Service
Service
Service

220VW9FB/97
220VW9FB/62
220VW9FB/27
220VW9FB/05
220VW9FB/00
220VW9FB/93
220VW9FB/75
220VW9FB/94

Service Manual

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 TRANSFOMER FOR THIS UNIT WHEN SERVICING

REFER TO BACK COVER FOR IMPORTANT SAFETY GUIDELINES

GB 3122 785 17840

飞利浦 PHILIPS

Revision List

Version	Release Date	Revision History
A00	Apr, 10, 2008	Initial release, Draft Version
A01	Apr.16, 2008	Add CTV Model 220VW9FB/00, 220VW9FB/05,220VW9FB/27, 220VW9FB/62 in Item18
		Add CTV Model 220VW9FB/97 in Item17
		Add Philips 12NC for 220VW9FB/97
A02	Apr.25, 2008	Add CTV Model 220VW9FB/93 and 220VW9FB/75 in Item18
A03	Apr.30, 2008	Add CTV Model 220VW9FB/94 in Item18
A04	May.07, 2008	Perfect Philips 12NC for 220VW9FB/75 and 220VW9FB/93

Important Safety Notice

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 is also important to understand that these CAUTIONS and NOTICES ARE NOT EXHAUSTIVE. Philips could not possibly know, evaluate and advise the service trade of all conceivable ways in which service might be done or of the possible hazardous consequences of each way. Consequently, Philips has not undertaken any such broad evaluation. Accordingly, a servicer who uses a service procedure or tool which is not recommended by Philips must first satisfy himself thoroughly that neither his safety nor the safe operation of the equipment will be jeopardized by the service method selected.

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

WARNING

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.

FOR PRODUCTS CONTAINING LASER:

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

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

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

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

Take care during handling the LCD module with backlight unit

-Must mount the module using mounting holes arranged in four corners.

-Do not press on the panel, edge of the frame strongly or electric shock as this will result in damage to the screen.

-Do not scratch or press on the panel with any sharp objects, such as pencil or pen as this may result in damage to the panel.

-Protect the module from the ESD as it may damage the electronic circuit (C-MOS).

-Make certain that treatment person’s body is grounded through wristband.

-Do not leave the module in high temperature and in areas of high humidity for a long time.

-Avoid contact with water as it may a short circuit within the module.

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

1. Monitor Specifications

LCD PANEL	
Type	TFT LCD
Screen size	22" visual
Pixel Pitch	0.277 x 0.277 mm
LCD Panel type	1680 x 1050 pixels R.G.B. vertical stripe Anti-glare polarizer, hard coated
Effective viewing area	464.9 x 290.6 mm
Display Colors	16.7m
SCANNING	
Vertical refresh rate	56 Hz-76 Hz
Horizontal Frequency	30 kHz - 83 kHz
VIDEO	
Video dot rate	165 MHz
Input impedance	
- Video	75 ohm
- Sync	2.2K ohm
Input signal levels	0.7 Vpp
Sync input signal	Separate sync Composite sync Sync on green
Sync polarities	Positive and negative

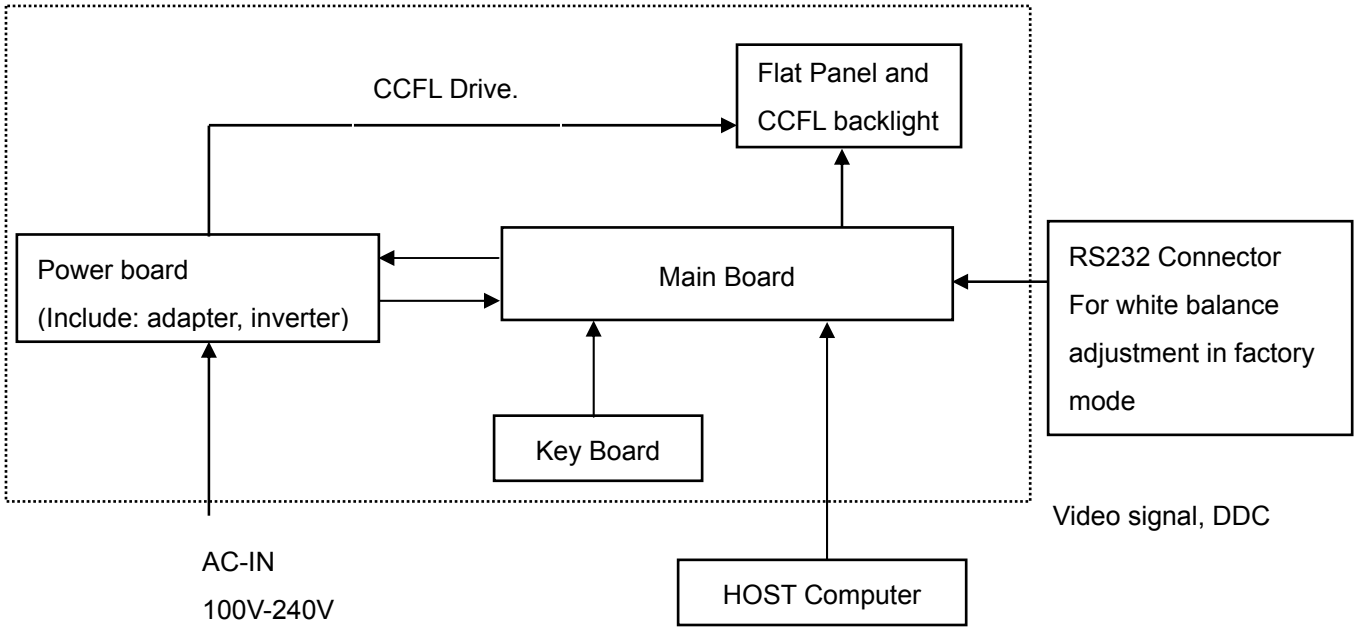
Tilt	-5° ~ 20°
Power supply	100 ~ 240 VAC, 50/60 Hz
Power consumption	<49 W* (typ.)
Temperature	0° C to 40° C (operating) -20° C to 60° C (storage)
Relative humidity	20% to 80%
System MTBF	50K hours (CCFL 40K hours)
Cabinet color	220VW9FB: Black

2. LCD Monitor Description

The LCD monitor will contain a main board, a power board and a key board which house the flat panel control logic, brightness control logic and DDC.

The power board will provide AC to DC Inverter voltage to drive the backlight of panel and the main board chips each voltage.

Monitor Block Diagram



3. Operating Instructions

3.1 General Instructions

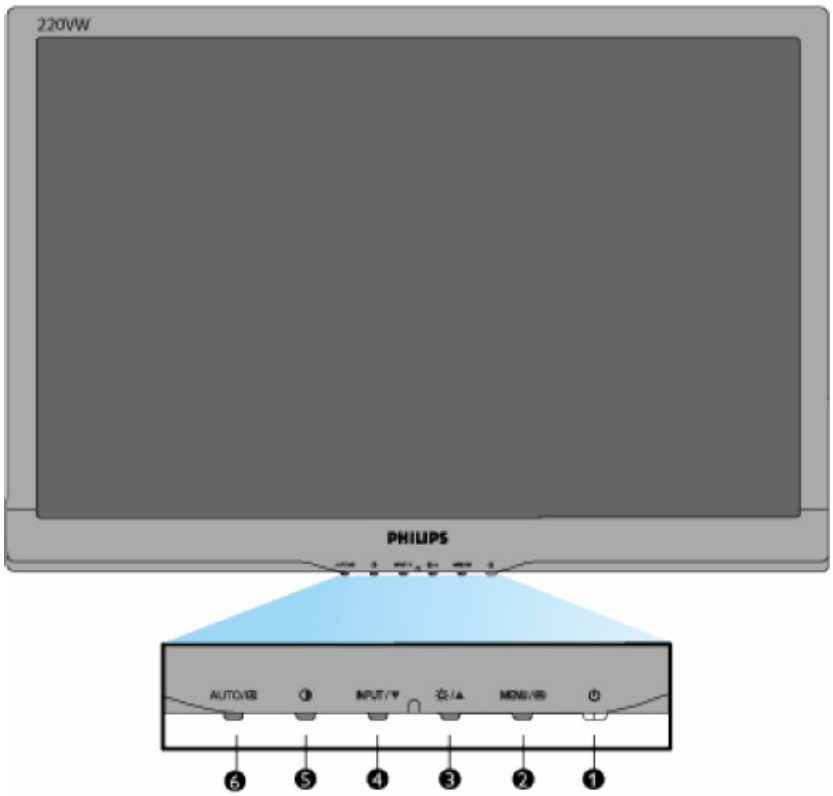
Press the power button to turn the monitor on or off. The other control buttons are located at the front of the panel of the monitor.

By changing these settings, the picture can be adjusted to your personal preferences.

- The power cord should be connected.
- Connect the video cable from the monitor to the video card.
- Press the power button to turn on the monitor, the power indicator will light up.

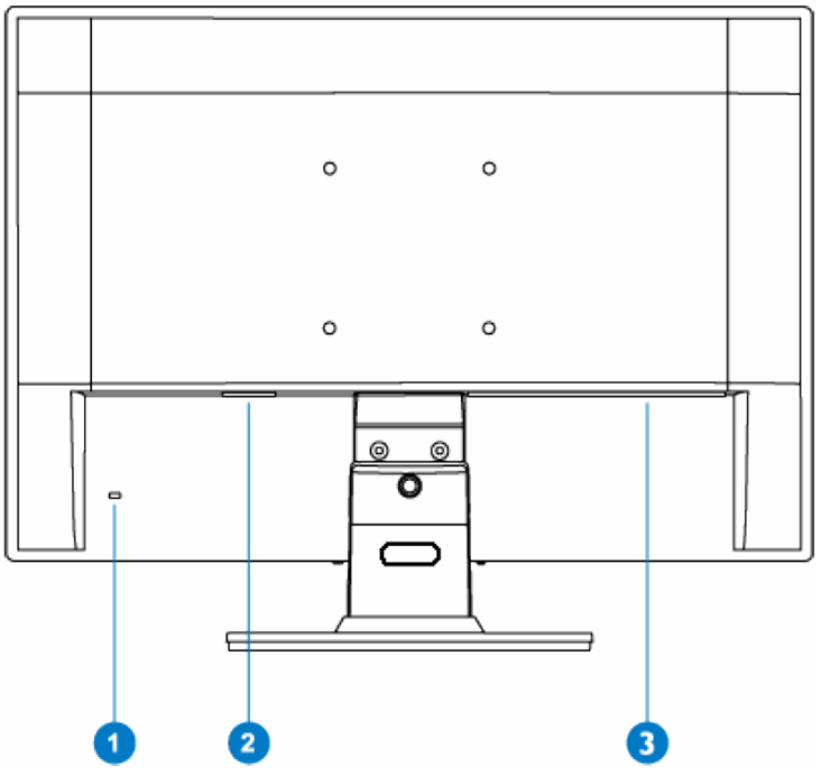
3.2 Control Buttons

Front View



1	⏻	To switch monitor's power On and Off
2	MENU/OK	To access OSD menu
3	☼ / ▲	To adjust brightness of the display
4	Input / ▼	To change the signal input source.
5	◑	To adjust contrast of the display
6	AUTO/◀	Automatically adjust the horizontal position, vertical position, phase and clock settings. Return to previous OSD level.

Rear View



1 Kensington anti-thief lock

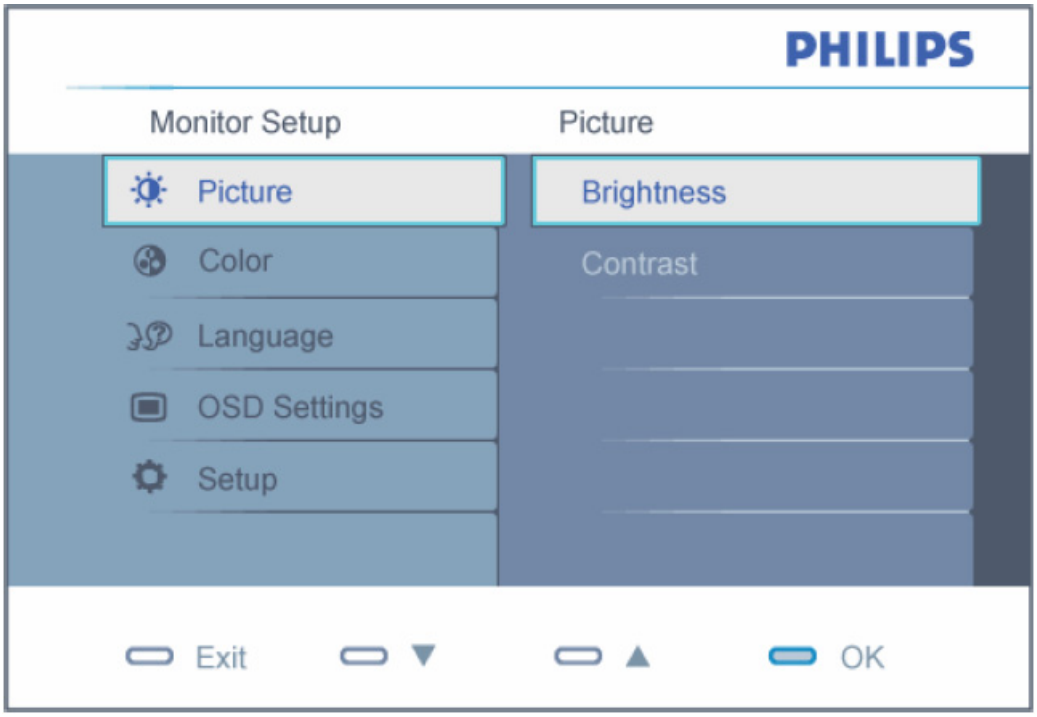
2 AC power input

3 VGA input

3.3 Adjusting the Picture

Description of the On Screen Display

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



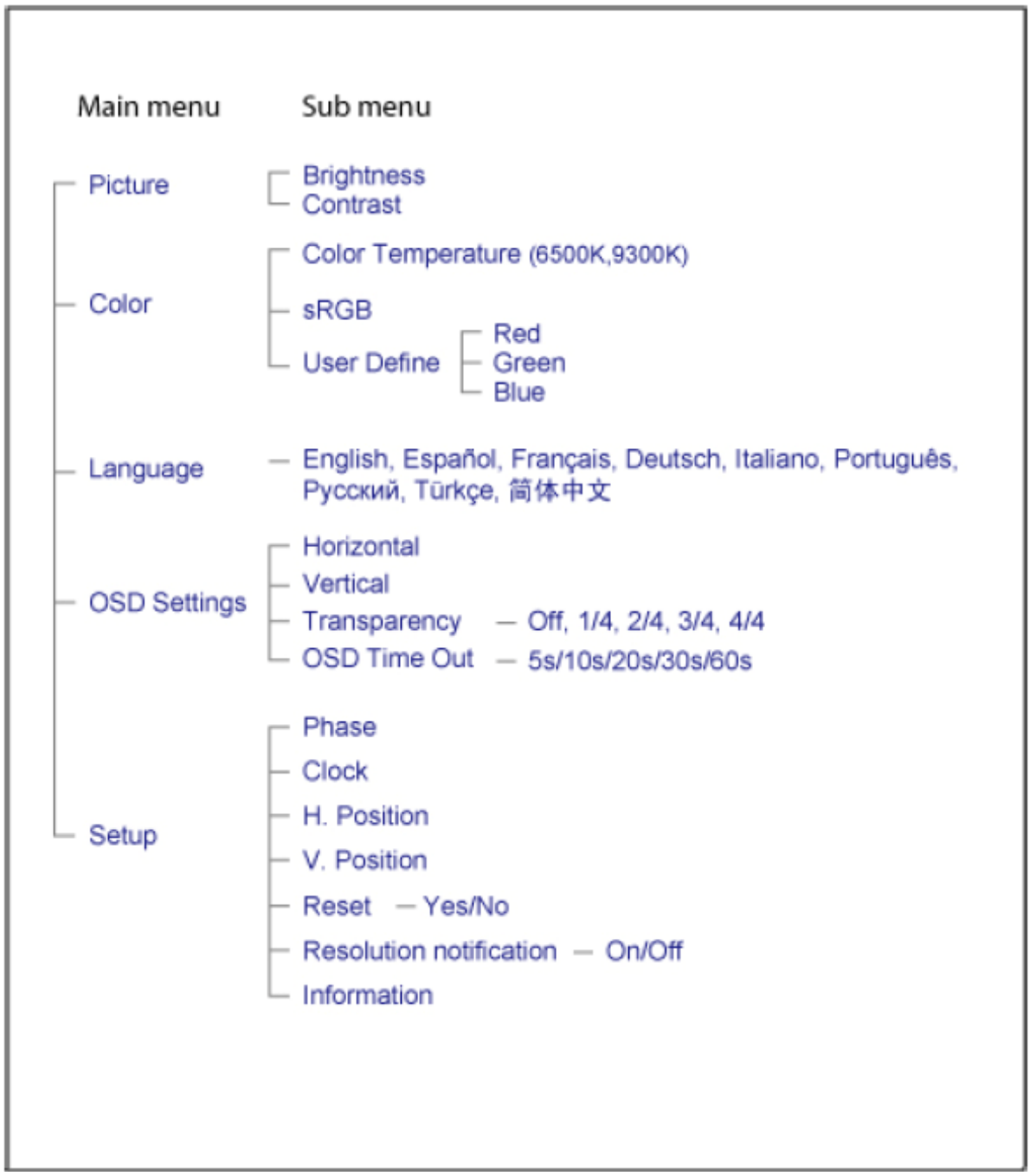
To Lock/Unlock OSD function (User Mode)

The OSD function can be locked by pressing “MENU” button for more than 10 seconds.

