning

Sync polarity : Positive or Negative  
Scanning frequency : 30 - 83 K Hz

3.3.4 Vertical scanning

Sync polarity : Positive or Negative  
Scanning frequency : 56 - 76 Hz

3.4 Power input connection

Power cord length : 1.8 M  
Power cord type : 3 leads power cord with protective earth plug.

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		BRAND : HP L1730			
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3.5 Power management

The power consumption and the status indication of the set with power management function are as follows,

STATUS	Horizontal	Vertical	Power Spec	LED
Power On	Pulse	Pulse	< 50 W	Green (with Audio)
H-off V-on	No Pulse	Pulse	< 2 W	Amber (with Audio)
H-on V-off	Pulse	No Pulse	< 2 W	Amber (with Audio)
Off	No Pulse	No Pulse	< 2 W	Amber (with Audio)

According to VESA power saving signal.  
TCO99/TCO2003 power saving requirement  
EPA energy star requirement  
(Power Switch Off)  
For digital input power consumption is less 2W  
(In non-DMPM recoverable off mode)

3.6 Display identification

- 3.6.1 In accordance with VESA Display Channel Standard V1.0 and having DDC-2B capability.
- 3.6.2 In accordance with DVI requirement (DDWG digital Visual Interface revision 1.0) use DDC-2B and EDID 3.0 structure 2.0

4.0 Visual characteristics

4.1 Test conditions

- Unless otherwise specified, this specification is defined under the following conditions.
- (1) Input signal: As defined in 3.3, 1280 x 1024/60Hz non-interlaced mode, signal sources must have 75 ohm output impedance.
- (2) Luminance setting: controls to be set to 200 nits with full screen 70 % duty cycle white signal
- (3) Warm up: more than 30 minutes after power on with signal supplied.
- (4) Ambient light: 400 -- 600 lux.
- (5) Ambient temperature: 20 +/- 5 Degree C

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		BRAND : HP L1730			
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#	Resolution	H-Frequency (Hz)	Pixel rate (MHz)	V-Frequency (Hz)	Comment
1	640X480	31.469K	25.175	59.940	VGA
2	640X480	37.861K	31.5	72.809	VESA
3	640X480	37.5K	31.501	75	VESA
4	720X400	31.469K	28.322	70.087	VGA
5	800X600	37.879K	40	60.317	VESA
6	800X600	48.077K	50	72.188Hz	VESA
7	800X600	46.875K	49.498	75Hz	VESA
8	832X624	49.726K	57.284	74.551Hz	MAC
9	1024X768	48.363K	65	60.004Hz	VESA
10	1024X768	56.476K	75	70.069Hz	VESA
11	1024X768	60.023K	78.75	75.029Hz	VESA
12	1152X870	68.68K	100	75.06Hz	MAC
13	1152X900	71.71K	108	76.05Hz	SUN
14	1280X1024	63.98K	108	60.02Hz	VESA
15	1280X1024	79.97K	135	75.02Hz	VESA

4.2 Resolution  
Factory preset modes (15 modes)

Note: 1. Screen displays perfect picture at 15 factory preset modes.

2. Screen displays visible picture when input modes are other then 15 preset modes

4.3 Brightness: The luminance shall be greater than 200 nits in Brightness =100%, Contrast=100% condition at Custom Color Temperature.( Screen center point, Fig. 1)

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		TYPE :CJ6B5M/22		8639 000 15208	
		BRAND : HP L1730			
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4.4Image size

4.4.1Actual display size  
338x270mm

4.5Brightness uniformity

Set contrast at 100% and turn the brightness to get average above 200 nits at center of the screen.  
Apply the Fig 1. It should comply with the following formula:

Minimum luminance of nine points (brightness)

Maximum luminance of nine points (brightness)

>= 0.75 (Min)

4.6Check Cross talk (S)

Apply Pattern 2. Set contrast at 100 % and brightness at 100 %. Measure A. Then output Pattern 3 and measure A'. The cross talk value:

ABS ( A - A' )

A

X 100 % < 1.5 % (Max)

4.7White color adjustment

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

Apply full white pattern, with brightness in 90 % position and the contrast control at 80 % position. The 1931 CIE Chromaticity (color triangle) diagram (x,y) coordinate for the screen center should be:

9300K CIE coordinatesX = 0.283 +/- 0.020  
Y = 0.297 +/- 0.020

6500K-sRGB CIE coordinatesX = 0.313 +/-0.020  
Y = 0.329 +/- 0.020

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		BRAND : HP L1730			
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5.0 Mechanical characteristics

