

Service
Service
Service

V40 107P5



107P50

Service Manual

Horizontal frequencies
30 - 97 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 PHILIPS Company** Equipment. The service procedures recommended by PHILIPS and described in this service manual are effective methods of performing service operations. Some of these service operations require the use of tools specially designed for the purpose. The special tools should be used when and as recommended.

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

** Hereafter throughout this manual, PHILIPS Company Will be referred to as PHILIPS.

WARNING

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

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

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

* Broken Line

FOR PRODUCTS CONTAINING LASER :

- DANGER- 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.

Technical Data

Go to cover page

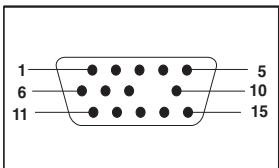
Technical Specification*

CRT
Size and deflection :17 inch/41cm, 90° deflection angle
Dot pitch : 0.21 mm with black matrix
Horizontal Dot pitch : 0.25 mm
Tube type : Shadow mask, real flat, high contrast, anti-glare, anti-static,anti reflection, light transmission 50%
Phosphor : P22
Recommended display area : 12.2" x 9.0"/310 x 230 mm
Maximum display area : 12.8" x 9.6"/325 x 244 mm
Scanning
Horizontal scanning : 30 - 97 KHz
Vertical scanning : 50 - 160 Hz
Video
Video dot rate : 203 Mhz
Input impedance
-Video : 75 Ohms
- Sync : 4.7K Ohms
Signal input level : 0.7Vpp
Separate sync
Sync input signal : Composite sync.
Sync polarities : Positive or negative

White Color Temperature
Chromaticity CIE coordinates:
at 9300 °k x = 0.283 +/- 0.015 y = 0.297 +/- 0.015
at 6500 °k x = 0.313 +/- 0.015 y = 0.329 +/- 0.015
at 5500 °k x = 0.332 +/- 0.015 y = 0.347 +/- 0.015
at sRGB x = 0.313 +/- 0.015 y = 0.329 +/- 0.015
Carton box
Size (with pedestal) : 399(W)x410(H)x419(D)
Net weight : 15.1 Kg
Power supply : 90 - 264 VAC, 50/60 Hz
Power consumption : 90 Watts Max.

Operating condition
Temperature : 0 °C to 40 °C
Relative Humidity : 10 % - 90 % (W/O condensation)
Storage condition
Temperature : - 25 °C to 65 °C
Relative Humidity : 5 % to 95 % (W/O condensation)

Pin assignment :



The 15-pin D-sub connector(male) of the signal cable :

Pin No.	Assignment	Pin No.	Assignment
1	Red video input	9	No pin
2	Green video input	10	Logic. Ground
3	Blue video input	11	Identical output-connected to pin 10
4	Identical output-connected to pin 10	12	Serial data line(SDA)
5	fground	13	H.Sync /H + V
6	Red video ground	14	V.Sync(VCLK for DDC)
7	Green video ground	15	Data clock line(SCL)
8	Blue video ground		

Data Storage

Factory preset modes:
This monitor has 11 factory-preset modes as indicated in the following table :

	Mode	Resolution	Frequen		Sync polarity	
			H(KHz)	V(Hz)	H	V
M01	VGA	720 x 400	31.5	70	-	+
M02	VGA	640 x 480	31.47	60	-	-
M03	VGA	800 x 600	35.2	56	+	+
M04	VGA	640 x 350	37.9	85	+	-
M05	VGA	640 x 480	43.3	85	-	-
M06	SVGA	800 x 600	46.9	75	+	+
M07	SVGA	800 x 600	53.674	85	+	+
M08	EVGA	1080 x 960	60.0	60	+	+
M09	EVGA	1024 x 768	68.7	85	+	+
M10		1280 x 1024	80.0	75	+	+
M11		1280 x 1024	91.2	85	+	+

Automatic Power Saving

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

Power Management Definition						
VESA's mode	VIDEO	H-SYNC	V-SYNC	POWER USED	POWER SAVING(%)	LED COLOR
ON	Active	Yes	Yes	Tyical 70 w	0 %	Green
OFF	Blanked	No	No	<2 w	97 %	Flashing Green

This monitor is ENERGY STAR compliant.
As an ENERGY STAR Partner, PHILIPS has determined that this product meets the ENERGY STAR guidelines for energy efficiency

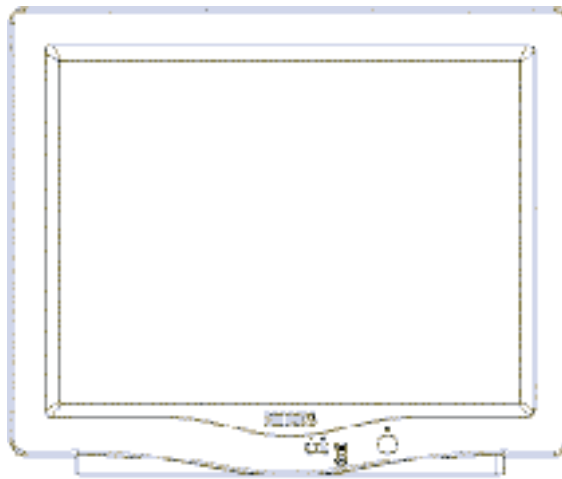


ENERGY STAR® is a U.S. registered mark. AS AN ENERGY STAR PARTNER, DELL Computer Corporation HAS DETERMINED THAT THIS PRODUCT MEETS THE ENERGY STAR GUIDELINES FOR ENERGY EFFICIENCY.

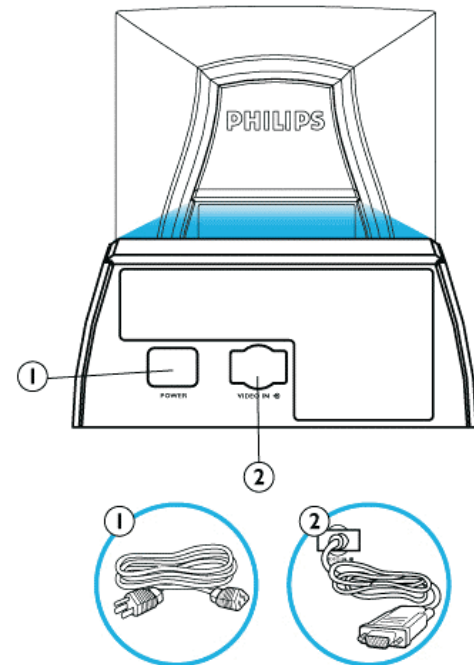
Front control & OSD

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Front View



Rear view



1. Power in - attach power cable here.
2. Video In - this is a cable which is already attached to your monitor. Connect the other end of the cable to your PC.

Description of the On Screen Display

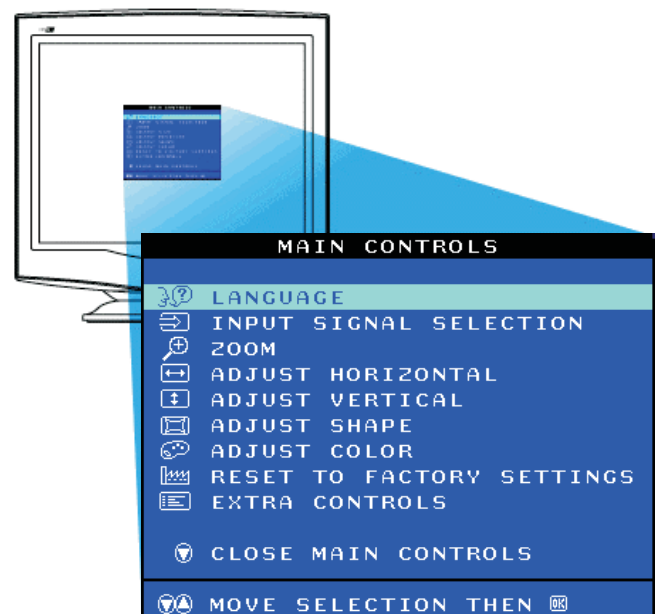
What is the On-Screen Display?

This is a feature in all Philips monitors which allows an end-user to adjust screen performance of monitors directly through an on-screen instruction window. The user interface provides user-friendliness and ease-of-use when operating the monitor.

Basic and simple instruction on the control keys.

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

Use the   the keys to make your adjustments within.

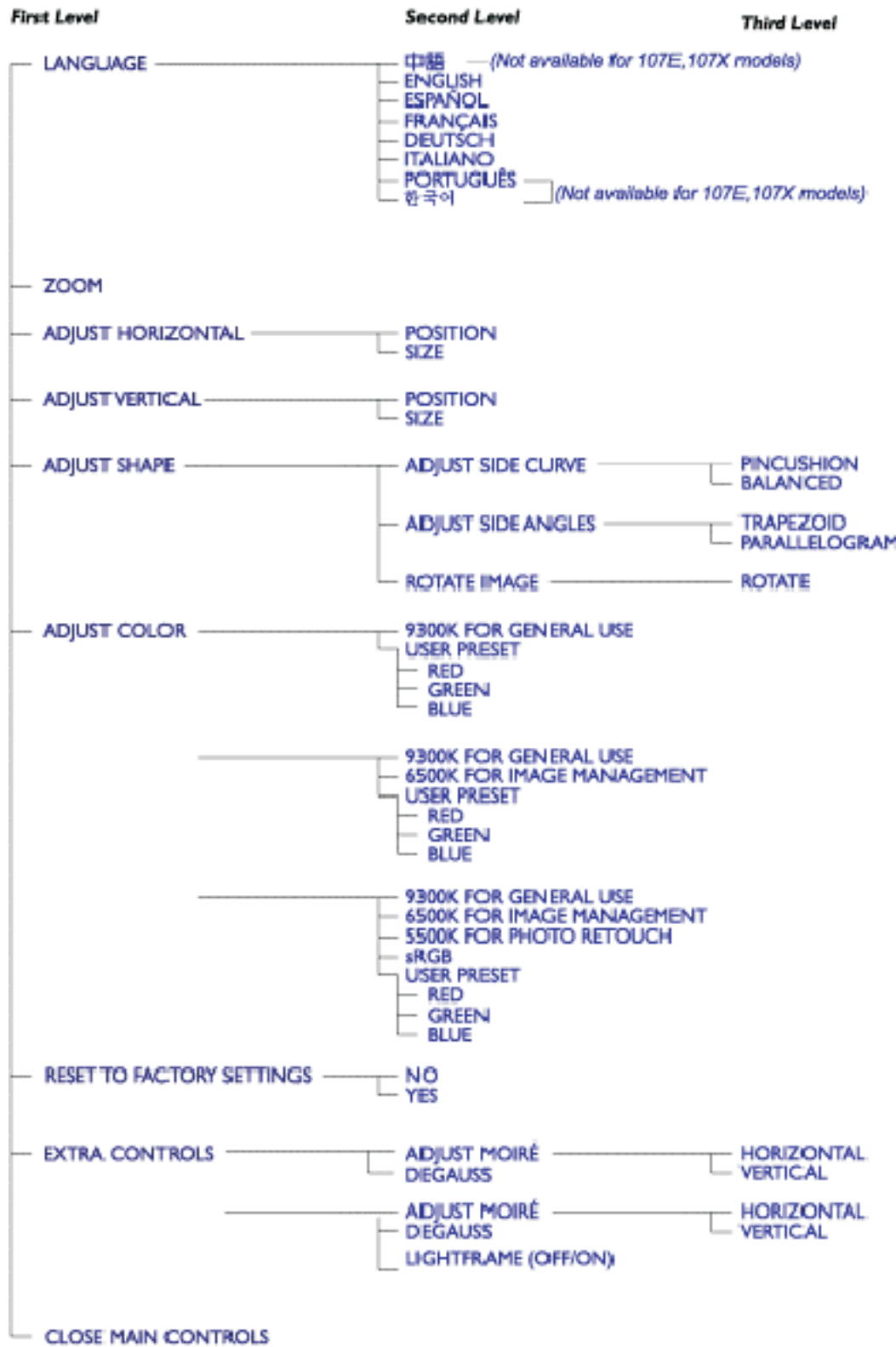


-  Power button switches your monitor on.
-  OK button which when pressed will take you to the OSD controls
-  Contrast hotkey. When the "-" button is pressed, the adjustment controls for the CONTRAST will show up.
-  Brightness hotkey. When the "+" button is pressed, the adjustment controls for BRIGHTNESS will show up.
-  "-" and "+" buttons, are used for adjusting the OSD of your Monitor.
-  EXIT button which when pressed will close the OSD controls.

The OSD Tree

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

CRT OSD tree / English



* Specifications are subject to change without prior notice.

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OSD Lock

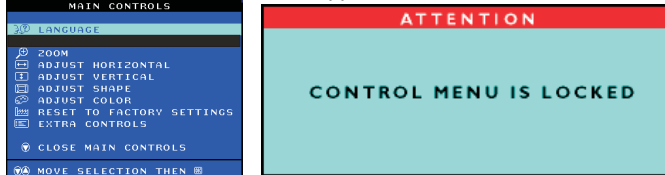
OSD lock is a feature which disables the OSD controls. It can be used when the monitor is set up for demonstration purposes or when adjustment of the OSD is not desirable.

Switch on OSD lock feature:

Press and hold the button continuously for 15 seconds.

Release the button when the message

"CONTROL MENU IS LOCKED" appears.



Switch off OSD lock feature:

Press and hold the button continuously for 15 seconds or until the message window "CONTROL MENU IS LOCKED" disappears, and

"MAIN CONTROLS" appears.



To access factory mode

1. Turn off monitor (don't turn off PC)
2. Press " " and " " simultaneously on the front control panel, then press " ", wait till the OSD menu with characters V40 107P5 V0.11 20030804 (below OSD menu) come on the screen of monitor.



3. If OSD menu disappears on the screen of monitor, press " " again (anytime), then the OSD menu comes on the screen again.
4. Using " " : to select OSD menu.
5. Using " " : to increase or decrease the setting.
6. Using " " to access/confirm the selection.

To leave factory mode

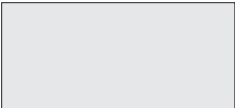
7. After alignment of factory mode, turn off monitor (if you do not turn off monitor, the OSD menu is always at the factory mode), then turn on monitor again (at this moment, the OSD menu goes back to user mode).

To access BURN IN mode

First of all, monitor displays an image.

1. Disconnect the video cable (interface cable).
2. Turn off monitor
3. Press " " and " " simultaneously on the front control panel, then the BURN IN mode comes on the screen of monitor as below.

50 seconds around



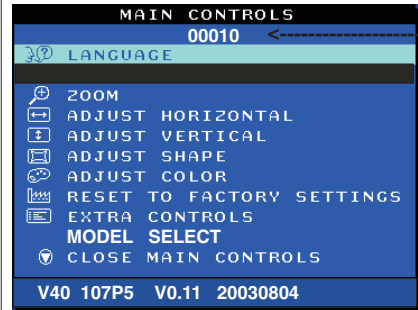
5 seconds around



repeatedly

4. Reconnect the video cable, then return to normal image.

SERVICE MODE (Indication-Factory mode)



00010: stands for
1. using 10 hours already.
2. turn on/off 10 times.
3. using several hours
+ turn on/off monitor.

Default setting of MODEL SELECT (Do not change it.)

MODEL SELECT	
☒	107P5
☐	RESERVE
☐	RESERVE
☐	RESERVE
☐	RESERVE
☐	RESERVE
☒	SWDDC
☒	LF 3 OSD
☒	LF 3



0. General

To be able to perform measurements and repairs on the "circuit boards", these unit should placed in the service position first.

1. Remove the rear cover in Fig. 1.

- Remove 2 screws as shown
- Remove back cover as shown
- Remove pedestal as shown
- Remove cover clip at right and left side on the back cover in Fig2.

2. Video panel

- Disconnect the wire between metal shield of Video panel and CRT neck as shown in Fig. 3.
- Disconnect the CRT ground from Video panel.
- Remove screw grounding and grounding wire in Fig. 3.

3. Main board connector in Fig. 4

- Disconnect york wire
- Disconnect rotation connector
- Disconnect control board connector
- Remove Screw for fixed I/F cable

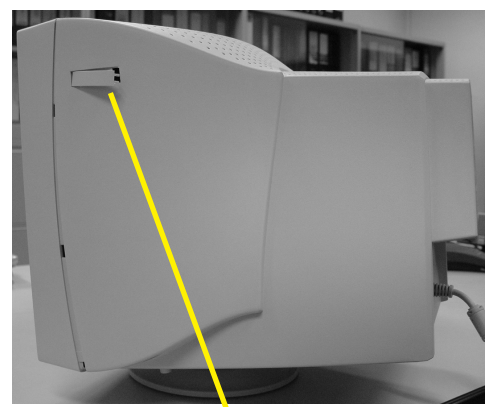
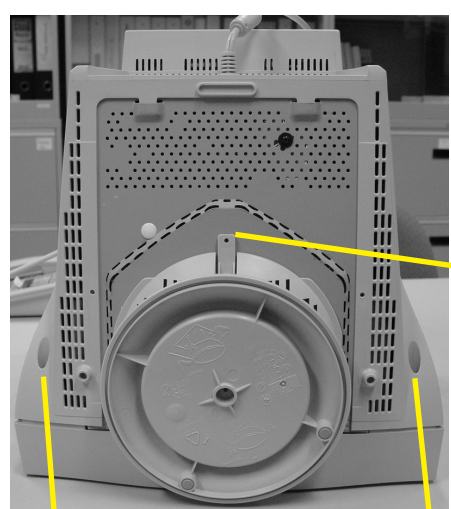


Fig. 2

Cover clip



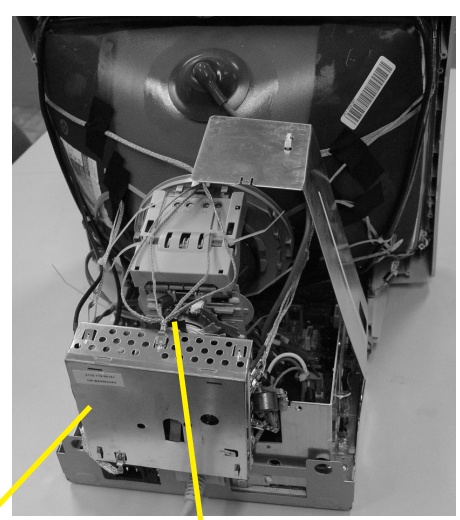
Clip

Pedestal ass'y

Screw

Screw

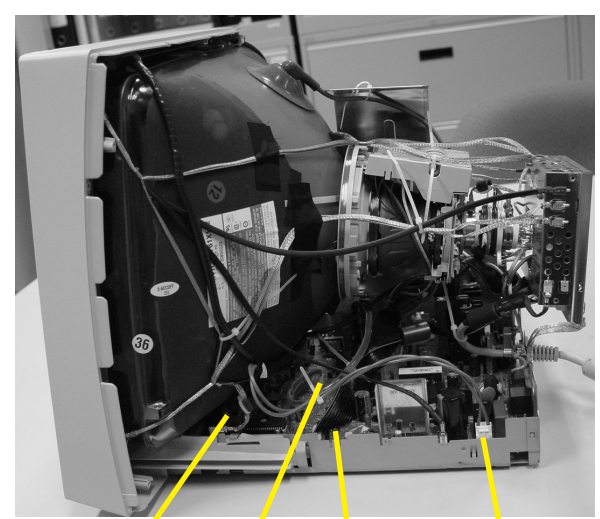
Fig. 1



Video Panel

CRT grounding wire

Fig. 3



Control connector

Rotation connector

Signal connector

Degaussing wire connector

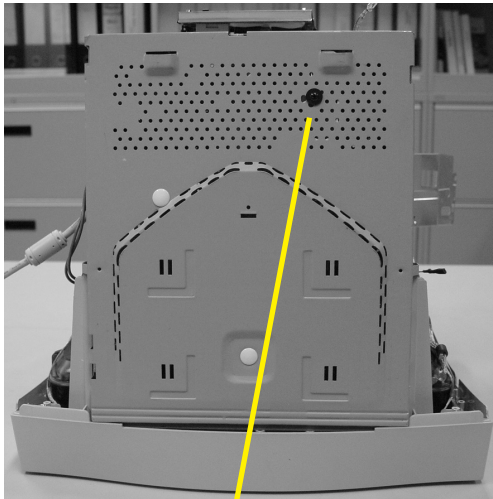
Fig. 4

4. Main panel with Bottom Tray

- Remove 9 screws for disconnect the Bottom tray as Fig. 5.
- Pull the bottom tray on press right and left side clip from fig. 6 & fig. 7.
- Remove all screws between main board and bottom tray, then transfer to service position.

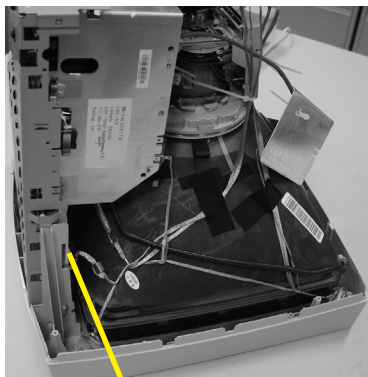
5. SERVICE POSITION

Reconnect connectors, some wires and panels (chassis), service position can be available for DC/AC measurement as shown in Fig. 8.



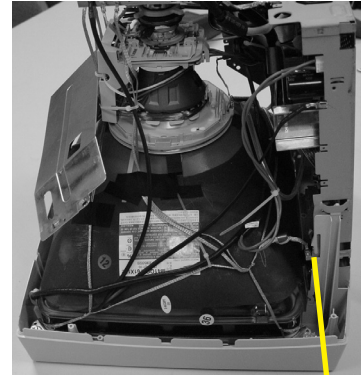
Screw

Fig. 5



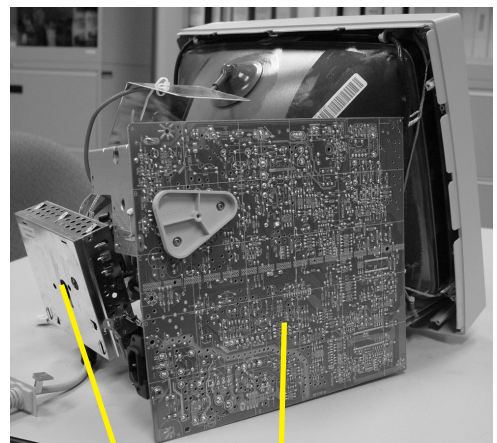
Press CLIP

Fig. 6



Press clip then Pull-up

Fig. 7



Video panel

Main panel

Fig. 8 SERVICE POSITION

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Warnings

1. Safety regulations require that the unit should be returned in its original condition and that components identical to the original components are used. The safety components are indicated by the symbol .
2. In order to prevent damage to ICs and transistors, all high-voltage flash-overs must be avoided. In order to prevent damage to the picture tube, the method shown in Fig. 1 should be used to discharge the picture tube. Use a high-voltage probe and a multimeter (position DC-V). Discharge until the meter reading is **0 V** (after approximately 30 seconds).
3. **ESD** 
All ICs and many other semiconductors are sensitive to electrostatic discharges (ESD). Careless handling during repair can drastically shorten their life. Make sure that during repair you are connected by a pulse band with resistance to the same potential as the ground of the unit. Keep components and tools also at this same potential.
4. When repairing a unit, always connect it to the AC Power voltage via an isolating transformer.
5. Be careful when taking measurements in the high-voltage section and on the picture tube panel.
6. It is recommended that safety goggles be worn when replacing the picture tube.
7. When making adjustments, use plastic rather than metal tools. This will prevent any short-circuit or the danger of a circuit becoming unstable.
8. Never replace modules or other components while the unit is switched on.
9. Together with the deflection unit, the picture tube is used as an integrated unit. Adjustment of this unit during repair is not recommended.
10. After repair, the wiring should be fastened in place with the cable clamps.
11. All units that are returned for service or repair must pass the original manufacturer's safety tests.

Notes

1. The direct voltages and waveforms are average voltages. They have been measured using the Service test software and under the following conditions :
 - Mode : 640 * 480 (31.5kHz / 60Hz)
 - Signal pattern : grey scale
 - Adjust brightness and contrast control for the mechanical mid-position (click position)
2. The picture tube panel has printed spark gaps. Each spark gap is connected between an electrode of the picture tube and the Aquadag coating.
3. The semiconductors indicated in the circuit diagram(s) and in the parts lists are completely interchangeable per position with the semiconductors in the unit, irrespective of the type indication on these semiconductors.

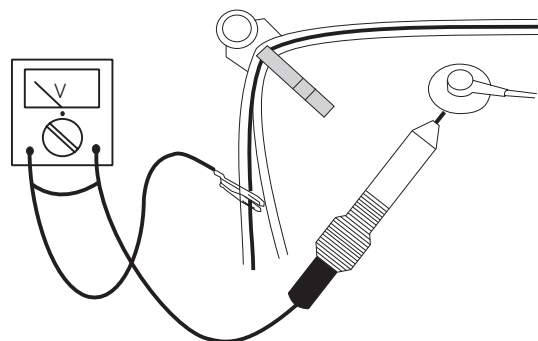


Fig.1

Electrical Adjustments

V40 107P5

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1. General

2. Input signal mode

Factory preset modes : 11

Resolution modes	H. freq.	V. freq.	H.	V.
1. 720 x 400	31.5 Khz	70Hz (VGA)	-	+
2. 640 x 480	31.5 Khz	60 Hz (VGA)	-	-
3. 800 x 600	35.2 Khz	56 Hz (Mac- II)	+	+
4. 640 x 350	37.9 Khz	85 Hz (VESA)	+	-
5. 640 x 480	43.3 Khz	85 Hz (VGA)	-	-
6. 800 x 600	46.9 Khz	75 HZ(VESA)	+	+
7. 800 x 600	53.7 Khz	85 HZ(VESA)	+	+
8. 1024 x 768	60.0 Khz	75 HZ(VESA)	+	+
9. 1024 x 768	68.7 Khz	85 HZ(VESA)	+	+
10. 1280 x 1024	80.0 Khz	75 Hz (VESA)	+	+
11. 1280 x 1024	91.2 Khz	85 Hz (VESA)	+	+

3.0 Main chassis alignment

3.1 Power supply adjustment

3.1.1 Set Vg2 manually (screen) to fully counterclockwise (zero beam current).

3.1.2 Apply 80KHz/75Hz full black pattern.

3.1.3 Monitor the following auxiliary voltages.

+197.0V source across C2152 and gnd	+197.0V +/- 3.0 VDC
+ 82.5V source across C2151	+ 82.5V +/- 1.5 VDC
+ 6.2V source across C2155	+ 6.2V +/- 0.2 VDC
+ 12.2V source across C2153	+12.2V +/- 0.7 VDC
- 12.2V source across C2154	- 12.2V +/- 0.7 VDC

3.2 H-Deflection supply voltage adjustment

3.2.1 Apply 80KHz /75Hz 1280 x 1024 full black pattern.

Adjust manually R3561 to obtain 48V +/-0.3V for SDI CRT
152V +/-0.3V for LG CRT
across C2600 at zero beam current.

3.3 Picture geometry and EHT regulation adjustment

3.3.1 EHT regulation adjustment

At 1280 x 1024 80KHz/75Hz mode full black pattern
Use DC voltage meter to measure socket 1681 Pin 1.
Adjust VR 3699
To get 4.7V +/- 0.05V at socket 1681 pin 1.

4. General conditions for alignment

4.1 During all alignments, supply a distortion free AC mains voltage to set via an isolating transformer with low internal impedance.

4.2 Align in pre-warmed condition, at least 30 minutes warm-up with nominal picture brightness.

4.3 Purity, geometry and subsequent alignments should be carried out in magnetic cage with correct magnetic field.

Northern hemisphere : H=0, V=450 mG, Z=0

Southern hemisphere : H=0, V=-520 mG, Z=0

4.4 All voltages are to be measured or applied with respect to ground.

Note: Do not use heatsink as ground.

4.5 Adjust brightness controls to center position except for contrast control which should be set to MAX.

4.6 Any external voltage sources should have a low internal impedance.

4.7 Adjust function controls to center position unless otherwise stated.

4.8 The white balance and purity has to be adjusted in dully lighted room.

4.9 All alignments have to be done in a room with a temperature of 25+/- 10° C.

5. To access factory mode

5.1 Turn off monitor (don't turn off PC)

5.2 Press " " and " " simultaneously on the front control panel, then press " ", wait till the OSD menu with characters V40 109F5 V0.45 20030410 (below OSD menu)" come on the screen of monitor.

Factory
Mode
Indicator



5.3 If OSD menu disappears on the screen of monitor, press " " again (anytime), then the OSD menu comes on the screen again.

5.4 Using " " : to select OSD menu.

5.5 Using " " : to increase or decrease the setting.

5.6 Using " " to access/confirm the selection.

To leave factory mode

5.7 After alignment of factory mode, turn off monitor (if you do not turn off monitor, the OSD menu is always at the factory mode), then turn on monitor again (at this moment, the OSD menu goes back to user mode).

6. Picture geometry setting

- Apply a video signal with cross-hatch pattern.

- Apply a video signal in the 1024 x 768 with 68.7 kHz/85 Hz mode.