Locked OSD function can be released by pressing “MENU” button for more than 10 seconds again.

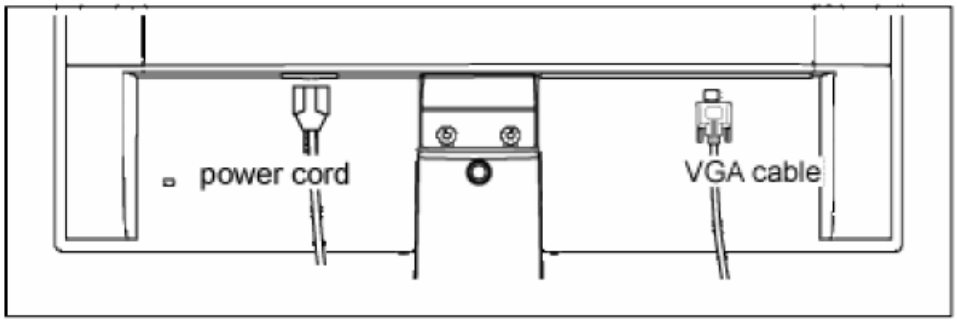
The OSD Tree

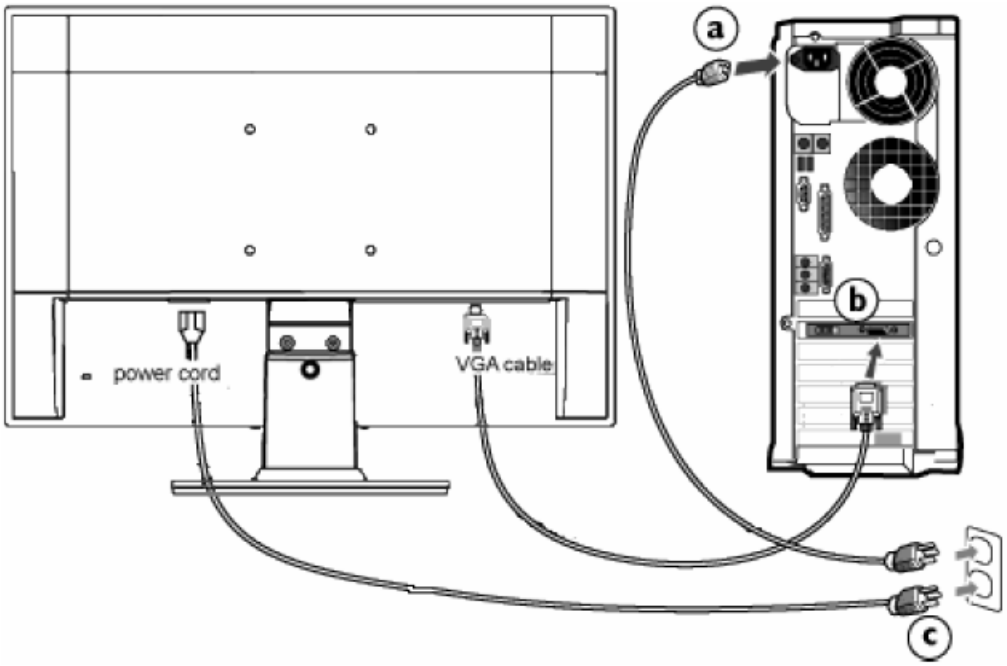
Below is an overall view of the structure of the On-Screen Display. You can use this as a reference when you want to work your way around the different adjustments later on.



3.4 Connecting to the PC

1) Connect the power cord to the back of the monitor firmly.





2) Connect to PC

(a) Turn off your computer and unplug its power cable.

(b) Connect the monitor signal cable to the video connector on the back of your computer.

(c) Plug the power cord of your computer and your monitor into a nearby outlet.

(d) Turn on your computer and monitor. If the monitor displays an image, installation is complete.

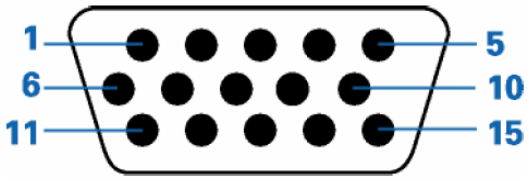
4. Input/ Output Specification

4.1 Input Signal Connector

Analog connectors

Pin No.	Description	Pin No.	Description
1.	Red video input	9.	+5V
2.	Green video input	10.	Logic Ground
3.	Blue video input	11.	Ground
4.	Sense (GND)	12.	Serial data line (SDA)
5.	Cable detect (GND)	13.	H. Sync
6.	Red video ground	14.	V. Sync
7.	Green video ground	15.	Data clock line (SCL)
8.	Blue video ground		

VGA connector layout



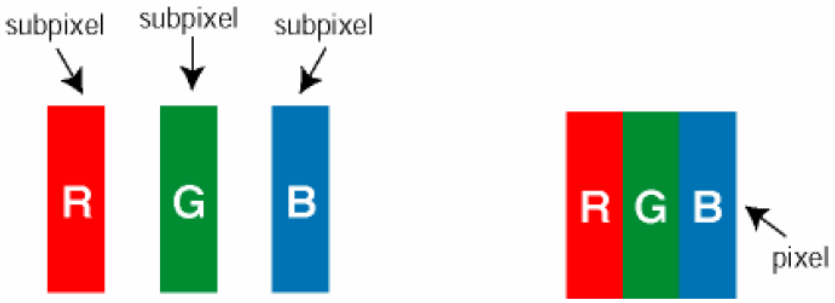
4.2 Factory Preset Display Modes

H. freq (kHz)	Resolution	V. freq (Hz)
31.47	720*400	70.09
31.47	640*480	59.94
37.50	640*480	75.00
37.88	800*600	60.32
46.88	800*600	75.00
48.36	1024*768	60.00
60.02	1024*768	75.03
63.89	1280*1024	60.02
79.98	1280*1024	75.03
55.94	1440*900	59.89
70.64	1440*900	74.98
65.29	1680*1050	59.95

4.3 Pixel Defect Policy

Philips' Flat Panel Monitors Pixel Defect Policy

Philips strives to deliver the highest quality products. We use some of the industry's most advanced manufacturing processes and practice stringent quality control. However, pixel or sub pixel defects on the TFT LCD panels used in flat panel monitors are sometimes unavoidable. No manufacturer can guarantee that all panels will be free from pixel defects, but Philips guarantees that any monitor with an unacceptable number of defects will be repaired or replaced under warranty. This notice explains the different types of pixel defects and defines acceptable defect levels for each type. In order to qualify for repair or replacement under warranty, the number of pixel defects on a TFT LCD panel must exceed these acceptable levels. For example, no more than 0.0004% of the sub pixels on a 22" XGA monitor may be defective. Furthermore, Philips sets even higher quality standards for certain types or combinations of pixel defects that are more noticeable than others. This policy is valid worldwide.



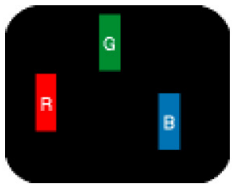
Pixels and Sub pixels

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

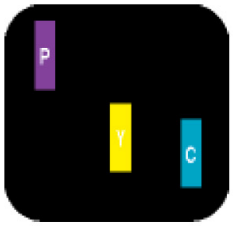
Types of Pixel Defects

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

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



One lit red, green or blue sub pixel

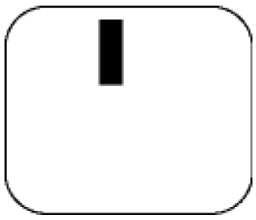


Two adjacent lit sub pixels:
- Red + Blue = Purple
- Red + Green = Yellow
- Green + Blue = Cyan (Light Blue)

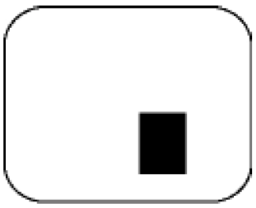
Three adjacent lit sub pixels (one white pixel)

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

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



One dark sub pixel



Two or three adjacent dark sub pixels

Proximity of Pixel Defects

Because pixel and sub pixels defects of the same type that are near to one another may be more noticeable, Philips also specifies tolerances for the proximity of pixel defects.

Pixel Defect Tolerances

In order to qualify for repair or replacement due to pixel defects during the warranty period, a TFT LCD panel in a Philips flat panel monitor must have pixel or sub pixel defects exceeding the tolerances listed in the following tables.

BRIGHT DOT DEFECTS	ACCEPTABLE LEVEL
MODEL	**220VW9**
1 lit subpixel	3
2 adjacent lit subpixels	1
3 adjacent lit subpixels (one white pixel)	0
Distance between two bright dot defects*	>15mm
Total bright dot defects of all types	3

BLACK DOT DEFECTS	ACCEPTABLE LEVEL
MODEL	**220VW9**
1 dark subpixel	5
2 adjacent dark subpixels	2
3 adjacent dark subpixels	0
Distance between two black dot defects*	>15mm
Total black dot defects of all types	5

TOTAL DOT DEFECTS	ACCEPTABLE LEVEL
MODEL	**220VW9**
Total bright or black dot defects of all types	5

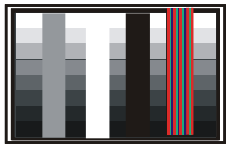
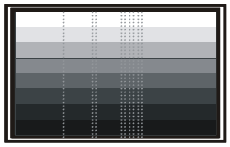
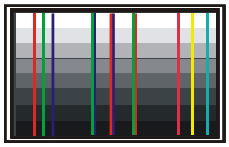
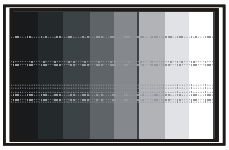
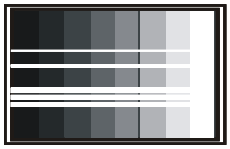
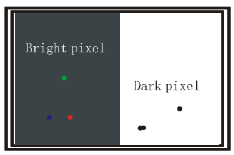
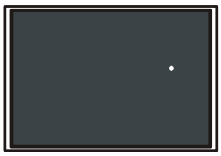
Note:

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

4.4 Failure Mode Of Panel

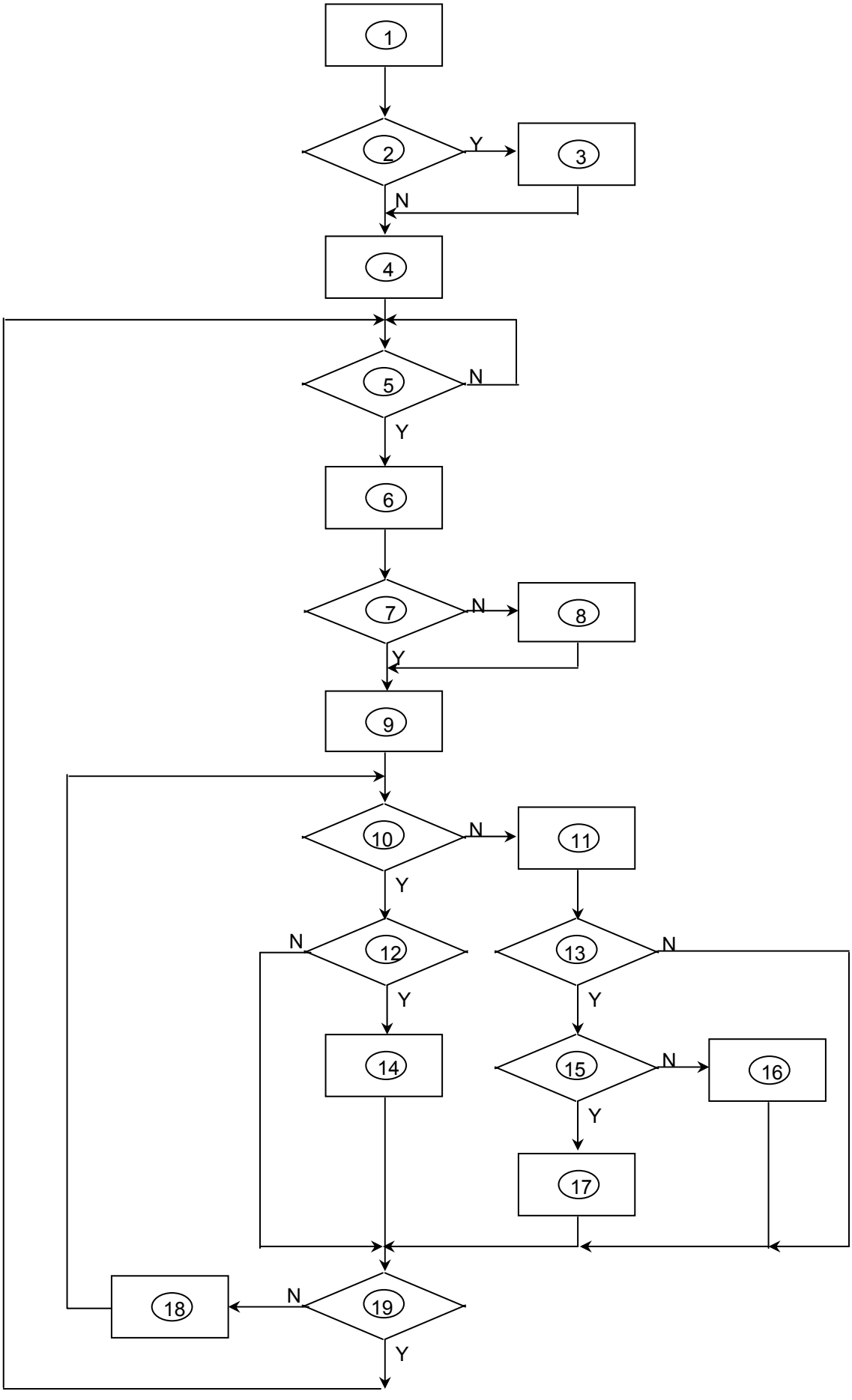
Quick reference for failure mode of LCD panel

this page presents problems that could be made by LCD panel.
It is not necessary to repair circuit board. Simply follow the mechanical instruction on this manual to eliminate failure by replace LCD panel.