5.1 Controls  
Front side:

DC power switch  
OSD Menu Function key  
Minus( " - " ) Key (Auto adjustment key)  
Plus( " + " ) Key (Video Input Select key)

Rear:

Video signal cable  
DVI signal cable  
Power cord socket  
Audio socket

5.2 Unit dimension / Weight

Set dimension (incl. pedestal): 380.4(W) \* 418.7(H) \* 210(D) mm  
Net weight. : 6.75 kg  
Net weight (All-in-two base) : 8.15 kg

5.3 Tilt and swivel base

Basic base:  
tilt angle : -5 Degree to +25 Degree ( operation )  
swivel rotation : +/-170 Degree

5.4 Transportation packages

5.4.1 Shipping dimension/Weight

Carton dimension. : 456(W) \* 435(D) \* 189(H) mm  
Gross weight. : 8 Kg  
Gross weight (All-in-to base). : 9.75 Kg

5.4.2 Block unit / Palletization

It use two kind of pallets, which mixed into container  
(please sheet sheet 560)

A type pallet:

layers / block	sets/layer	sets/block unit
11	6	66
blocks/container		
20 feet	40 feet	
5	12	

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		TYPE :CJ6B5M/22			
		BRAND : HP L1730			
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B type pallet:

layers / block	sets/layer	sets/block unit
11	4	44
blocks/container		
20 feet	40 feet	
7	14	

- 6.0 Environmental characteristics
- 6.1 Susceptibility of display to external environment
- 6.1.1 Temperature Ranges  
Operating Temperature (Independent of altitude):  
5Degree C to 35Degree C.  
Non-Operating Temperature (Independent of altitude):  
-20 Degree C to 60 Degree C.
- 6.1.2 Humidity  
Operating (non-condensing): 20% to 80%  
Non-Operating (38.7 Degree C maximum wet bulb temperature): 5% to 90%
- 6.1.3 Altitude  
Operating: 0 to 12,000 feet [3,658 m]. Equivalent to  
14.7 to 10.1 psia.

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		TYPE : CJ6B5M/22			
		BRAND : HP L1730			
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NAME Jacky Lee		SUPERS.	28	590 — 20	10
TY	CHECK	DATE 2004-02-02	Property of PHILIPS ELECTRONICS INDUSTRIES (TAIWAN) LTD.-B.E.		



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6.2 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 Degree C, humidity 70 %)

6.3 Display disturbances from external environment  
According to IEC 801-2 for ESD disturbances

CLASS NO.		17 inch LCD Monitor		8639 000 15208	
		TYPE :CJ6B5M/22			
		BRAND : HP L1730			
2004-02-02					
NAME Jacky Lee		SUPERS.	28	590 — 21	10 A4
TY	CHECK	DATE 2004-02-02	Property of PHILIPS ELECTRONICS INDUSTRIES (TAIWAN) LTD.-B.E.		



## 7.0 Reliability

## 7.1 Mean Time Between Failures

System MTBF (Excluding the LCD panel and CCFL): 80,000 hrs  
CCFL MTBF: 30,000 hrs (50% of original brightness)

## 8.0 Quality assurance requirements

## 8.1 Acceptance test

According to MIL-STD-105D Control II level

AQL: 0.65 (major)

2.50 (minor)

(Please also refer to annual quality agreement)

Customer acceptance criteria: UAW0377/00

## 9.0 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.

## 10.0 Panel Defect Limits

Both of HP & Philips agree to follow up panel specification as inspection condition in business kick off stage, if any deviation between SHT590 and customer specification, should follow up panel specification.

Table 14 lists the countable and rejectable sizes for each type of 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 = Subpixel stuck on/off (electrical).

CLASS NO.		17 inch LCD Monitor		8639 000 15208	
		TYPE : CJ6B5M/22			
		BRAND : HP L1730			
2004-02-02					
NAME	Jacky Lee	SUPERS.	28	590 — 22	10 A4
TY	CHECK	DATE	2004-02-02	Property of PHILIPS ELECTRONICS INDUSTRIES (TAIWAN) LTD.-B.E.	

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TABLE 1  
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)	$N \leq 5$	$N > 5$
Minimum Distance Between Electrical Defects		
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 Lines(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)	$N > 5$

CLASS NO.		17 inch LCD Monitor		8639 000 15208	
		TYPE :CJ6B5M/22			
		BRAND : HP L1730			
2004-02-02					
NAME Jacky Lee		SUPERS.	28	590 — 23	10
TY	CHECK	DATE 2004-02-02	Property of PHILIPS ELECTRONICS INDUSTRIES (TAIWAN) LTD.-B.E.		