- Set contrast control at Max. position, and brightness control in the mid-point.

6.4 Alignment of horizontal geometry and vertical geometry

6.4.1 Adjust the H-width to 306 mm

6.4.2 Adjust the H-phase to center position.

6.4.3 Adjust V-size to 230mm.

6.4.4 Adjust V-Position to center.

Adjust/Trapezoid/pincushion/balance pincushion/paralleogram

6.4.5 Adjust picture tilt via I²C BUS for correct top/bottom lines.

6.4.6 Adjust the top and bottom corner by I²C to get optimum corner geometry.

6.4.7 Adjust the parallelogram by I²CBUS to get optimum vertical line.

6.4.8 Adjust the balance pincushion by I²C BUS to get optimum vertical line.

6.4.9 Adjust the trapezoid to get optimum vertical line.

6.5 Adjust size/centering/trapezium/pincushion/paralleogram of all other preset modes via I²C bus.
(to repeat from step 6.4.1 to step 6.4.9)

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7. Alignment of Vg2 cut-off point, white tracking

Equipment : 1. Video Test Generator-801GC (Quantum Data)
2. Color-analyzer (Minolta CA-100)
VG2 [(screen), at the bottom of the L.O.T.].
7.1 Apply a video signal in the 1024 x 768 with 68.7 kHz/85 Hz mode, select the "full white pattern" (sizes 306 x 230 mm).
* Use color-analyzer (Minolta CA-100) to adjust R/G/B cutoff and gain.

OSD R/G/B cut-off and R/G/B gain can be accessed (for Philips CRT), with initial data:
9300 °K
R cutoff = 50%, R gain = 73% (I² C)
G cutoff = 50%, G gain = 73% (I² C)
B cutoff = 50%, B gain = 73% (I² C)
6500 °K
R cutoff = 50%, R gain = 71% (I² C)
G cutoff = 50%, G gain = 71% (I² C)
B cutoff = 50%, B gain = 71% (I² C)

Brightness = 50%, Sub-Contrast = 86%, ABL = 63% (I² C)

Step 1: To access factory mode

- Turn off monitor (don't turn off PC)
- Press " " and " " simultaneously on the front control panel, then press " ", wait till the OSD menu with characters V40 107P5 V0.11 20030804 (below OSD menu) comes on the screen of monitor as shown in Fig. 2.1.

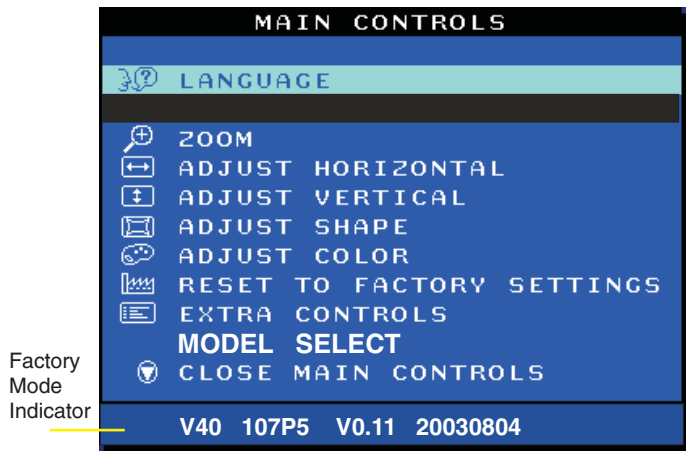


Fig. 2.1

- If OSD menu disappears on the screen of monitor, press " " again (anytime), then the OSD menu comes on the screen again.
- Using " " to select V40 107P5 V0.11 20030804.
- Press " " button to access/confirm the selection. Bring up the "function adjustment" as shown in Fig. 2.2.
- Press " " button for function selection as shown in Fig. 2.2.
- Press " " button to access/confirm each item selection (The cursor indicator will be changed from yellow colour to red colour.)
- Using " " : to increase or decrease the value.

9300	BIAS	R	G	B	GAIN	R	G	B	(for ref. 158,122,111,212,192,192)
6500	BIAS	R	G	B	GAIN	R	G	B	(for ref. 159,123,110,238,186,144)
5500	BIAS	R	G	B	GAIN	R	G	B	(for ref. 160,125,110,247,180,118)
SRGB	BIAS	R	G	B	GAIN	R	G	B	(for ref. 165,129,115,162,114,81)
SRGB	(-)				CUTOFF	OSD			(for ref. 127,255,7,188)
FOCUS	(H V)				VLINBAL	USER			(for ref. 0,143,98,50)
RASTER	(H V)				LIN(H V)	SUB			(for ref. 151,255,255,108,50)
V(OFFSET	GAIN)				SUB				(for ref. 153,255,161)
CORNER	(T B)				ABL	SUB			(for ref. 111,91,190,255)
HEHT									(for ref. 0)
LF(BRIGH	SHARP)								(for ref. 3,3)
EXIT									

Fig. 2.2
(for example: 131 is value of "BIAS R")

BIAS R G B : R(red) G(green) B(blue) cutoff
GAIN R G B : R(red) G(green) B(blue) gain
OSD contrast : OSD window contrast
V OFFSET : Vertical raster center
V GAIN : Vertical size center
VLIN BAL : Vertical Linearity Balance
V FOCUS : Vertical Focus adjustment
T CORNER: Corner Correction of TOP
B CORNER: Corner Correction of BOTTOM
EHT H : Horizontal Size compensation
ABL : Auto brightness Limitation
SUB : Sub Contrast allowance range
SUB : Sub Brightness allowance range
SUB : Horizontal size range adjustment range
HLIN : Horizontal Linearity
V LIN : Vertical Linearity
RANGE : Zoom range

7.2 Connect the video input, set brightness control at center, and contrast control at maximum

7.3

set R,G,B cut-off at 127 9300k and 6500K(EEPROM preload value)
R,G,B gain at 185 9300k and 180 6500K(EEPROM preload value)
ABL at 160 9300k (EEPROM preload value)
SUB-CON at 220 9300k (EEPROM preload value)

7.4 Adjust 9300K color:

With color analyzer CA 100,
set R,G,B cut-off x=0.283, y=0.297, Y=0.10

7.5 Set R,G,B gain Y= 41+/- 1FL, x=0.283, y=0.297

7.6 Repeat 7.4,7.5 until RGB three guns get x=0.283, y=0.297, readings on low Y=0.10+/-0.05FL and high Y=41+/-1FL brightness of 9300.

7.7 Adjust 6500K color:

With color analyzer CA 100,
set R,G,B cut-off x=0.313, y=0.329, Y=0.10

7.8 Set R,G,B gain Y= 36+/- 1FL, x=0.313, y=0.329

7.9 Repeat 7.7,7.8 until RGB three guns get x=0.313, y=0.329, readings on low Y=0.10+/-0.05FL and high Y=36+/-1FL brightness of 6500.

7.10 Adjust SUB-CON to get Y=41+/-1FL.

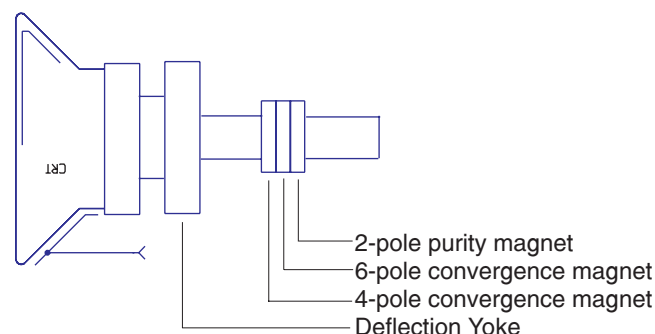
7.11 Apply full white pattern of 9300 mode, adjust ABL to reach 30 +/- 1FL(at 9300 high brightness of R/G/B gain, contrast at 100%)

8. Focus adjustment

With 9-blocks ME pattern display at timing 79.9KHz 1280 X 1024, each block is a square of 90mm x 90mm. Set brightness at 50% and contrast at 100% at the center of the screen. and adjust focus pot-meter which is located at fly-back transformer, until the haze just disappears on 2/3 east and west, top and down of the screen.

9. Loading DDC code

The DDC HEX data should be written into the EEPROM (7802) by EDID301.EXE Program(3138 106 10103) and software DDC Alignment kits (4822 310 11184).

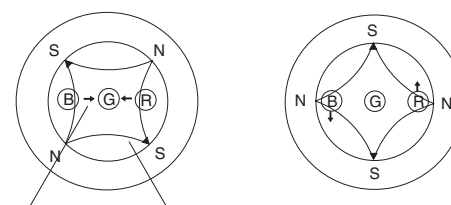


10. Purity adjustment

- Make sure the monitor is not exposed to any external magnetic field.
- Produce a full red pattern on the screen, adjust the purity magnet rings on the PCM assy (on CRT) to obtain a complete field of the color red. This is done by moving the two tabs (2-pole) in such a manner that they advance in an opposite direction but at the same time to obtain the same angle between the two tabs, which should be approximately 180 degree.
- Check by full green pattern and full blue pattern again to observe their respective color purity.

4-pole

Beam motion produced by the 4-pole convergence magnet



Beam displacement direction

Magnetic flux lines

11. Static convergence

Introduction

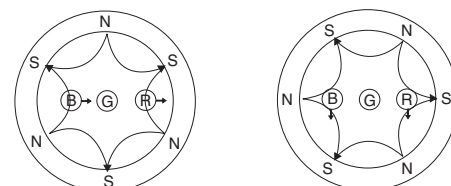
Slight deviation in the static convergence can be corrected by using two permanent pairs of magnets which are fitted around the neck of the CRT. These are the 4-pole magnet and the 6-pole magnet. The 4-pole magnet move the outermost electron beams (R and B) parallel in the opposite direction from the other. The 6-pole magnet moves the outermost electron beam (R, B and G) parallel in the opposite direction from the other. The magnetic field of the above magnets do not affect the center of the CRT neck.

Setting

- Before the static convergence setting can be made, the monitor must be switched on for 30 minutes.
- The focus setting must be made correctly.
- Signal: 640 * 480, 31.5 kHz/60 Hz mode.
- Set the tabs of the 4-pole magnet in the neutral position. This is when the tabs are opposite one another. In this position the magnets do not affect the deflection of the R and B electron beams.
- Set the tabs of the 6-pole magnet in the neutral position. This is when the tabs are opposite one another. In this position the magnets do not affect the deflection of the R, B, and G electron beams.
- First set the 4-pole magnet optimally.
- Then set the 6-pole magnet optimally.
- If the convergence is not now optimal, then adjust to the optimal setting with the 4-pole magnet and then with the 6- Pole magnet again.
- Set the tabs of the 6-pole magnet in the neutral position. This is when the tabs are opposite one another. In this position the magnets do not affect the deflection of the R, B, and G electron beams.
- First set the 4-pole magnet optimally.
- Then set the 6-pole magnet optimally.
- If the convergence is not now optimal, then adjust to the optimal setting with the 4-pole magnet and then with the 6- pole magnet again.

6-pole

Beam motion produced by the 6- pole convergence magnet



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1. General

DDC Data Re-programming

In case the main EEPROM with Software DDC which store all factory settings were replaced because a defect, repaired monitor the serial numbers have to be re-programmed.

It is advised to re-soldered the main EEPROM with Software DDC 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 the monitor : Standard Version 3.0
Structure Version 1.2

2. System and equipment requirements

- 1. An i486 (or above) personal computer or compatible.
 - 2. Microsoft operation system Windows 95/98.
 - 3. EDID301.EXE program (3138 106 10103) shown as Fig. 1
 - 4. Software DDC Alignment kits (4822 310 11184) shown as Fig. 2.
- The kit contents: a. Alignment box x1
b. Printer cable x1
c. D-Sub cable x1

Note: The EDID301.EXE (Release Version 1.58, 20000818) is a windows-based program, which cannot be run in MS-DOS.



Figure 1 Diskette with EDID301.EXE

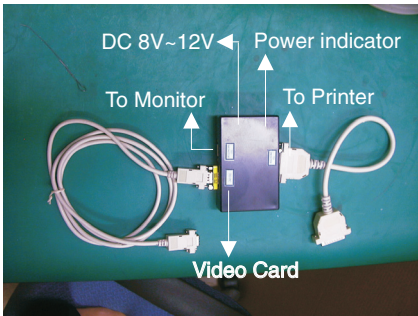
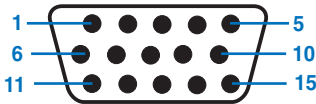


Fig. 2 Alignment Kits

3. Pin assignment

A. 15-pin D-Sub Connector

The 15-pin D-sub connector (male) of the signal cable on the 3rd row for DDC feature :



Pin No.	Assignment	Pin No.	Assignment
1	Red video input	9	DDC 5V
2	Green video input	10	Sync. Ground
3	Blue video input	11	Ground
4	Ground	12	Bi-directional data(SDA)
5	for selftest(PC ground)	13	H.Sync
6	Red video ground	14	V.Sync(VCLK)
7	Green video ground	15	Data clock line(SCL)
8	Blue video ground		

DDC Instructions (Continued)

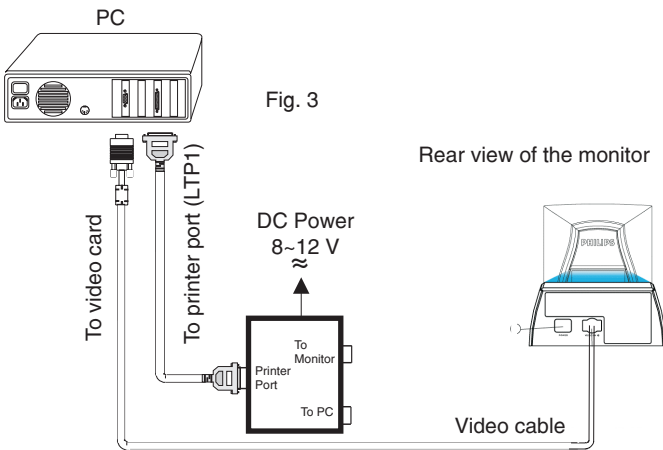
4. Configuration and procedure

There is no Hardware DDC (DDC IC) anymore. Main EEPROM stores all factory settings and DDC data (EDID code) which is so called Software DDC. The following section describes the connection and procedure for Software DDC application. The main EEPROM can be re-programmed by enabling "factory memory data write" function on the DDC program (EDID301.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 re-programming DDC Data. 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 shown in Fig.3.



Step 3: Installation of EDID301.EXE

Method 1: Start on DDC program

- Start Microsoft Windows.
- 1. Insert the disk containing EDID301.EXE program into floppy disk drive.
- 2. Click Start, choose Run at start menu of Windows 95/98 as shown in Fig. 4.

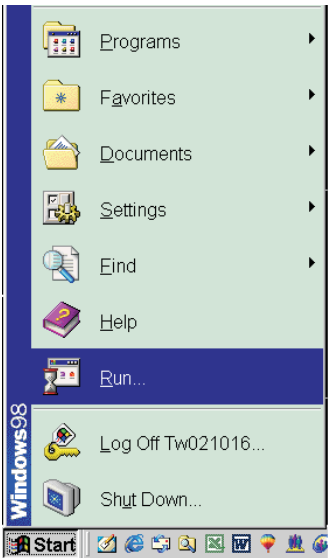


Fig. 4

- 3. At the submenu, type the letter of your computer's floppy disk drive followed by :EDID301 (for example, A:\EDID301, as shown in Fig. 5).

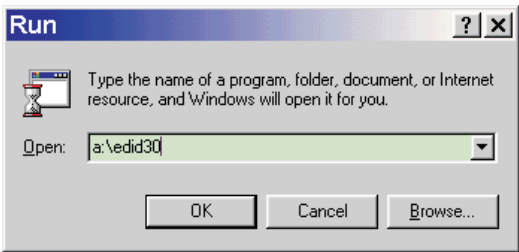


Fig. 5

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

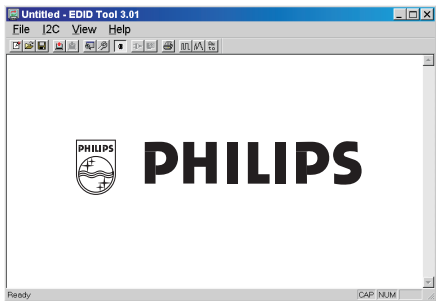


Fig. 6

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

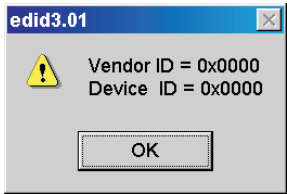


Fig. 7

Method 2: After create a shortcut of EDID301.EXE

- : Double click EDID301 icon (as shown in Fig. 8) which is on the screen of Windows Wallpaper. Bring up main menu of EDID301 as shown in Fig. 9. This is for initialize alignment box.



Fig. 8

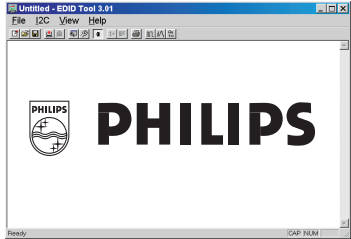
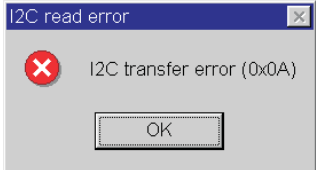


Fig. 9

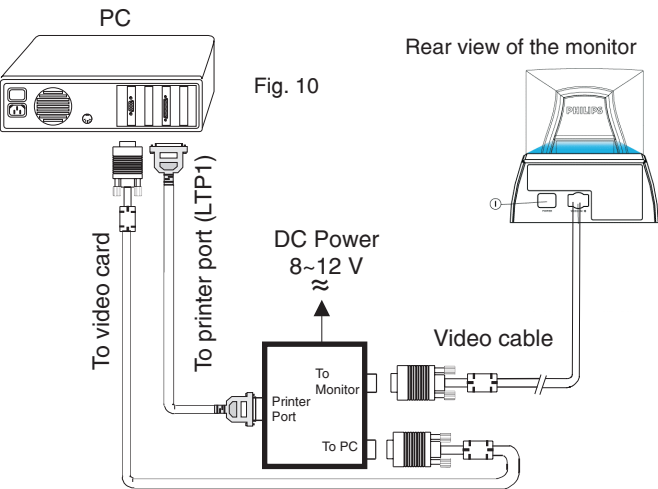
Note 2: During the loading, EDID301 will verify the EDID data which just loaded from monitor before proceed any further function, once the data structure of EDID can not be recognized, the following error message will appear on the screen as below. Please confirm following steps to avoid this message.

- 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.



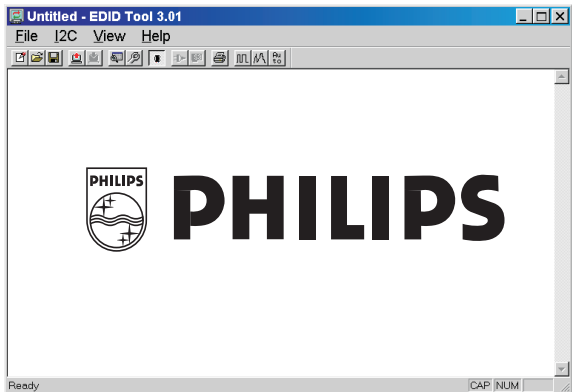
DDC Instructions (Continued)

Re-programming EEPROM (Software DDC)
Step 1: After initialize alignment box, connecting all cables and box as shown in Fig. 10

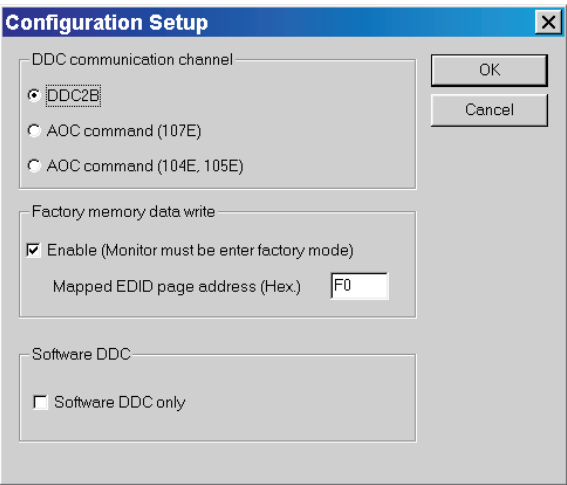


Step 2: Read DDC data from monitor

- 1-1 Click the left key of Mouse, or hit any key on the keyboard, then the characters disappear from the screen.
1-2 Click  icon as shown if Fig. 11 from the tool bar to bring up the "Configuration Setup" windows as shown in Fig. 12.



2. Select the DDC2B as the communication channel. Select "Enable" & fill out "F0" for Mapped EDID page address as shown in Fig. 12.



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. 13.

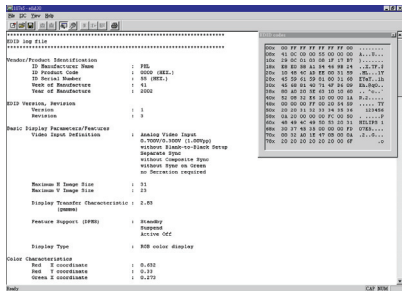


Fig. 13

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. 14 . EDID301 DDC application provides the function selection and text change (select & fill out) from Step 1 to Step 9.

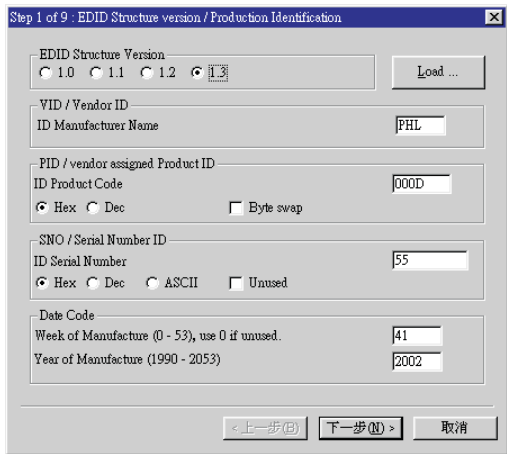


Fig. 14

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

1. Click Next till the Step 7 of 9 window appears as shown in Fig. 15.
2. Fill out the new Serial No. (for example, TY 503960, TY 123456).
3. Click Next till the last step window appears, then click Finish to exit the Step window.

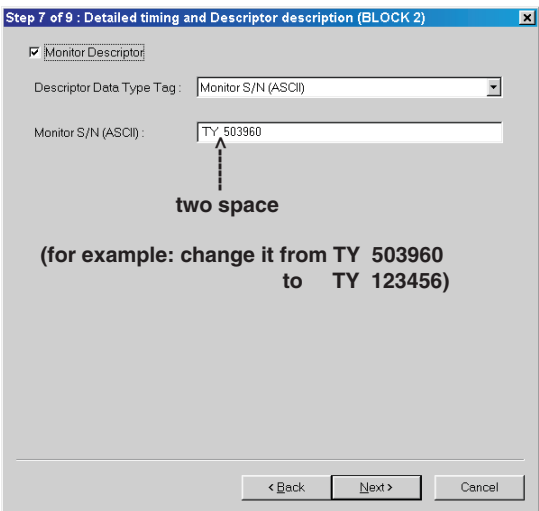
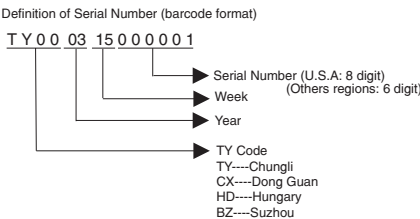


Fig. 15



DDC Instructions (Continued)

Step 5: **Configuration Setup & Enter Factory Mode **
for "write EDID data"

1. Click  icon from the tool bar to bring up the Configuration Setup windows again. Then, select "Software DDC only" as shown in Fig. 16. Click "OK".

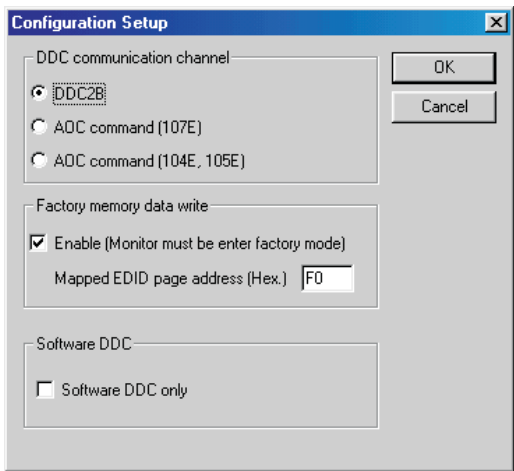


Fig. 16

If you do not select "Software DDC only", when you execute "write EDID", it will bring up an error message as below.



To access factory mode

1. Turn off monitor (don't turn off PC)
2. Press "⏻" and "⏻" simultaneously on the front control panel, then press "⏻", wait till the OSD menu with characters "V40 107P5 V0.11 20030804 (below OSD menu)" come on the screen of monitor.



Fig. 17

If OSD menu disappears on the screen of monitor, press "⏻" again (anytime), then the OSD menu comes on the screen again.

If you do not access "Factory mode", when you execute "write EDID", it will bring up an error message as below.



Step 6: Write DDC data

1. 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.
2. Click  (Read EDID) to confirm it.

Step 7: Confirm Serial Number in User Mode

1. Press the  button to turn off the monitor. Press the  button again to turn on the monitor.
2. Press the  button to bring up the OSD Main Menu.
3. Press the  button to select Extra Controls, press the  button to confirm your selection.
4. Confirm the Serial Number "123456" is updated as shown in Fig. 18.

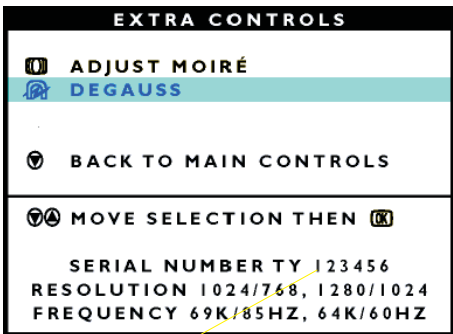


Fig. 18

Step 8: 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. 19. The file type is EDID301 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 EEPROM for DDC Data application.

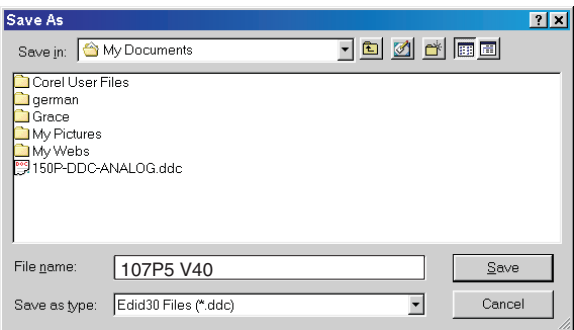


Fig. 19

2. Click **Save**.

DDC Instructions (Continued)

Go to cover page

Step 9: Load DDC data

- 1. Click  from the tool bar.
- 2. Select the file you want to open as shown in Fig. 20.
- 3. Click **Open**.
- 4. Access "Factory Mode" and enable "Software DDC only" as shown in Fig. 17 & Fig. 16.
- 5. Write EDID (click ).

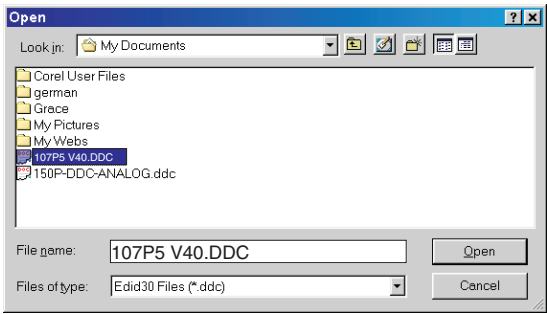


Fig. 20

Note 2 : In Factory Mode: Read/Write DDC data
Before Read/Write EDID code, please confirm that the **Software DDC only** was enabled as shown in Fig. 23.

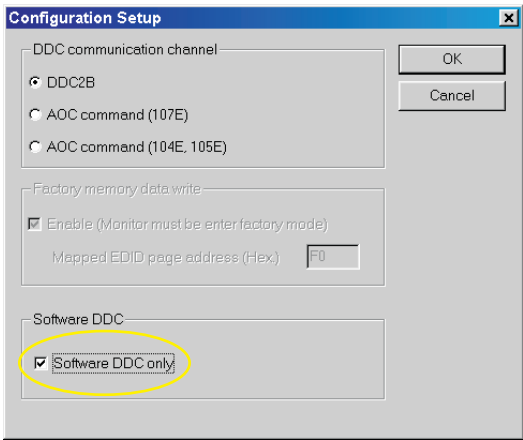


Fig. 23

Step 10: Exit DDC program

Pull down the File menu and select Exit as shown in Fig. 21.
(EDID Tool 3.01)

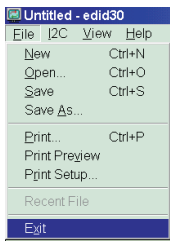


Fig. 21

Note1 : In User Mode: Read DDC data only
Before read EDID code, please confirm that the **Software DDC only** was disabled as shown in Fig. 22.