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

5. Block Diagram

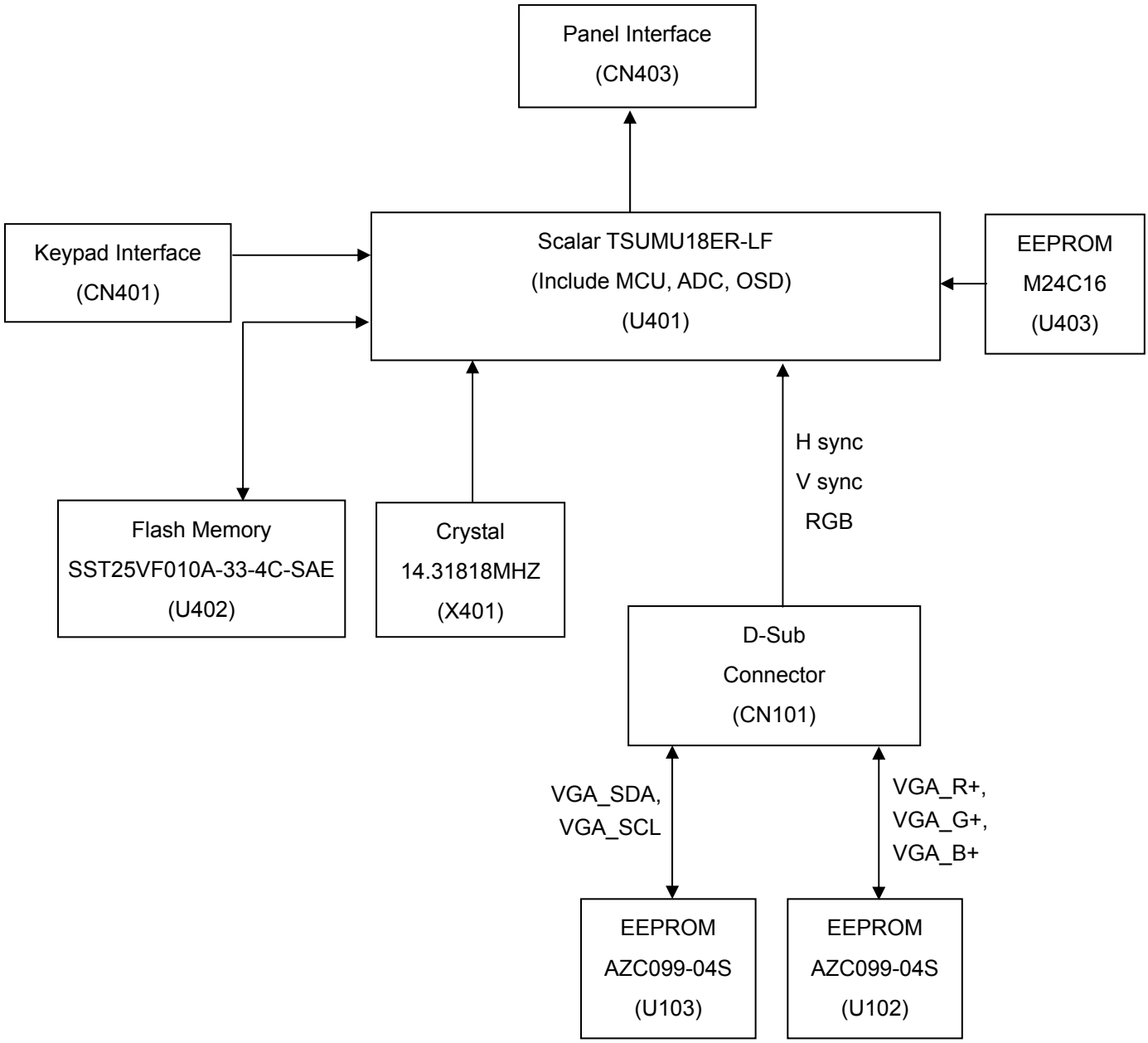
5.1 Software Flow Chat



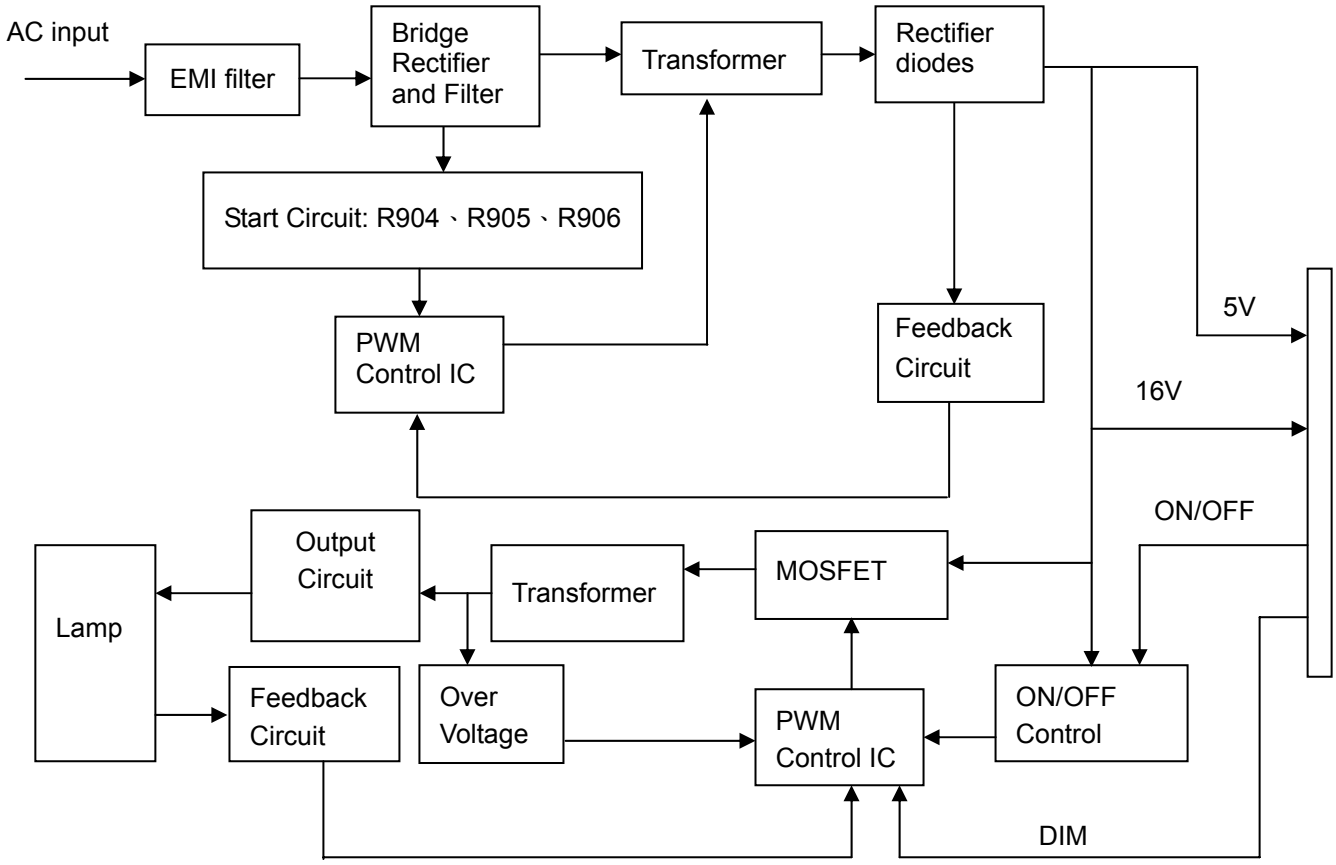
1) MCU initialize.
2) Is the EPROM blank?
3) Program the EPROM by default values.
4) Get the PWM value of brightness from EPROM.
5) Is the power key pressed?
6) Clear all global flags.
7) Are the AUTO and SELECT keys pressed?
8) Enter factory mode.
9) Save the power key status into EPROM. Turn on the LED and set it to green color. Scalar initializes.
10) In standby mode?
11) Update the lifetime of back light.
12) Check the analog port, are there any signals coming?
13) Does the scalar send out an interrupt request?
14) Wake up the scalar.
15) Are there any signals coming from analog port?
16) Display "No connection Check Signal Cable" message. And go into standby mode after the message disappear.
17) Program the scalar to be able to show the coming mode.
18) Process the OSD display.
19) Read the keyboard. Is the power key pressed?