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NOTES:

Electrical defect intensity shall be evaluated using a shade gauge that covers 2% and 5% of the clear sheet background. Bright spot defects visible through the 2% shade are to be considered high level defects; those visible through the 5% shade are considered low level defects. Unless otherwise specified, optical defects whose length L is greater than four times the width W, that is  $L > 4W$ , shall be considered as linear defects. Defects whose length is less than four times the width ( $L < 4W$ ) shall be considered as spot defects. All gray shade testing will be based on Shades 1, 12, and 16 for Black/White/Red/Green/Blue (from a base of 16 gray shades, where 16 is maximum bright and 1 is minimum bright). A high level dot cannot be adjacent to any other dot.

11.0 Audio

Amplifier section :

Output power : 2 x 2Wrms into 16 Ohm

Input sensitivity : 530mVrms(1.5Vpp)

Total Harmonic Distortion: limited to 5% at 2.0 W at 1K Hz

Frequency range: 100Hz - 20KHz

Loudspeaker section :

Rated input2.0W  
Max. input3.0W  
Impedance16 Ohm+/- 15%  
Sensitivity(minimum)75 dB +/-3 dB (at 1W/1m at 1KHz)

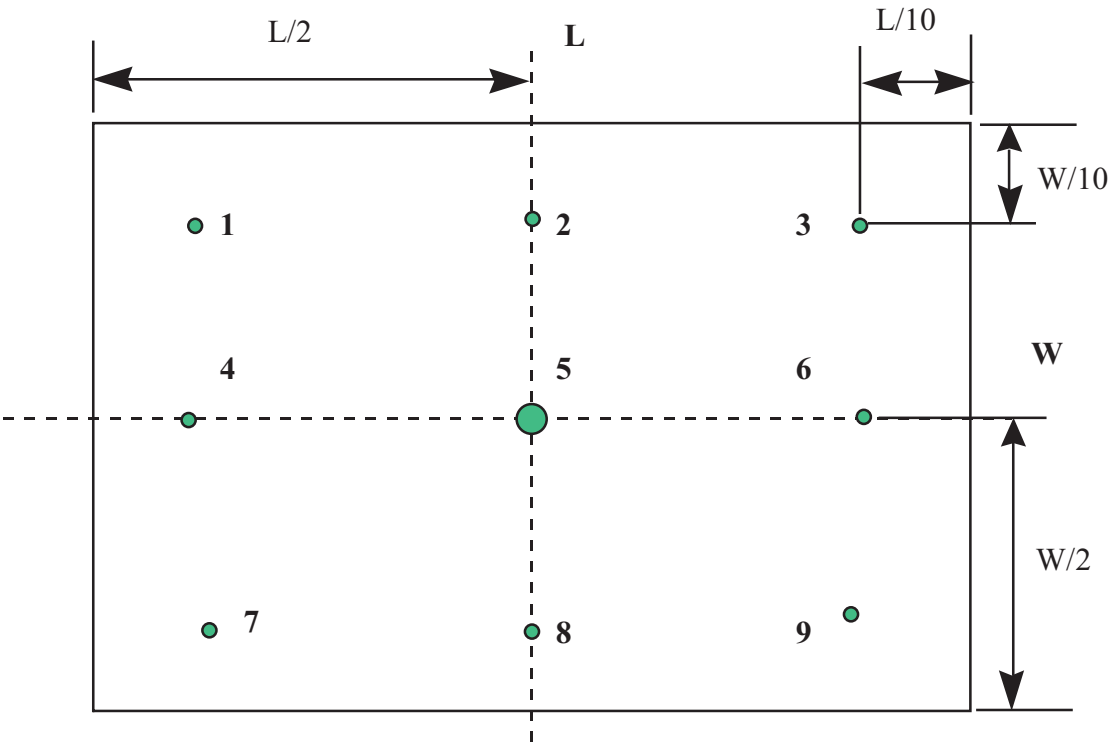
CLASS NO.		17 inch LCD Monitor		8639 000 15208	
		TYPE : CJ6B5M/22			
		BRAND : HP L1730			
2004-02-02					
NAME Jacky Lee		SUPERS.		28	590 — 24 10 A4
TY	CHECK	DATE 2004-02-02	Property of PHILIPS ELECTRONICS INDUSTRIES (TAIWAN) LTD.-B.E.		