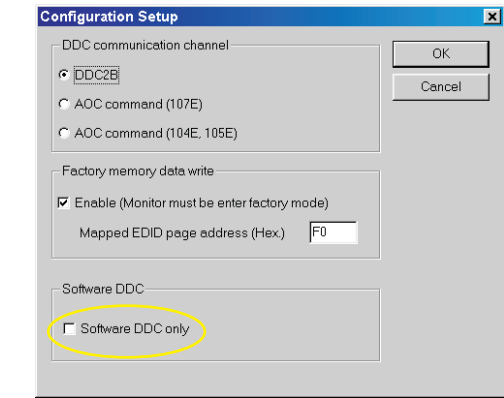
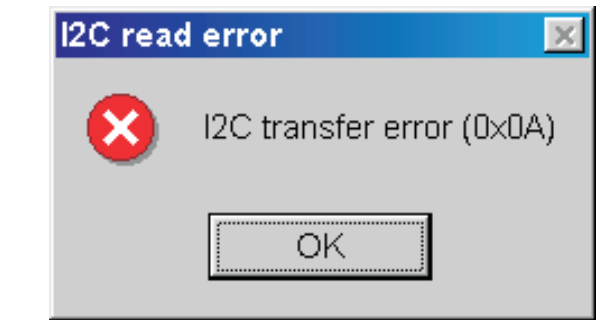


Fig. 22

If you do not disable "Software DDC only", when you execute "read EDID", it will bring up an error message as below.



Hex Data of DDC2B

***** EDID log file (LG tube) *****		Standard Timing Identification #3 Horizontal active pixels : 1024 Aspect Ratio : 4:3 Refresh Rate : 85	
Vendor/Product Identification ID Manufacturer Name : PHL ID Product Code : E014 (HEX.) ID Serial Number : 12345 (DEC.) Week of Manufacture : 35 Year of Manufacture : 2003		Standard Timing Identification #4 Horizontal active pixels : 1280 Aspect Ratio : 5:4 Refresh Rate : 85	
EDID Version, Revision Version : 1 Revision : 3		Standard Timing Identification #5 Horizontal active pixels : 1600 Aspect Ratio : 4:3 Refresh Rate : 75	
Basic Display Parameters/Features Video Input Definition : Analog Video Input 0.700V/0.000V (0.70Vpp) without Blank-to-Black Setup Separate Sync Composite Sync without Sync on Green no Serration required Maximum H Image Size : 31 Maximum V Image Size : 23 Display Transfer Characteristic : 2.87 (gamma) Feature Support (DPMS) : Standby Suspend Active Off Display Type : RGB color display		Standard Timing Identification #6 Horizontal active pixels : 1920 Aspect Ratio : 4:3 Refresh Rate : 60 Detailed Timing #1 Pixel Clock (MHz) : 202.5 H Active (pixels) : 1600 H Blanking (pixels) : 560 V Active (lines) : 1200 V Blanking (lines) : 50 H Sync Offset (F Porch) (pixels): 64 H Sync Pulse Width (pixels): 192 V Sync Offset (F Porch) (lines): 1 V Sync Pulse Width (lines) : 3 H Image Size (mm) : 310 V Image Size (mm) : 230 H Border (pixels) : 0 V Border (lines) : 0 Flags : Non-interlaced : Normal Display, No stereo : Digital Separate sync. : Positive Vertical Sync. : Positive Horizontal Sync.	
Color Characteristics Red X coordinate : 0.625 Red Y coordinate : 0.336 Green X coordinate : 0.29 Green Y coordinate : 0.599 Blue X coordinate : 0.149 Blue Y coordinate : 0.073 White X coordinate : 0.283 White Y coordinate : 0.297		Monitor Descriptor #2 Serial Number : TY 123456 Monitor Descriptor #3 Monitor Name : PHILIPS 107P5	
Established Timings Established Timings I : 720 x 400 @70Hz (IBM,VGA) 720 x 400 @88Hz (IBM,XGA2) 640 x 480 @60Hz (IBM,VGA) 640 x 480 @67Hz (Apple ,Mac II) 640 x 480 @72Hz (VESA) 640 x 480 @75Hz (VESA) 800 x 600 @56Hz (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(Apple,MacII)		Monitor Descriptor #4 Monitor Range Limits Min. Vt rate Hz : 50 Max. Vt rate Hz : 160 Min. Horiz. rate kHz : 30 Max. Horiz. rate kHz : 97 Max. Supported Pixel : 240 No secondary GTF timing formula supported. Extension Flag : 0 Check sum : A3 (HEX.)	
Standard Timing Identification #1 Horizontal active pixels : 640 Aspect Ratio : 4:3 Refresh Rate : 85		***** EDID data (128 bytes LG) ***** 0: 00 1: ff 2: ff 3: ff 4: ff 5: ff 6: ff 7: 00 8: 41 9: 0c 10: 14 11: e0 12: 39 13: 30 14: 00 15: 00 16: 23 17: 0d 18: 01 19: 03 20: 6c 21: 1f 22: 17 23: bb 24: e8 25: 05 26: 78 27: a0 28: 56 29: 4a 30: 99 31: 26 32: 12 33: 48 34: 4c 35: ff 36: ef 37: 80 38: 31 39: 59 40: 45 41: 59 42: 61 43: 59 44: 81 45: 99 46: a9 47: 4f 48: d1 49: 40 50: 01 51: 01 52: 01 53: 01 54: 1a 55: 4f 56: 40 57: 30 58: 62 59: b0 60: 32 61: 40 62: 40 63: c0 64: 13 65: 00 66: 36 67: e6 68: 10 69: 00 70: 00 71: 1e 72: 00 73: 00 74: 00 75: ff 76: 00 77: 54 78: 59 79: 20 80: 31 81: 32 82: 33 83: 34 84: 35 85: 36 86: 0a 87: 20 88: 20 89: 20 90: 00 91: 00 92: 00 93: fc 94: 00 95: 50 96: 48 97: 49 98: 4c 99: 49 100: 50 101: 53 102: 20 103: 31 104: 30 105: 37 106: 50 107: 35 108: 00 109: 00 110: 00 111: fd 112: 00 113: 32 114: a0 115: 1e 116: 61 117: 18 118: 00 119: 0a 120: 20 121: 20 122: 20 123: 20 124: 20 125: 20 126: 00 127: a3	
Standard Timing Identification #2 Horizontal active pixels : 800 Aspect Ratio : 4:3 Refresh Rate : 85			

Hex Data of DDC2B

EDID log file (CPT tube)

Vendor/Product Identification
ID Manufacturer Name : PHL
ID Product Code : E014 (HEX.)
ID Serial Number : 12345 (DEC.)
Week of Manufacture : 35
Year of Manufacture : 2003

EDID Version, Revision
Version : 1
Revision : 3

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

Maximum H Image Size : 31
Maximum V Image Size : 23

Display Transfer Characteristic : 2.86
(gamma)

Feature Support (DPMS): Standby
Suspend
Active Off

Display Type : RGB color display

Color Characteristics
Red X coordinate : 0.631
Red Y coordinate : 0.329
Green X coordinate : 0.276
Green Y coordinate : 0.600
Blue X coordinate : 0.143
Blue Y coordinate : 0.057
White X coordinate : 0.283
White Y coordinate : 0.297

Established Timings
Established Timings I : 720 x 400 @70Hz (IBM,VGA)
720 x 400 @88Hz (IBM,XGA2)
640 x 480 @60Hz (IBM,VGA)
640 x 480 @67Hz (Apple ,Mac II)
640 x 480 @72Hz (VESA)
640 x 480 @75Hz (VESA)
800 x 600 @56Hz (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 (Apple ,Mac II)

Standard Timing Identification #1
Horizontal active pixels : 640
Aspect Ratio : 4:3
Refresh Rate : 85

Standard Timing Identification #2
Horizontal active pixels : 800
Aspect Ratio : 4:3
Refresh Rate : 85

Standard Timing Identification #3
Horizontal active pixels : 1024
Aspect Ratio : 4:3
Refresh Rate : 85

Standard Timing Identification #4
Horizontal active pixels : 1280
Aspect Ratio : 5:4
Refresh Rate : 85

Standard Timing Identification #5
Horizontal active pixels : 1600
Aspect Ratio : 4:3
Refresh Rate : 75

Standard Timing Identification #6
Horizontal active pixels : 1920
Aspect Ratio : 4:3
Refresh Rate : 60

Detailed Timing #1
Pixel Clock (MHz) : 202.5
H Active (pixels) : 1600
H Blanking (pixels) : 560
V Active (lines) : 1200
V Blanking (lines) : 50
H Sync Offset (F Porch) (pixels): 64
H Sync Pulse Width (pixels) : 192
V Sync Offset (F Porch) (lines) : 1
V Sync Pulse Width (lines) : 3
H Image Size (mm) : 310
V Image Size (mm) : 230
H Border (pixels) : 0
V Border (lines) : 0
Flags : Non-interlaced
: Normal Display, No stereo
: Digital Separate sync.
: Positive Vertical Sync.
: Positive Horizontal Sync.

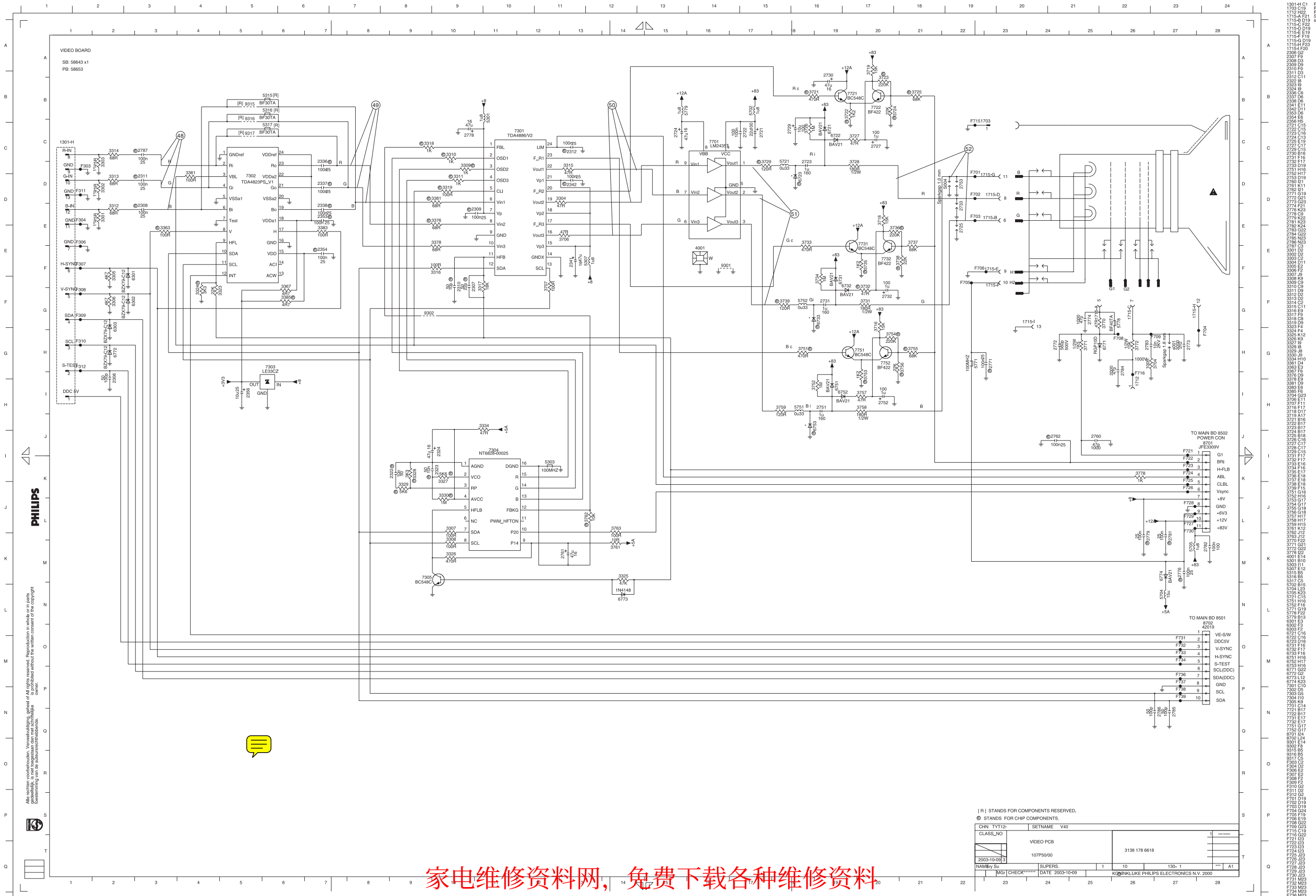
Monitor Descriptor #2
Serial Number : TY 123456
Monitor Descriptor #3
Monitor Name : PHILIPS 107P5
Monitor Descriptor #4
Monitor Range Limits
Min. Vt rate Hz : 50
Max. Vt rate Hz : 160
Min. Horiz. rate kHz : 30
Max. Horiz. rate kHz : 97
Max. Supported Pixel : 240
No secondary GTF timing formula supported.

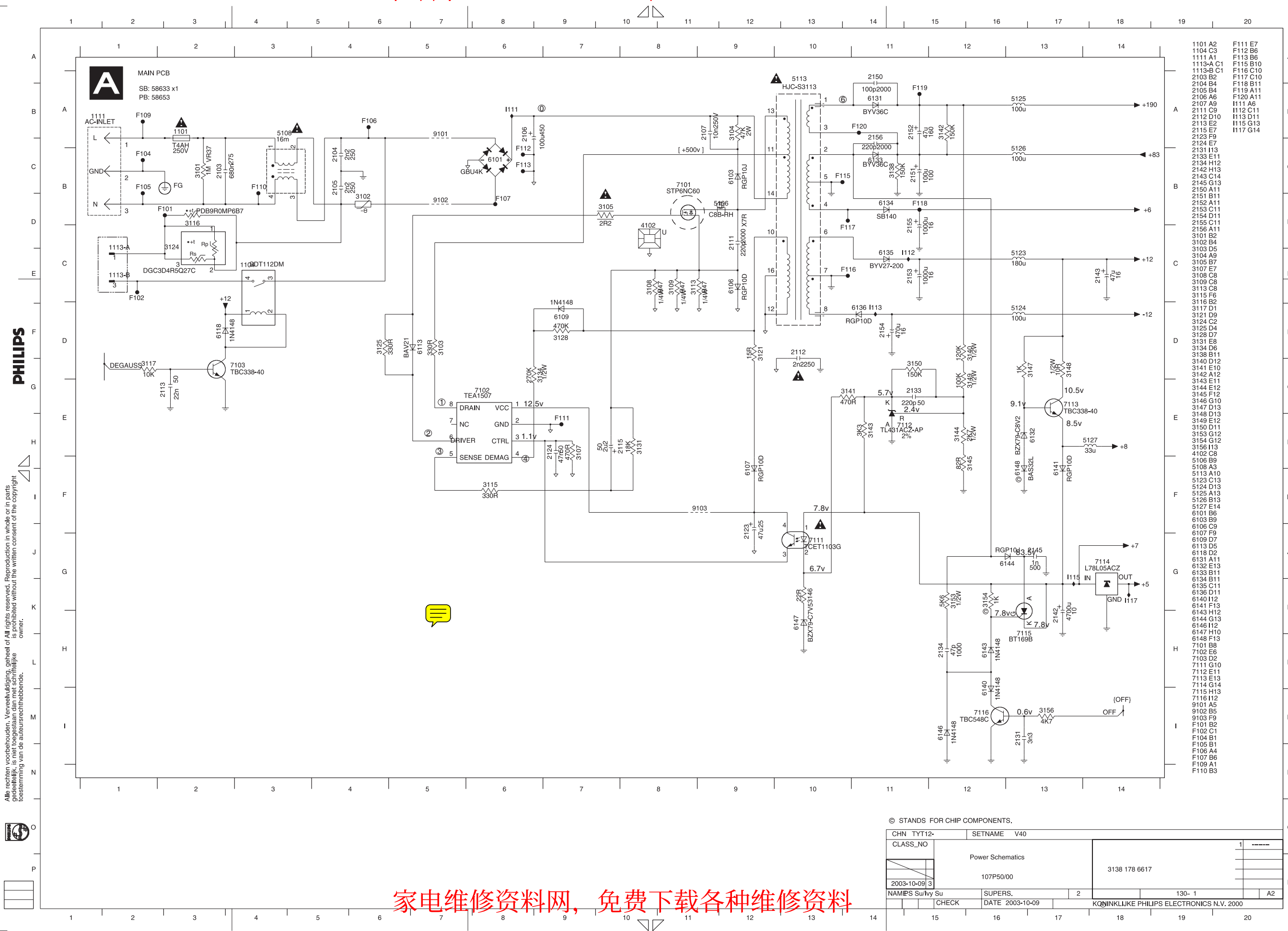
Extension Flag : 0
Check sum : E6 (HEX.)

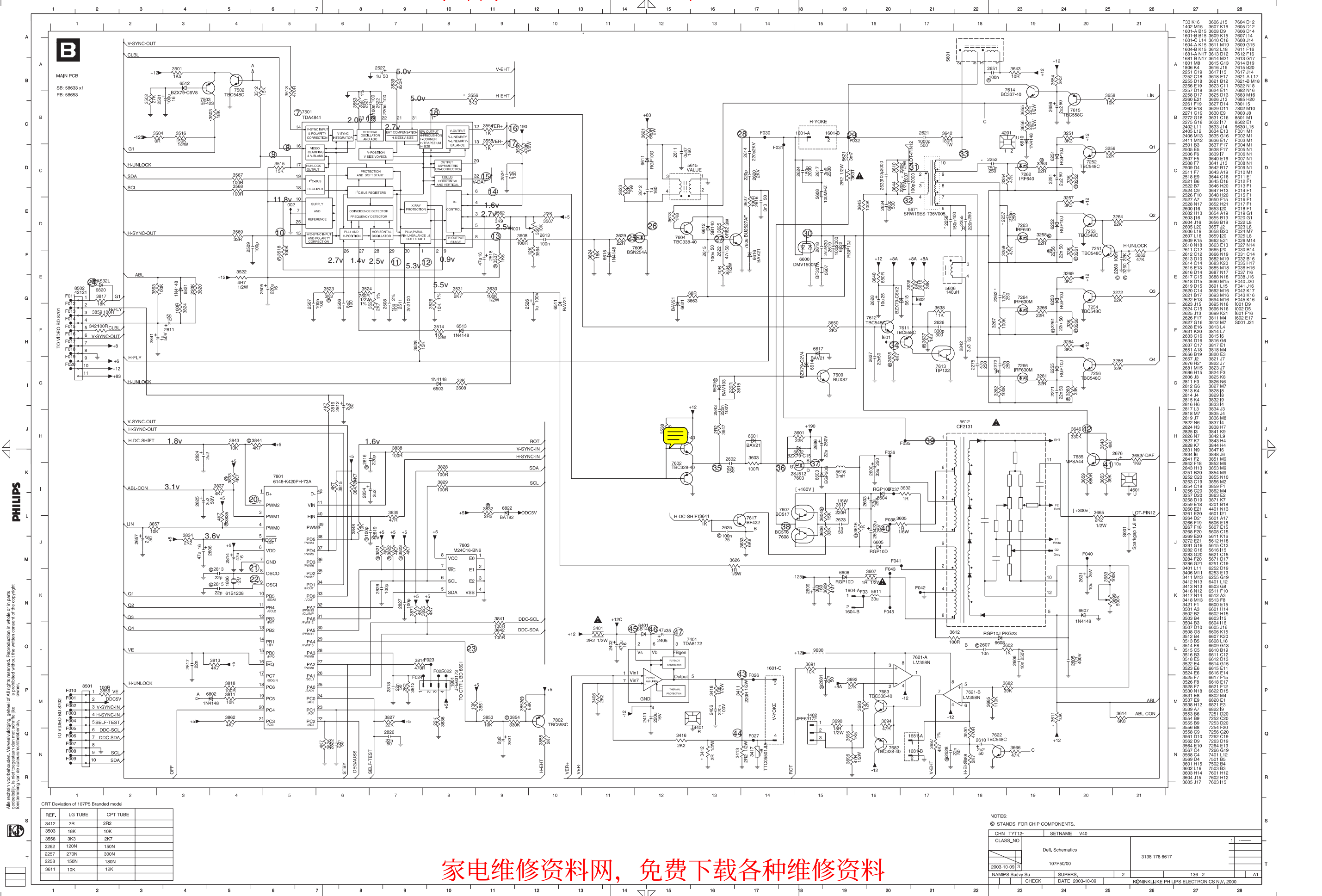
EDID data (128 bytes CPT)

0: 00 1: ff 2: ff 3: ff 4: ff 5: ff 6: ff 7: 00
8: 41 9: 0c 10: 14 11: e0 12: 39 13: 30 14: 00 15: 00
16: 23 17: 0d 18: 01 19: 03 20: 6c 21: 1f 22: 17 23: ba
24: e8 25: 9e 26: a8 27: a1 28: 54 29: 46 30: 99 31: 24
32: 0e 33: 48 34: 4c 35: ff 36: ef 37: 80 38: 31 39: 59
40: 45 41: 59 42: 61 43: 59 44: 81 45: 99 46: a9 47: 4f
48: d1 49: 40 50: 01 51: 01 52: 01 53: 01 54: 1a 55: 4f
56: 40 57: 30 58: 62 59: b0 60: 32 61: 40 62: 40 63: c0
64: 13 65: 00 66: 36 67: e6 68: 10 69: 00 70: 00 71: 1e
72: 00 73: 00 74: 00 75: ff 76: 00 77: 54 78: 59 79: 20
80: 31 81: 32 82: 33 83: 34 84: 35 85: 36 86: 0a 87: 20
88: 20 89: 20 90: 00 91: 00 92: 00 93: fc 94: 00 95: 50
96: 48 97: 49 98: 4c 99: 49 100: 50 101: 53 102: 20 103: 31
104: 30 105: 37 106: 50 107: 35 108: 00 109: 00 110: 00 111: fd
112: 00 113: 32 114: a0 115: 1e 116: 61 117: 18 118: 00 119: 0a
120: 20 121: 20 122: 20 123: 20 124: 20 125: 20 126: 00 127: e6

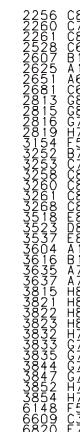




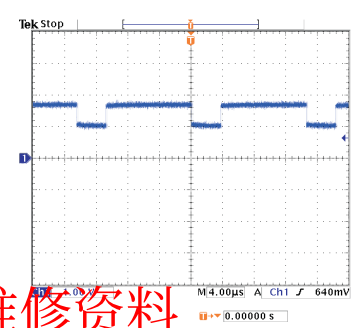
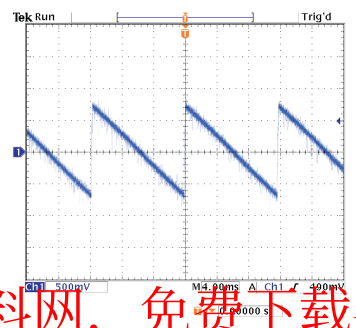
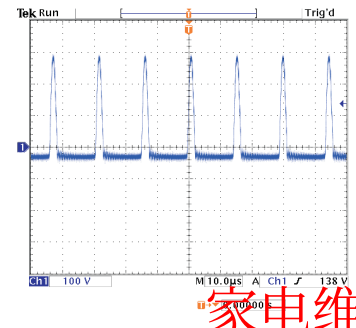
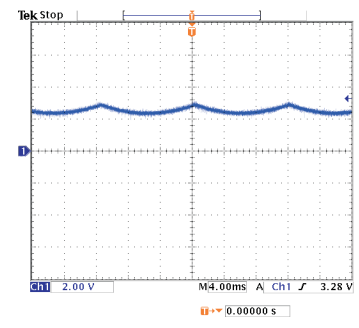
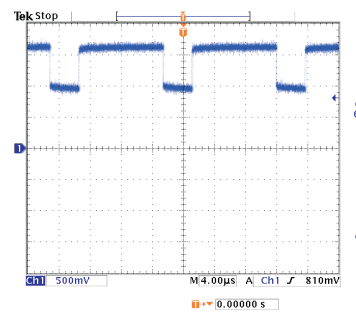
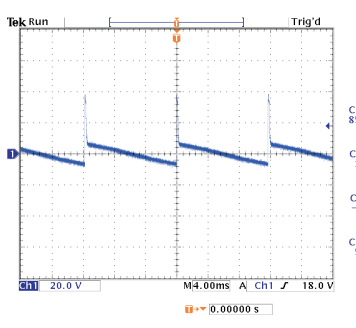
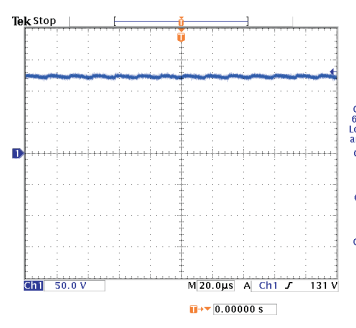
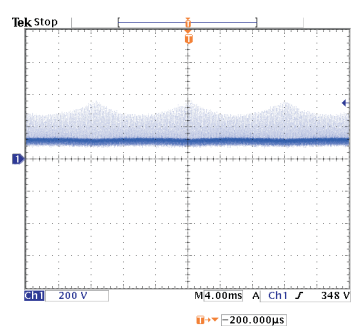
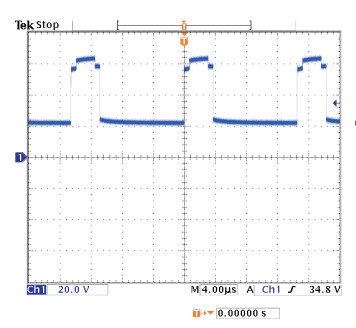
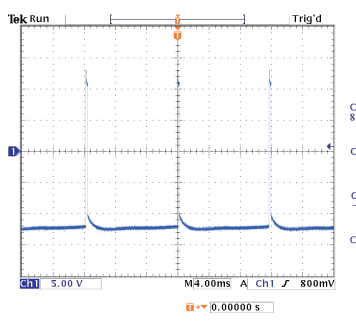
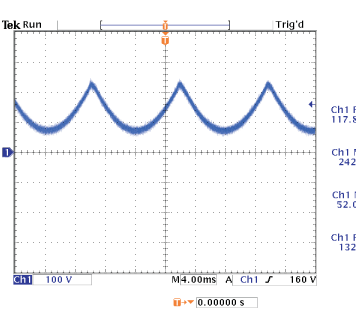
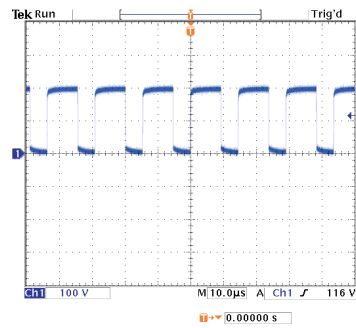
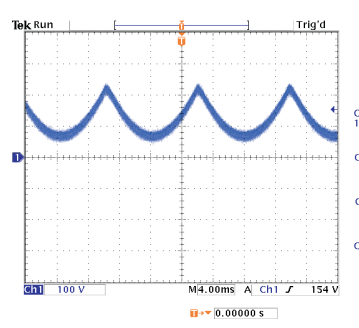
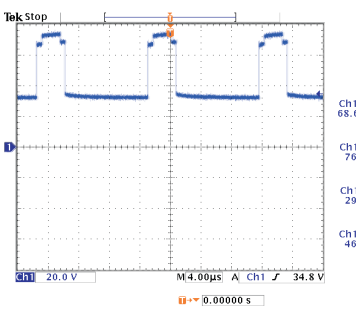
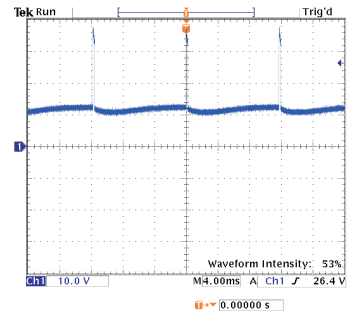
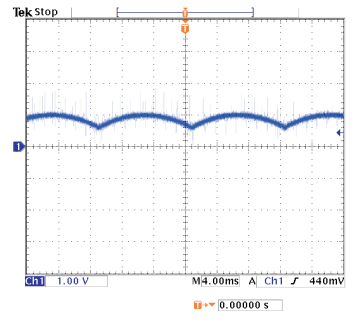
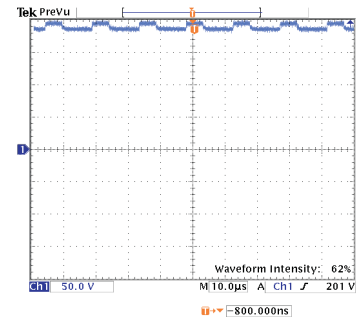
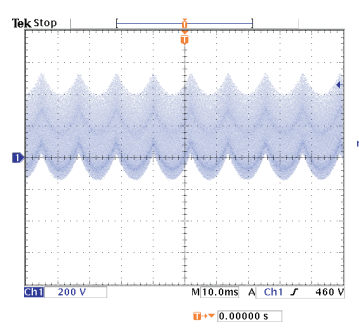
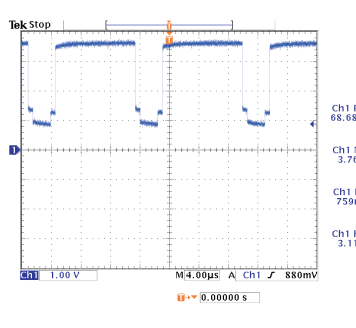
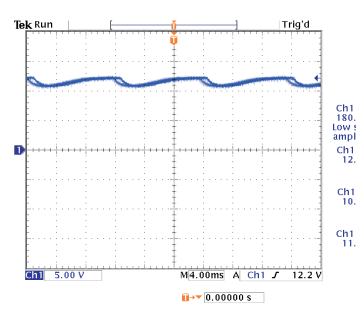
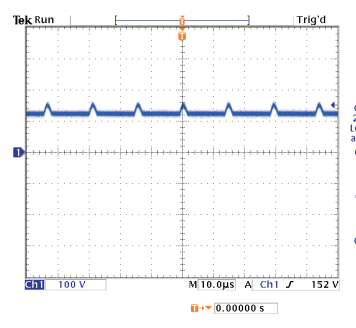
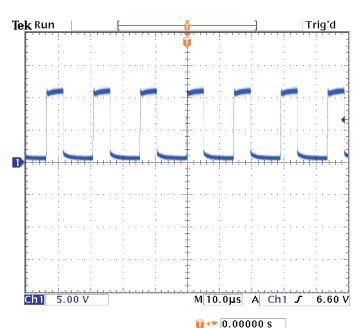
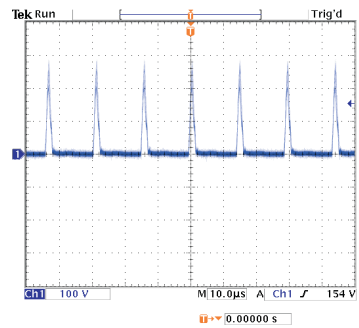