5.2 Electrical Block Diagram

5.2.1 Main Board



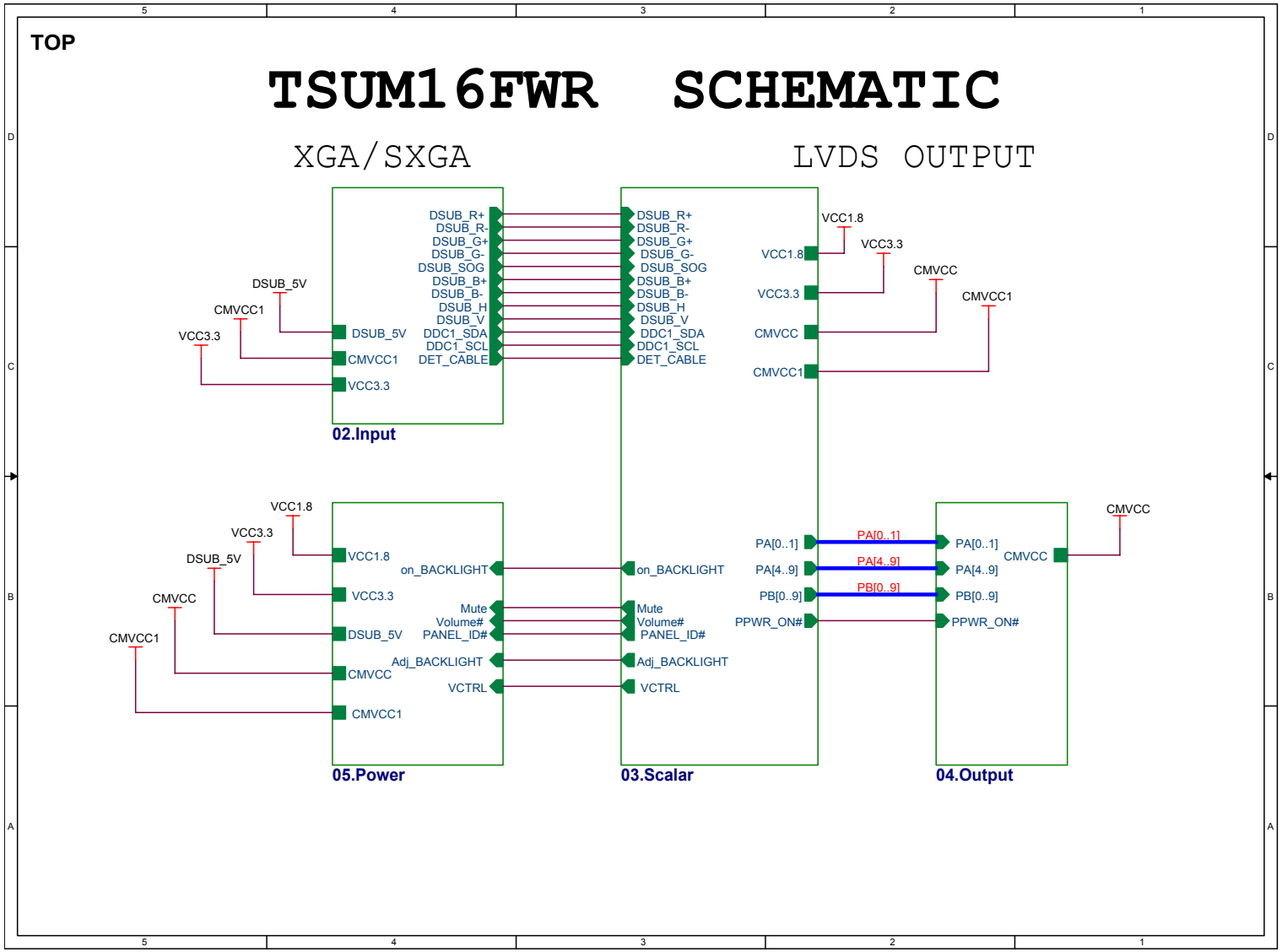
5.2.2 Inverter/Power Board

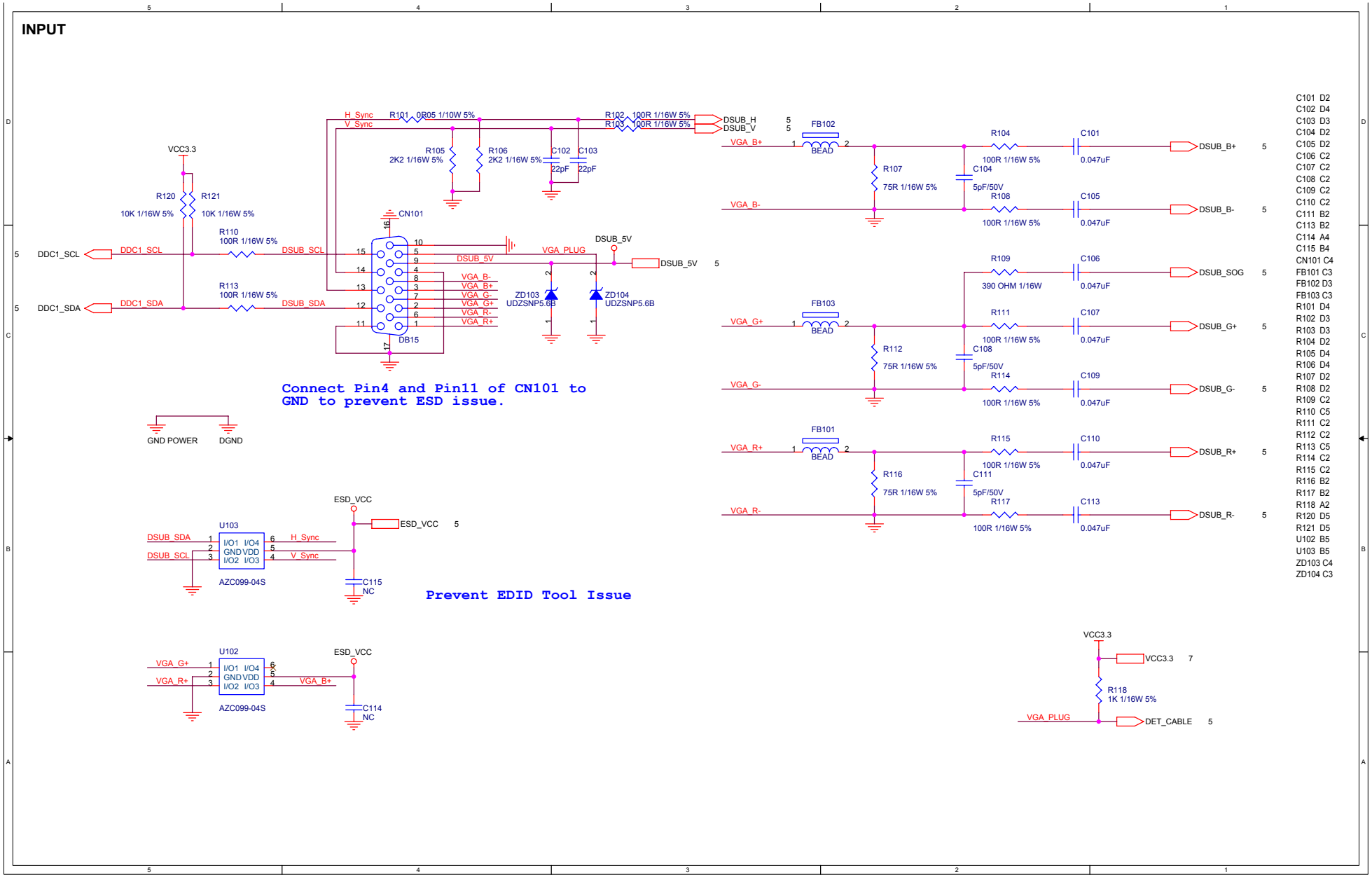


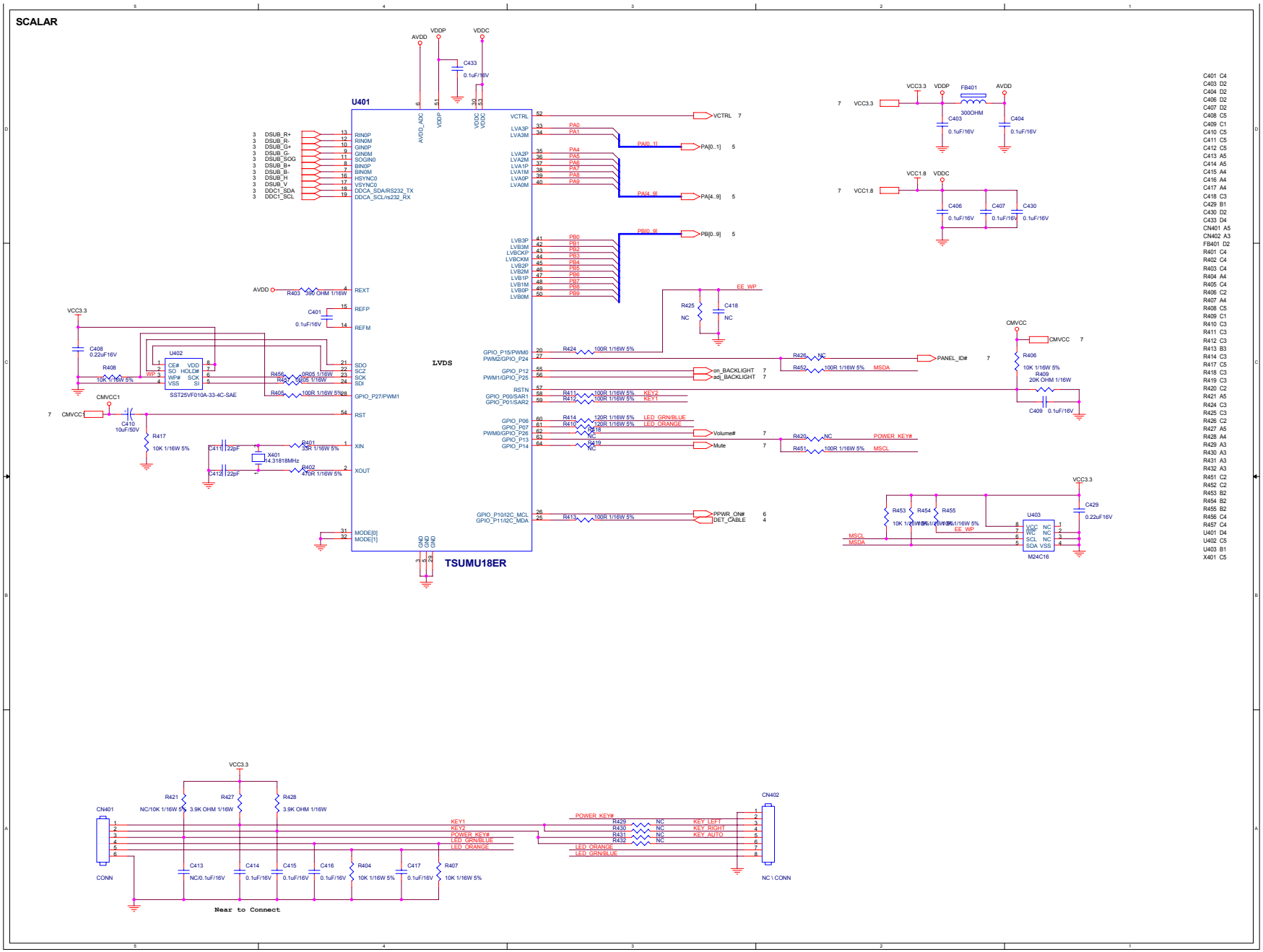
6. Schematic

6.1 Main Board

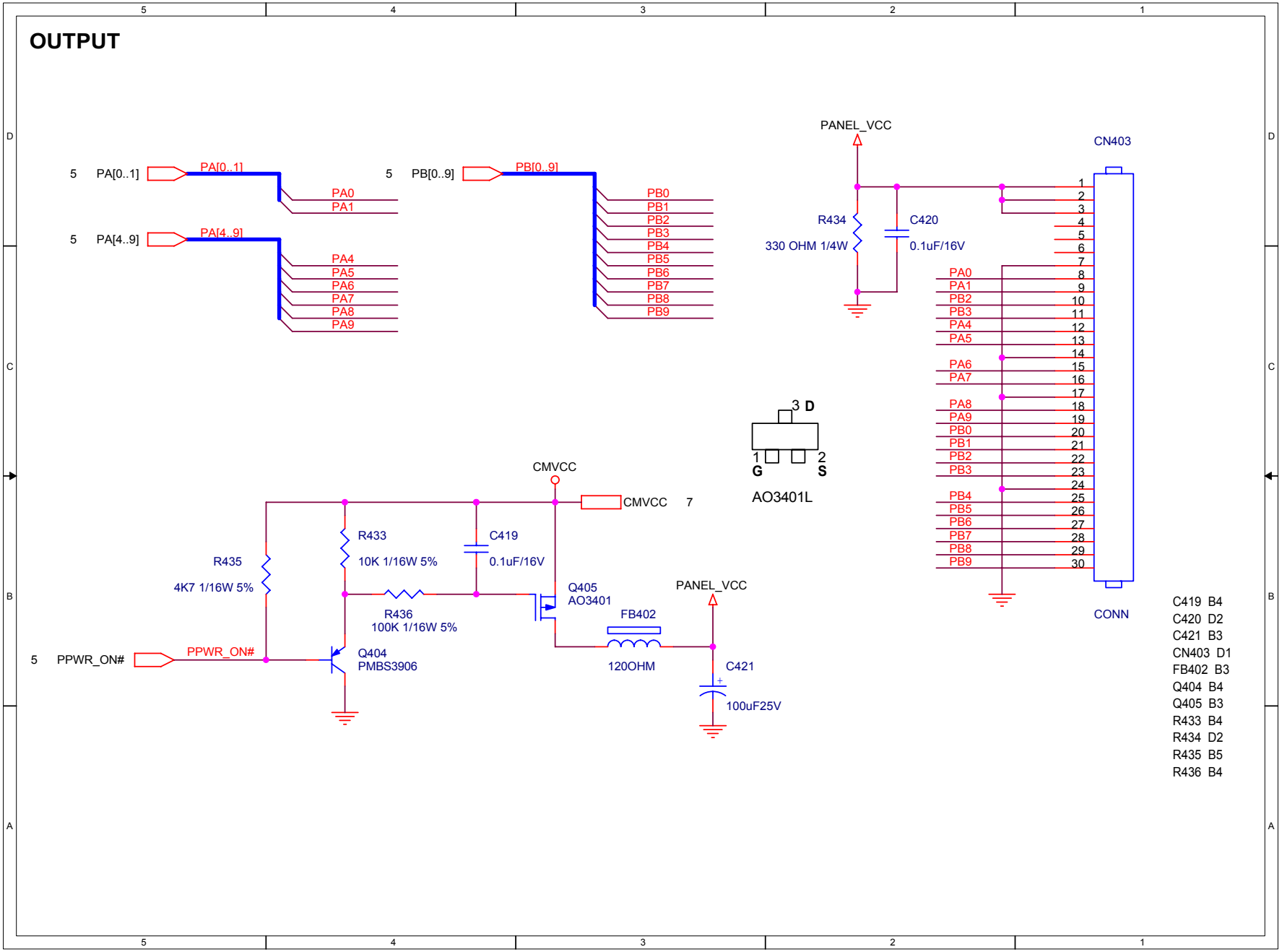
715G2904-1-5




INPUT
H_Sync
V_Sync
R101 0R05 1/10W 5%
R102 100R 1/16W 5%
R103 100R 1/16W 5%
DSUB_H 5
DSUB_V 5
VCC3.3
R120 10K 1/16W 5%
R121 10K 1/16W 5%
R105 2K2 1/16W 5%
R106 2K2 1/16W 5%
C102 22pF
C103 22pF
CN101
R110 100R 1/16W 5%
R113 100R 1/16W 5%
DDC1_SCL
DDC1_SDA
DSUB_SCL
DSUB_SDA
DSUB_5V
VGA_PLUG
VGA_B-
VGA_B+
VGA_G-
VGA_G+
VGA_R-
VGA_R+
ZD103 UDZSNP5.6B
ZD104 UDZSNP5.6B
DB15
Connect Pin4 and Pin11 of CN101 to GND to prevent ESD issue.
GND POWER
DGND
FB102 BEAD
FB103 BEAD
FB101 BEAD
R104 100R 1/16W 5%
R107 75R 1/16W 5%
C104 5pF/50V
C101 0.047uF
R108 100R 1/16W 5%
C105 0.047uF
R109 390 OHM 1/16W
C106 0.047uF
R111 100R 1/16W 5%
R112 75R 1/16W 5%
C108 5pF/50V
C107 0.047uF
R114 100R 1/16W 5%
C109 0.047uF
R115 100R 1/16W 5%
R116 75R 1/16W 5%
C111 5pF/50V
C110 0.047uF
R117 100R 1/16W 5%
C113 0.047uF
DSUB_B+ 5
DSUB_B- 5
DSUB_SOG 5
DSUB_G+ 5
DSUB_G- 5
DSUB_R+ 5
DSUB_R- 5
ESD_VCC
U103
AZC099-04S
C115 NC
Prevent EDID Tool Issue
U102
AZC099-04S
C114 NC
VCC3.3 7
R118 1K 1/16W 5%
DET_CABLE 5
C101 D2
C102 D4
C103 D3
C104 D2
C105 D2
C106 C2
C107 C2
C108 C2
C109 C2
C110 C2
C111 B2
C113 B2
C114 A4
C115 B4
CN101 C4
FB101 C3
FB102 D3
FB103 C3
R101 D4
R102 D3
R103 D3
R104 D2
R105 D4
R106 D4
R107 D2
R108 D2
R109 C2
R110 C5
R111 C2
R112 C2
R113 C5
R114 C2
R115 C2
R116 B2
R117 B2
R118 A2
R120 D5
R121 D5
U102 B5
U103 B5
ZD103 C4
ZD104 C3


SCALAR
U401
LVDS
TSUMU18ER
U402
SST25VF010A-33-4C-SAE
U403
M24C16
CN401
CONN
CN402
NC \ CONN
Near to Connect
AVDD
VDDP
VDDC
VCC3.3
VCC1.8
CMVCC
CMVCC1
VCTRL
PA[0..1]
PA[4..9]
PB[0..9]
EE_WP
PANEL_ID#
POWER_KEY#
KEY1
KEY2
KEY_LEFT
KEY_RIGHT
KEY_AUTO
LED_ORANGE
LED_GRN/BLUE
MSCL
MSDA
on_BACKLIGHT
adj_BACKLIGHT
Volume#
Mute
PPWR_ON#
DET_CABLE
C401 C4
C403 D2
C404 D2
C406 D2
C407 D2
C408 C5
C409 C1
C410 C5
C411 C5
C412 C5
C413 A5
C414 A5
C415 A4
C416 A4
C417 A4
C418 C3
C429 B1
C430 D2
C433 D4
CN401 A5
CN402 A3
FB401 D2
R401 C4
R402 C4
R403 C4
R404 A4
R405 C4
R406 C2
R407 A4
R408 C5
R409 C1
R410 C3
R411 C3
R412 C3
R413 B3
R414 C3
R417 C5
R418 C3
R419 C3
R420 C2
R421 A5
R424 C3
R425 C3
R426 C2
R427 A5
R428 A4
R429 A3
R430 A3
R431 A3
R432 A3
R451 C2
R452 C2
R453 B2
R454 B2
R455 B2
R456 C4
R457 C4
U401 D4
U402 C5
U403 B1
X401 C5

OUTPUT


5 PA[0..1]
PA[0..1]
PA0
PA1
5 PA[4..9]
PA[4..9]
PA4
PA5
PA6
PA7
PA8
PA9
5 PB[0..9]
PB[0..9]
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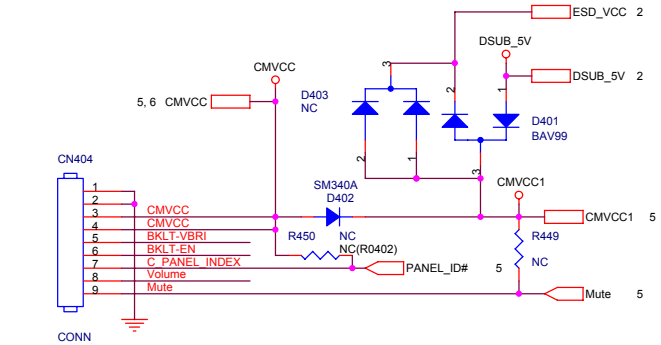
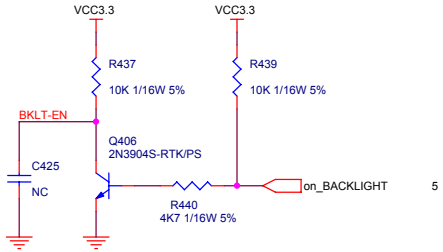
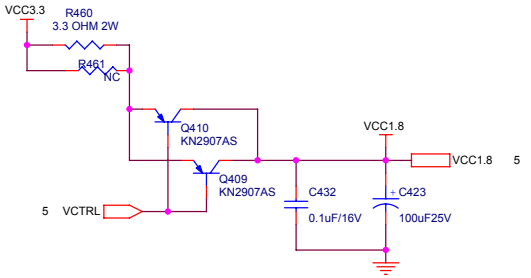
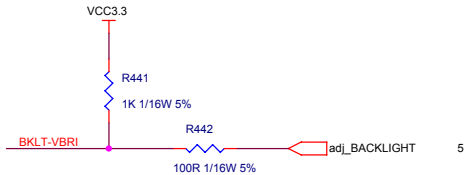
PB1
PB2
PB3
PB4
PB5
PB6
PB7
PB8
PB9
PANEL_VCC
R434
330 OHM 1/4W
C420
0.1uF/16V
CN403
CONN
3 D
1
2
G
S
AO3401L
CMVCC
CMVCC 7
R433
10K 1/16W 5%
C419
0.1uF/16V
R435
4K7 1/16W 5%
R436
100K 1/16W 5%
Q405
AO3401
FB402
120OHM
PANEL_VCC
C421
100uF25V
5 PPWR_ON#
PPWR_ON#
Q404
PMBS3906
C419 B4
C420 D2
C421 B3
CN403 D1
FB402 B3
Q404 B4
Q405 B3
R433 B4
R434 D2
R435 B5
R436 B4

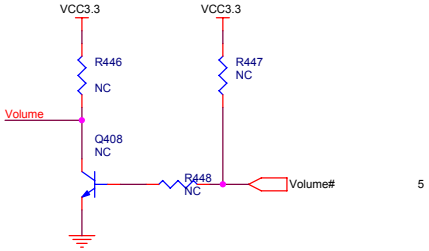
POWER

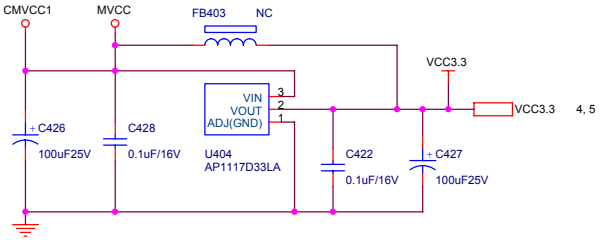








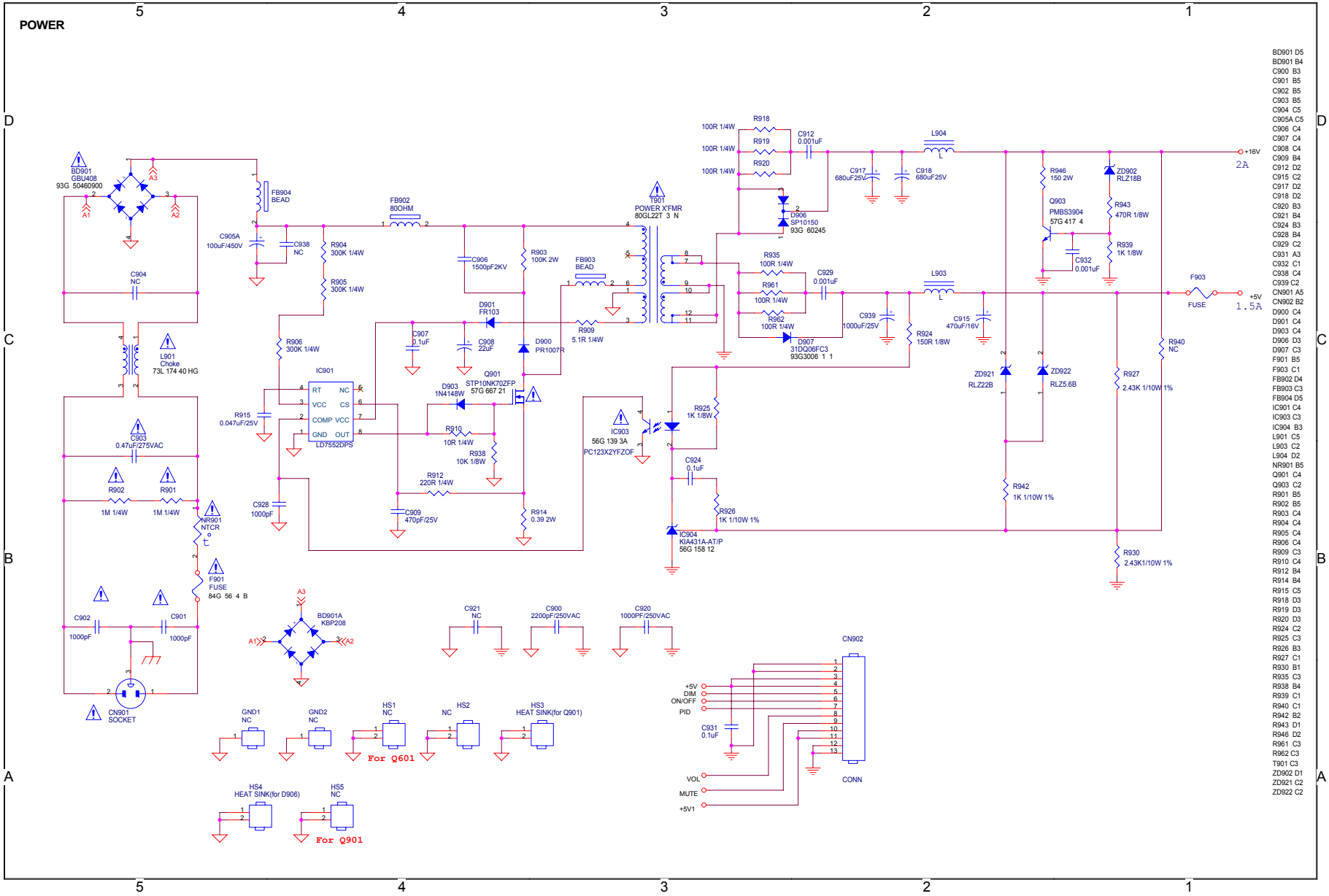




C422 B2
C423 C1
C425 C4
C426 B3
C427 B2
C428 B2
C432 C2
CN404 C5
D401 D4
D402 C5
D403 D4
FB403 B2
Q406 C3
Q408 B4
Q409 C2
Q410 C2
R437 C3
R439 C3
R440 C3
R441 B5
R442 B5
R446 B4
R447 B3
R448 B3
R449 C4
R450 C5
R460 D2
R461 C2
U404 B2