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Fig 1: Brightness and Uniformity



Position 5 = Screen center point

CLASS NO.		17 inch LCD Monitor		8639 000 15208	
		TYPE :CJ6B5M/22			
		BRAND : HP L1730			
2004-02-02					
NAME Jacky Lee		SUPERS.		28	
TY		CHECK		DATE 2004-02-02	
				Property of PHILIPS ELECTRONICS INDUSTRIES (TAIWAN) LTD.-B.E.	



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Fig 2: Cross talk pattern  
Gray level 184 (256 Gray level)

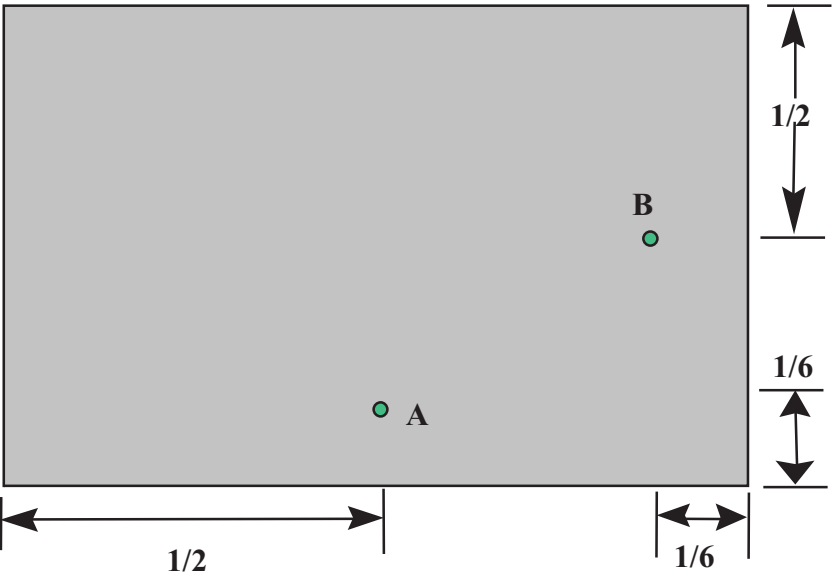
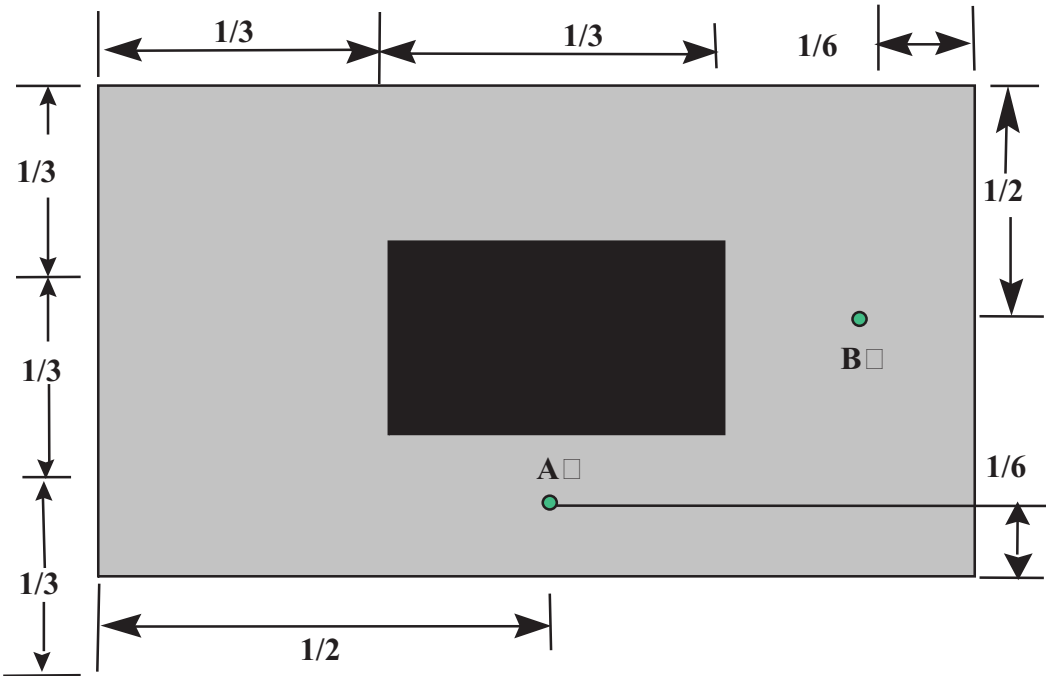