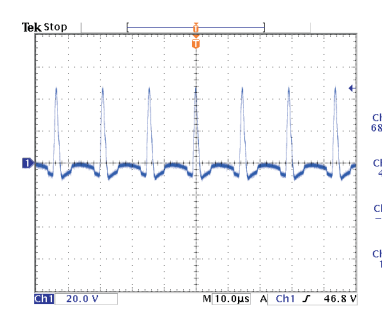
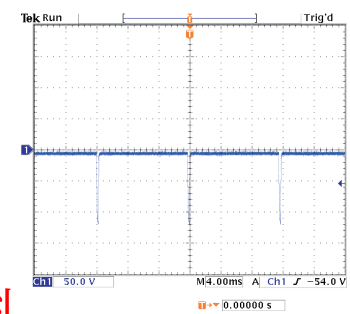
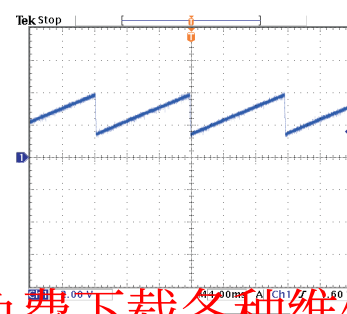
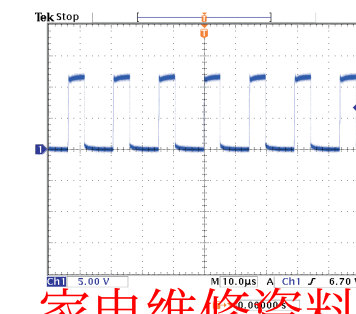
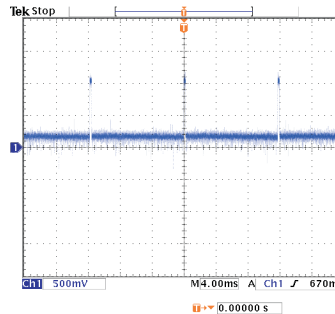
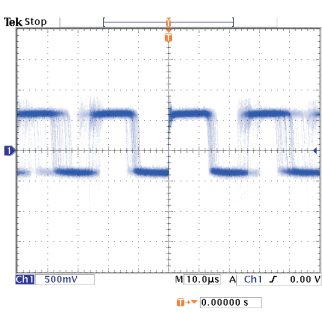
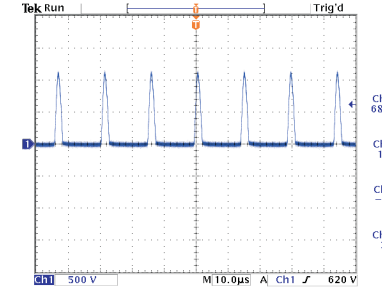
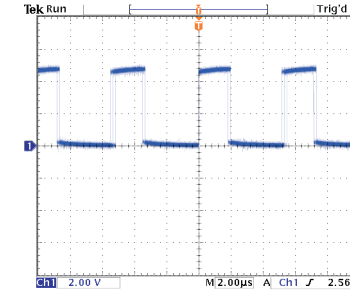
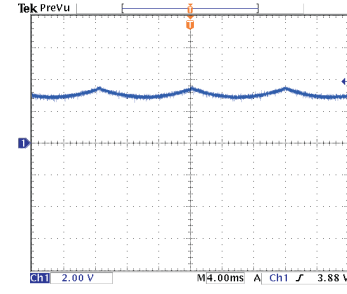
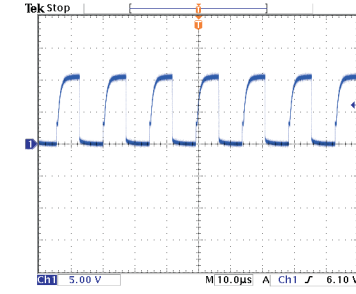
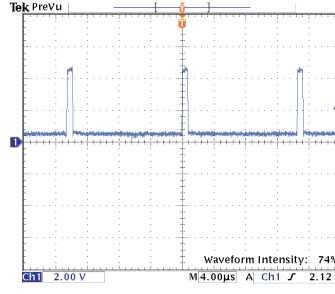
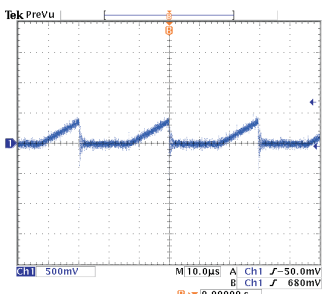
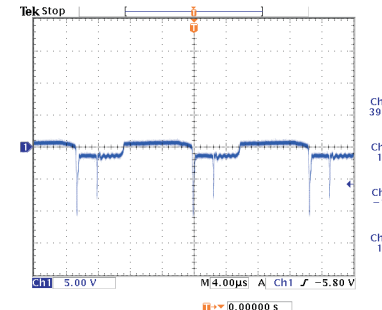
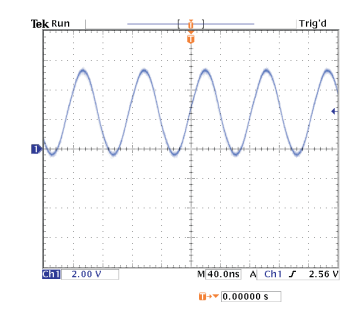
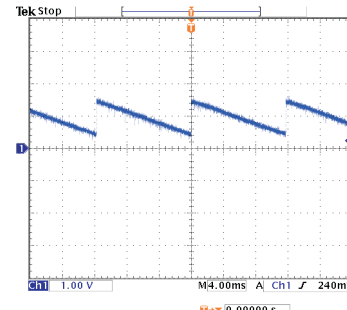
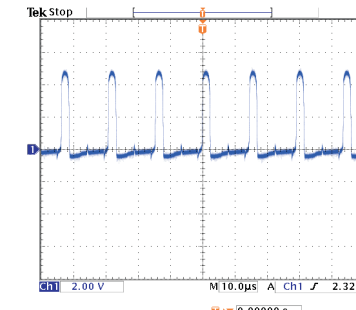
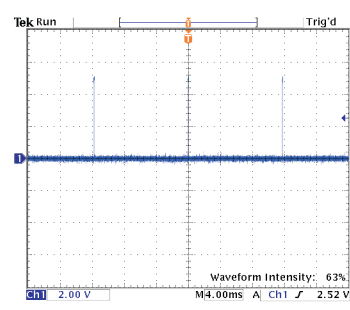
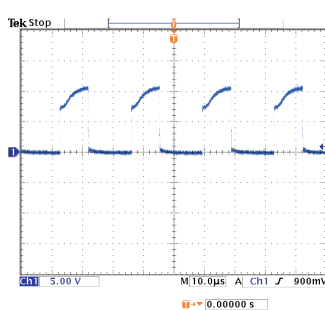
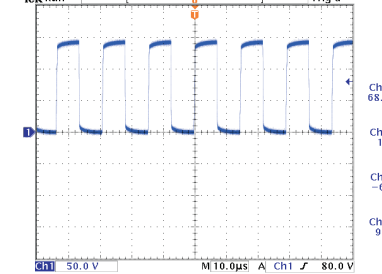
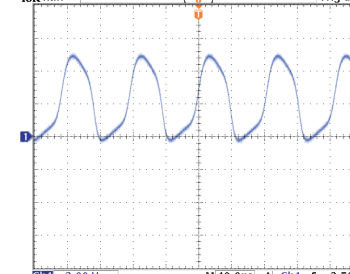
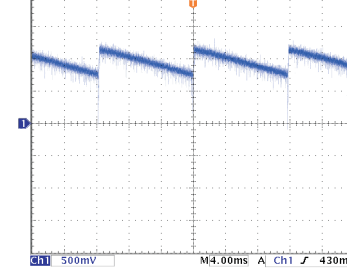
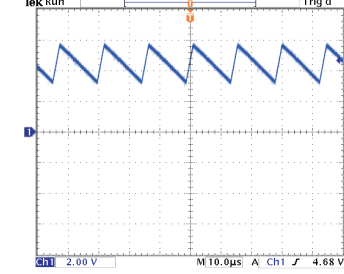
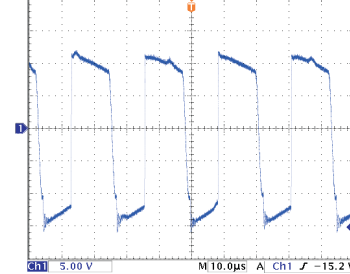
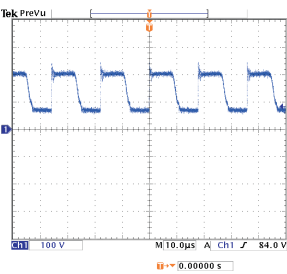
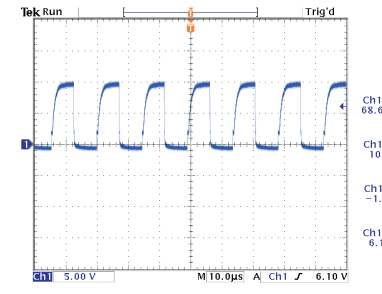
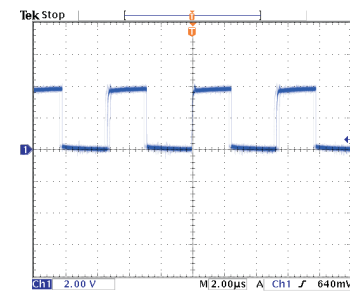
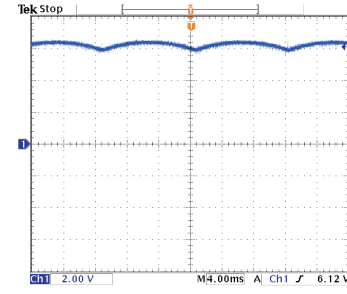
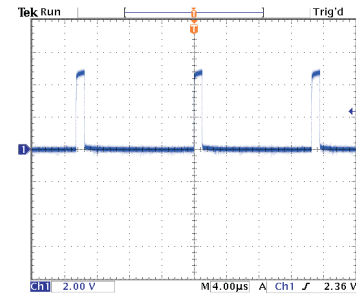
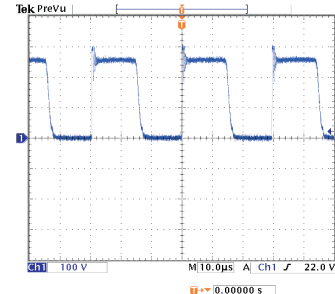
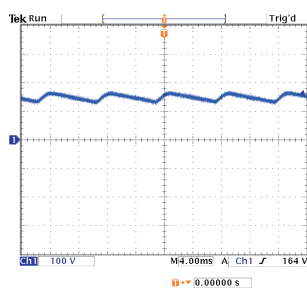


CN: TYT12-3906				V40 LXH			
CLASS NO. 3XX000		Pwr+Defl PCB		3138 103 5863 3 2003-10-13 2 2003-08-20 1 2003-06-13			
1		V40 LXH CRT MTR					
2							
3							
2003-06-13							
FORM PS SUPPLY VOLT SUP				2		10 132 - 1 A3	
CHECK		DATE 2003-06-13		© Philips Electronics N.V.			



CN: TYT12-3906				V40 LXH			
CLASS NO. 3XX000		Pwr+Defl PCB		3138 103 5863		3	2003-10-13
		V40 LXH CRT MTR				2	2003-08-20
						1	2003-06-13
2003-06-13-3							
NAME (as Supplied)				2	10	132 - 2	A3
CHECK		DATE 2003-06-13		© Philips Electronics N.V.			



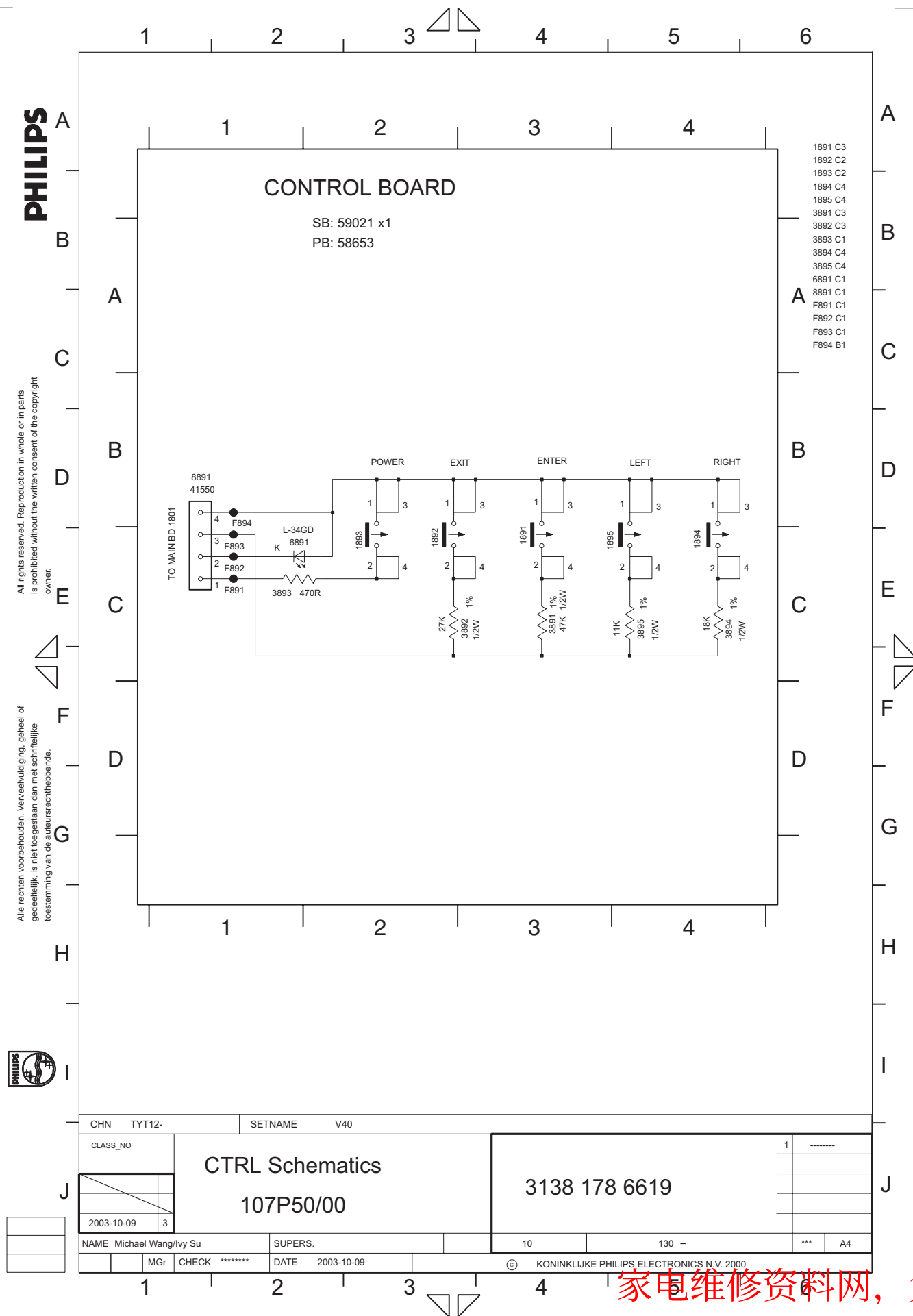


Schematic Diagram Of Control Panel

<http://jdwxzlw.5d6d.com/?fromuser=华盛维修>

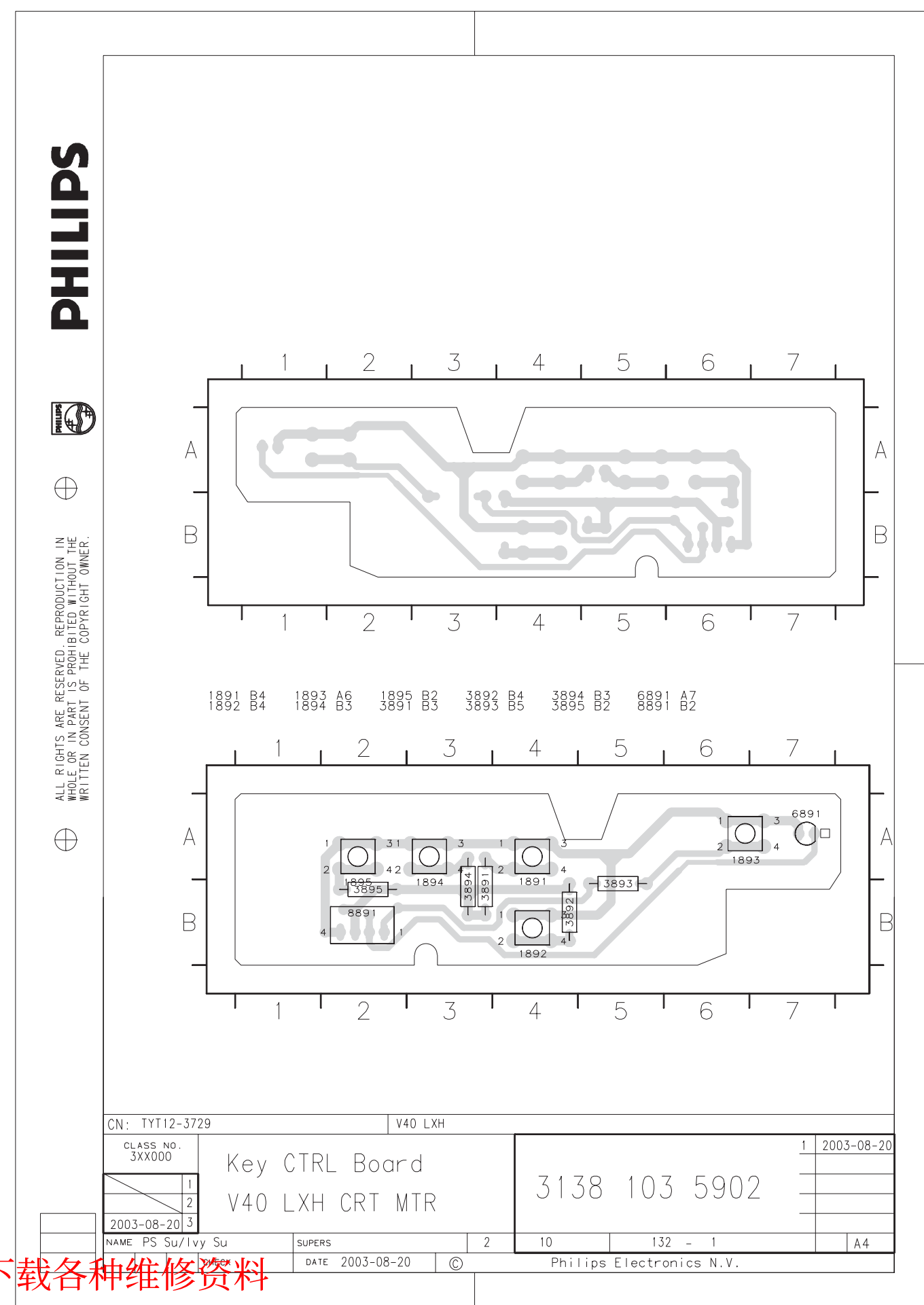
C.B.A. Of Control Panel

Go to cover page



PHILIPS ELECTRONICS N.V. 2000

家电维修资料网, 免费下载各种维修资料



A. Power Supply Failure

1. Sympton :
no startup sound
LED light off

check 7102 pin8
 $100V < \text{pin8} < 380V$

NO

check
1102/6101/
7101/2105

check 7102
pin1 > 2V

NO

replace 7102

check 7102
pin 5=2.4V

Ok

check 7102
pin6 output ?

Ok

check
3113/
3104/7101

NO

check
pin6>8V

check
6105

replace 7102

2. Sympton :
hicup mode with
startup sound or
blinking LED

Turn power off
check the resistance for
all output voltages+190,
83,12,-12,+6.0,+5,
check 6151~6158 short?

check 7102
pin 1 < 13.5V

No

OVP possibly active
check 6105

Ok

replace 5113

check 7102
pin 5

No

OCP possibly active
check 3109,3108,6106
3115,

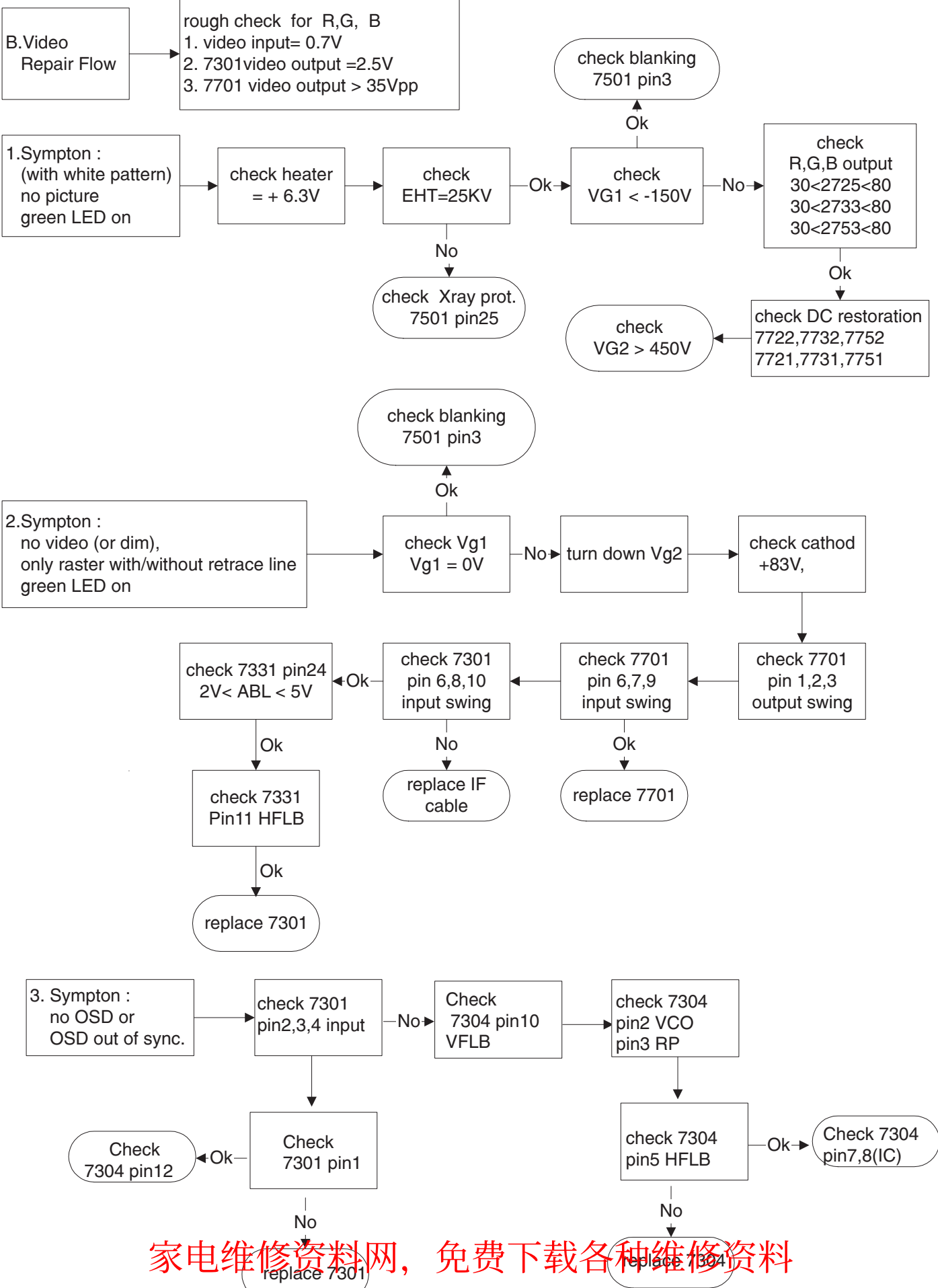
replace 5113

OK

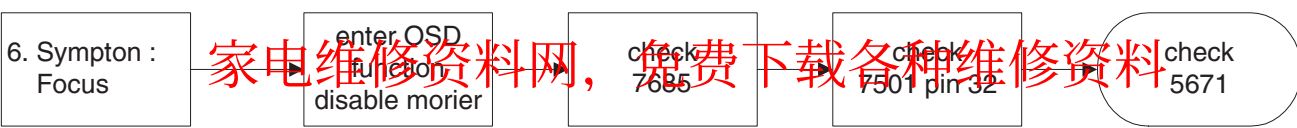
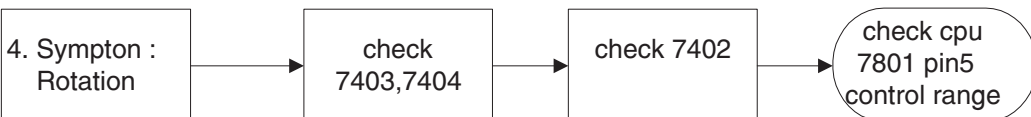
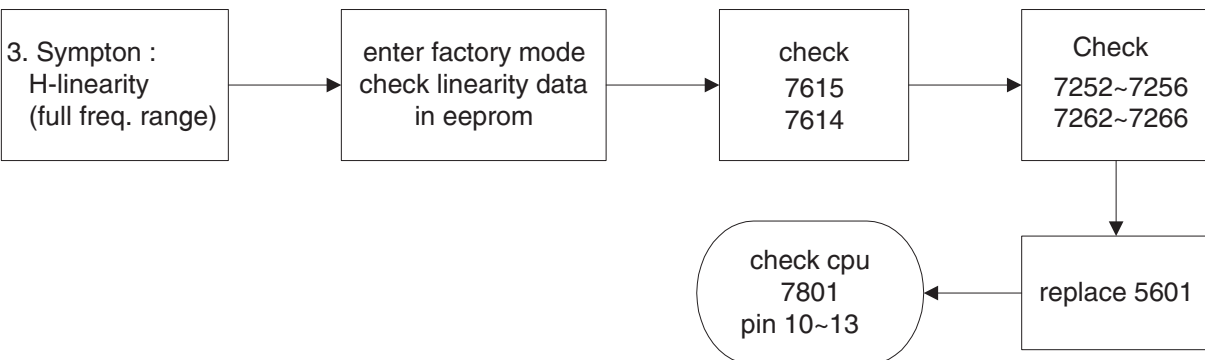
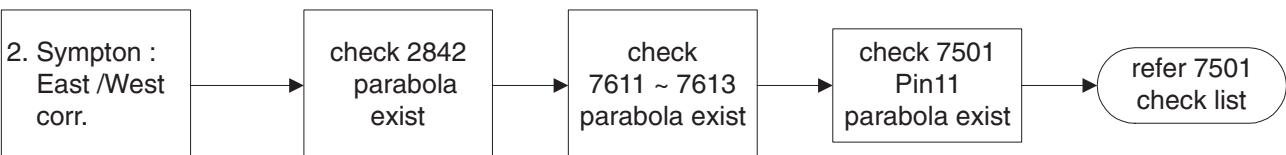
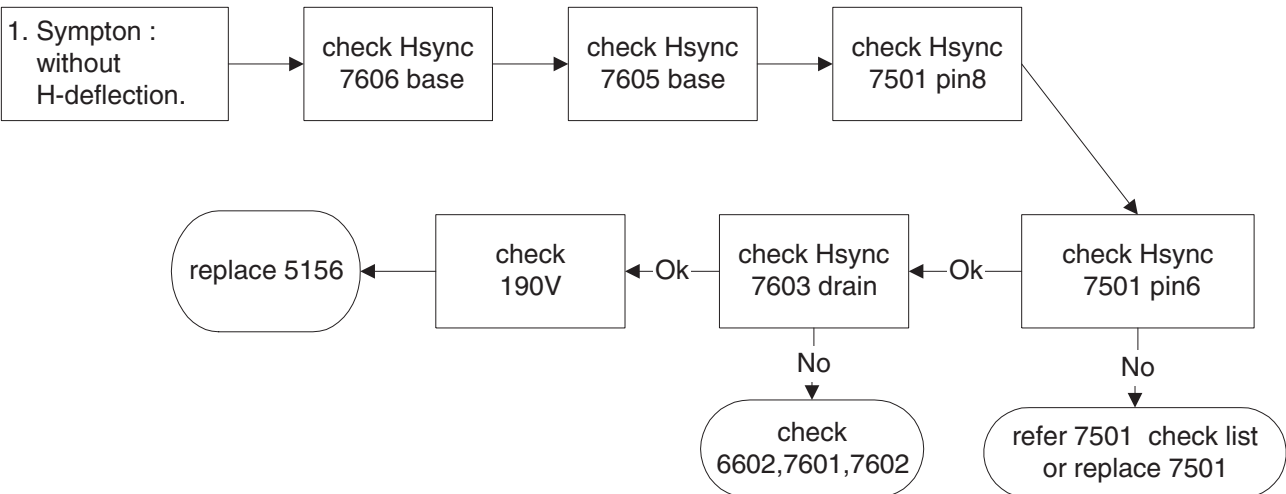
7102 pin4 DEMAG
possibly active
short 7154 pinC