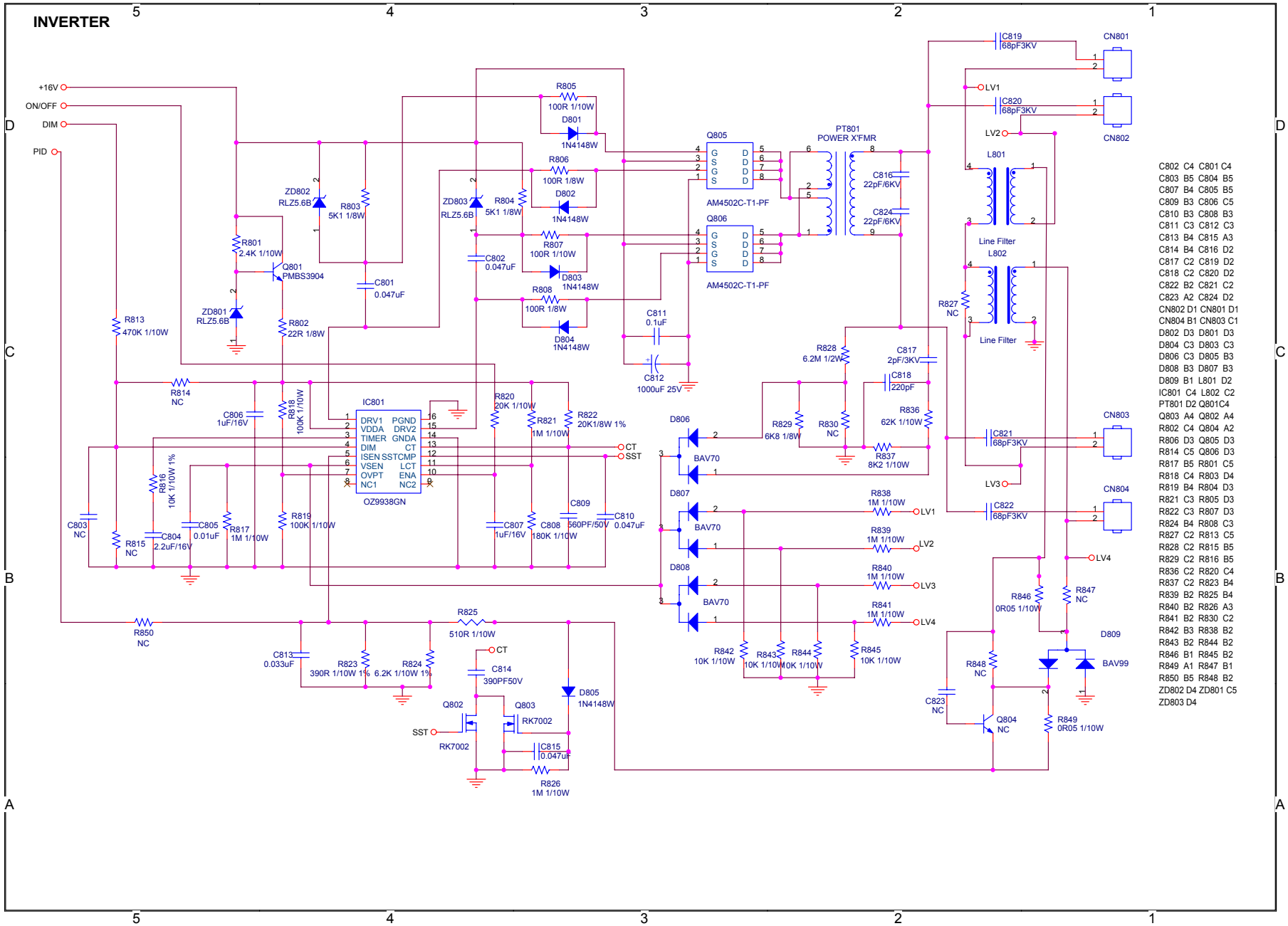
6.2 Power Board

715G2824-1



BD901 D5
BD901 B4
C900 B3
C901 B5
C902 B5
C903 B5
C904 C5
C905A C5
C906 C4
C907 C4
C908 C4
C909 B4
C912 D2
C915 C2
C917 D2
C918 D2
C920 B3
C921 B4
C924 B3
C928 B4
C929 C2
C931 A3
C932 C1
C938 C4
C939 C2
CN901 A5
CN902 B2
D900 C4
D901 C4
D903 C4
D906 D3
D907 C3
F901 B5
F903 C1
FB902 D4
FB903 C3
FB904 D5
IC901 C4
IC903 C3
IC904 B3
L901 C5
L903 C2
L904 D2
NR901 B5
Q901 C4
Q903 C2
R901 B5
R902 B5
R903 C4
R904 C4
R905 C4
R906 C4
R909 C3
R910 C4
R912 B4
R914 B4
R915 C5
R918 D3
R919 D3
R920 D3
R924 C2
R925 C3
R926 B3
R927 C1
R930 B1
R935 C3
R938 B4
R939 C1
R940 C1
R942 B2
R943 D1
R946 D2
R961 C3
R962 C3
T901 C3
ZD902 D1
ZD921 C2
ZD922 C2

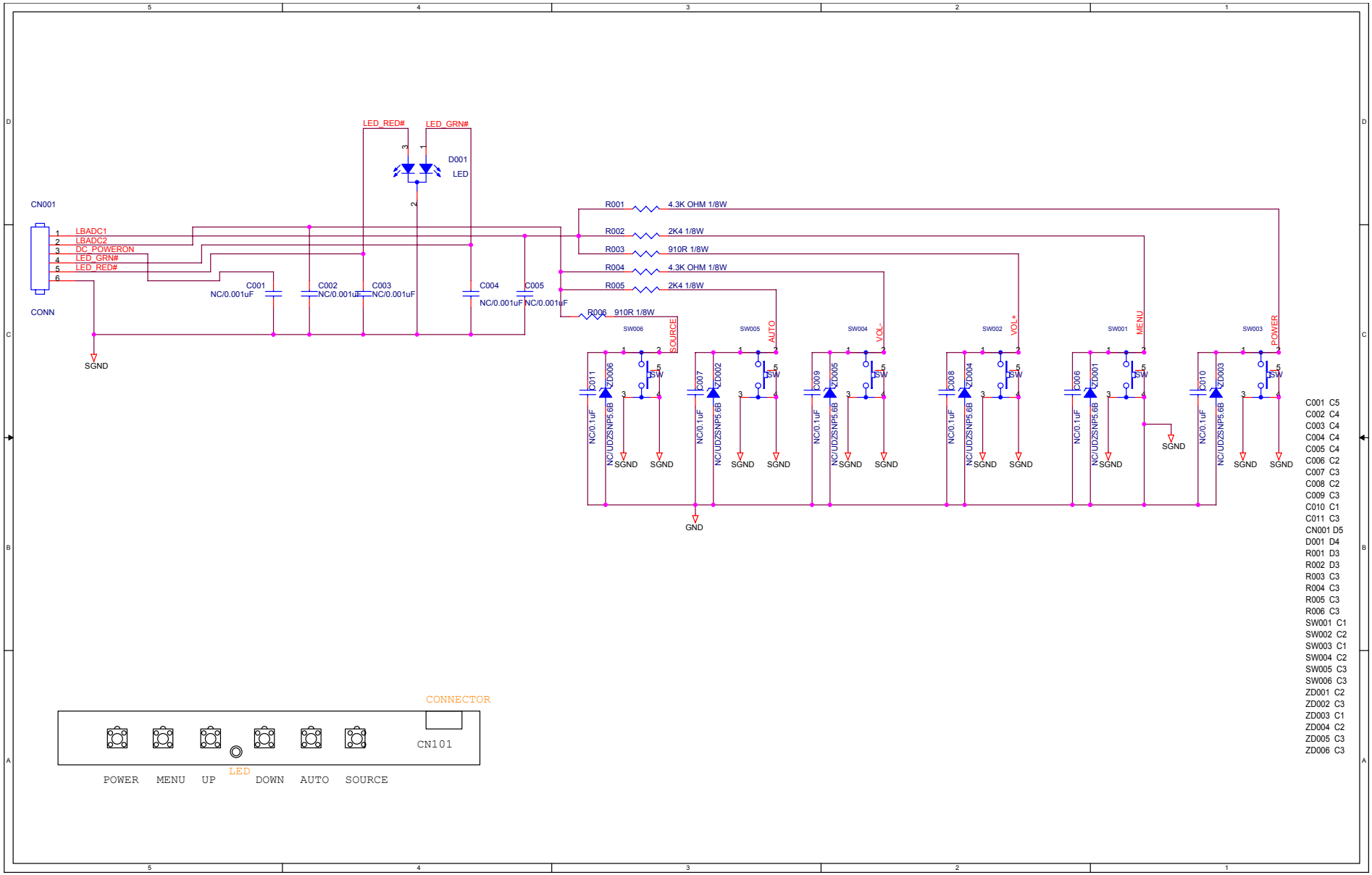
INVERTER



C802 C4 C801 C4
C803 B5 C804 B5
C807 B4 C805 B5
C809 B3 C806 C5
C810 B3 C808 B3
C811 C3 C812 C3
C813 B4 C815 A3
C814 B4 C816 D2
C817 C2 C819 D2
C818 C2 C820 D2
C822 B2 C821 C2
C823 A2 C824 D2
CN802 D1 CN801 D1
CN804 B1 CN803 C1
D802 D3 D801 D3
D804 C3 D803 C3
D806 C3 D805 B3
D808 B3 D807 B3
D809 B1 L801 D2
IC801 C4 L802 C2
PT801 D2 Q801C4
Q803 A4 Q802 A4
R802 C4 Q804 A2
R806 D3 Q805 D3
R814 C5 Q806 D3
R817 B5 R801 C5
R818 C4 R803 D4
R819 B4 R804 D3
R821 C3 R805 D3
R822 C3 R807 D3
R824 B4 R808 C3
R827 C2 R813 C5
R828 C2 R815 B5
R829 C2 R816 B5
R836 C2 R820 C4
R837 C2 R823 B4
R839 B2 R825 B4
R840 B2 R826 A3
R841 B2 R830 C2
R842 B3 R838 B2
R843 B2 R844 B2
R846 B1 R845 B2
R849 A1 R847 B1
R850 B5 R848 B2
ZD802 D4 ZD801 C5
ZD803 D4