Fig 3: Cross talk pattern  
Center at Gray level 0 (Black)



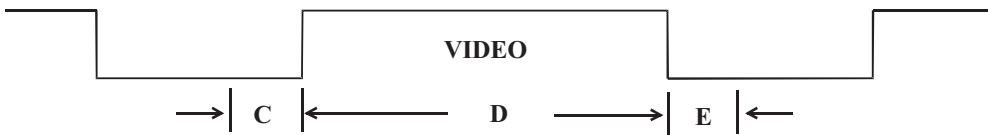
CLASS NO.		17 inch LCD Monitor TYPE : CJ6B5M/22 BRAND : HP L1730		8639 000 15208			
	2004-02-02			28	590	— 26	10
TY		CHECK	DATE 2004-02-02	Property of PHILIPS ELECTRONICS INDUSTRIES (TAIWAN) LTD.-B.E.			
						A4	

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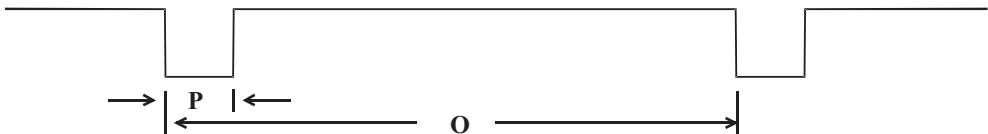
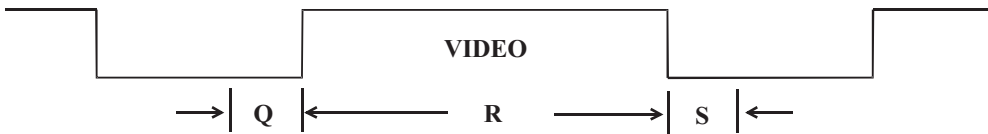
SEPARATE SYNC.



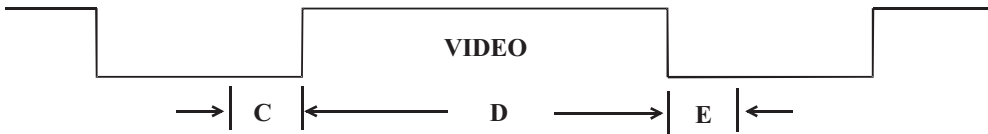
HORIZONTAL



VERTICAL



COMPOSITE SYNC.



HORIZONTAL

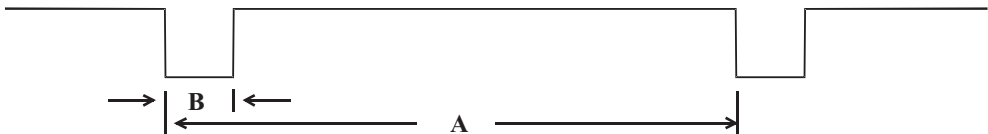


FIG-4 TIMING CHART -1

CLASS NO.		17 inch LCD Monitor TYPE :CJ6B5M/22 BRAND : HP L1730		8639 000 15208			
	2004-02-02						
	NAME Jacky Lee	SUPERS.		28	590	— 27	10 A4
	TY	CHECK	DATE 2004-02-02	Property of PHILIPS ELECTRONICS INDUSTRIES (TAIWAN) LTD.-B.E.			