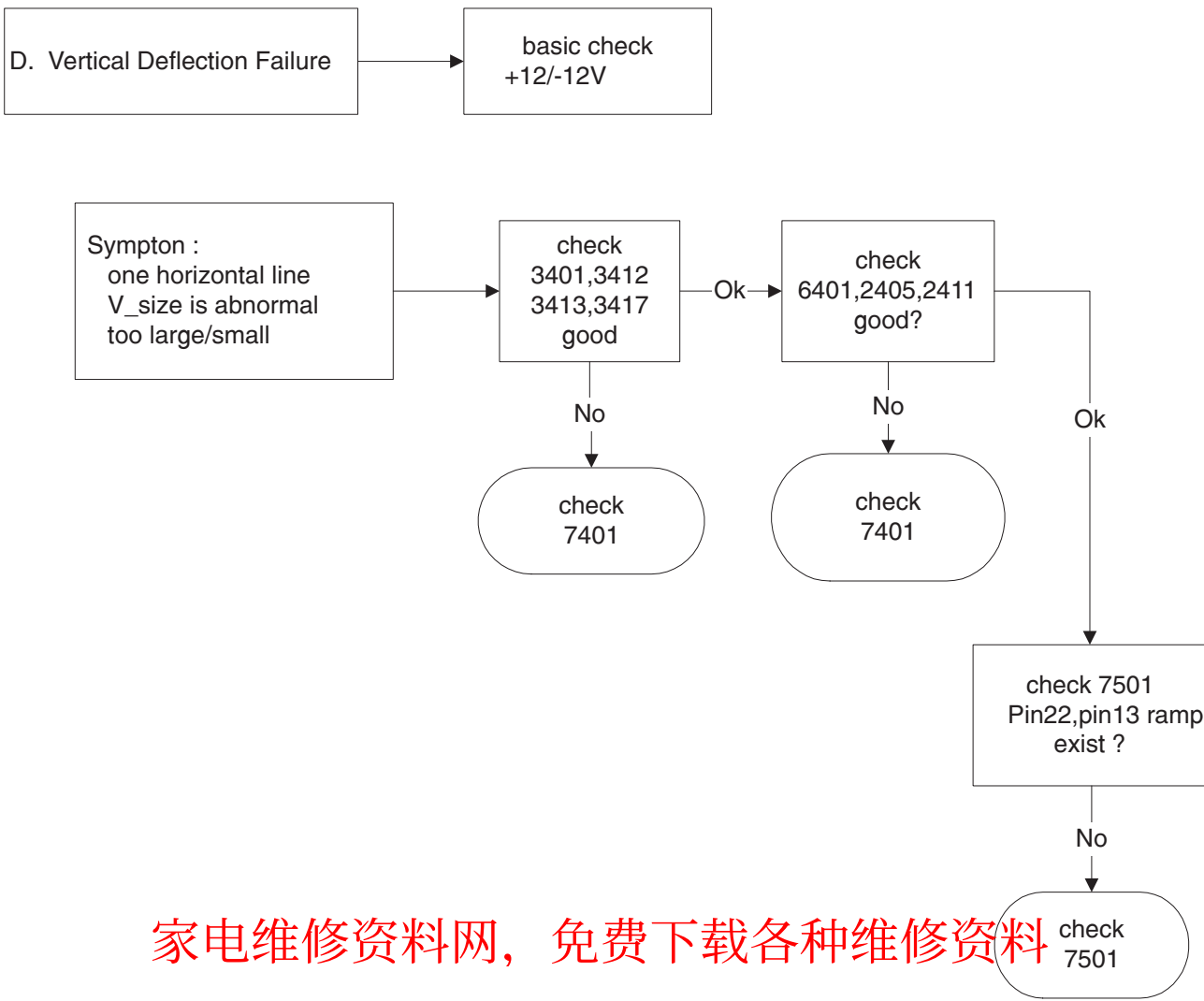
Ok

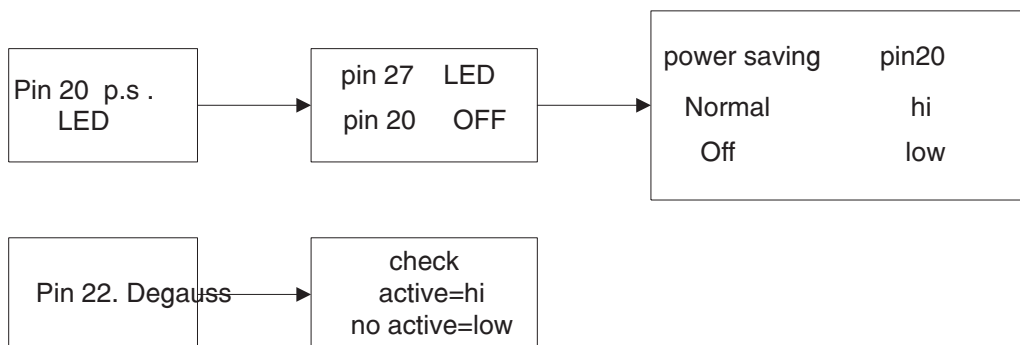
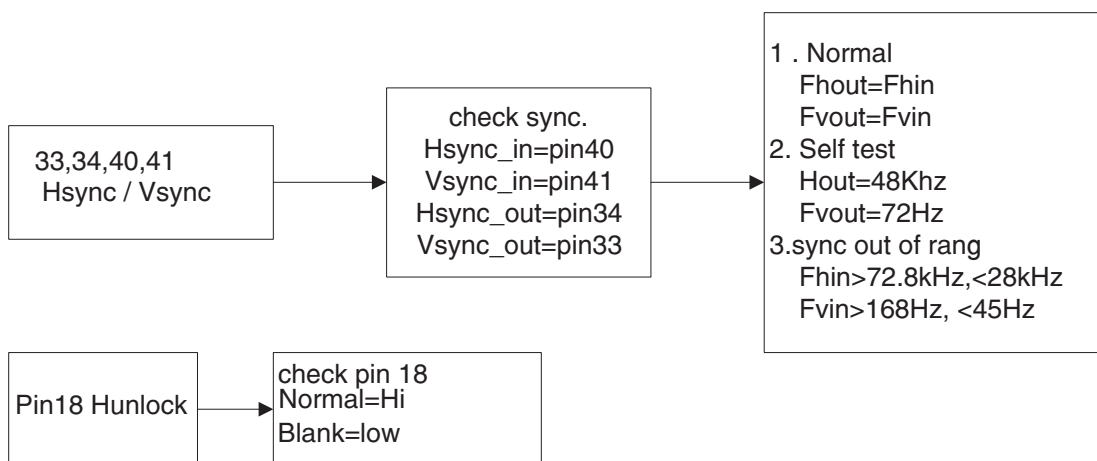
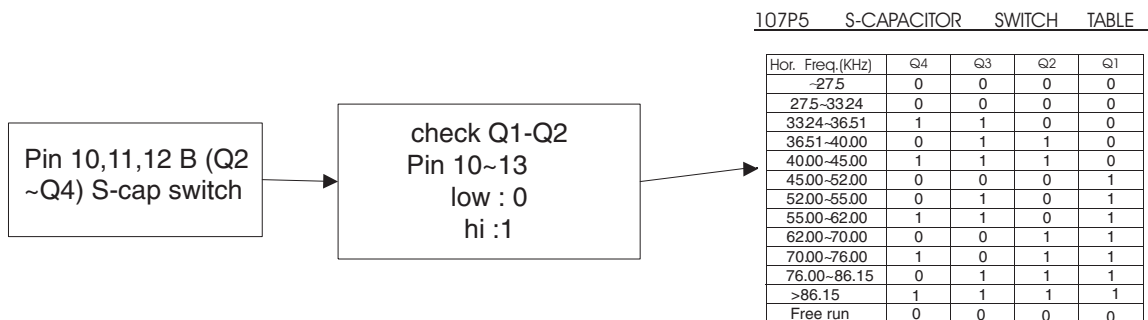
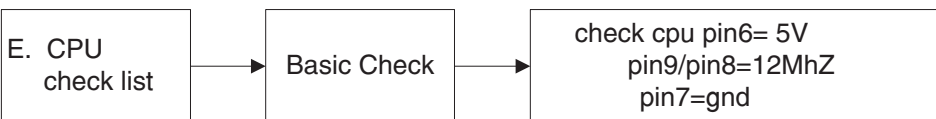
check CPU pin 22



C. Horizontal deflection
output repair flow :







Pin38 Rotation

check
output from 0V to 5V

pin3 ABL-CON

check
output from 0V to 5V

Pin23. Keypad

check key Power, Ok, LF,

check 3836
3891~3894

Pin24. Selftest

check pin24

- 1.no H/V sync & IF cable pin5 floating - show msg.
- 2.H/V sync exist & IF cable pin5 to ground - normal
- 3.H/V sync non-exist & IF cable pin5 to gnd -power saving
- 4.After 1892&1893 pressed on, then power on (1895) with IFcable pin5 =L -factory mode
- 5.After 1892&1893 pressed on, then power on (1895) without IFcable pin5=H -burn in mode

Pin25,26. DDC bus

check idle status
sda=pin25=hi
scl=pin26=hi

Pin31,32. IIC bus

check idle status
sda=pin32=hi
scl=pin31=hi

check

7803	M24C16
7501	TDA4841A
7304	NT60875K
7301	TDA4886A
7302	TDA4823

PIN30, VCLK
EEPROMcheck 7803 pin 7
Low : write enable
Hi : write disable

PIN41 1-linearly

check
output from 0V to 5V

F. TDA9112A
Check List

Vcc=pin9=12V
gnd =pin7=pin25=0V

PIN12. HFLB
(from H.defl)

Check pin 12
pulse

Check 6806

PIN2. Xray
(from LOT)

if active

pin3 = Vblk = floating
Pin5 = Hpl12 = 0V
pin6 = HDRV = floating
pin8 = BDRV = flaoating
pin12 = Vout1 = floating
pin13 = Vout2 = floating
pin16 = CLBL= Hi

Pin8. HDRV

to H_deflection.
7605 base

Pin11.EWDRV

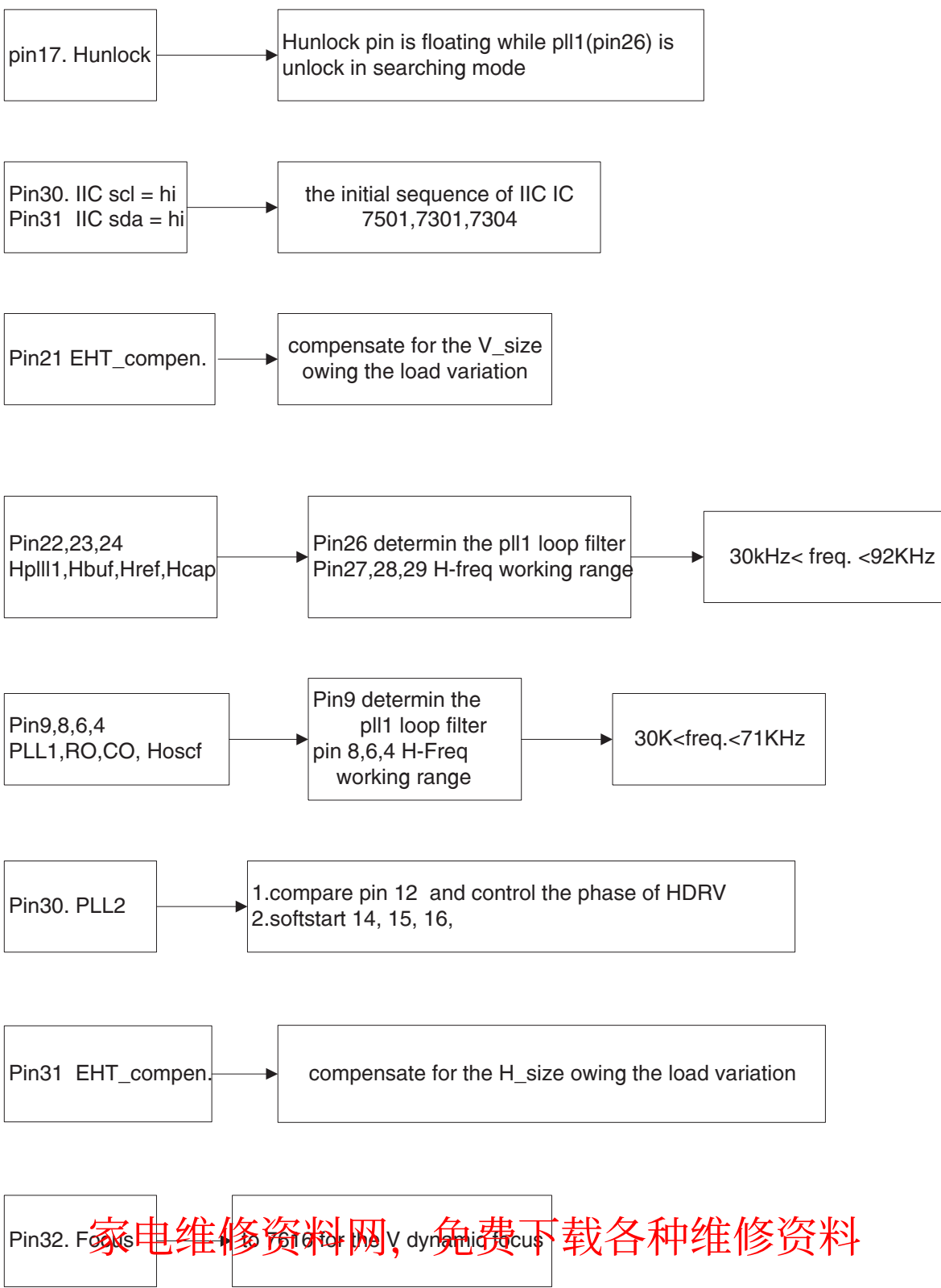
to H_deflection
east/west control
7612 base

pin12,13 Vout1/Vout2

differential input
to 7401 pin 1, 7

Pin14,15
Vsync,Hsync

the input sync from
cpu pin 33,34



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)

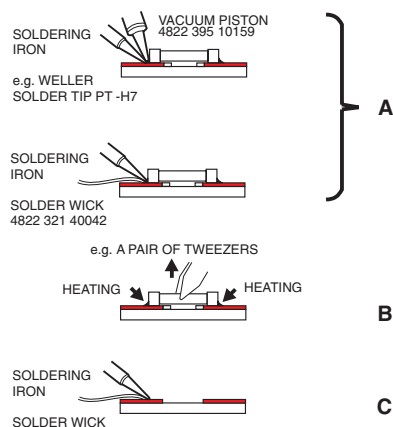
1.1 General cautions on handling and storage

- 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

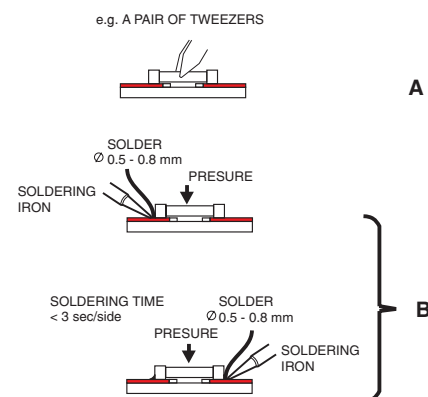
preferably be equipped with a thermal control (soldering temperature: 225 to 250 °C).

- 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).

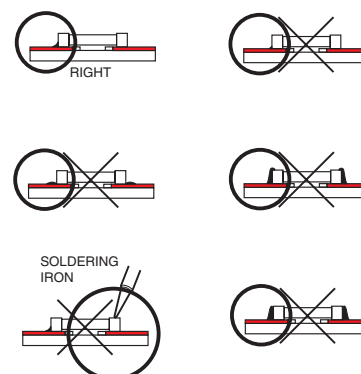
Fig. 2 MOUNTING



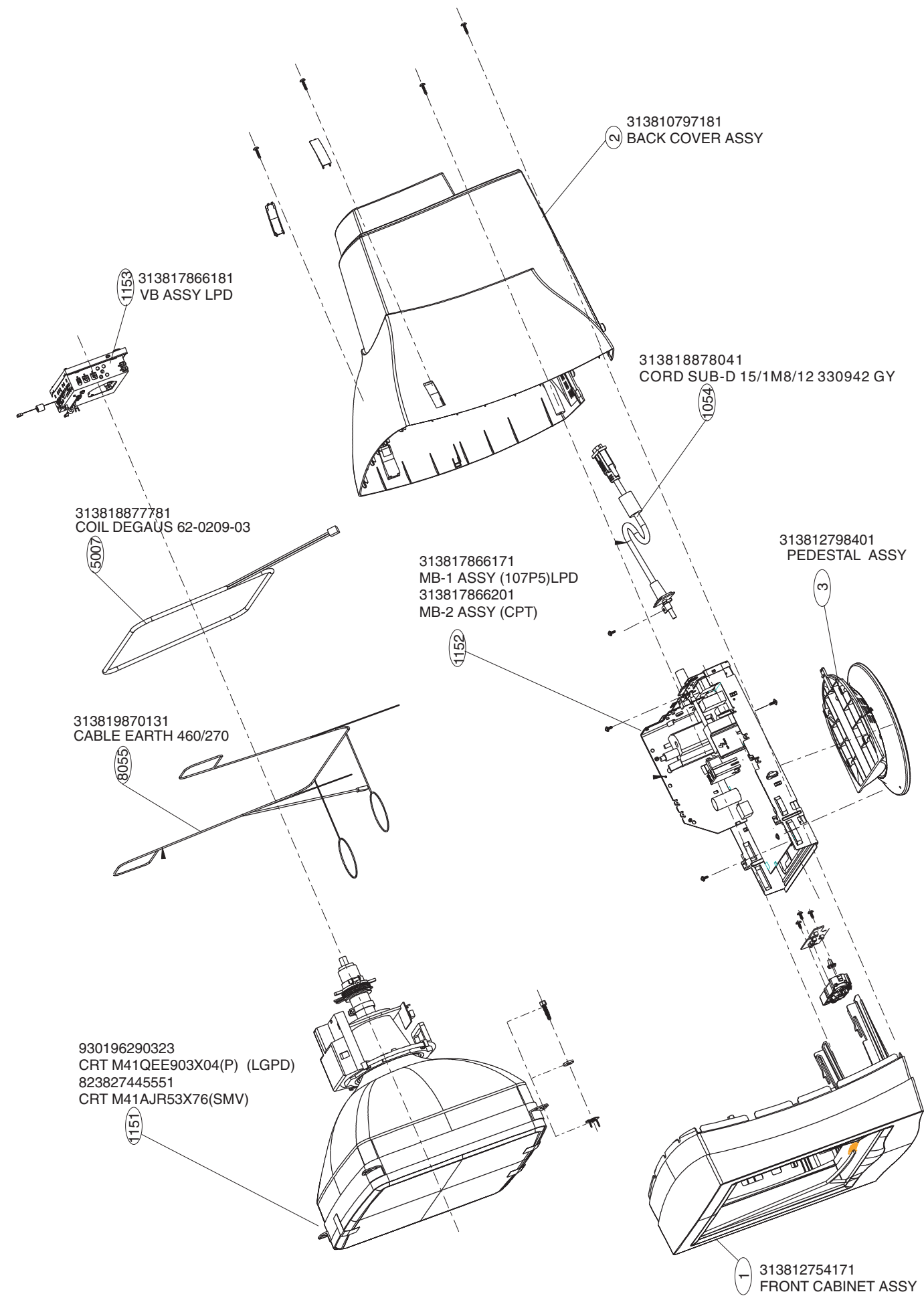
2. Caution when attaching SMDs

- 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



Exploded view



Recommended Parts List

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Model : V40 107P5/00

0001	313812754171	FRONT CABINET ASSY
0002	313810797181	BACK COVER ASSY
0003	313810798401	PEDESTAL ASSY
0022	313812754191	BOTTOM PLATE ASSY
0041	313810461201	FRONT CABINET
0043	313812754181	KNOB ASSY
0044	313810448612	BASE(CHEIL HR-1360)
0048	313810461211	LENS-POWER
0049	313810461221	FUNCTION BUTTOM
0051	313810449601	SCREW COVER
0053	313810448602	SWIVEL(CHEIL HR-1360)
0450	313810662551	CARTON
0451	313810662631	CUSHION - TOP
0453	313810662641	CUSHION - BTM
0454	313810656651	PE BAG
0601	313811705613	E-D.F.U. ASSY
0615	313811705801	HEX CODE OF F/W (NO MATL REQ)
1151	930196290323	CRT M41QEE903X04(P) (LGPD)
1151	823827445551	CRT M41AJR53X76(SMV)
1152	313817866171	MB-1 ASSY(107P5) LPD
1152	313817866201	MB-2 (CPT)107P5
1153	313817866181	VB-1 ASSY(107P5-LPD)
1154	313817866191	C/B ASSY(107P5)
5007	313818877781	COIL DEGAUS 62-0209-03 A
5601	313816878191	LINEARITY COIL
5612	313818878021	TFM LOT LAYER 11MM WIRE
6101	932205814682	BRIDGE GBU4K (VISH)
7101	932215891687	FET POW STP6NC60 (ST00)
7102	935267356112	IC TEA1507P/N1 (PHSE)
7103	933953420676	TRA SIG TBC338-40 (TOSJ)
7111	932214014667	OPT CP TCET1103(G) (VISH)
7112	932208697676	IC TL431ACZ S (ST00)
7113	933953420676	TRA SIG TBC338-40 (TOSJ)
7114	932208234676	IC L78L05ACZ (ST00)
7115	933826850126	THYRIS BT169B (PHSE)
7116	932209011673	TRA SIG BC548C (KEC0)
7266	932217995687	FET POW IRF630B (FSC0)
7301	935266857112	IC TDA4886/V2 (PHSE)
7303	932210611676	IC LE33CZ (ST00)
7304	932218565682	IC NT68275-00031 (NOVA)
7305	932209011673	TRA SIG BC548C (KEC0)
7401	933922940682	IC TDA8172 (ST00)
7501	935267455112	IC TDA4841PS/V3 (PHSE)
7502	932209011673	TRA SIG BC548C (KEC0)
7503	932214472676	TRA SIG BF423 (KEC0)
7601	933953420676	TRA SIG TBC338-40 (TOSJ)
7603	932214679682	FET POW 2SJ512 (TOSJ)
7604	933953420676	TRA SIG TBC338-40 (TOSJ)
7605	934003960126	FET SIG BSN254A (PHSE)
7606	934026300127	TRA POW BU2527AF (PHSE)
7607	933567130126	TRA SIG BC517 (PHSE)
7608	933567120126	TRA SIG BC516 (PHSE)
7609	932206519687	TRA POW BUX87 (ST00)
7611	932210142676	TRA SIG BC558C (KEC0)
7613	931101033687	TRA POW TIP122 (ONSE)
7614	932216831676	TRA SIG BC337-40 (KEC0)

7615	932210142676	TRA SIG BC558C (KEC0)
7617	932214469676	TRA SIG BF422 (KEC0)
7621	933984890682	IC LM358N (ST00)
7622	932209011673	TRA SIG BC548C (KEC0)
7682	933953410676	TRA SIG TBC328-40 (TOSJ)
7685	934025870126	TRA SIG MPSA44 (PHSE)
7701	932214602667	IC LM2435T (NSC0)
7751	932209011673	TRA SIG BC548C (KEC0)
7752	932214469676	TRA SIG BF422 (KEC0)
7801	823827445281	CPU IC 6148-K420PH-77A
7802	932210142676	TRA SIG BC558C (KEC0)
7803	932212662682	IC M24C16-BN6 (ST00)