6.3 Key Board

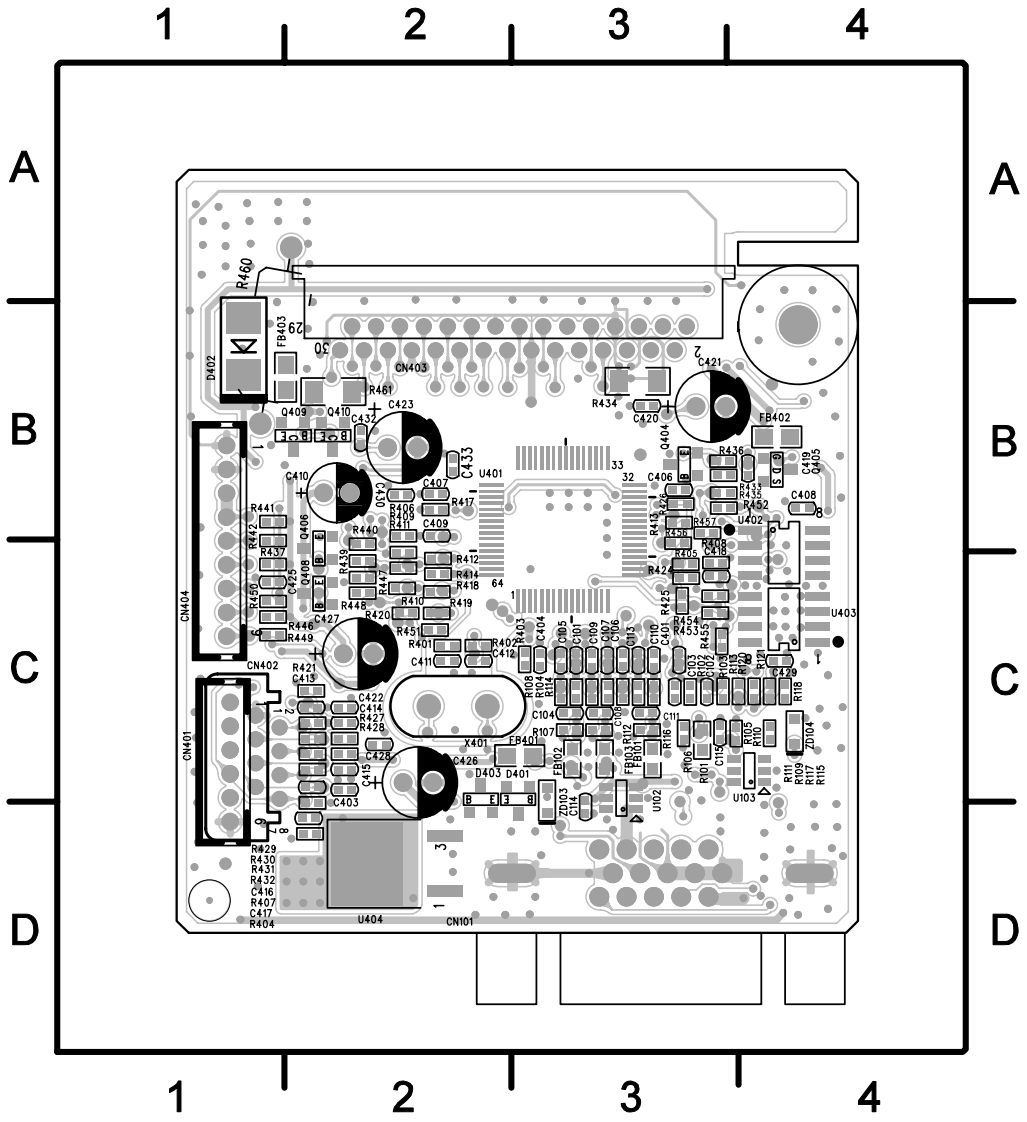
715G2836-1-2



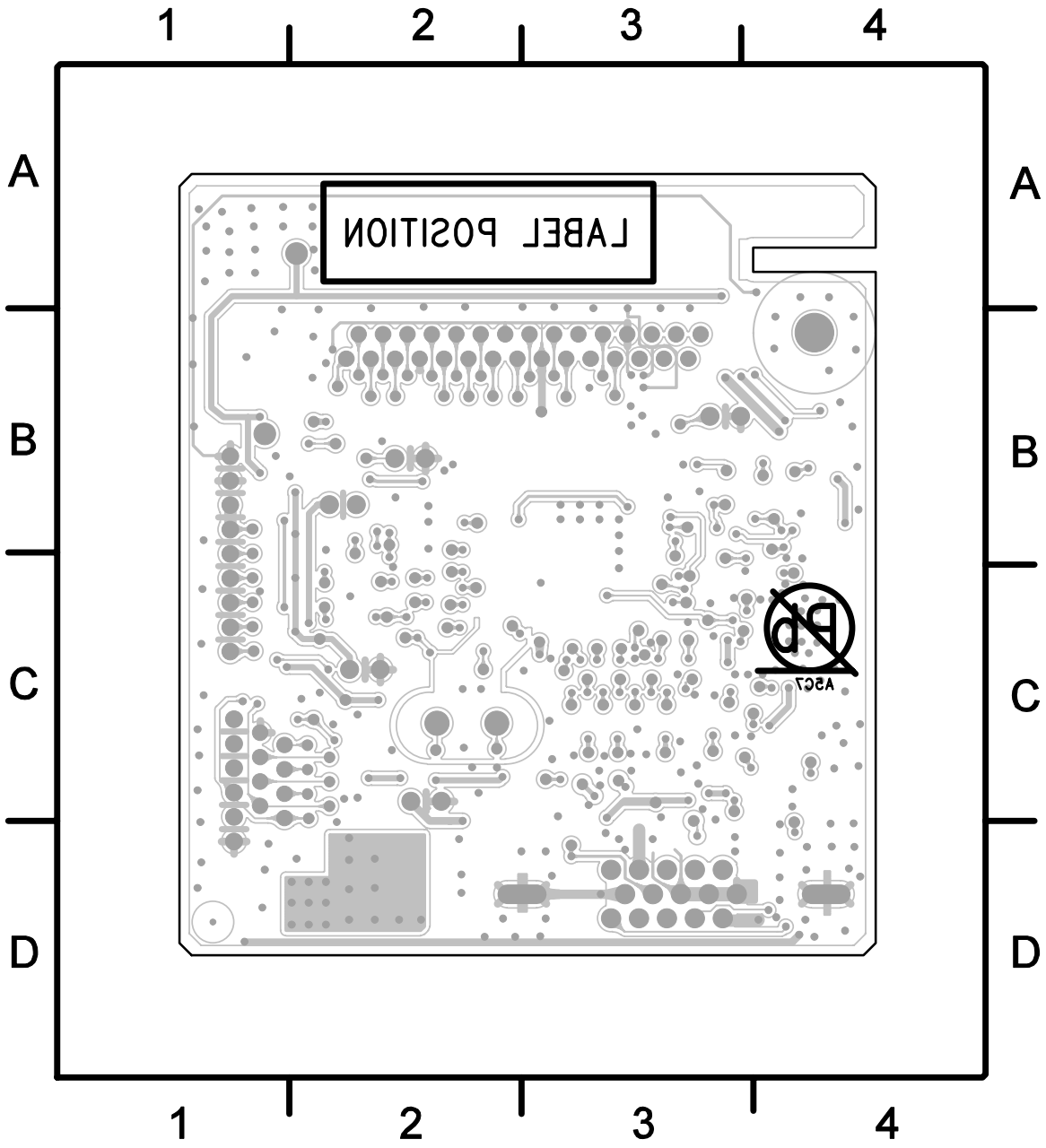
7. PCB Layout

7.1 Main Board

715G2904-1-5

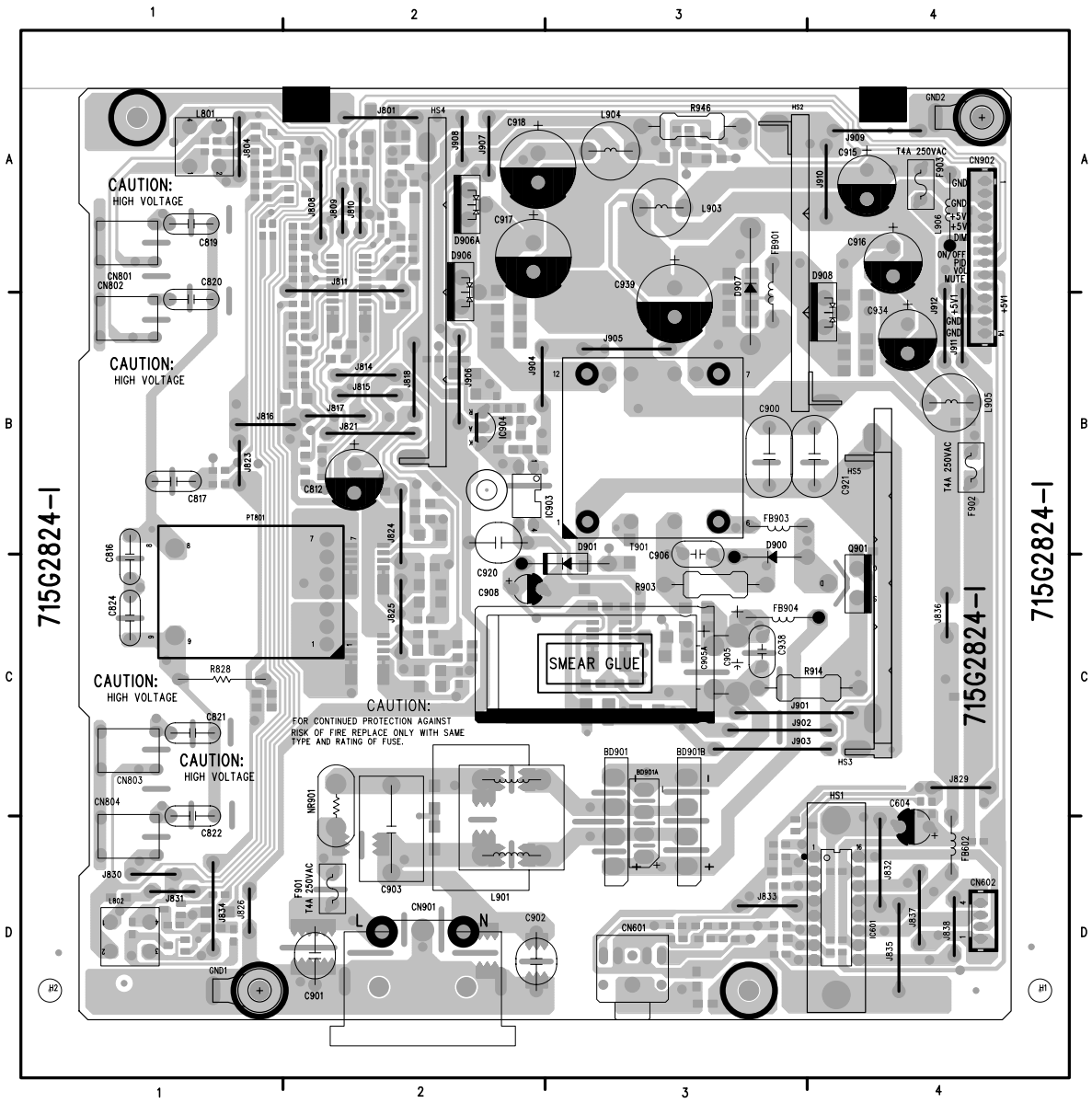


C101	C3	R111	C3	ZD104	C4	R108	C3
C103	C3	R113	C4	C102	C4	R110	C4
C105	C3	R115	C3	C104	C3	R112	C3
C107	C3	R117	C3	C106	C3	R114	C3
C109	C3	R120	C4	C108	C3	R116	C3
C111	C3	R401	C2	C110	C3	R118	C4
C114	D3	R403	C3	C113	C3	R121	C4
C401	C3	R405	C3	C115	C4	R402	C2
C404	C3	R407	D1	C403	D2	R404	D1
C407	B2	R409	C2	C406	B3	R406	B2
C409	B2	R411	C2	C408	B4	R408	C4
C411	C2	R413	B3	C410	B1	R410	C2
C413	C1	R417	B2	C412	C2	R412	C2
C415	D2	R419	C2	C414	C2	R414	C2
C417	D1	R421	C1	C416	D1	R418	C2
C419	B4	R425	C3	C418	C4	R420	C2
C421	B4	R427	C2	C420	B3	R424	C3
C423	B2	R429	C1	C422	C2	R426	B3
C426	D2	R431	D1	C425	C1	R428	D2
C428	D2	R433	B4	C427	C2	R430	C1
C430	B2	R435	B4	C429	C4	R432	D1
C433	B2	R437	C1	C432	B2	R434	B3
CN401	C1	R440	B2	CN101	D3	R436	B4
CN403	A2	R442	B1	CN402	D1	R439	C2
D401	D3	R447	C2	CN404	B1	R441	B1
D403	D2	R449	C1	D402	A1	R446	C1
FB102	D3	R451	C2	FB101	D3	R448	C2
FB401	D3	R453	C4	FB103	D3	R450	C1
FB403	B1	R455	C4	FB402	B4	R452	B4
Q404	B4	R457	B4	MH1	A4	R454	C4
Q406	C1	R461	B1	Q405	B4	R456	B3
Q409	B1	U102	D3	Q408	C1	R460	B1
R101	C4	U401	B3	Q410	B1	U103	D4
R103	C4	U403	C4	R102	C4	U402	B4
R105	C4	X401	C2	R104	C3	U404	D2
R107	C3	R109	C3	R106	C3	ZD103	D3

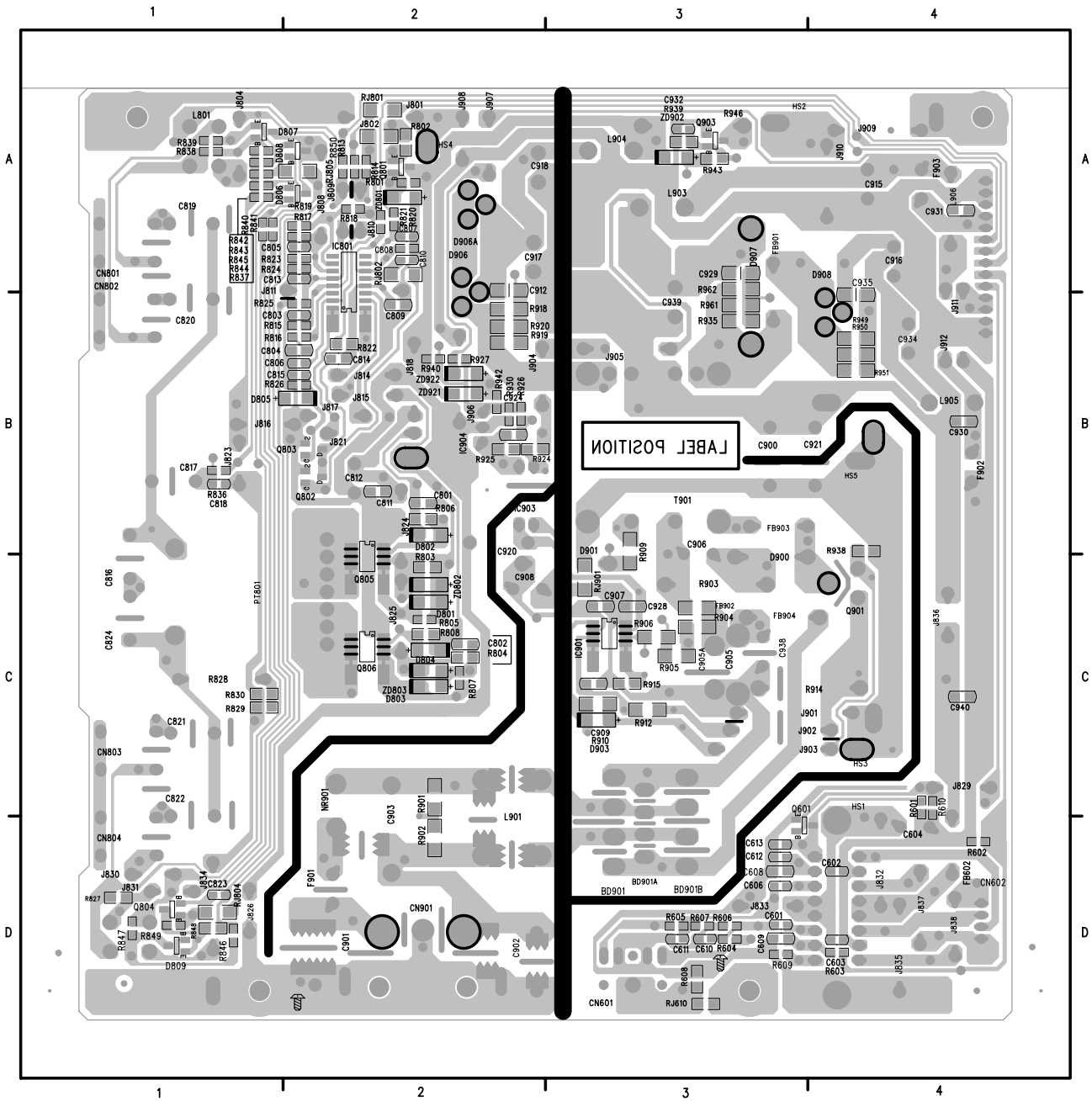

1
2
3
4
A
B
C
D
LABEL POSITION
Pb
A5G7

7.2 Power Board

715G2824-1



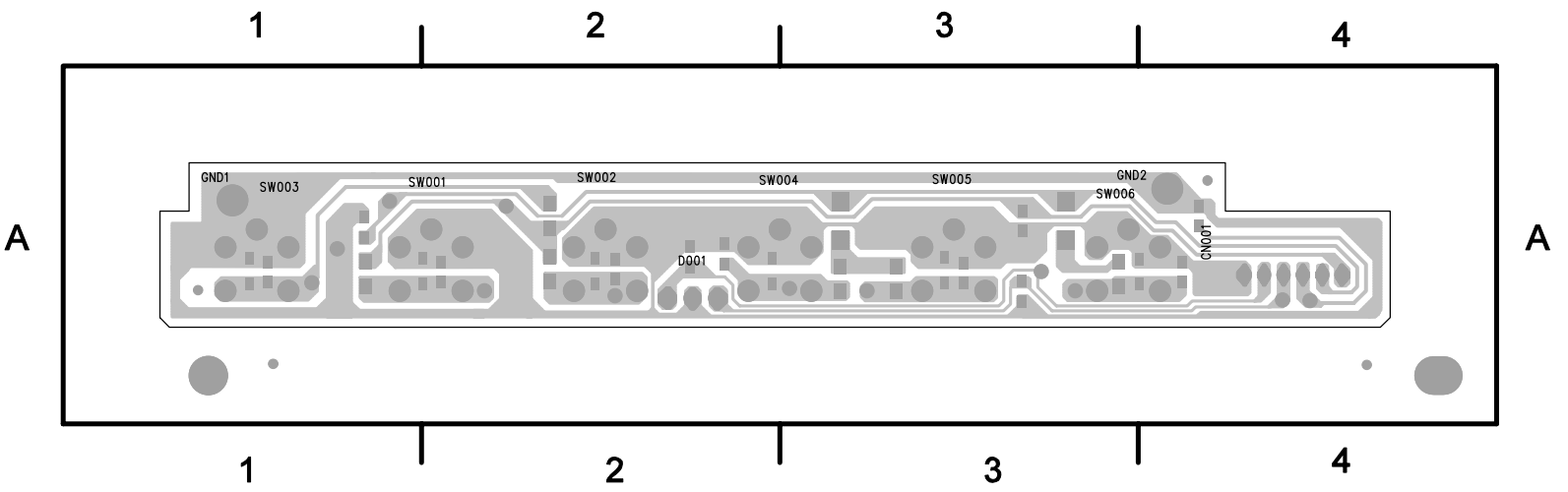
BD901	D3	J821	B2
BD901A	D3	J823	B1
BD901B	D3	J824	B2
C604	D4	J825	C2
C812	B2	J826	D1
C816	C1	J829	C4
C817	B1	J830	D1
C819	A1	J831	D1
C820	B1	J832	D4
C821	C1	J833	D3
C822	C1	J834	D1
C824	C1	J835	D4
C900	B3	J836	C4
C901	D2	J837	D4
C902	D2	J838	D4
C903	D2	J901	C4
C905	C3	J902	C3
C905A	C3	J903	C3
C906	B3	J904	B2
C908	C2	J905	B3
C915	A4	J906	B2
C916	A4	J907	A2
C917	A2	J908	A2
C918	A2	J909	A4
C920	B2	J910	A4
C921	B4	J911	B4
C934	B4	J912	B4
C938	C3	L801	A1
C939	B3	L802	D1
CN601	D3	L901	D2
CN602	D4	L903	A3
CN801	A1	L904	A3
CN802	B1	L905	B4