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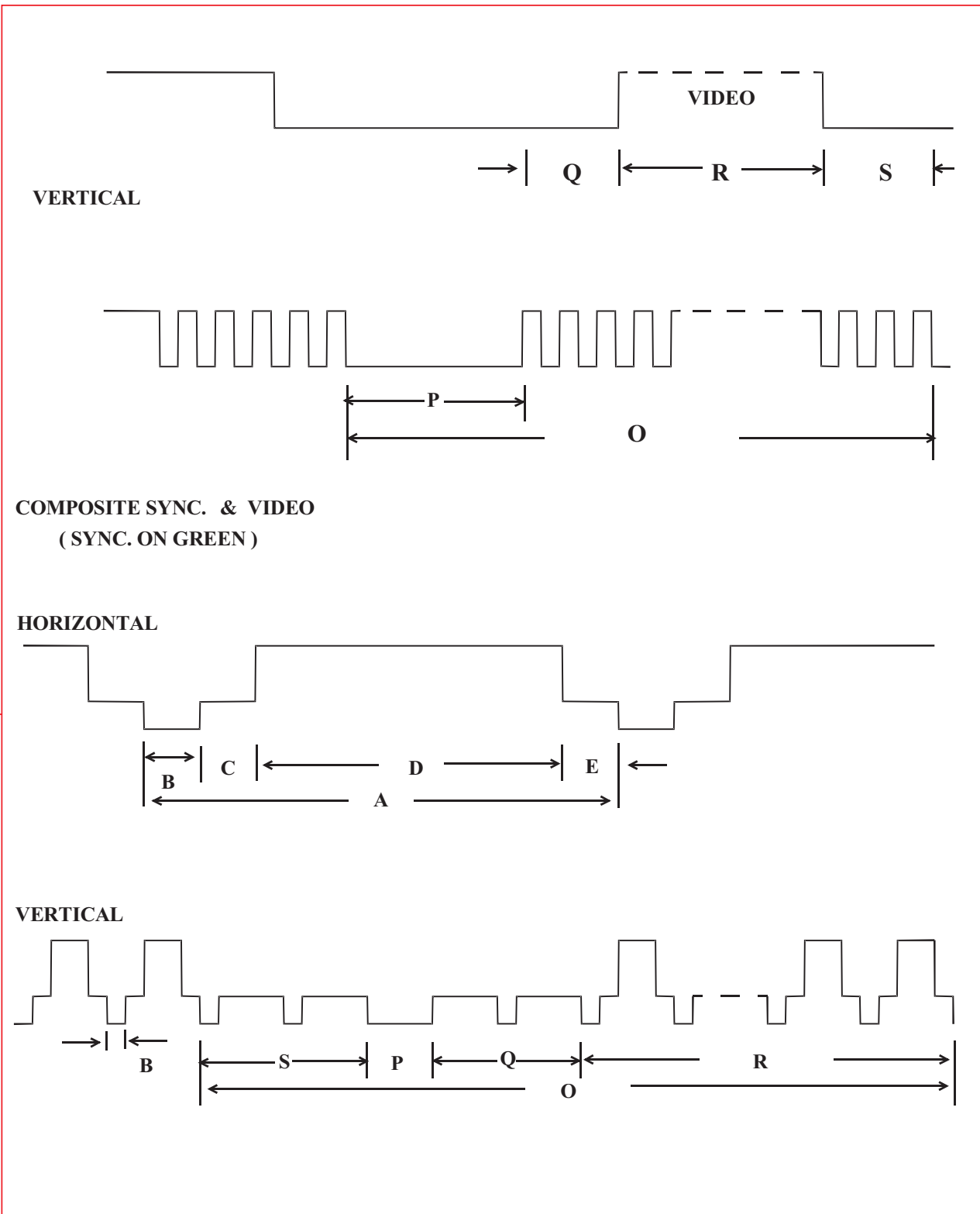


FIG-5 TIMING CHART -2

CLASS NO.		17 inch LCD Monitor		8639 000 15208	
		TYPE : CJ6B5M/22			
		BRAND : HP L1730			
2004-02-02					
NAME Jacky Lee		SUPERS.		28	
TY		CHECK		590 — 28	
		DATE 2004-02-02		10	
		Property of PHILIPS ELECTRONICS INDUSTRIES (TAIWAN) LTD.-B.E.		A4	

(FOR HP L1730 DIGITAL FOR LPL PANEL)  
\*\*\*\*\*  
EDID log file  
\*\*\*\*\*

Vendor/Product Identification

ID Manufacturer Name	: HWP
ID Product Code	: 260E(HEX.)
ID Serial Number	: 56303031 (HEX.)
Week of Manufacture	: 2
Year of Manufacture	: 2004

EDID Version, Revision

Version	: 1
Revision	: 3

Basic Display Parameters/Features

Video Input Definition	: Digital Video Input
Maximum H Image Size	: 34
Maximum V Image Size	: 27
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	: 0.641
Red Y coordinate	: 0.342
Green X coordinate	: 0.292
Green Y coordinate	: 0.611
Blue X coordinate	: 0.147
Blue Y coordinate	: 0.068
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)
	1280 x 1024 @75Hz (VESA)
Manufacturer's timings:	1152 x 870 @75Hz (VESA)

Standard Timing Identification #1

Horizontal active pixels	: 1280
Aspect Ratio	: 5:4
Refresh Rate	: 60

Detailed Timing #1

Pixel Clock (MHz)	: 108
H Active (pixels)	: 1280
H Blanking (pixels)	: 408
V Active (lines)	: 1024
V Blanking (lines)	: 42
H Sync Offset (F Porch) (pixels):	48
H Sync Pulse Width (pixels)	: 112
V Sync Offset (F Porch) (lines)	: 1
V Sync Pulse Width (lines)	: 3
H Image Size (mm)	: 338
V Image Size (mm)	: 270
H Border (pixels)	: 0
V Border (lines)	: 0
Flags	: Non-interlaced
	: Normal Display, No stereo
	: Digital Separate sync.
	: Positive Vertical Sync.
	: Positive 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	: 83
Max. Supported Pixel	: 140
No secondary GTF timing formula supported.	