Spare Parts List

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Model : 107P50/00 8639 000 13853			2153	202203100149	ELCAP KM 16V S 1000U PM20	2818	202055290834	CER2 DC F 50V S 22N P8020
Mechanical			2154	203803527205	ELCAP KM 16V S 470U PM20	2819	223886115101	CER1 0805 NP0 50V 100P PM5
0001	313812754171	FRONT CABINET ASSY	2155	202203100149	ELCAP KM 16V S 1000U PM20	2822	202055290834	CER2 DC F 50V S 22N P8020
0002	313810797181	BACK COVER ASSY	2156	225260214216	CER2 DC X7R 2KV S 220P PM10	2824	202202000805	ELCAP GS 50V S 2U2 PM20
0003	313810798401	PEDESTAL ASSY	2251	202203100147	ELCAP KM 50V S 2U2 PM20	2825	202202000805	ELCAP GS 50V S 2U2 PM20
0022	313812754191	BOTTOM PLATE ASSY	2252	203830100221	CAP MPP MPS 250V S 750N PM5	2826	202055290834	CER2 DC F 50V S 22N P8020
0041	313810461201	FRONT CABINET	2256	223858015641	CER2 0805 X7R 50V 22N PM10	2827	202055290794	CER2 DC B 50V S 100P PM10
0043	313812754181	KNOB ASSY	2257	203830100225	CAP MPP MPS 250V S 270N PM5	2828	202055290794	CER2 DC B 50V S 100P PM10
0044	313810448612	BASE(CHEIL HR-1360)	2257	203830100218	CAP MPP MPS 250V S 300N PM5	2831	202202000805	ELCAP GS 50V S 2U2 PM20
0048	313810461211	LENS-POWER	2258	203830100419	CAP MPP MPSA 400V S 150N PM5	2834	202202000805	ELCAP GS 50V S 2U2 PM20
0049	313810461221	FUNCTION BUTTOM	2258	203830100421	CAP MPP MPSA 400V S 180N PM5	2841	202202000836	ELCAP GS 50V S 1U PM20
0051	313810449601	SCREW COVER	2260	223891015649	CER2 0805 X7R 25V 100N PM10	2842	203803523601	ELCAP BP BP 63V S 3U3 PM10
0053	313810448602	SWIVEL(CHEIL HR-1360)	2261	223858015641	CER2 0805 X7R 50V 22N PM10	2843	203830250125	CAP MPOL 100V S 220N PM10
0057	313810440571	HOUSING COVER	2262	203830100307	CAP MPP MPS 250V S 120N PM5			
0060	313810449481	FOOT RUBBER	2262	203830100223	CAP MPP MPS 250V S 150N PM5			
Various			2271	202055290834	CER2 DC F 50V S 22N P8020	3101	232224213105	RST MGL VR37 A 1M PM5
0450	313810662551	CARTON	2275	203830100183	CAP PP PPN 250V S 47N PM5	3102	213866000027	NTC DC SCK-104 S 10R PM15
0451	313810662631	CUSHION - TOP	2402	203803521218	ELCAP GS 16V S 470U PM20	3103	213810113331	RST CRB CFR-12 A 330R PM5
0453	313810662641	CUSHION - BTM	2405	203803521404	ELCAP GS 35V S 47U PM20	3104	313810050511	MET FLM RST RSS2T 47K 6E
0454	313810656651	PE BAG	2406	203830250125	CAP MPOL 100V S 220N PM10	3105	212020200002	RST FUSE RFS1/2 A 2R2 PM5
Accessories			2411	203803521209	ELCAP GS 16V S 220U PM20	3107	213810113471	RST CRB CFR-12 A 470R PM5
0601	313811705613	E-D.F.U. ASSY	2501	203803521207	ELCAP GS 16V S 100U PM20	3108	213811273477	RST CRB CFR-25 A 0R47 PM5
1053	313816874231	MAINS CORD	2505	203803521209	ELCAP GS 16V S 220U PM20	3109	213811273477	RST CRB CFR-25 A 0R47 PM5
1054	313818878041	CORD SUB-D 15/1M8/12 330942 G	2506	203830150186	CAP PP PPN 100V S 8N2 PM5	3113	213811273477	RST CRB CFR-25 A 0R47 PM5
CRT			2507	203830250095	CAP MPOL 100V S 100N PM10	3115	213810113331	RST CRB CFR-12 A 330R PM5
1151	930196290323	CRT M41QEE903X04(P) (LGPD)	2508	203830250218	CAP MPOL 100V S 10N PM2	3117	213810113103	RST CRB CFR-12 A 10K PM5
1151	823827445551	CRT M41AJR53X76(SMV)	2509	202055290794	CER2 DC B 50V S 100P PM10	3121	213810113159	RST CRB CFR-12 A 15R PM5
Others			2511	203830150135	CAP PP PPN 100V S 2N2 PM5	3124	213866000037	PTC DBL-MONO 270V 4R5 P3020
1101	242208600208	FUSE 5X20 HT 4A 250V IEC	2518	203803521206	ELCAP GS 16V S 47U PM20	3125	213810113331	RST CRB CFR-12 A 330R PM5
1104	242213207402	RELAY 1P 12V 10/80A SDT-SS	2521	203830250095	CAP MPOL 100V S 100N PM10	3128	213810113474	RST CRB CFR-12 A 470K PM5
0210	313800990371	PROCESS BOX	2522	203830250125	CAP MPOL 100V S 220N PM10	3131	213810113183	RST CRB CFR-12 A 18K PM5
0212	313811578561	LABEL-CEPU	2524	203830150135	CAP PP PPN 100V S 2N2 PM5	3134	212211000421	RST MFLM MF1/2WS A 270K PM1
0213	313811578571	LABEL-EEPROM (LG)	2526	202202000809	ELCAP GS 100V S 1U PM20	3138	213810113154	RST CRB CFR-12 A 150K PM5
0213	313811578591	LABEL-EEPROM (CPT)	2527	202202000836	ELCAP GS 50V S 1U PM20	3140	212211000412	RST MFLM MF1/2WS A 120K PM1
0615	313811705801	HEX CODE OF F/W (NO MATL REQ)	2528	223858015641	CER2 0805 X7R 50V 22N PM10	3141	213810113471	RST CRB CFR-12 A 470R PM5
1806	243854300061	RES XTL 12MHZ 30P HC49/U	2600	202202000731	ELCAP GS 250V S 33U PM20	3142	213810113154	RST CRB CFR-12 A 150K PM5
4444	313810610333	CD ROM-SERVICE MANUAL	2602	203830250142	CAP MPOL 250V S 22N PM10	3143	213810113332	RST CRB CFR-12 A 3K3 PM5
4444	313810610334	SERVICE MANUAL	2603	203803527301	ELCAP KM 25V S 22U PM20	3144	212211000367	RST MFLM MF1/2WS A 2K7 PM1
Main PCB			2604	203803527301	ELCAP KM 25V S 22U PM20	3145	213810113829	RST CRB CFR-12 A 82R PM5
1152	313817866171	MB-1 ASSY(107P5) LPD	2605	203830250166	CAP MPOL 400V S 10N PM10	3146	213810113229	RST CRB CFR-12 A 22R PM5
1152	313817866201	MB-2 (CPT)107P5	2606	203830250229	CAP MPOL 250V S 10N PM5	3147	213810113102	RST CRB CFR-12 A 1K PM5
1153	313817866181	VB-1 ASSY(107P5-LPD)	2607	223858015636	CER2 0805 X7R 50V 10N PM10	3148	212211000315	RST MFLM MF1/2WS A 10R PM1
1154	313817866191	C/B ASSY(107P5)	2609	203803521804	ELCAP GS 160V S 3U3 PM20	3149	212211000409	RST MFLM MF1/2WS A 100K PM1
1152	31381786617	MB-1 ASSY(107P5) LPD	2610	202202000805	ELCAP GS 50V S 2U2 PM20	3150	213810113154	RST CRB CFR-12 A 150K PM5
2103	203831000014	CAP MPP 275V S 680N PM10	2611	203803522802	ELCAP BP NK 160V S 0U47 PM20	3153	212211000376	RST MFLM MF1/2WS A 5K6 PM1
2104	202055490163	CERSAF NSB 250V S 2N2 PM20	2612	203803521802	ELCAP KM 160V S 1U PM20	3154	232273061102	RST SM 0805 RC11 1K PM5
2105	202055490163	CERSAF NSB 250V S 2N2 PM20	2613	225279508453	CER2 DC Y5V 50V 100N P8020	3156	213810113472	RST CRB CFR-12 A 4K7 PM5
2106	202202000725	ELCAP LP 450V S 100U PM20	2614	202055890561	CERHDT RR 2KV S 220P PM10	3251	213810113332	RST CRB CFR-12 A 3K3 PM5
2107	203830250229	CAP MPOL 250V S 10N PM5	2615	225279508453	CER2 DC Y5V 50V 100N P8020	3252	232273061333	RST SM 0805 RC11 33K PM5
2111	225260214216	CER2 DC X7R 2KV S 220P PM10	2616	202055290814	CER2 DC B 50V S 3N3 PM10	3253	232273061229	RST SM 0805 RC11 22R PM5
2112	202055490158	CERSAF CD 250V S 2N2 PM20	2617	222237590633	CAP PP-MPOL 2KV5 S 3N9 PM5	3254	213810113473	RST CRB CFR-12 A 47K PM5
2113	202055290834	CER2 DC F 50V S 22N P8020	2618	203830100192	CAP PP PPN 630V S 2N2 PM5	3256	213810113223	RST CRB CFR-12 A 22K PM5
2115	202203100147	ELCAP KM 50V S 2U2 PM20	2620	202055890561	CERHDT RR 2KV S 220P PM10	3257	213810113332	RST CRB CFR-12 A 3K3 PM5
2123	203803521306	ELCAP GS 25V S 47U PM20	2621	225260808021	CER2 DC X7R 500V S 1N PM10	3258	232273061229	RST SM 0805 RC11 22R PM5
2124	202055290835	CER2 DC F 50V S 47N P8020	2622	202055290835	CER2 DC F 50V S 47N P8020	3259	213810113473	RST CRB CFR-12 A 47K PM5
2131	202055290814	CER2 DC B 50V S 3N3 PM10	2623	202055290807	CER2 DC B 50V S 1N PM10	3260	232273061223	RST SM 0805 RC11 22K PM5
2133	202055290798	CER2 DC B 50V S 220P PM10	2624	225271214116	CERHDT F-Y5R 2KV S 150P PM10	3261	232273061333	RST SM 0805 RC11 33K PM5
2134	225256108406	CER1 DC SL 1KV S 47P PM10	2625	223891015649	CER2 0805 X7R 25V 100N PM10	3264	213810113223	RST CRB CFR-12 A 22K PM5
2142	202202000716	ELCAP GS 10V S 4700U PM20	2626	202055790686	CER2 DC B 500V S 330P PM10	3266	213810113229	RST CRB CFR-12 A 22R PM5
2143	203803521206	ELCAP GS 16V S 47U PM20	2627	202055290834	CER2 DC F 50V S 22N P8020	3267	213810113104	RST CRB CFR-12 A 100K PM5
2145	202055790151	CER2 DC B 500V S 1N PM10	2628	203803521303	ELCAP GS 25V S 10U PM20	3268	232273061333	RST SM 0805 RC11 33K PM5
2150	202055890604	CERHDT RR 2KV S 100P PM10	2631	203803521303	ELCAP GS 25V S 10U PM20	3269	213810113332	RST CRB CFR-12 A 3K3 PM5
2151	203803521706	ELCAP GS 100V S 100U PM20	2633	202055890604	CERHDT RR 2KV S 100P PM10	3272	213810113223	RST CRB CFR-12 A 22K PM5
2152	202202000717	ELCAP GS 160V S 47U PM20	2634	202055790148	CER2 DC B 500V S 680P PM10	3281	213810113229	RST CRB CFR-12 A 22R PM5
			2637	202055890604	CERHDT RR 2KV S 100P PM10	3282	213810113104	RST CRB CFR-12 A 100K PM5
			2651	223891015649	CER2 0805 X7R 25V 100N PM10	3283	213810113333	RST CRB CFR-12 A 33K PM5
			2656	202202000805	ELCAP GS 50V S 2U2 PM20	3284	213810113332	RST CRB CFR-12 A 3K3 PM5
			2657	202202000805	ELCAP GS 50V S 2U2 PM20	3286	213810113223	RST CRB CFR-12 A 22K PM5
			2676	203803521303	ELCAP GS 25V S 10U PM20	3401	212020200002	RST FUSE RFS1/2 A 2R2 PM5
			2681	223858015641	CER2 0805 X7R 50V 22N PM10	3406	213810113222	RST CRB CFR-12 A 2K2 PM5
			2686	202202000729	ELCAP GS 250V S 22U PM20	3411	212211000338	RST MFLM MF1/2WS A 220R PM1
			2806	203803521206	ELCAP GS 16V S 47U PM20	3412	212211000303	RST MFLM MF1/2WS A 1R8 PM1
			2811	202202000836	ELCAP GS 50V S 1U PM20	3413	212211000304	RST MFLM MF1/2WS A 2R2 PM1
			2812	202202000805	ELCAP GS 50V S 2U2 PM20	3416	213810113222	RST CRB CFR-12 A 2K2 PM5
			2813	223886115229	CER1 0805 NP0 50V 22P PM5	3417	212261200062	NTC DC TTC-501 S 500R PM5
			2814	203803521206	ELCAP GS 16V S 47U PM20	3418	212211000302	RST MFLM MF1/2WS A 1R8 PM1
			2815	223886115229	CER1 0805 NP0 50V 22P PM5	3421	213810113101	RST CRB CFR-12 A 100R PM5
			2816	223886115221	CER1 0805 NP0 50V 220P PM5	3501	213810113152	RST CRB CFR-12 A 1K5 PM5
			2817	202055290834	CER2 DC F 50V S 22N P8020	3502	213810113273	RST CRB CFR-12 A 27K PM5

3503	212211000389	RST MFLM MF1/2WS A 18K PM1	3653	213810113393	RST CRB CFR-12 A 39K PM5	6101	932205814682	BRIDGE GBU4K (VISH)
3504	2138101100369	RST JUMP CR-12 A MAX 0R01	3654	213810113222	RST CRB CFR-12 A 2K2 PM5	6103	933497950673	DIO REC RGP10J A (VISH)
3507	212211000391	RST MFLM MF1/2WS A 20K PM1	3655	212211000321	RST MFLM MF1/2WS A 22R PM1	6106	933751660673	DIO REC RGP10D A (VISH)
3508	213810113223	RST CRB CFR-12 A 22K PM5	3656	212211000321	RST MFLM MF1/2WS A 22R PM1	6107	933751660673	DIO REC RGP10D A (VISH)
3512	213810113153	RST CRB CFR-12 A 15K PM5	3657	213810113103	RST CRB CFR-12 A 10K PM5	6109	933256030673	DIO SIG 1N4148 A (VISH)
3513	213810113471	RST CRB CFR-12 A 470R PM5	3658	213810113103	RST CRB CFR-12 A 10K PM5	6113	933189210133	DIO SIG BAV21 A (PHSE)
3514	212211000401	RST MFLM MF1/2WS A 47K PM1	3659	213810113681	RST CRB CFR-12 A 680R PM5	6118	933256030673	DIO SIG 1N4148 A (VISH)
3515	213810113153	RST CRB CFR-12 A 15K PM5	3662	213810113473	RST CRB CFR-12 A 47K PM5	6131	933730980133	DIO REC BYV36C A (PHSE)
3516	212211000412	RST MFLM MF1/2WS A 120K PM1	3663	213810113689	RST CRB CFR-12 A 68R PM5	6132	933117770133	DIO REC BZX79-C8V2 A (PHSE)
3518	232273061104	RST SM 0805 RC11 100K PM5	3665	212211000365	RST MFLM MF1/2WS A 2K2 PM1	6133	933730980133	DIO REC BYV36C A (PHSE)
3522	212211000311	RST MFLM MF1/2WS A 4R7 PM1	3666	213810113473	RST CRB CFR-12 A 47K PM5	6134	933957760673	DIO REC SB140 A (VISH)
3523	232273061332	RST SM 0805 RC11 3K3 PM5	3682	213810113393	RST CRB CFR-12 A 39K PM5	6135	932210346673	DIO REC SBV27-200 A (VISH)
3524	212211000353	RST MFLM MF1/2WS A 750R PM1	3683	213810113104	RST CRB CFR-12 A 100K PM5	6136	933751660673	DIO REC RGP10D A (VISH)
3525	212211000367	RST MFLM MF1/2WS A 2K7 PM1	3685	213810113114	RST CRB CFR-12 A 110K PM5	6140	933256030673	DIO SIG 1N4148 A (VISH)
3526	212211000383	RST MFLM MF1/2WS A 10K PM1	3687	212211000374	RST MFLM MF1/2WS A 4K7 PM1	6141	933751660673	DIO REC RGP10D A (VISH)
3528	213810113153	RST CRB CFR-12 A 15K PM5	3688	212211000367	RST MFLM MF1/2WS A 2K7 PM1	6143	933256030673	DIO SIG 1N4148 A (VISH)
3530	213810113471	RST CRB CFR-12 A 470R PM5	3690	213810113159	RST CRB CFR-12 A 15R PM5	6144	933497950673	DIO REC RGP10J A (VISH)
3531	213810113272	RST CRB CFR-12 A 2K7 PM5	3691	213810113103	RST CRB CFR-12 A 10K PM5	6146	933256030673	DIO SIG 1N4148 A (VISH)
3537	232273061152	RST SM 0805 RC11 1K5 PM5	3692	213810113273	RST CRB CFR-12 A 27K PM5	6147	933497950673	DIO REC RGP10J A (VISH)
3538	213810113152	RST CRB CFR-12 A 1K5 PM5	3693	213810113123	RST CRB CFR-12 A 12K PM5	6148	933256030673	DIO SIG 1N4148 A (VISH)
3539	213810113821	RST CRB CFR-12 A 820R PM5	3694	213810113479	RST CRB CFR-12 A 47R PM5	6147	933117760133	DIO REG BZX79-C7V5 A (PHSE)
3553	212211000392	RST MFLM MF1/2WS A 22K PM1	3695	213810113152	RST CRB CFR-12 A 1K5 PM5	6148	933913910115	DIO SIG SM BAS32L (PHSE)
3554	213810113102	RST CRB CFR-12 A 1K PM5	3696	212211000325	RST MFLM MF1/2WS A 47R PM1	6251	933497950673	DIO REC RGP10J A (VISH)
3555	213810113102	RST CRB CFR-12 A 1K PM5	3699	212037900001	RTRM CER LIN 500K H VG067TL1	6252	933497950673	DIO REC RGP10J A (VISH)
3556	212211000369	RST MFLM MF1/2WS A 3K3 PM1 A	3811	213810113103	RST CRB CFR-12 A 10K PM5	6253	933497950673	DIO REC RGP10J A (VISH)
3558	212211000427	RST MFLM MF1/2WS A 470K PM1	3812	213810113222	RST CRB CFR-12 A 2K2 PM5	6255	933497950673	DIO REC RGP10J A (VISH)
3561	213836500076	RTRM CER LIN 10K H VG067TL1	3813	213810113472	RST CRB CFR-12 A 4K7 PM5	6401	933957760673	DIO REC SB140 A (VISH)
3562	213810113392	RST CRB CFR-12 A 3K9 PM5	3814	213810113471	RST CRB CFR-12 A 470R PM5	6503	933256030673	DIO SIG 1N4148 A (VISH)
3564	213810113123	RST CRB CFR-12 A 12K PM5	3815	232273061472	RST SM 0805 RC11 4K7 PM5	6511	933189210133	DIO SIG BAV21 A (PHSE)
3567	213810113101	RST CRB CFR-12 A 100R PM5	3816	213810113472	RST CRB CFR-12 A 4K7 PM5	6512	933117750133	DIO REG BZX79-C6V8 A (PHSE)
3568	213810113101	RST CRB CFR-12 A 100R PM5	3817	213810113183	RST CRB CFR-12 A 18K PM5	6513	933256030673	DIO SIG 1N4148 A (VISH)
3569	213810113339	RST CRB CFR-12 A 33R PM5	3818	213810113101	RST CRB CFR-12 A 100R PM5	6600	932216961687	DIO REC DMV1500M (ST00)
3601	213810113223	RST CRB CFR-12 A 22K PM5	3820	213810113224	RST CRB CFR-12 A 220K PM5	6601	933189210133	DIO SIG BAV21 A (PHSE)
3602	213810113102	RST CRB CFR-12 A 1K PM5	3821	232273061472	RST SM 0805 RC11 4K7 PM5	6602	933117830133	DIO REG BZX79-C15 A (PHSE)
3603	213810113101	RST CRB CFR-12 A 100R PM5	3822	232273061472	RST SM 0805 RC11 4K7 PM5	6603	932205787673	DIO REC EGP20G A (VISH)
3604	232273061153	RST SM 0805 RC11 15K PM5	3823	232273061472	RST SM 0805 RC11 4K7 PM5	6604	933751660673	DIO REC RGP10D A (VISH)
3605	213810113108	RST CRB CFR-12 A 1R PM5	3824	213810113101	RST CRB CFR-12 A 100R PM5	6605	933751660673	DIO REC RGP10D A (VISH)
3606	213810113333	RST CRB CFR-12 A 33R PM5	3825	213810113472	RST CRB CFR-12 A 4K7 PM5	6606	933751660673	DIO REC RGP10D A (VISH)
3607	212020200001	RST FUSE RFS1/2 A 1R PM5	3826	213810113472	RST CRB CFR-12 A 4K7 PM5	6607	933256030673	DIO SIG 1N4148 A (VISH)
3608	213810113101	RST CRB CFR-12 A 100R PM5	3827	213810113223	RST CRB CFR-12 A 22K PM5	6608	933497950673	DIO REC RGP10J A (VISH)
3609	212211000442	RST MFLM MF1/2WS A 4M7 PM1	3828	213810113101	RST CRB CFR-12 A 100R PM5	6609	933952580685	DIO SIG SM BAV103 (VISH)
3610	212211000418	RST MFLM MF1/2WS A 220K PM1	3829	213810113101	RST CRB CFR-12 A 100R PM5	6610	933256030673	DIO SIG 1N4148 A (VISH)
3611	212211000383	RST MFLM MF1/2WS A 10K PM1	3832	232273061228	RST SM 0805 RC11 2R2 PM5	6611	933493960673	DIO REC RGP10G A (VISH)
3611	212211000385	RST MFLM MF1/2WS A 12K PM1	3833	232273061472	RST SM 0805 RC11 4K7 PM5	6612	933957760673	DIO REC SB140 A (VISH)
3612	213810113101	RST CRB CFR-12 A 100R PM5	3834	213810113222	RST CRB CFR-12 A 2K2 PM5	6614	933414680133	DIO REG BZX79-C2V4 A (PHSE)
3613	213810113182	RST CRB CFR-12 A 1K8 PM5	3835	232273061472	RST SM 0805 RC11 4K7 PM5	6615	933256030673	DIO SIG 1N4148 A (VISH)
3614	213810113682	RST CRB CFR-12 A 6K8 PM5	3836	212211000392	RST MFLM MF1/2WS A 22K PM1	6616	933189210133	DIO SIG BAV21 A (PHSE)
3615	213810113221	RST CRB CFR-12 A 220R PM5	3837	213810113472	RST CRB CFR-12 A 4K7 PM5	6617	933189210133	DIO SIG BAV21 A (PHSE)
3616	232273061102	RST SM 0805 RC11 1K PM5	3838	213810113101	RST CRB CFR-12 A 100R PM5	6618	933117770133	DIO REG BZX79-C8V2 A (PHSE)
3617	213810113221	RST CRB CFR-12 A 220R PM5	3841	213810113101	RST CRB CFR-12 A 100R PM5	6621	933189210133	DIO SIG BAV21 A (PHSE)
3618	213810113363	RST CRB CFR-12 A 36K PM5	3842	213810113101	RST CRB CFR-12 A 100R PM5	6622	933497950673	DIO REC RGP10J A (VISH)
3621	212010592161	RST MOX 2W RSS S 680R PM5	3843	213810113103	RST CRB CFR-12 A 10K PM5	6622	933256030673	DIO SIG 1N4148 A (VISH)
3623	213810500212	RST MOX 2W RSS S 22K PM5	3844	232273061472	RST SM 0805 RC11 4K7 PM5	6800	933913910115	DIO SIG SM BAS32L (PHSE)
3624	213810113153	RST CRB CFR-12 A 15K PM5	3847	232273061472	RST SM 0805 RC11 4K7 PM5	6821	933256030673	DIO SIG 1N4148 A (VISH)
3625	212010593614	RST MOX 3W RSS S 0R82 PM5	3848	213810113103	RST CRB CFR-12 A 10K PM5	6822	932215365673	DIO SIG BAT82S (VISH)
3626	213810113108	RST CRB CFR-12 A 1R PM5	3851	213810113103	RST CRB CFR-12 A 10K PM5	7101	932215891687	FET POW STP6NC60 (ST00)
3627	213810113101	RST CRB CFR-12 A 100R PM5	3852	232273061683	RST SM 0805 RC11 68K PM5	7102	935267356112	IC TEA1507P/N1 (PHSE)
3629	213810113229	RST CRB CFR-12 A 22R PM5	3853	213810113103	RST CRB CFR-12 A 10K PM5	7103	933953420676	TRA SIG TBC338-40 (TOSJ)
3630	212211000409	RST MFLM MF1/2WS A 100K PM1	3854	232273061334	RST SM 0805 RC11 330K PM5	7111	932214014667	OPT CP TCZT1103(G) (VISH)
3631	212020200016	RST FUSE RFU1/3 A 2R2 PM5	3855	213810113272	RST CRB CFR-12 A 2K7 PM5	7112	932208697676	IC TL431ACZ S (ST00)
3632	213810113108	RST CRB CFR-12 A 1R PM5	3856	213810113101	RST CRB CFR-12 A 100R PM5	7113	933953420676	TRA SIG TBC338-40 (TOSJ)
3633	213810113682	RST CRB CFR-12 A 6K8 PM5	3859	213810113101	RST CRB CFR-12 A 100R PM5	7114	932208234676	IC L78L05ACZ (ST00)
3634	212211000315	RST MFLM MF1/2WS A 10R PM1	3862	213810113472	RST CRB CFR-12 A 4K7 PM5	7115	933826850126	THYRIS BT169B (PHSE)
3635	232273061472	RST SM 0805 RC11 4K7 PM5	3863	213810113104	RST CRB CFR-12 A 100K PM5	7116	932209011673	TRA SIG BC548C (KECO)
3636	212211000377	RST MFLM MF1/2WS A 6K2 PM1	3871	213810113472	RST CRB CFR-12 A 4K7 PM5	7251	932209011673	TRA SIG BC548C (KECO)
3637	232273061122	RST SM 0805 RC11 1K2 PM5				7252	932209011673	TRA SIG BC548C (KECO)
3638	213810113123	RST CRB CFR-12 A 12K PM5				7253	932209011673	TRA SIG BC548C (KECO)
3639	213810113479	RST CRB CFR-12 A 47R PM5	5001	243853598018	IND FXD BEAD EMI A 2U5 PM20	7254	932209011673	TRA SIG BC548C (KECO)
3640	213810113681	RST CRB CFR-12 A 680R PM5	5002	243853598018	IND FXD BEAD EMI A 2U5 PM20	7256	932209011673	TRA SIG BC548C (KECO)
3641	213810113102	RST CRB CFR-12 A 1K PM5	5003	243853598018	IND FXD BEAD EMI A 2U5 PM20	7262	932217996687	FET POW IRF640B (FSCO)
3642	212010592403	RST MOX 1W RSS S 180R PM5	5007	313818877781	COIL DEGAUS 62-0209-03 A	7263	932217996687	FET POW IRF640B (FSCO)
3643	213810113109	RST CRB CFR-12 A 10R PM5	5106	313816872631	BEAD COIL	7264	932217995687	FET POW IRF630B (FSCO)
3644	212211000418	RST MFLM MF1/2WS A 220K PM1	5108	313818876471	FIL MAINS 16MH 1A2 163Y1R2	7266	932217995687	FET POW IRF630B (FSCO)
3645	213810113104	RST CRB CFR-12 A 100K PM5	5113	313818877961	TFM SMT LAYER HJC-S3113 WIRE	7401	933922940682	IC TDA8172 (ST00)
3646	212211000423	RST MFLM MF1/2WS A 330K PM1	5123	242253560039	IND FXD TSL0808 S 180U PM10	7501	935267455112	IC TDA4841PS/V3 (PHSE)
3647	213810113228	RST CRB CFR-12 A 2R2 PM5	5124	242253600036	IND FXD TSL0808 S 100U PM10	7502	932209011673	TRA SIG BC548C (KECO)
3648	212211000442	RST MFLM MF1/2WS A 4M7 PM1	5125	242253597249	IND FXD SP0406 A 100U PM10	7503	932214472676	TRA SIG BF423 (KECO)
3650	213810113222	RST CRB CFR-12 A 2K2 PM5	5126	242253597249	IND FXD SP0406 A 100U PM10	7601	933953420676	TRA SIG TBC338-40 (TOSJ)
3652	213810113182	RST CRB CFR-12 A 1K8 PM5	5127	242253597416	IND FXD SP0406 A 33U PM10			