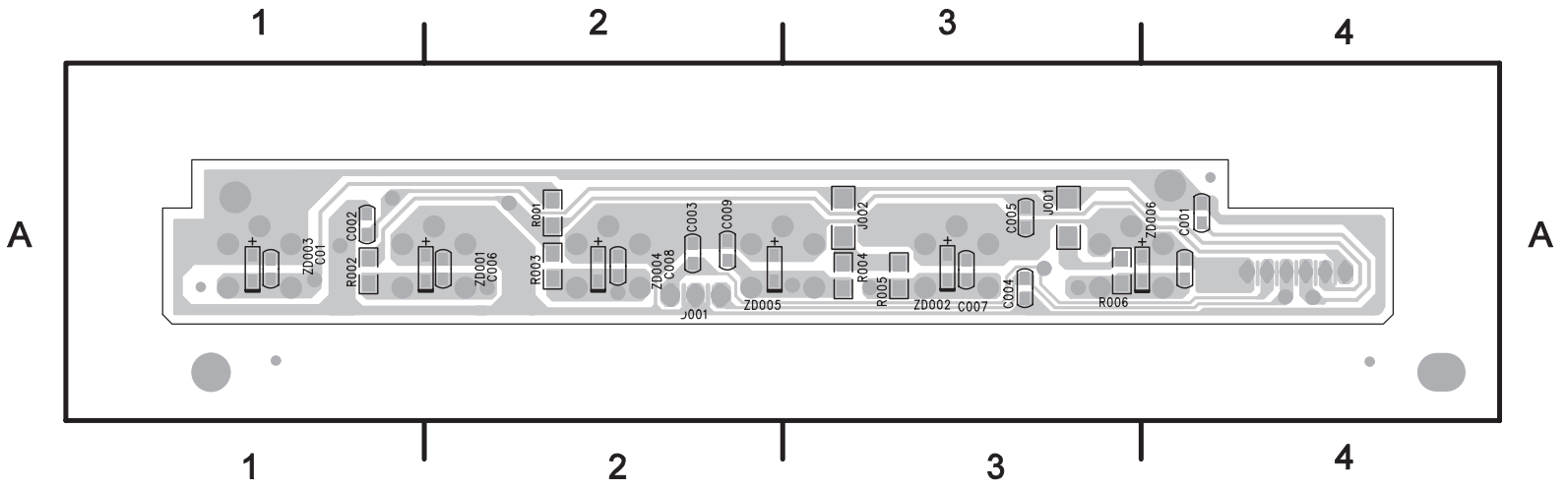


C601	D3	R818	A2	D805	B2	R926	B2
C602	D4	R819	A2	D806	A2	R927	B2
C603	D4	R820	A2	D807	A1	R930	B2
C606	D3	R821	A2	D808	A2	R935	B3
C608	D3	R822	B2	D809	D1	R938	B4
C609	D3	R823	A2	D903	C3	R939	A3
C610	D3	R824	A2	FB902	C3	R940	B2
C611	D3	R825	B2	IC801	B2	R942	B2
C612	D3	R826	B2	IC901	C3	R943	A3
C613	D3	R827	D1	J802	A2	R949	B4
C801	B2	R829	C1	Q601	D3	R950	B4
C802	C2	R830	C1	Q801	A2	R951	B4
C803	B2	R836	B1	Q802	B2	R961	B3
C804	B2	R837	A1	Q803	B2	R962	A3
C805	A2	R838	A1	Q804	D1	RJ610	D3
C806	B2	R839	A1	Q805	B2	RJ801	A2
C807	A2	R840	A1	Q806	C2	RJ802	A2
C808	A2	R841	A1	Q903	A3	RJ804	D1
C809	B2	R842	A1	R601	C4	RJ805	A2
C810	A2	R843	A1	R602	D4	RJ901	C3
C811	B2	R844	A1	R603	D4	SG12	=4
C813	A2	R845	A1	R604	D3	SG13	D2
C814	B2	R846	D1	R605	D3	SG14	D2
C815	B2	R847	D1	R606	D3	SG15	D2
C818	B1	R848	D1	R607	D3	SG16	D2
C823	D1	R849	D1	R608	D3	SG18	D1
C907	C3	R850	A2	R609	D3	SG19	D2
C909	C3	R901	C2	R610	C4	SG20	D2
C912	A2	R902	D2	R801	A2	SG21	D2
C924	B2	R904	C3	R802	A2	SG22	D2
C928	C3	R905	C3	R803	C2	SG23	D2
C929	A3	R906	C3	R804	C2	SG24	D2
C930	B4	R909	B3	R805	C2	SG25	D2
C931	A4	R910	C3	R806	B2	SG26	C2
C932	A3	R912	C3	R807	C2	SG27	C2
C935	B4	R915	C3	R808	C2	ZD801	A2
C940	C4	R918	B2	R813	A2	ZD802	C2
D801	C2	R919	B2	R814	A2	ZD803	C2
D802	B2	R920	B2	R815	B2	ZD902	A3
D803	C2	R924	B2	R816	B2	ZD921	B2
D804	C2	R925	B2	R817	A2	ZD922	B2

7.3 Key Board

715G2836-1-2

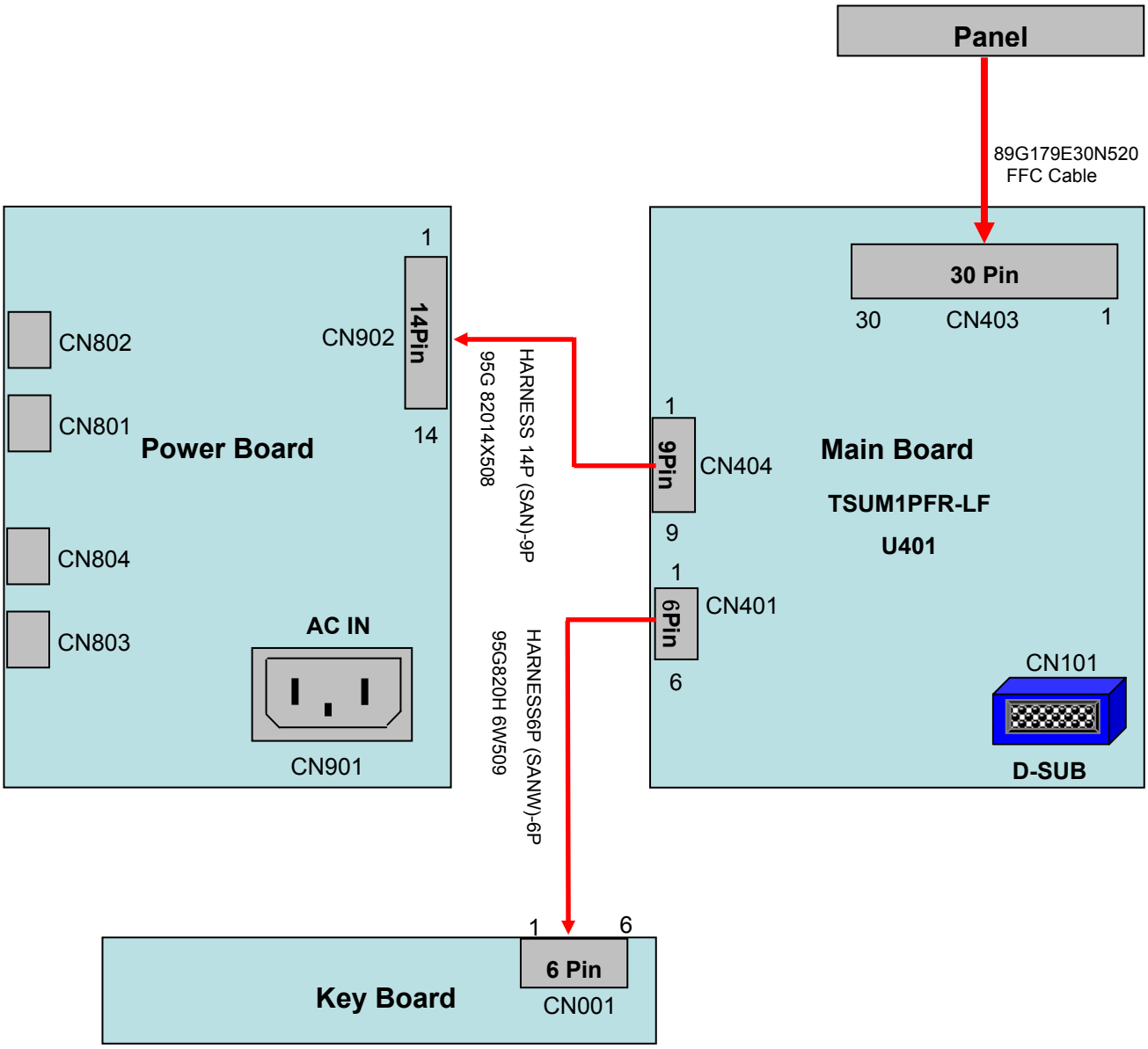




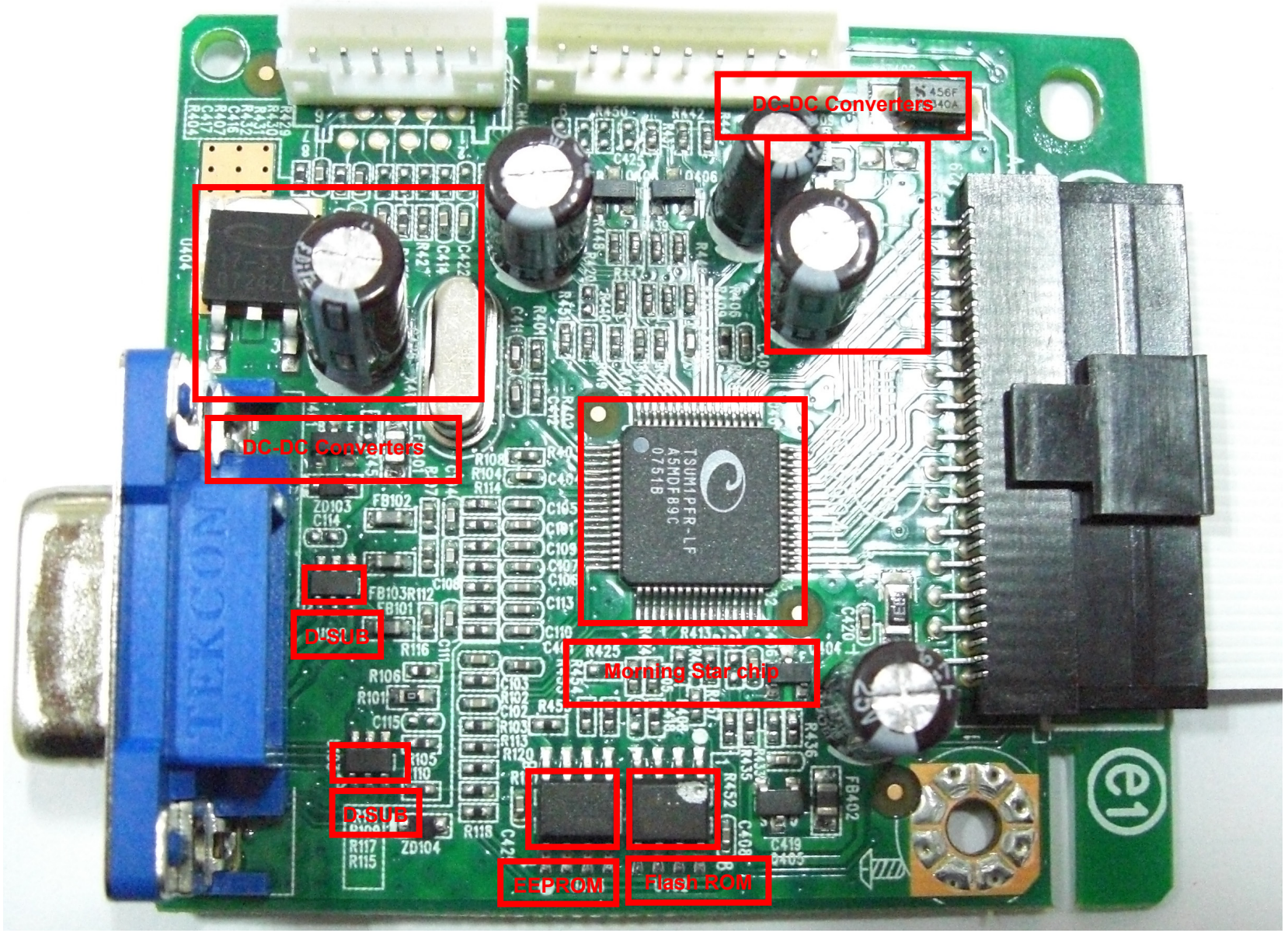
CN001	A4
D001	A2
GND1	A1
GND2	A4
SW001	A1
SW002	A2
SW003	A1
SW004	A3
SW005	A3
SW006	A4

C001	A4
C005	A3
C006	A1
C007	A3
C005	A3
C006	A1
C007	A3
C008	A2
C009	A2
C010	A1
C011	A4
R003	A2
R004	A3
R005	A3
R003	A2
R004	A3
R005	A3
R006	A4
ZD001	A1
ZD002	A3
ZD003	A1
ZD004	A2
ZD005	A3
ZD006	A4

8. Wiring Diagram



9. Scalar Board Overview



10. Mechanical Instructions

1. Back View as Fig1

Place the monitor face down on a smooth surface as Fig 1. Be careful to avoid scratch and injury during the uninstallation.

Fig1

2. Remove the hinge as Fig2.

Remove the three screws remarked in red to remove the hinge as Fig2.

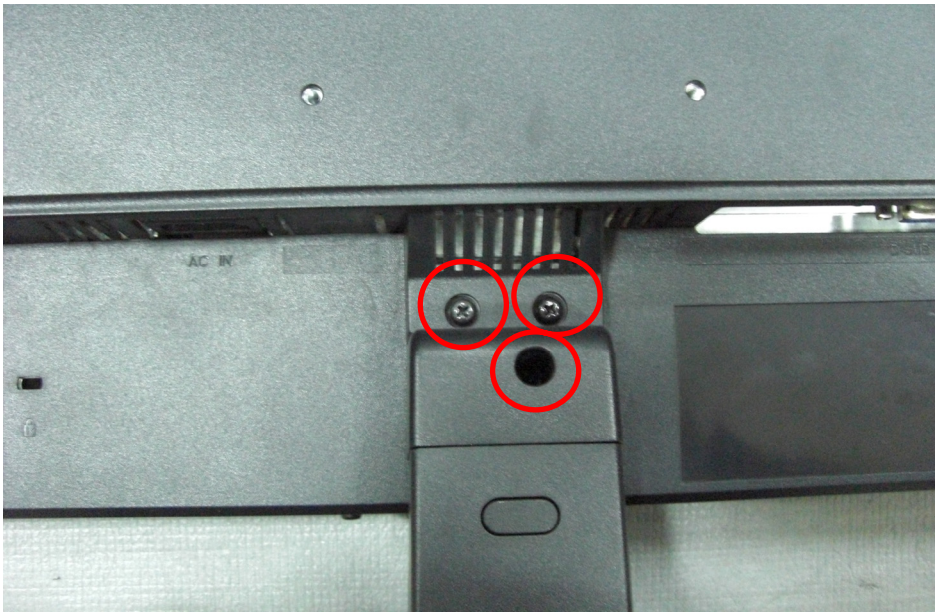


Fig2

3. Remove rear cover as Fig3~Fig7.

Fig3

Fig4

Fig5

Fig6

Fig7

4. Remove the bezel as Fig8.

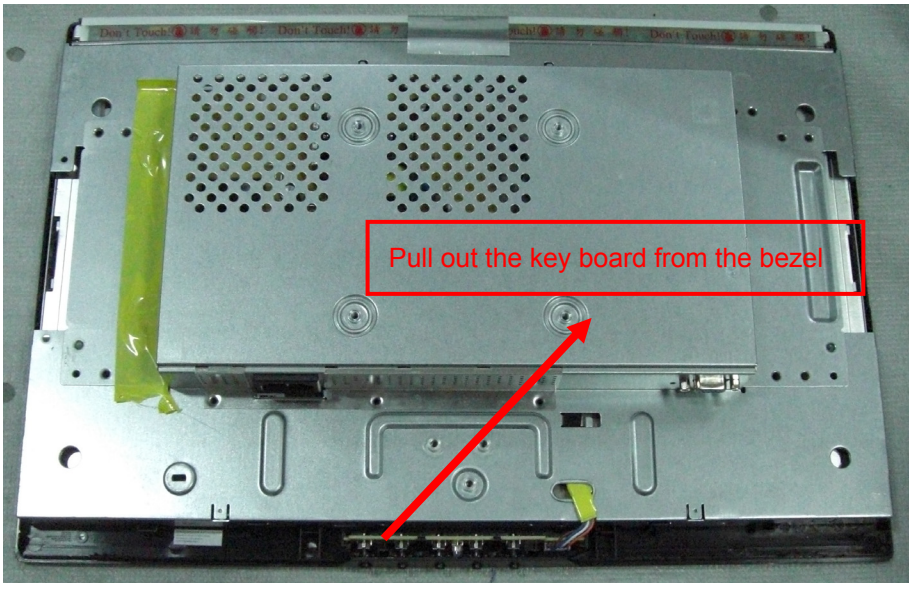


Fig8

5. Remove main frame cover as Fig9~Fig10.

a. Remove the two screws marked in red as Fig9.

b. Disconnect the four connector marked in blue as Fig9.

c. Remove the two screws marked in red as Fig10.

Fig9

Fig10

6. Remove power board as Fig11.

a. Remove the two screws marked in red as Fig11.

b. Disconnect the connector marked in blue as Fig11.