Monitor Descriptor #3

Monitor Name	: hp L1730
--------------	------------

Monitor Descriptor #4

Serial Number	: CNP311V001
---------------	--------------

Extension Flag : 0

Check sum : B9 (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: 0e	11: 26	12: 31	13: 30	14: 30	15: 56
16: 02	17: 0e	18: 01	19: 03	20: 80	21: 22	22: 1b	23: 78
24: ea	25: 2e	26: e5	27: a4	28: 57	29: 4a	30: 9c	31: 25
32: 11	33: 50	34: 54	35: ad	36: ef	37: 80	38: 81	39: 80
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: 30	55: 2a
56: 00	57: 98	58: 51	59: 00	60: 2a	61: 40	62: 30	63: 70
64: 13	65: 00	66: 52	67: 0e	68: 11	69: 00	70: 00	71: 1e
72: 00	73: 00	74: 00	75: fd	76: 00	77: 38	78: 4c	79: 1e
80: 53	81: 0e	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: 37	101: 33	102: 30	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: 31	118: 31	119: 56
120: 30	121: 30	122: 31	123: 0a	124: 20	125: 20	126: 00	127: b9



Go to cover page

THE DISPLAY DATA CHANNEL (DDC\_2B) CONTENT INCLUDING:  
(FOR HP L1730 ANALOG FOR LPL PANEL)

EDID log file

Vendor/Product Identification

ID Manufacturer Name : HWP  
ID Product Code : 260E(HEX.)  
ID Serial Number : 56303031 (HEX.)  
Week of Manufacture : 2  
Year of Manufacture : 2004

EDID Version, Revision

Version : 1  
Revision : 3

Basic Display Parameters/Features

Video Input Definition : Analog Video Input  
0.700V/0.300V (0.70 Vpp)  
Without Blank-to-Black Setup  
  
Separate Sync  
Without Composite Sync  
Without Sync on Green  
No Serration required

Maximum H Image Size : 34  
Maximum V Image Size : 27  
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 : 0.641  
Red Y coordinate : 0.342  
Green X coordinate : 0.292  
Green Y coordinate : 0.611  
Blue X coordinate : 0.147  
Blue Y coordinate : 0.068  
White X coordinate : 0.313  
White Y coordinate : 0.329

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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)  
1280 x 1024 @75Hz (VESA)

Manufacturer's timings: 1152 x 870 @75Hz (VESA)

Standard Timing Identification #1

Horizontal active pixels : 1280  
Aspect Ratio : 5:4  
Refresh Rate : 60

Detailed Timing #1

Pixel Clock (MHz) : 108  
H Active (pixels) : 1280  
H Blanking (pixels) : 408  
V Active (lines) : 1024  
V Blanking (lines) : 42  
H Sync Offset (F Porch) (pixels): 48  
H Sync Pulse Width (pixels) : 112  
V Sync Offset (F Porch) (lines) : 1  
V Sync Pulse Width (lines) : 3  
H Image Size (mm) : 338  
V Image Size (mm) : 270  
H Border (pixels) : 0  
V Border (lines) : 0  
Flags : Non-interlaced  
: Normal Display, No stereo  
: Digital Separate sync.  
: Positive Vertical Sync.  
: Positive 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 : 83  
Max. Supported Pixel : 140  
No secondary GTF timing formula supported.