Spare parts list

7602	933953410676	TRA SIG TBC328-40	(TOSJ)	2782	203830250095	CAP MPOL 100V S 100N PM10	3761	213810113109	RST CRB CFR-12 A 10R PM5
7603	932214679682	FET POW 2SJ512	(TOSJ)	2783	823827445591	CERHDT B RB 2KV S 10N PM10	3762	232273061103	RST SM 0805 RC11 10K PM5
7604	933953420676	TRA SIG TBC338-40	(TOSJ)	2784	225256214406	CER1 DC SL 2KV S 47P PM10	3763	213810113101	RST CRB CFR-12 A 100R PM5
7605	934003960126	FET SIG BSN254A	(PHSE)	2785	223886115101	CER1 0805 NP0 50V 100P PM5	3771	212211000361	RST MFLM MF1/2WS A 1K5 PM1
7606	934026300127	TRA POW BU2527AF	(PHSE)	2786	223886115101	CER1 0805 NP0 50V 100P PM5	3772	212211000387	RST MFLM MF1/2WS A 15K PM1
7607	933567130126	TRA SIG BC517	(PHSE)	2787	223891015649	CER2 0805 X7R 25V 100N PM10	3778	213810113102	RST CRB CFR-12 A 1K PM5
7608	933567120126	TRA SIG BC516	(PHSE)						
7609	932206519687	TRA POW BUX87	(ST00)	3301	213810113759	RST CRB CFR-12 A 75R PM5	5301	242253597608	IND FXD SPT0305 A 1U8 PM10
7611	932210142676	TRA SIG BC558C	(KECO)	3302	213810113759	RST CRB CFR-12 A 75R PM5	5303	313816872621	BEAD COIL (BF30TA-2.5X3X1B)
7612	932209011673	TRA SIG BC548C	(KECO)	3303	213810113759	RST CRB CFR-12 A 75R PM5	5307	242253597608	IND FXD SPT0305 A 1U8 PM10
7613	931101033687	TRA POW TIP122	(ONSE)	3304	213810113479	RST CRB CFR-12 A 47R PM5	5601	313816878191	LINEARITY COIL
7614	932216831676	TRA SIG BC337-40	(KECO)	3305	213810113472	RST CRB CFR-12 A 4K7 PM5	5606	313818875161	TFM SIG LS-NB02C-009
7615	932210142676	TRA SIG BC558C	(KECO)	3306	213810113472	RST CRB CFR-12 A 4K7 PM5	5607	313816872621	BEAD COIL (BF30TA-2.5X3X1B)
7617	932214469676	TRA SIG BF422	(KECO)	3307	213810113101	RST CRB CFR-12 A 100R PM5	5608	313816872631	BEAD COIL
7621	933984890682	IC LM358N	(ST00)	3308	213810113101	RST CRB CFR-12 A 100R PM5	5611	242253597416	IND FXD SP0406 A 33U PM10
7622	932209011673	TRA SIG BC548C	(KECO)	3309	232273061102	RST SM 0805 RC11 1K PM5	5612	313818878021	TFM LOT LAYER 11MM WIRE
7682	933953410676	TRA SIG TBC328-40	(TOSJ)	3310	232273061102	RST SM 0805 RC11 1K PM5	5615	313818875151	TFM SIG DRIVER LS-NB02D-002
7683	933953420676	TRA SIG TBC338-40	(TOSJ)	3311	232273061102	RST SM 0805 RC11 1K PM5	5616	313818871121	DRUM CHOKE
7685	934025870126	TRA SIG MPSA44	(PHSE)	3312	213810113689	RST CRB CFR-12 A 68R PM5	5621	242253600037	IND FXD TSL0808 S 3700U PM5
7801	823827445281	CPU IC 6148-K420PH-77A		3313	213810113689	RST CRB CFR-12 A 68R PM5	5671	313818875111	TFM POW DAF SRW19ES-T36V005
7802	932210142676	TRA SIG BC558C	(KECO)	3314	213810113689	RST CRB CFR-12 A 68R PM5	5702	242253597608	IND FXD SPT0305 A 1U8 PM10
7803	932212662682	IC M24C16-BN6	(ST00)	3315	213810113479	RST CRB CFR-12 A 47R PM5	5704	242253597076	IND FXD SP0305 A 15U PM10
				3316	213810113101	RST CRB CFR-12 A 100R PM5	5705	242253597608	IND FXD SPT0305 A 1U8 PM10
8056	313819870121	CBLE OE/850/OE BENT AWG24		3317	213810113223	RST CRB CFR-12 A 22K PM5	5721	242253597064	IND FXD SP0305 A 0U33 PM20
8057	313819870151	CBLE FASTS.8MM/75/FAST BRAID		3318	232273061102	RST SM 0805 RC11 1K PM5	5751	242253597064	IND FXD SP0305 A 0U33 PM20
8058	313819870161	CBLE FAST 5.8/95 TERM BRAID		3319	232273061101	RST SM 0805 RC11 100R PM5	5752	242253597064	IND FXD SP0305 A 0U33 PM20
8059	313818874811	CBLE FASTS.8MM/140/RING		3323	213810113223	RST CRB CFR-12 A 22K PM5	5771	243853598058	IND FXD BEAD EMI 100MHZ 80R
8751	313818876171	CBLE CLIP/55/RING TERM BRAID		3324	232273061332	RST CRB CFR-12 A 3K3 PM5	5778	313816872631	BEAD COIL
8751	313818877441	CBLE RING TERM/60/CLIP BRAID		3325	213810113473	RST CRB CFR-12 A 47K PM5	5779	242253597608	IND FXD SPT0305 A 1U8 PM10
8752	313819870141	CBLE RING TERM/55/CLIP BRAID		3326	213810113471	RST CRB CFR-12 A 470R PM5			
8753	313818878381	CBLE FAST 5.8/70/FAST BRAID		3327	232273061562	RST SM 0805 RC11 5K6 PM5			
8754	313818878411	CBLE FAST 5.8/90/FAST BRAID		3328	232273061332	RST SM 0805 RC11 3K3 PM5	6301	933117810133	DIO REG BZX79-C12 A (PHSE)
				3329	232273061562	RST SM 0805 RC11 5K6 PM5	6302	933117810133	DIO REG BZX79-C12 A (PHSE)
1153	313817866181	VB-1 ASSY(107P5-LPD)		3330	232273061105	RST SM 0805 RC11 1M PM5	6303	933117810133	DIO REG BZX79-C12 A (PHSE)
				3334	213810113479	RST CRB CFR-12 A 47R PM5	6721	933189210133	DIO SIG BAV21 A (PHSE)
2306	223886115101	CER1 0805 NP0 50V 100P PM5		3361	213810113101	RST CRB CFR-12 A 100R PM5	6722	933189210133	DIO SIG BAV21 A (PHSE)
2307	223886115229	CER1 0805 NP0 50V 22P PM5		3363	232273061101	RST SM 0805 RC11 100R PM5	6731	933189210133	DIO SIG BAV21 A (PHSE)
2308	223891015649	CER2 0805 X7R 25V 100N PM10		3367	213810113478	RST CRB CFR-12 A 4R7 PM5	6732	933189210133	DIO SIG BAV21 A (PHSE)
2309	223891015649	CER2 0805 X7R 25V 100N PM10		3376	232273061689	RST SM 0805 RC11 68R PM5	6751	933189210133	DIO SIG BAV21 A (PHSE)
2310	223886115109	CER1 0805 NP0 50V 10P PM5		3378	213810113689	RST CRB CFR-12 A 68R PM5	6752	933189210133	DIO SIG BAV21 A (PHSE)
2311	223891015649	CER2 0805 X7R 25V 100N PM10		3381	232273061689	RST SM 0805 RC11 68R PM5	6771	933751660673	DIO REC RGP10D A (VISH)
2312	223891015649	CER2 0805 X7R 25V 100N PM10		3383	213810113101	RST CRB CFR-12 A 100R PM5	6772	933117810133	DIO REG BZX79-C12 A (PHSE)
2322	223858015636	CER2 0805 X7R 50V 10N PM10		3385	232273061478	RST SM 0805 RC11 4R7 PM5	6773	933256030673	DIO SIG 1N4148 A (VISH)
2323	223858015636	CER2 0805 X7R 50V 10N PM10		3704	213810113101	RST CRB CFR-12 A 100R PM5	6774	933189210133	DIO SIG BAV21 A (PHSE)
2324	203803521206	ELCAP GS 16V S 47U PM20		3706	213810113479	RST CRB CFR-12 A 47R PM5			
2336	223891015649	CER2 0805 X7R 25V 100N PM10		3707	213810113101	RST CRB CFR-12 A 100R PM5	7301	935266857112	IC TDA4886/V2 (PHSE)
2337	223891015649	CER2 0805 X7R 25V 100N PM10		3716	212211000387	RST MFLM MF1/2WS A 15K PM1	7302	935270542112	IC TDA4823PS/V1 (PHSE)
2338	223891015649	CER2 0805 X7R 25V 100N PM10		3718	212211000387	RST MFLM MF1/2WS A 15K PM1	7303	932210611676	IC LE33CZ (ST00)
2341	203803527201	ELCAP KM 16V S 47U PM20		3719	212211000387	RST MFLM MF1/2WS A 15K PM1	7304	932218565682	IC NT68275-00031 (NOVA)
2342	223891015649	CER2 0805 X7R 25V 100N PM10		3721	232273061471	RST SM 0805 RC11 470R PM5	7305	932209011673	TRA SIG BC548C (KECO)
2353	223891015649	CER2 0805 X7R 25V 100N PM10		3722	232273061122	RST SM 0805 RC11 1K2 PM5	7701	932214602667	IC LM2435T (NSCO)
2354	223891015649	CER2 0805 X7R 25V 100N PM10		3723	232273061224	RST SM 0805 RC11 220K PM5	7721	932209011673	TRA SIG BC548C (KECO)
2356	203803521303	ELCAP GS 25V S 10U PM20		3724	232273061223	RST SM 0805 RC11 22K PM5	7722	932214469676	TRA SIG BF422 (KECO)
2721	203803527703	ELCAP KM 100V S 22U PM20		3725	232273061683	RST SM 0805 RC11 68K PM5	7731	932209011673	TRA SIG BC548C (KECO)
2722	225232626104	CER2 ML X7R 100V S 100N PM10		3726	213810113105	RST CRB CFR-12 A 1M PM5	7732	932214469676	TRA SIG BF422 (KECO)
2723	203803522801	ELCAP BP NK 160V S 1U PM20		3727	213810113479	RST CRB CFR-12 A 47R PM5	7751	932209011673	TRA SIG BC548C (KECO)
2724	203803527201	ELCAP KM 16V S 47U PM20		3728	212211000336	RST MFLM MF1/2WS A 180R PM1	7752	932214469676	TRA SIG BF422 (KECO)
2725	242254945382	SURGE PROTECT SGP-201M-DRF		3729	232273061121	RST SM 0805 RC11 120R PM5			
2727	202202000809	ELCAP GS 100V S 1U PM20		3731	212211000336	RST MFLM MF1/2WS A 180R PM1			
2729	203803527702	ELCAP KM 100V S 10U PM20		3732	232273061479	RST SM 0805 RC11 47R PM5			
2730	203803521206	ELCAP GS 16V S 47U PM20		3733	213810113471	RST CRB CFR-12 A 470R PM5			
2731	203803522801	ELCAP BP NK 160V S 1U PM20		3734	213810113105	RST CRB CFR-12 A 1M PM5	1154	313817866191	C/B ASSY(107P5)
2732	202203100153	ELCAP KM 100V S 1U PM20		3735	232273061122	RST SM 0805 RC11 1K2 PM5			
2733	242254945382	SURGE PROTECT SGP-201M-DRF		3736	232273061224	RST SM 0805 RC11 220K PM5	1891	243812800196	SWI TACT H=5 GY 160G SKHHAM
2751	203803522801	ELCAP BP NK 160V S 1U PM20		3737	213810113683	RST CRB CFR-12 A 68K PM5	1892	243812800196	SWI TACT H=5 GY 160G SKHHAM
2752	202202000809	ELCAP GS 100V S 1U PM20		3738	232273061223	RST SM 0805 RC11 22K PM5	1893	243812800196	SWI TACT H=5 GY 160G SKHHAM
2753	242254945382	SURGE PROTECT SGP-201M-DRF		3739	232273061121	RST SM 0805 RC11 120R PM5	1894	243812800196	SWI TACT H=5 GY 160G SKHHAM
2760	225256108406	CER1 DC SL 1KV S 47P PM10		3749	232273091002	RST SM 0805 JUMP. MAX 0R05	1895	243812800196	SWI TACT H=5 GY 160G SKHHAM
2761	203803521206	ELCAP GS 16V S 47U PM20		3750	232273091002	RST SM 0805 JUMP. MAX 0R05	3891	212211000401	RST MFLM MF1/2WS A 47K PM1
2762	223891015649	CER2 0805 X7R 25V 100N PM10		3751	232273061471	RST SM 0805 RC11 470R PM5	3892	212211000394	RST MFLM MF1/2WS A 27K PM1
2771	223891015649	CER2 0805 X7R 25V 100N PM10		3752	213810113105	RST CRB CFR-12 A 1M PM5	3893	213810113471	RST CRB CFR-12 A 470R PM5
2772	225261810511	CER2 DC Y5P 500V S 560P PM10		3753	232273061122	RST SM 0805 RC11 1K2 PM5	3894	212211000389	RST MFLM MF1/2WS A 18K PM1
2773	202055890658	CERHD B RB 2KV S 2N2 PM10		3754	232273061224	RST SM 0805 RC11 220K PM5	3895	212211000384	RST MFLM MF1/2WS A 11K PM1
2774	225256108406	CER1 DC SL 1KV S 47P PM10		3755	232273061683	RST SM 0805 RC11 68K PM5	6891	932218424682	LED VS L-34GD (KIEL)
2776	223891015649	CER2 0805 X7R 25V 100N PM10		3756	232273061223	RST SM 0805 RC11 22K PM5	8891	313818878401	CBLE 333384 4/300/4 OE AWG24
2778	203803527201	ELCAP KM 16V S 47U PM20		3757	213810113479	RST CRB CFR-12 A 47R PM5			
2779	223891015649	CER2 0805 X7R 25V 100N PM10		3758	212211000336	RST MFLM MF1/2WS A 180R PM1			
2781	223891015649	CER2 0805 X7R 25V 100N PM10		3759	213810113121	RST CRB CFR-12 A 120R PM5			

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V40 107P5 ,17 97kHz model General Specification (Sheet 590)

FEATURES / BENEFITS

- Extremely high MTBF (over 75K Hours, exclude. CRT).
- User friendly OSD display for mode identification and adjustment
- Professional look, with non-flammable cabinet (94V-0).
- Better display performance.
- . Flat display tube
- . Finer CRT dot pitch
- . Full screen size application
- . Real multi-freq.
- Power saving management system.
- VESA DDC2B
- Picture tilt control
- Low emission TCO03

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1.0 Introduction

This document is related to the 17" AUTOSCAN color monitor and max. resolution: 1600 X 1200 by 75Hz refresh rate

2.0 General description

The AUTOSCAN analog color monitor is to operate at H: 30 to 97.0 kHz V: 50 to 160 Hz can be applied to all RGB analog computers within this scanning frequencies.

The AUTOSCAN analog color monitor is intended to be a finished product, basically a display device mounted inside a plastic enclosure which provides the aesthetic, mechanical, ergonomic and safety requirements.

2.1 General condition

The unit will produce a usable image after switching -on, measurements are to be carried out with a full stabilization set after about 30 minutes warm -up at room ambient temp. of 25 C. Repetitive power on/off cycles are allowed though should be avoided within 4 sec.

3.0 Electrical characteristics

3.1 Signal interface

This AUTOSCAN analog color display has an analog video interface to operates at a multi -frequencies timing in several display modes.

3.1.1 Input requirements

- A. Input signals
- Video - 0.7 Vp-p 75 ohms (for individual of R,G and B signals must not deviate 0.015 Vp -p from each other for balance of white pattern)
- Sync - TTL level (between 0 and 0.6 V to be considered as low level, between 2.3 and 5.0 V as high level)
- B. Impedance
- Video - Terminated with 75 ohms
- Sync - Terminated with 4.7K ohms pull-down resistors.

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3.1.2 Signals input

The input video signals are applied to the display device through a video cable which is fixed to the monitor (flying cable length 1.8M).

Video input cable:
15 pin D-Sub connector type with pin assignment as follows:

Pin assignment of 15P D-SUB connector

Pin nbr.	Assignment
P1	Red video input
P2	Green video input
P3	Blue video input
P4	GND
P5	For selftest (PC Ground)
P6	Red video ground
P7	Green video ground
P8	Blue video ground
P9	Not connected -- No pin
P10	Sync ground
P11	GND
P12	Bi-directional Data (SDA)
P13	H SYNC
P14	V SYNC (VCLK)
P15	Data clock (SCL)

3.1.3 Factory preset modes:

Factory preset modes : 11

	Resolution modes	H. freq.	V. freq.	H.	V.
1.	720 x 400	31.5 Khz	70Hz (VGA)	-	+
2.	640 x 480	31.5 Khz	60 Hz (VGA)	-	-
3.	800 x 600	35.2 Khz	56 Hz (Mac- II)	+	+
4.	640 x 350	37.9 Khz	85 Hz (VESA)	+	-
5.	640 x 480	43.3 Khz	85 Hz (VGA)	-	-
6.	800 x 600	46.9 Khz	75 HZ(VESA)	+	+
7.	800 x 600	53.7 Khz	85 HZ(VESA)	+	+
8.	1024 x 768	60.0 Khz	75 HZ(VESA)	+	+
9.	1024 x 768	68.7 Khz	85 HZ(VESA)	+	+
10.	1280 x 1024	80.0 Khz	75 Hz (VESA)	+	+
11.	1280 x 1024	91.2 Khz	85 Hz (VESA)	+	+

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Factory preload modes : 29

	Fh(Khz)	Fv(hz)	resolution		Fh(Khz)	Fv(hz)	resolution
1	31.47 (+)	70 (-)	640x350	16	63.98 (+)	60 (+)	1280x1024
2	35.00 (-)	67 (-)	640x480	17	67.50 (+)	75 (+)	1152x864
3	37.50 (-)	75 (-)	640x480	18	68.68 (-)	75 (-)	1152x870
4	37.86 (-)	72 (-)	640x480	19	71.81 (+)	76 (+)	1152x900
5	37.87 (+)	60 (+)	800x600	20	72.54 (+)	90 (+)	1024x768
6	37.92 (-)	85 (+)	720x400	21	75.00 (+)	60 (+)	1600x1200
7	48.07 (+)	72 (+)	800x600	22	77.09 (+)	85 (+)	1152x864
8	48.36 (-)	60 (-)	1024x768	23	81.25 (+)	65 (+)	1600x1200
9	49.72 (+)	74 (+)	832x664	24	83.64 (x)	60 (x)	1792x1344
10	50.62 (-)	100 (-)	640x480	25	85.94 (+)	85 (+)	1280x960
11	56.47 (-)	70 (-)	1024x768	26	86.33 (x)	60 (x)	1856x1392
12	60.39 (+)	90 (+)	800x600	27	87.50 (+)	70 (+)	1600x1200
13	60.00 (+)	60 (+)	1200x960	28	90.00 (+)	60 (+)	1920x1440
14	63.85 (+)	70 (+)	1152x864	29	93.75 (+)	75 (+)	1600x1200
15	63.92 (+)	100 (+)	800x600				

3.2 Timing requirements

The AUTOSCAN color monitor must be capable of displaying standard resolutions within the vertical(refresh) frequency range of 50 to 160 Hz and horizontal scan range of 30 to 97 KHz.

Factory preset modes

TABLE 1: 31.469 KHz/70.087 Hz, 720 X 400, pixel=28.325 MHz

Horizontal	Vertical
Frame border = 0	Frame border = 0
Total size = 31.774 us	Total size = 14.268 ms
Display size = 25.422 us	Display size = 12.711 ms
Rear porch = 1.907 us	Rear porch = 1.112 ms
Sync width = 3.813 us	Sync width = 0.064 ms
Sync polarity = -	Sync polarity = +

TABLE 2: 31.469KHz/59.940 Hz, 640 X 480, pixel=25.175 MHz

Horizontal	Vertical
Frame border = 0	Frame border = 0
Total size = 31.778 us	Total size = 16.683 ms
Display size = 25.422 us	Display size = 15.253 ms
Rear porch = 1.907 us	Rear porch = 1.049 ms

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TABLE 3: 35. 16KHz/56 Hz, 800 X 600, pixel= 36.000 MHz

Horizontal	Vertical
Frame border = 0	Frame border = 0
Total size = 28.444 us	Total size = 17.778 ms
Display size = 22.222 us	Display size = 17.067 ms
Rear porch = 3.556 us	Rear porch = 0.626 ms
Sync width = 2.0us	Sync width = 0.057 ms
Sync polarity = +	Sync polarity = +

TABLE 4: 37. 86KHz/85 Hz, 640 X 350, pixel= 31.500 MHz

Horizontal	Vertical
Frame border = 0	Frame border = 0
Total size = 26.413 us	Total size = 11.754 ms
Display size = 20.317 us	Display size = 9.245 ms
Rear porch = 3.048 us	Rear porch = 1.585 ms
Sync width = 2.032us	Sync width = 0.079 ms
Sync polarity = +	Sync polarity = -

TABLE 5: 43.269KHz/85.008 Hz, 640 X 480, pixel=36.000 MHz

Horizontal	Vertical
Frame border = 0	Frame border = 0
Total size = 23.111 us	Total size = 11.764 ms
Display size = 17.778 us	Display size = 11.093 ms
Rear porch = 2.222 us	Rear porch = 0.578 ms
Sync width = 1.556 us	Sync width = 0.069 ms
Sync polarity = -	Sync polarity = -

TABLE 6: 46.875KHz/75.000Hz, 800 X 600, pixel=49.500MHz

Horizontal	Vertical
Frame border = 0	Frame border = 0
Total size = 21.333 us	Total size = 13.333 ms
Display size = 16.162 us	Display size = 12.800 ms
Rear porch = 3.232 us	Rear porch = 0.448 ms
Sync width = 1.616 us	Sync width = 0.064 ms
Sync polarity = +	Sync polarity = +

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TABLE 7: 53.674KHz/85.061Hz, 800 X 600, pixel=56.250MHz

Horizontal	Vertical
Frame border = 0	Frame border = 0
Total size = 18.631 us	Total size = 11.756 ms
Display size = 14.222 us	Display size = 11.179 ms
Rear porch = 2.702 us	Rear porch = 0.503 ms
Sync width = 1.138 us	Sync width = 0.056 ms
Sync polarity = +	Sync polarity = +

TABLE 8: 60.023KHz/75.029Hz, 1024 X 768, pixel=78.750MHz

Horizontal	Vertical
Frame border = 0	Frame border = 0
Total size = 16.660 us	Total size = 13.328 ms
Display size = 13.003 us	Display size = 12.795 ms
Rear porch = 2.235 us	Rear porch = 0.466 ms
Sync width = 1.219 us	Sync width = 0.050 ms
Sync. polarity = +	Sync. polarity = +

TABLE 9: 68.677KHz/84.997Hz, 1024 X 768, pixel=94.500 MHz

Horizontal	Vertical
Frame border = 0	Frame border = 0
Total size = 14.561 us	Total size = 11.765 ms
Display size = 10.836 us	Display size = 11.183 ms
Rear porch = 2.201 us	Rear porch = 0.524 ms
Sync width = 1.016 us	Sync width = 0.044 ms
Sync polarity = +	Sync polarity = +

TABLE 10: 79.976KHz/75.025Hz, 1280 X 1024, pixel=135.00MHz

Horizontal	Vertical
Frame border = 0	Frame border = 0
Total size = 12.504 us	Total size = 13.329 ms
Display size = 9.481 us	Display size = 12.804 ms
Rear porch = 1.837 us	Rear porch = 0.475 ms
Sync width = 1.067 us	Sync width = 0.038 ms
Sync polarity = +	Sync polarity = +

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TABLE 11: 91.146 KHz/85.024Hz, 1280 X 1024, pixel=157.500 MHz

Horizontal	Vertical
Frame border = 0	Frame border= 0
Total size = 11.971 μs	Total size = 11.761 ms
Display size = 8.127 μs	Display size = 11.234 ms
Rear porch = 1.422 μs	Rear porch = 0.483 ms
Sync width = 1.016 μs	Sync width = 0.033 ms
Sync polarity = +	Sync polarity = +

- 3.2.1 Horizontal scanning
- Scanning frequency : 30 - 97.0 KHz,
- H-shift range : 10 mm Min.
- Retrace time : Less than 2.40 us.

- 3.2.2 Vertical scanning
- Scanning frequency : 50 - 160 Hz
- V-shift range : 8 mm Min.

- 3.3 Power supply
- The display device maintains the specified performance in the range described as bellows :

Type	Mains current	Mains Voltage	Mains freq.
230V version	1.5A Max.	90 - 264 VAC	60 3 Hz
Power consumption : < 75 Watts			
Power cord length : 1.8 M			

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Power saving management system

	Signal			Compliance Requirement	Power
	H-Sync	V-Sync	Video		
On	Active	Active	Active	Mandatory	< 75w
Off	Inactive	Active	Blanked	Mandatory	? 2 w
Off	Active	Inactive	Blanked	Mandatory	? 2w
Off	Inactive	Inactive	Blanked	Mandatory	? 2w

Remark: Transition time from ON to any power saving mode will have 5 seconds delay

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3.5 CRT Description
This display unit employs a high resolution CRT complying with the following specifications :

- Dimensions
- : 17 inches
- flat screen
- Pitch
- : 0.25mm
- Deflection angle
- : 90 degrees
- Light transmission
- : 50% approximately(dark glass)
- Face treatment
- : Anti-glare, anti-static
- EHT
- : 25.0 KV (Ib=0)
- Visible screen area
- : 327.2 mm x 245.44mm
- CRT Source
- : LG/SDI/CPT tube

3.6 RGB Amplifier

- 3.6.1 Video amplifiers
- Dot Rate
- : 202.5 MHz
- Rise / Fall time
- : 8.0ns / 8.0ns
- Over / undershoot
- : 15% Max. (Transient response)
- Sag
- : 5% Max.(pulses of 0.70H)
- Black level shift
- : 5% Max.

- 3.6.2 Brightness and Contrast
- Reference mode 68.7 KHZ/85 HZ full white pattern.

DISPLAY LIGHT OUTPUT

Brightness	Contrast	Light output (full white)
Minimum	Minimum	no visible
Maximum	Maximum	30 ~ 40 FL.

100mm x 100mm block
brightness at center and contrast at maximum light output is

9300/6500/5500 K

1. 39.5 +/- 3.5 FL (for normal Brightness)

2. 80 +/- 8.0 FL (for HB brightness)

SRGB : 22.5 +/- 2.2 FL

3.7 Variation of image size after warm-up 30 minutes.

Due to brightness change
from 3 to 32 FL (Max.) : < 1.0 %

Due to aging
(0 to 40 C) : < 1.0 %

Due to mains voltage
variation : < 1.0 %

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- 3.8 Degaussing
An automatic degaussing circuit is provided which requires no intervention. The degaussing activated at the time of switch-on or switch-on again time of switch-on or switch-on again or pressing manual degaussing key after switching-off degaussing circuits for longer than 30 minutes.
- 3.9 Phosphor protection
The display device is sufficiently protected against the burning of phosphors in case of repetitive power cycling or absence of horizontal deflection.
- 3.10 Low emission requirements ()

Items	Band I ELF (rms)	Band II VLF (rms)
Alternating Electric Field	≤ 10 V/M	≤ 1.0V/M
Magnetic Field	≤ 250 nT	≤ 25 nT
E.S.P	≤ ± 500 V	

Band I : 5 to 2K Hz.
Band II : 2K to 400K Hz.
Test procedure according to Low emission test method.

- 3.11 Display data channel : DDC2B (VESA STANDARD)
The software DDC HEX Data should be written into EEPROM A0 page.

	DDC1	DDC2B
Software		V
Hardware		

4.0 Display image (CRT facing east)

The monitor is aligned in a magnetic cage having the following magnetic field components :

Northern Hemisphere: H = 0, V = +0.43 0.05G, Z = 0

Southern Hemisphere: H = 0, V = -0.52 0.05G, Z = 0

Conditions for visual testing, unless otherwise stated:

Input video signal - 700 mVp-p cross hatch
Brightness control - 50%
Contrast control - Adjusted to 30 +/- 3 FL of luminance with full white pattern

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4.1 Display resolutions

See 3.1.3

4.2 Image size (Factory pre-set modes only)

The dimensions of guaranteed display area to be measured along the picture center of horizontal and vertical axis of the screen as listed below: (preset modes only, refer to Fig- 1/ Fig- 2)

Width : 310 +/- 4 mm .(Fig- 1)

Height : 230 +/- 4 mm .(Fig- 1)

4.3 Image centering deviation (Factory preset modes only)

With respect to Fig- 2, the target relationships are the following:

$|A - B| \leq 4 \text{ mm}$ $|C - D| \leq 4 \text{ mm}$

Note: The centering is adjustable by the end-user.

4.4 Picture shift control range

H-shift range : 10 mm min. (+/- 3mm,from center to each side)

V-shift range : 10 mm min. (+/- 2mm,from center to each side)

4.5 Picture tilt

With respect to Fig- 3, Tilt to be measured on extremes of center line from bezel.

Tilt : $\leq 2 \text{ mm}$

4.6 Geometric distortions

It is acceptable that pincushion, trapezoid, rhomboid, rotation and various waves distortions must remain within the limits of tolerance as in Fig- 4,

A	,	B	2.0mm
C	,	D	2.0mm
A + B			3.5mm
C + D			3.5mm

The waviness of any vertical or horizontal shall be less than 1.0 mm over a 50 mm distance.

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4.7 Image non-linearity : pattern with 12 equal blocks along horizontal axis, 10 equal blocks along vertical axis. (see Fig. 1) (For preset & preload modes only)

Fh > 48Khz : H non-linearity <= 5.5 %
Fh < 48Khz : H non-linearity <= 8.0 %
It is calculated by following formula :

Horizontal non-linearity = $\frac{X_{max} - X_{min}}{X_{max} + X_{min}} \times 100\%$

Where Xmax : the max block , Xmin : the min block

Note : Un-adjacent spec is same as adjacent spec.

Vertical non-linearity
<= 5.5 % at any preset & preload modes

It is calculated by following formula :

Vertical non-linearity = $\frac{Y_{max} - Y_{min}}{Y_{max} + Y_{min}} \times 100\%$

Where Ymax = the max block , Ymin : the min block .

4.8 Mis-convergence
The maximum convergence error to be measured on a white spot or white line to represents the maximum distance between the energy centers of any two primary colors. (See Fig- 6)
Mis-Convergence SPEC. Zone A / C is 0.3 / 0.4 When ? 45kHz.

CRT Pitch	0.25mm
Zone A	0.25
Zone C	0.35
Center	0.15

4.9 Focus check (with 79.976KHz/75.025Hz, 1280 x 1024 mode)
Generate 9-blocks ME character pattern (Fig-7) to cover entire of the picture area
90mm x 90mm (display size respect to Fig-1), adjust brightness control to 50% and contrast at 100%, the ME character should be clearly identified in all display area.

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4.11 White color adjustment

Based on the 1931 CIE chromaticity (color triangle) diagram (x,y coordination).
coordination of white display on screen center should be:
for 9300 degree K X = 0.283 +/- 0.015
 Y = 0.297 +/- 0.015

for 6500 degree K & SRGB X = 0.313 +/- 0.015
 Y = 0.329 +/- 0.015
For 5500 degree K X = 0.332 +/- 0.015
 Y = 0.347 +/- 0.015

Check conditions :
Set brightness control at 50% position and contrast at maximum.

4.12 Color tracking on full white pattern

Ref. to white balance alignment result and set brightness at 50%, adjust contrast control from 5FL to max. position, the color coordinate should not deviate more than following tolerance when compare to display center:

X= X nominal +/- 0.015
Y= Y nominal +/- 0.015

4.13 Purity

Test patterns: Full White / Red / Green / Blue.
Conditions: As stated in item 4.0, the purity must be checked under specific destinations of earth magnetic environments and the monitor to be well degaussed.
After warming-up time of 30 min., no colored stains may occur in above four patterns.

4.14 Moire

Apply all preset timings with full-white pattern, picture size defined as in Fig.1
The moir should be invisible at normal mode with luminance 15FL ,and invisible at High Brightness mode with luminance 16FL. The moir should also be invisible on windows 98/95 picture.(cyanine color)

5.0 Mechanical characteristics

5.1 User controls (at front) right to left

- Power ON/OFF
- OSD Menu
- Quit OSD
- Brightness (with Increase)
- Contrast (with Decrease)

6.0 Environmental characteristics

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

6.1 Susceptibility of display to external environment

- 6.1.1 (A) Operating limits
- Temperature : 0 C to 40 C
- Humidity : 20 to 80% (W/O condensation)
- Air pressure : 700 ~ 1100 mbar
- (B) Non-operating limits (storage)
- Temperature : -40 to 60 C
- Humidity : 20 to 90 % (W/O condensation)
- Altitude : 300 to 1100 mbar

6.1.2 Transportation packages

- A) Carton box
- A-1 Size (with pedestal)
- 496(W)×520(H)×556(D)mm
- A-2 Carton paper : double wall AB flute corrugate board, color brown
- Bursting : 19.3 kg/cm² min
- Compression : 600 kgf min

B) Transportation conditions

B-1 Transportation standards

Standards		EU / Asia versions PHILIPS's UN-D1400	Legend
Drop test	Height	61 cm	70 cm
	Sequence	-10°C for 16 hours, 1 corner, 3 faces Right/Back/Top faces Left/Front/Bottom faces (only for reference)	6 faces 3 edges 1 corner
	Result	- Electrical function OK. - Mechanical function OK. - No serious damage in set.	
Vibration test	Sequence	a . 5~200Hz. 0.25G operating random vibration 30 min/axis, 3 axes b. 5~200Hz. 0.73 packing random vibration 30 min/axis, 3 axes	
	Result	- Electrical function OK. - Mechanical function OK. - No serious damage in set.	

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- 6.2 Display disturbances from external environment
- 6.2.1 ESD Disturbances
According to EN50082-1 (also refer to IEC801-2 for detail).
- 6.3 Display disturbances to external environment
- The disturbances induced by the display and tolerated by the environment are defined as follows :
- 6.3.1 Ionizetic radiation
Completely fulfilled International Commission of Radio logical Protection (ICRP) requirement 0.5 mR/Hr.
- Actually the set can reach 0.1 mR/Hr.
- 6.3.2 EMI
Can comply with FCC part 15,DOC C108.8 and EN55022.

7.0 Safety tests

- 7.1 Dielectric strength (Hi-pot test)
According to IEC950, UL1950 and CSA 22.2 No 950
- 7.2 Resistance for protective earth
According to IEC950
- 7.3 Leakage current
According to IEC950, UL1950 and CSA22.2 No. 950
- 7.4 Grounding
According to IEC950, UL1950 and CSA22.2 No. 950

8.0 Certifications

- 8.1 Safety
The monitors comply with the following safety standards:
- IEC950
- UL1950
- DHHS 21 CFR, subchapter J
- CSA-22.2 NO. 950
- GERMANY ZH1/618(GS),ISO9241-3,-7,-8
- 8.2 EMI (Electromagnetic Interference)
The monitor comply with the following EMI standards :
- CCC
- EN55022
- FCC Part 15
- DOC C108.8

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8.3 Fulfil approbation requirements
Destination basis, set can fulfil following requirements:

Countries	Safety	EMI
Germany	TUV,GS	CE
Sweden	SEMKO	----
Norway	NEMKO	----
Denmark	DEMKO	----
Finland	FIMKO	----
U.S.A.	UL , DHHS	FCC
Canada	CSA	DOC
Taiwan	----	BSM1

9.0 Reliability

9.1 Mean time between failures
MTBF to be calculated according to Military standard MIL-HDBK-217C.

MTBF ≥ 75,000 Hours (Excluding CRT)

PRACTICE of MTBF =
$$\frac{\text{TOTAL HRS (POWER ON)} \times \text{TOTAL SETS}}{\text{NBR. OF FAILURE SETS}}$$

10.0 Quality assurance requirements

10.1 Acceptance test

According to MIL-STD-105D level II,
AQL : 0.4 (Major)
: 1.0 (Minor)

Customer acceptance : UAW 0377/40
criteria

11.0 Service ability

The service ability of this monitor should fulfil the requirements which are prescribed in
UAW-0346 and must be checked with the check list UAT - 0361

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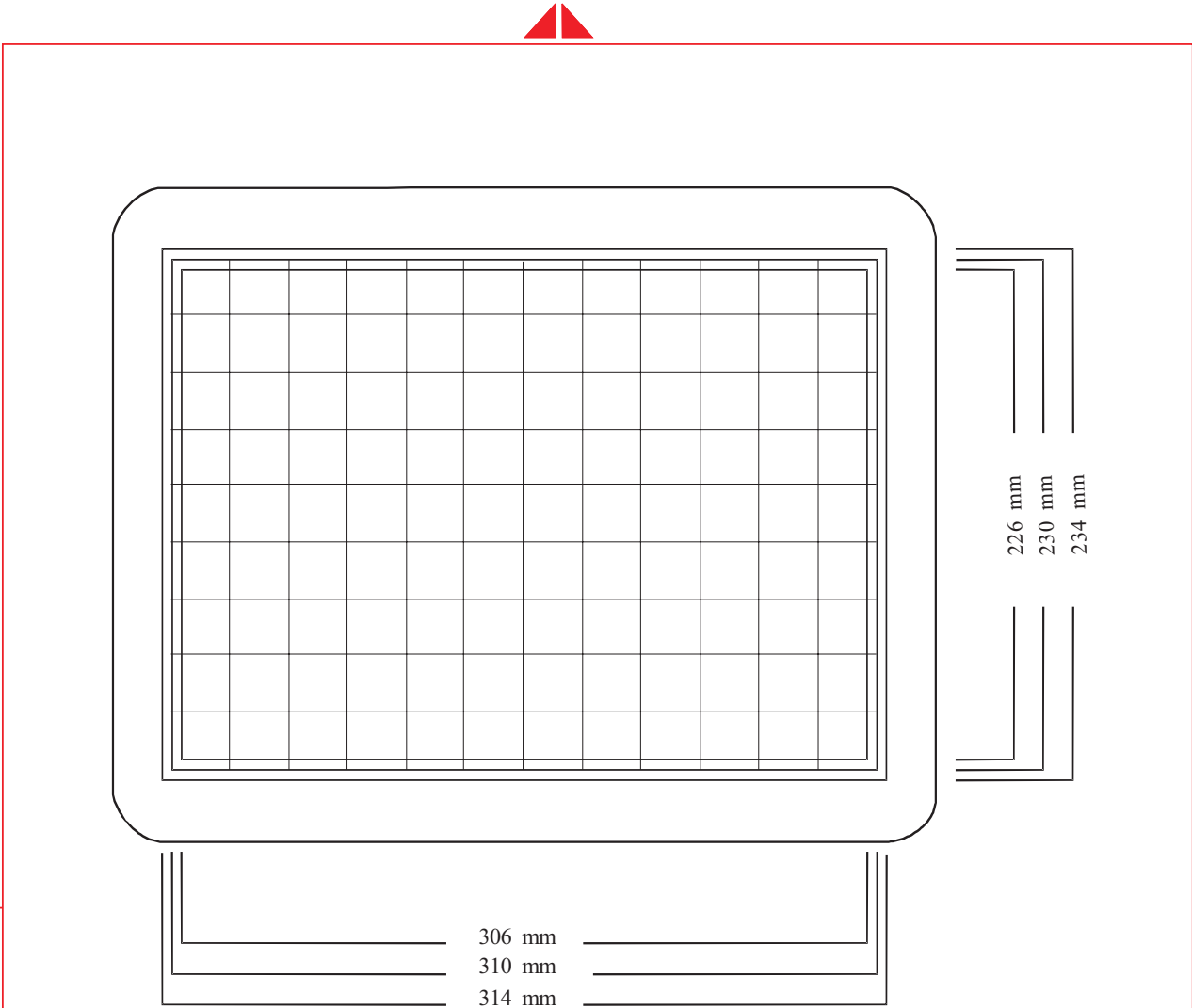


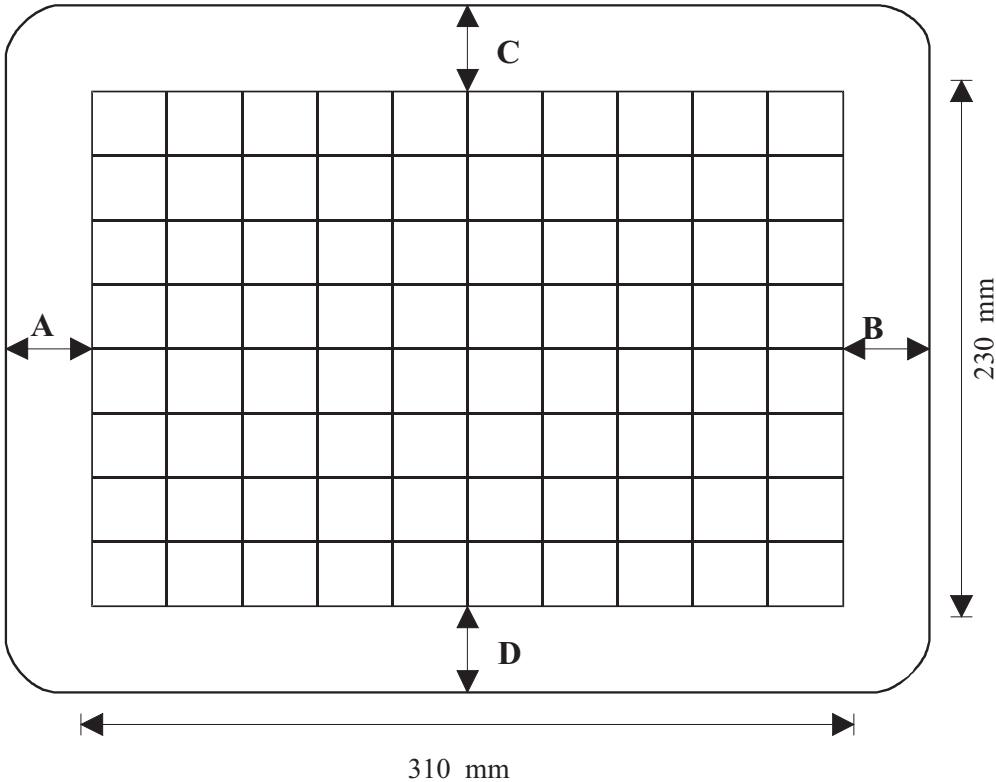
Fig-1 IMAGE DIMENSION

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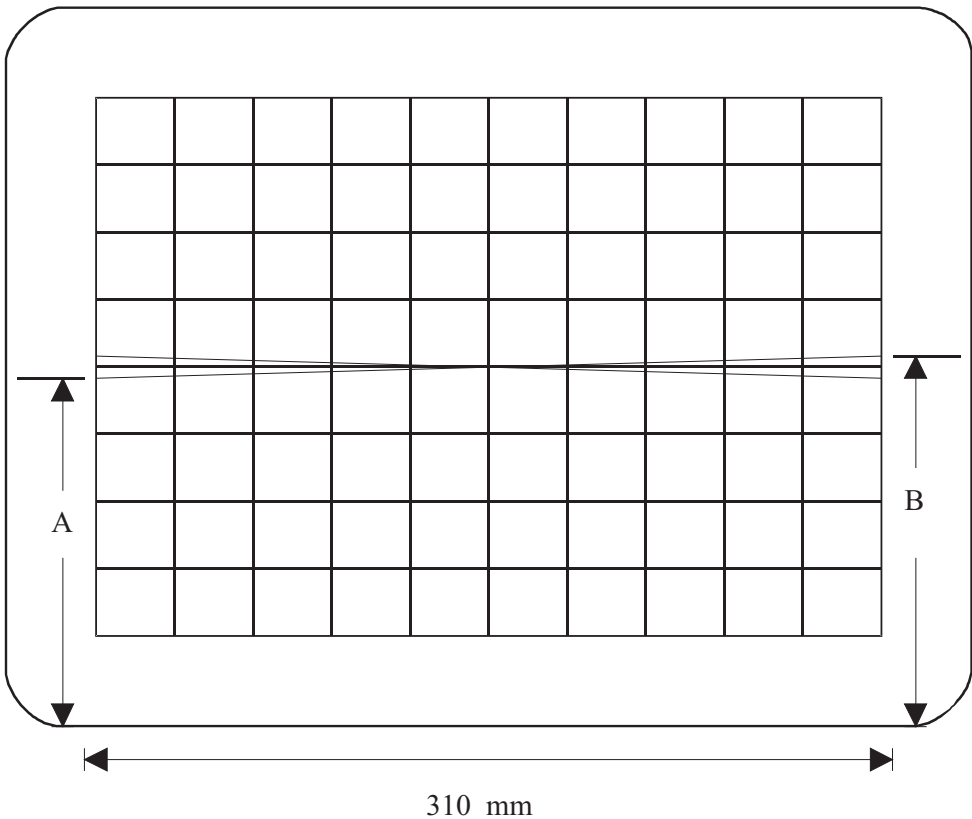
|A-B| AND |C-D| < 4 mm

FIG-2 IMAGE CENTERING

CLASS NO.		17" V40, 107P5 97KHz CMTR(HB)						
		TYPE : 107P50/00			8639 000 13853			
		BRAND : PHILIPS						
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$|A-B| < 2 \text{ mm}$

FIG-3 IMAGE ROTATION

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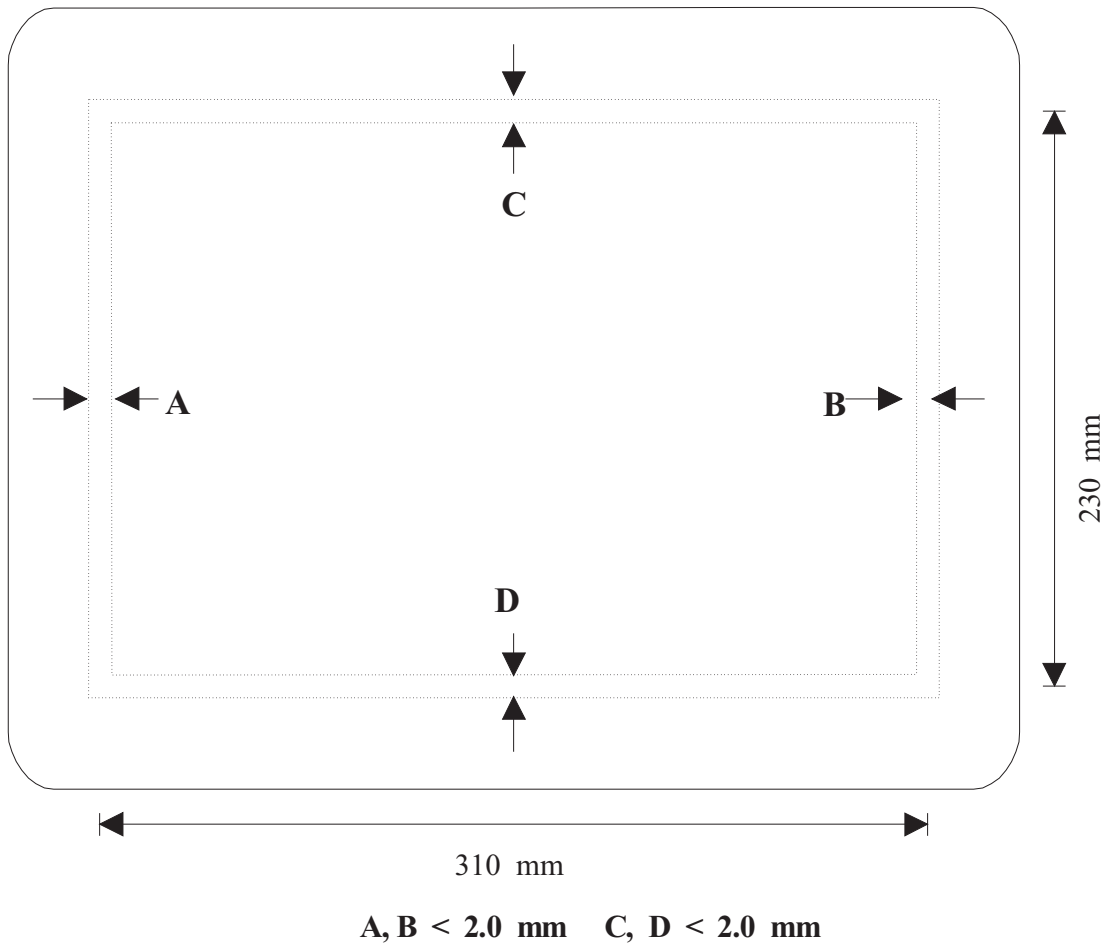


FIG-4 IMAGE GEOMETRY

CLASS NO.		17" V40, 107P5 97KHz CMTR(HB)			8639 000 13853					
		TYPE : 107P50/00								
		BRAND : PHILIPS								
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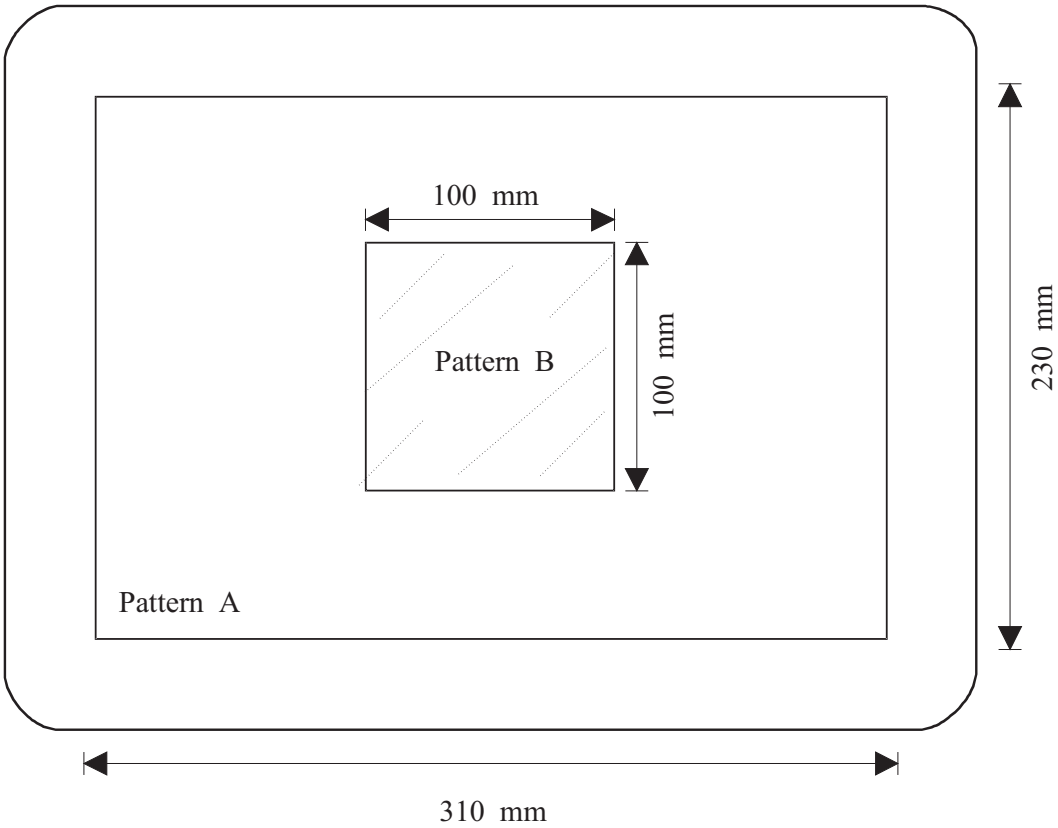


FIG-5 CONTRAST AND BRIGHTNESS MEASUREMENT PATTERNS

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		TYPE : 107P50/00		8639 000 13853	
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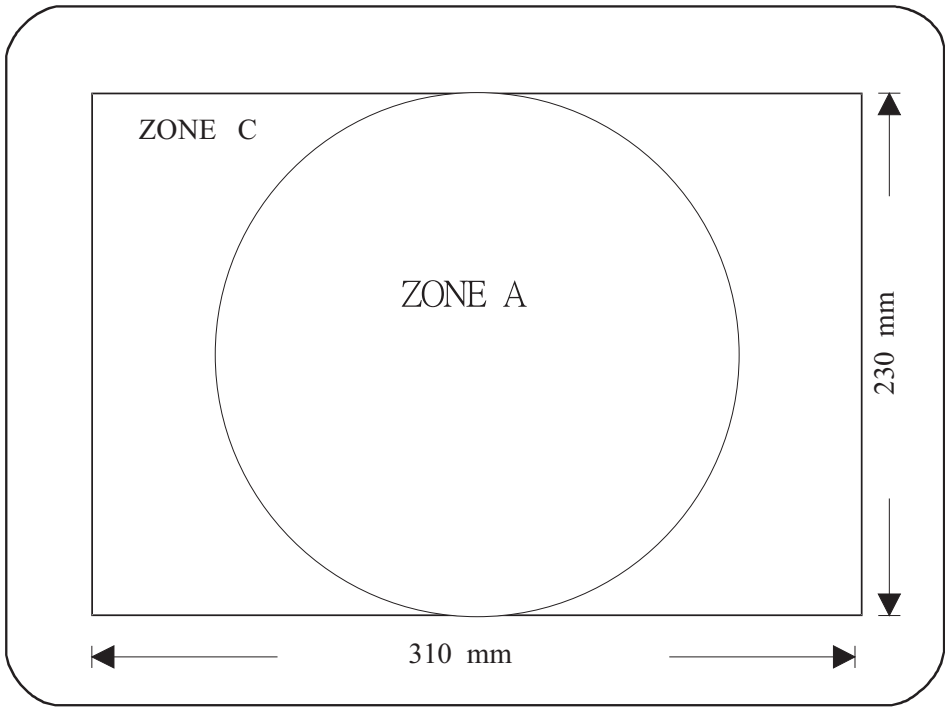


FIG-6 MISCONVERGENCE MEASUREMENT AREA

CLASS NO.		17" V40, 107P5 97KHz CMTR(HB)			
		TYPE : 107P50/00		8639 000 13853	
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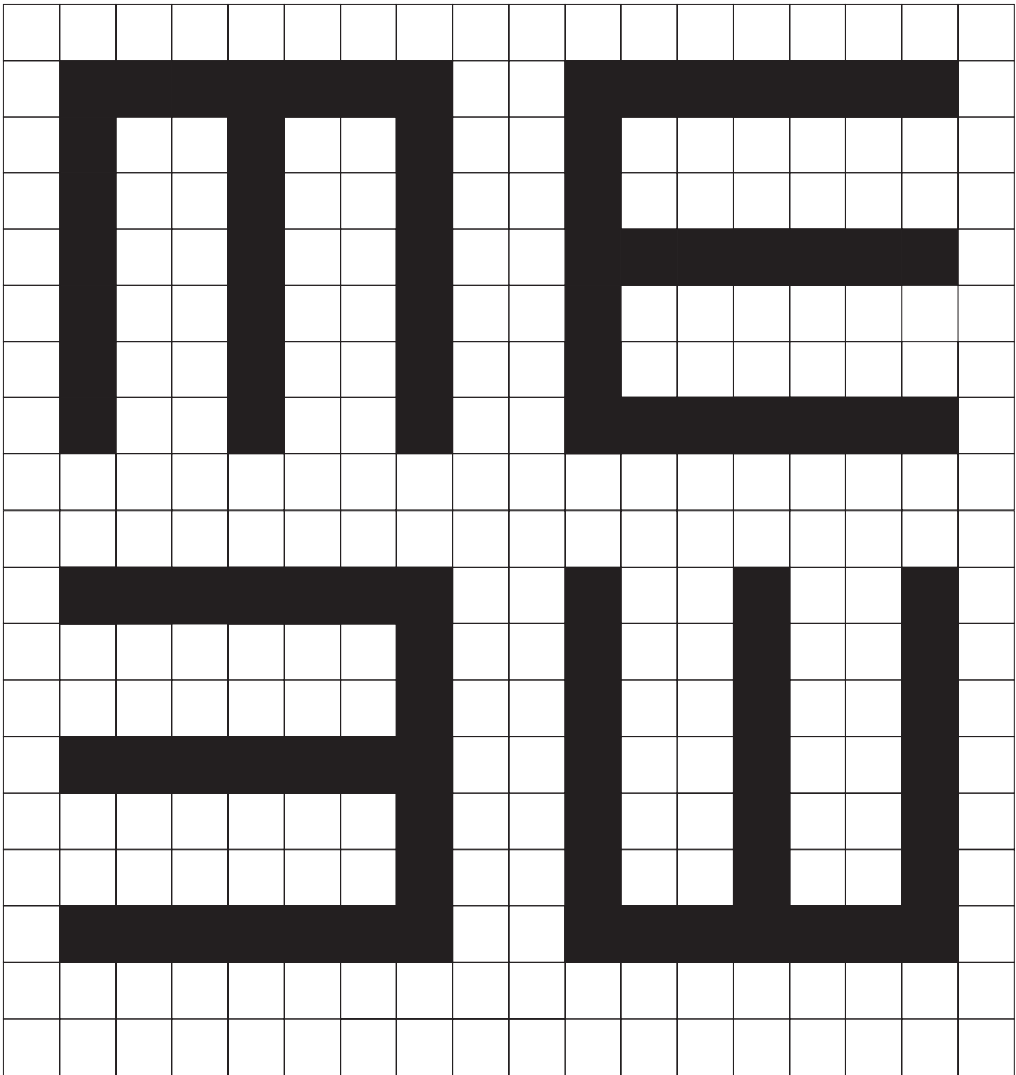


Fig-7 FOCUS CHECK CHARACTER

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

HI-POT TEST INSTRUCTION

1. Application requirements

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

2. Test method

2.1 Connecting conditions

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

2.2 Test Requirements

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

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

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

3. Equipments and Connection

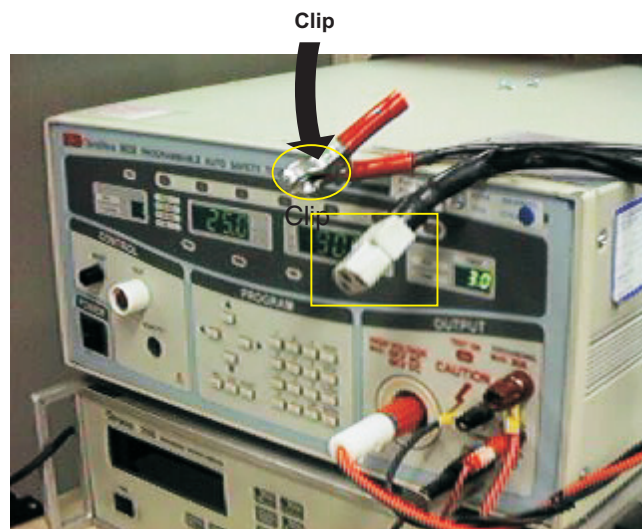
3.1. Equipments

For example :

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

3.2. Connection

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

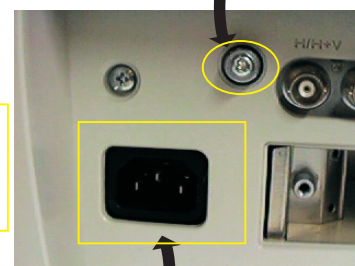


(ChenHwa 9032 tester)

Video cable



Grounding screw



Power outlet

(Rear view of monitor)

4. Recording

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

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Diversity V40 107P50/00 comparing with 107P50/74		
0201	313811578921	RATING LABEL
0450	313810662771	CARTON
1053	313812876071	MAINSCORD UL 10A 1M8 DET GY
1053	313818870481	MAINSCORD UL 10A 1M8 DET TDS
Diversity V40 107P50/00 comparing with 107P50/75		
1151	930196310323	CRT M41QEE903X04(P)S (LGPD) B
1151	930196320323	CRT M41QEE903X04(P)SM (LGPD) B
1151	823827445581	CRT M41AJR53X76R (SMV)
1053	313818878171	MAINSCORD AUS/NZ 10A 1M83 GY
Diversity V40 107P50/00 comparing with 107P50/89		
0201	313811578931	RATING LABEL
0450	313810662781	CARTON
0451	313810656842	CUSHION - TOP
0453	313810656852	CUSHION - BTM
1053	313818877651	MAINSCORD CHIN 10A 1M83 DET GY
Diversity V40 107P50/00 comparing with 107P50/97		
1053	313818878181	MAINSCORD ASTA 10A 1M83 GY

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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 servicer 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 ans 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 an 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.

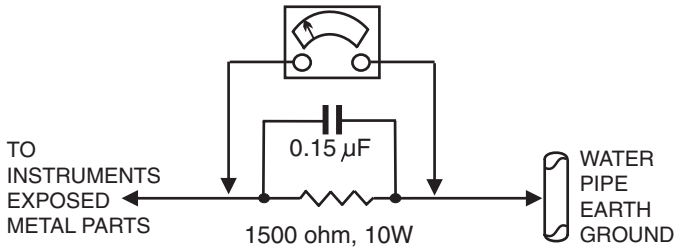
X-radiation

- 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 not operate the chassis longer than necessary to locate the cause of the excessive HV.

- 6. New picture tubes are specifically designed to withstand higher operathing 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-diation 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.