Monitor Descriptor #3

Monitor Name : hp L1730

Monitor Descriptor #4

Serial Number : CNP311V001

Extension Flag : 0

Check sum : D1 (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: 0e	11: 26	12: 31	13: 30	14: 30	15: 56
16: 02	17: 0e	18: 01	19: 03	20: 68	21: 22	22: 1b	23: 78
24: ea	25: 2e	26: e5	27: a4	28: 57	29: 4a	30: 9c	31: 25
32: 11	33: 50	34: 54	35: ad	36: ef	37: 80	38: 81	39: 80
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: 30	55: 2a
56: 00	57: 98	58: 51	59: 00	60: 2a	61: 40	62: 30	63: 70
64: 13	65: 00	66: 52	67: 0e	68: 11	69: 00	70: 00	71: 1e
72: 00	73: 00	74: 00	75: fd	76: 00	77: 38	78: 4c	79: 1e
80: 53	81: 0e	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: 37	101: 33	102: 30	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: 31	118: 31	119: 56
120: 30	121: 30	122: 31	123: 0a	124: 20	125: 20	126: 00	127: d1

## TELEVISION/MONITOR SAFETY GUIDELINES FOR THE PROFESSIONAL SERVICE TECHNICIAN

### Safety Checks

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

#### Fire and Shock Hazard

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

\* Broken line

#### Implosion

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

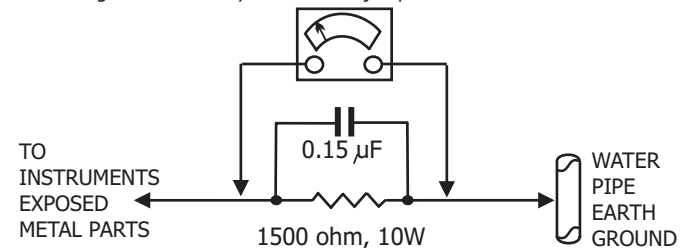
#### X-radiation

1. Be sure procedures and instructions to all your service personnel cover the subject of X-radiation. Potential sources of X-rays in TV receivers are the picture tube and the high voltage circuits. The basic precaution which must be exercised is to keep the high voltage at the factory recommended level.
2. To avoid possible exposure to X-radiation and electrical shock, only the manufacturer's specified anode connectors must be used.
3. It is essential that the service technician has an accurate HV meter available at all times. The calibration of this meter should be checked periodically against a reference standard.
4. When the HV circuitry is operating properly there is no possibility of an X-radiation problem. High voltage should always be kept at the manufacturer's rated value - no higher - for optimum performance. Every time a color set is serviced, the brightness should be run up and down while monitoring the HV with a meter to be certain that the HV is regulated correctly and does not exceed the specified value. We suggest that you and your technicians review test procedures so that HV and HV regulation are always checked as a standard servicing procedure, and the reason for this prudent routine is clearly understood by everyone. It is important to use an accurate and reliable HV meter. It is recommended that the HV recorded on each customer's invoice, which will demonstrate a proper concern for the customer's safety.
5. When troubleshooting and making test measurements in a receiver with a problem of excessive high voltage, reduce the line voltage by means of a Variac to bring the HV into acceptable limits while troubleshooting. Do

6. New picture tubes are specifically designed to withstand higher operating voltages without creating undesirable X-radiation. It is strongly recommended that any shop test fixture which is to be used with the new higher voltage chassis be equipped with one of the new type tubes designed for this service. Addition of a permanently connected HV meter to the shop test fixture is advisable. The CRT types used in these new sets should never be replaced with any other types, as this may result in excessive X-radiation.
7. It is essential to use the specified picture tube to avoid a possible X-radiation problem.
8. Most TV receivers contain some type of emergency "Hold Down" circuit to prevent HV from rising to excessive levels in the presence of a failure mode. These various circuits should be understood by all technicians servicing them, especially since many hold down circuits are inoperative as long as the receiver performs normally.

#### Leakage Current Cold Check

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



#### Leakage Current Hot Check

1. Do not use an isolation transformer for this test. Plug the completely reassembled receiver directly into the ac outlet.
2. Connect a 1.5k, 10w resistor paralleled by a 0.15uf. capacitor between each exposed metallic cabinet part and a good earth ground such as a water pipe, as shown above.
3. Use an ac voltmeter with at least 5000 ohms volt sensitivity to measure the potential across the resistor.
4. The potential at any point should not exceed 0.75 volts. A leakage current tester may be used to make this test; leakage current must not exceed 0.5 milliamps. If a measurement is outside of the specified limits, there is a possibility of shock hazard. The receiver should be repaired and rechecked before returning it to the customer.
5. Repeat the above procedure with the ac plug reversed. (Note: An ac adapter is necessary when a polarized plug is used. Do not defeat the polarizing feature of the plug.)

#### Picture Tube Replacement

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

#### Parts Replacement

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

**WARNING :** Before removing the CRT anode cap, turn the unit **OFF** and short the HIGH VOLTAGE to the CRT DAG ground.  
**SERVICE NOTE :** The CRT DAG is not at chassis ground.