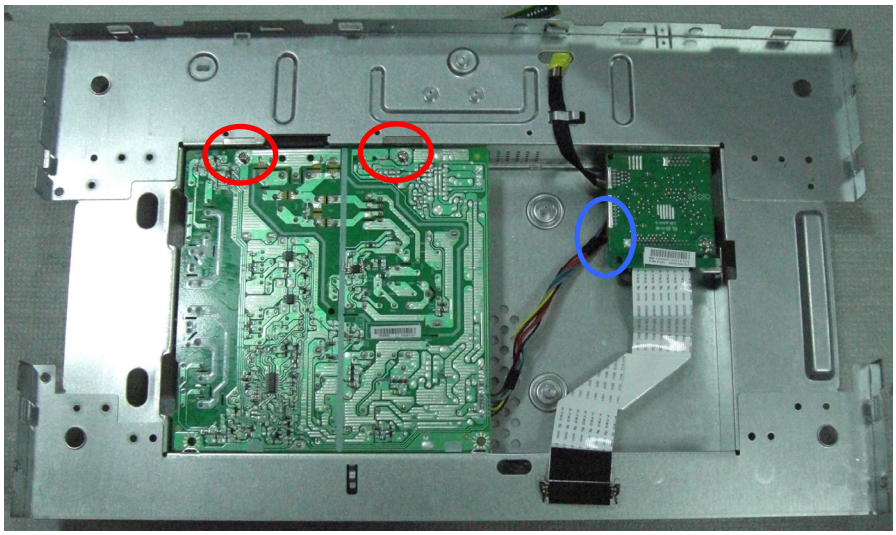


Fig11

7. Remove scalar board as Fig12~Fig13.

a. Remove the screw remarked in red as Fig12.

b. Disconnect the two connectors marked in blue as Fig12.

c. Remove the two screws remarked in red as Fig13.

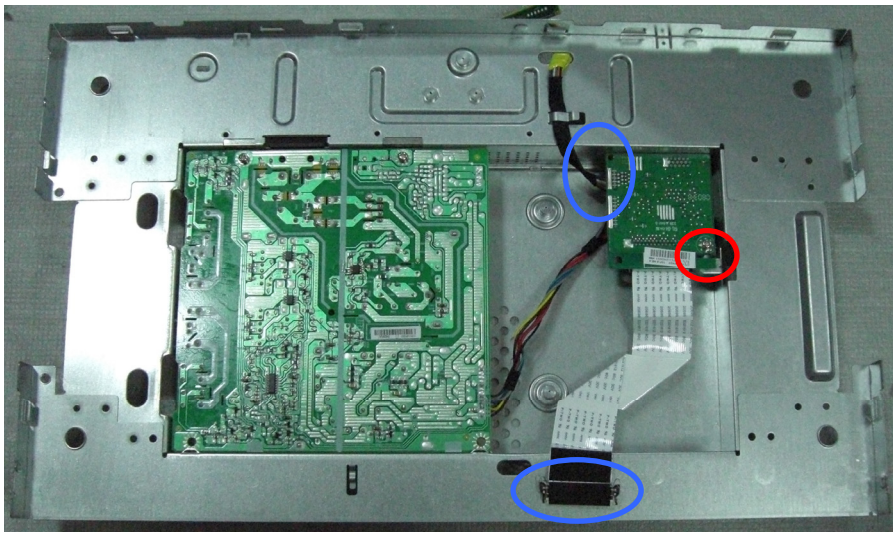


Fig12

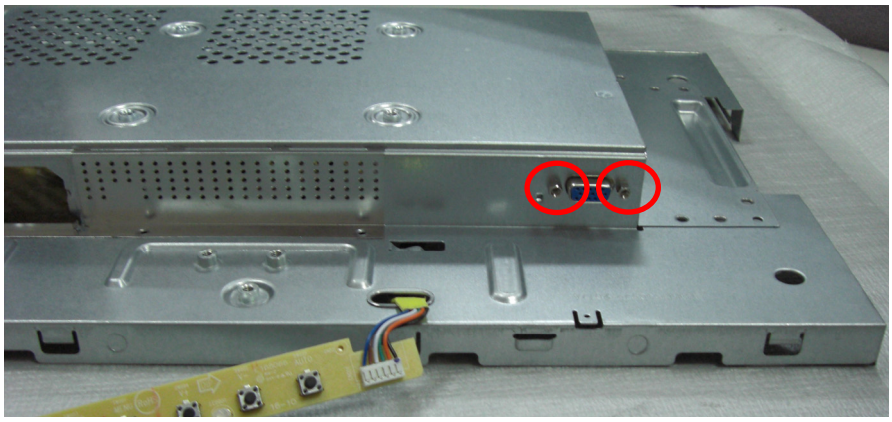


Fig13

11. Trouble Shooting

This page deals with problems that can be corrected by a user. If the problem still persists after you have tried these solutions, contact Philips customer service representative.

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

Vertical flicker appears 	• Press the Auto button. • Eliminate the vertical bars using the Phase/Clock of More Settings in OSD Main Controls.
Horizontal flicker appears  	• Press the Auto button. • Eliminate the vertical bars using the Phase/Clock of More Settings in OSD Main Controls.
The screen is too bright or too dark	• Adjust the contrast and brightness on On-Screen Display. (The backlight of the LCD monitor has a fixed life span. When the screen becomes dark or begins to flicker, please contact your sales representative).
An after-image appears	• If an image remains on the screen for an extended period of time, it may be imprinted in the screen and leave an after-image. This usually disappears after a few hours
An after-image remains after the power has been turned off.	• This is characteristic of liquid crystal and is not caused by a malfunction or deterioration of the liquid crystal. The after-image will disappear after a peroid of time.
Green, red, blue, dark, and white dots remains	• The remaining dots are normal characteristic of the liquid crystal used in todays technology.

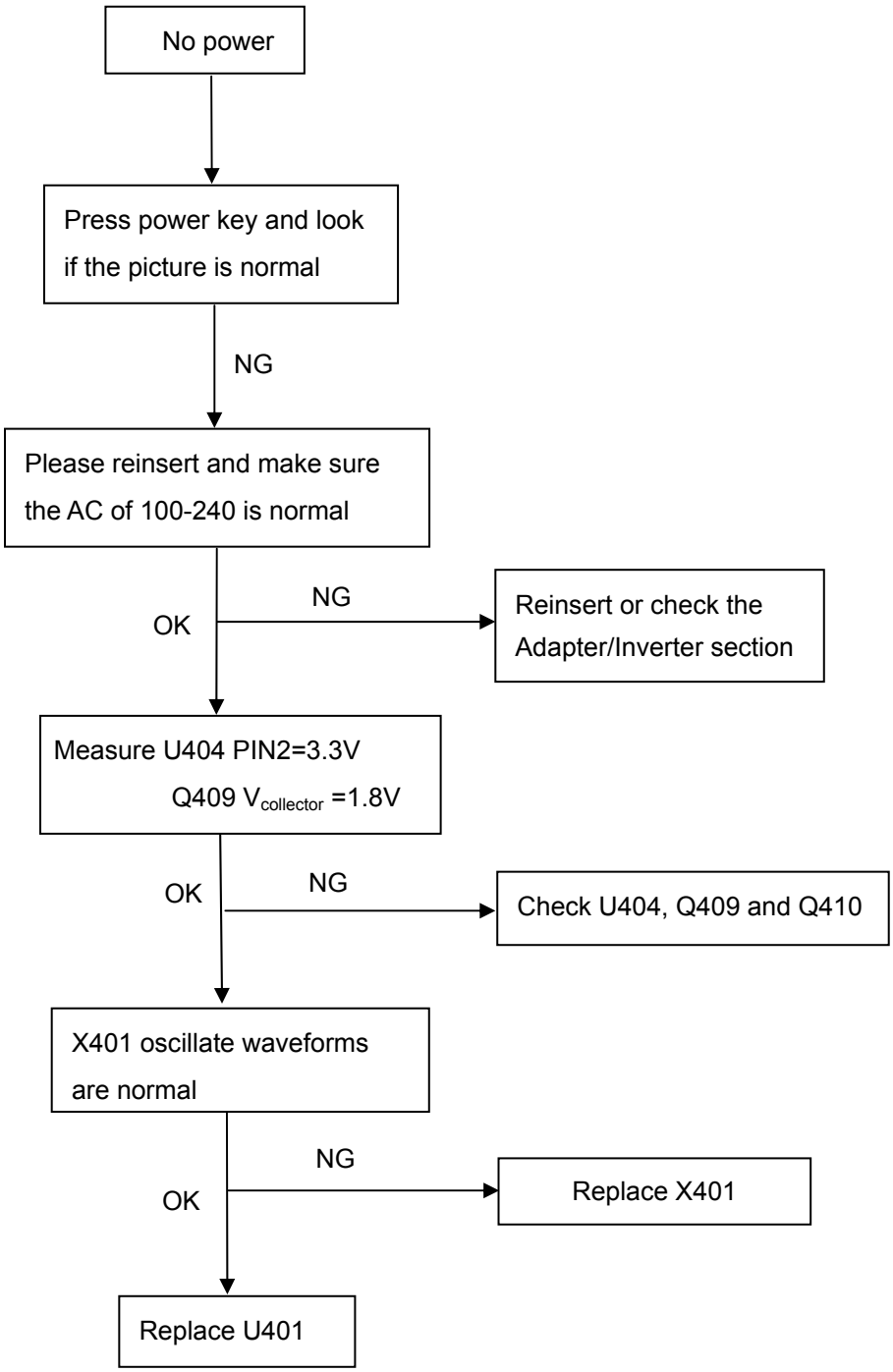
For further assistance, refer to the Consumer Information Centers list and contact Philips customer service representative.

RETURN TO TOP OF THE PAGE

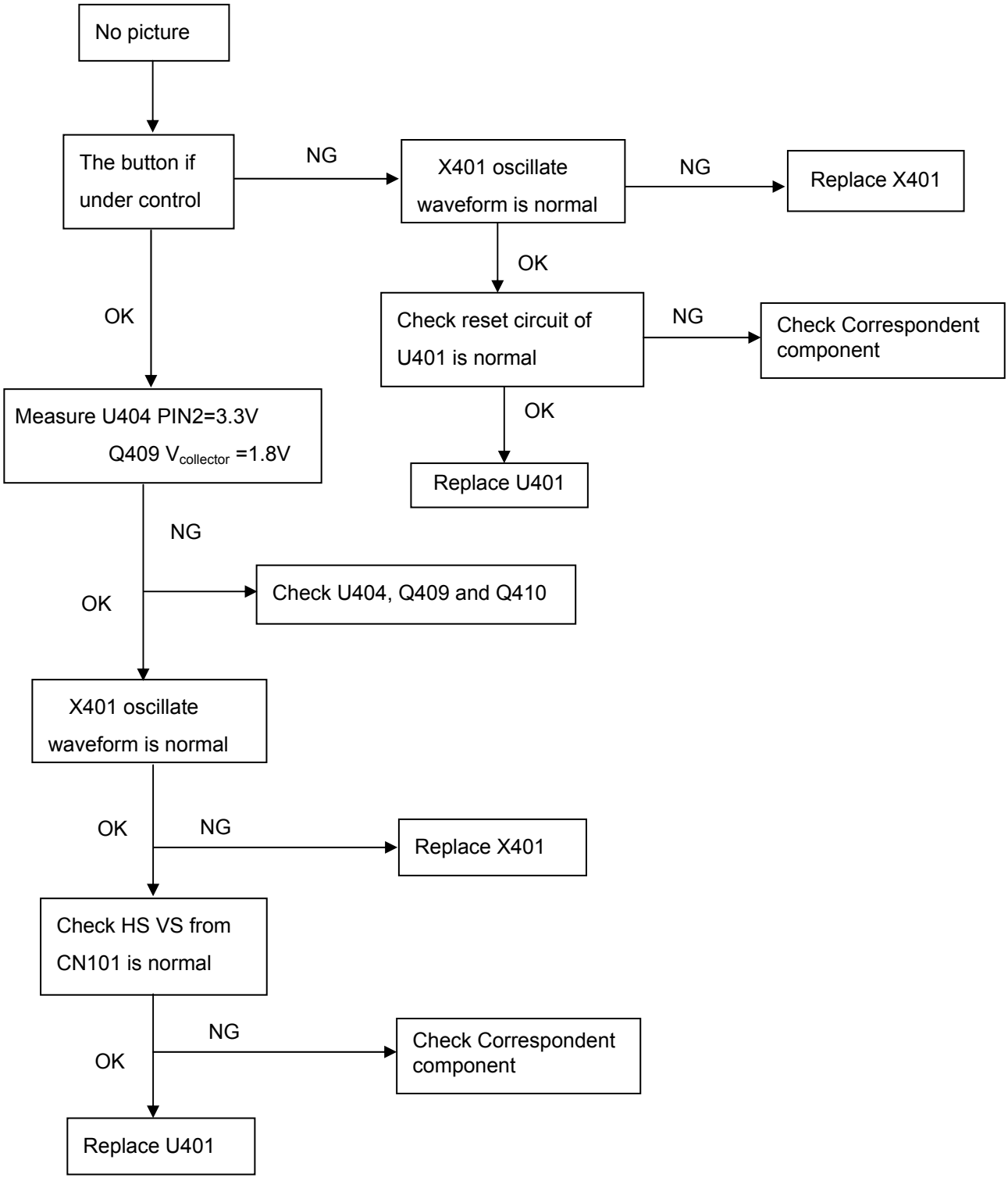
12. Repair Flow Chart

12.1 Main Board

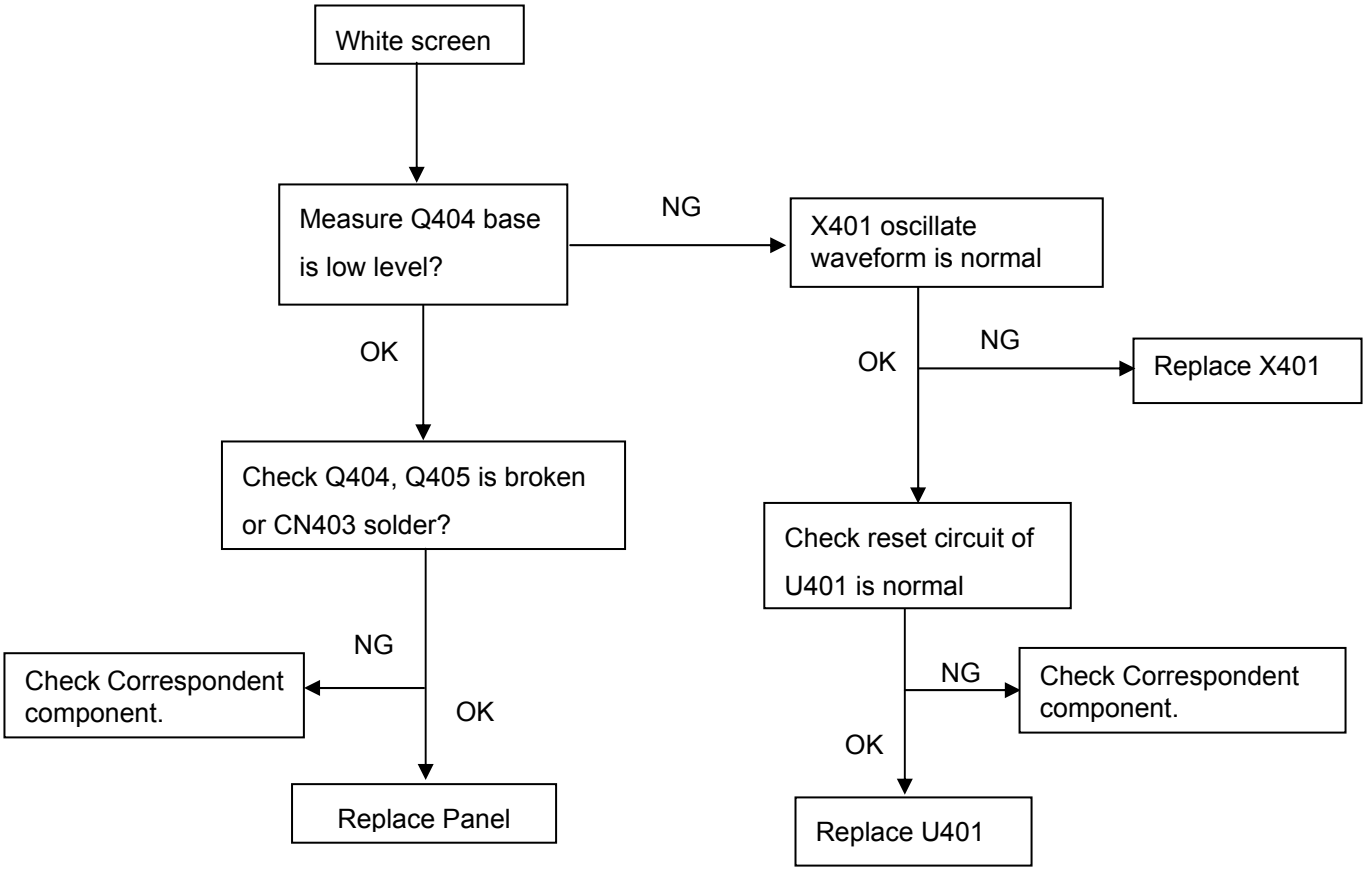
(1). No Power



(2). No Picture

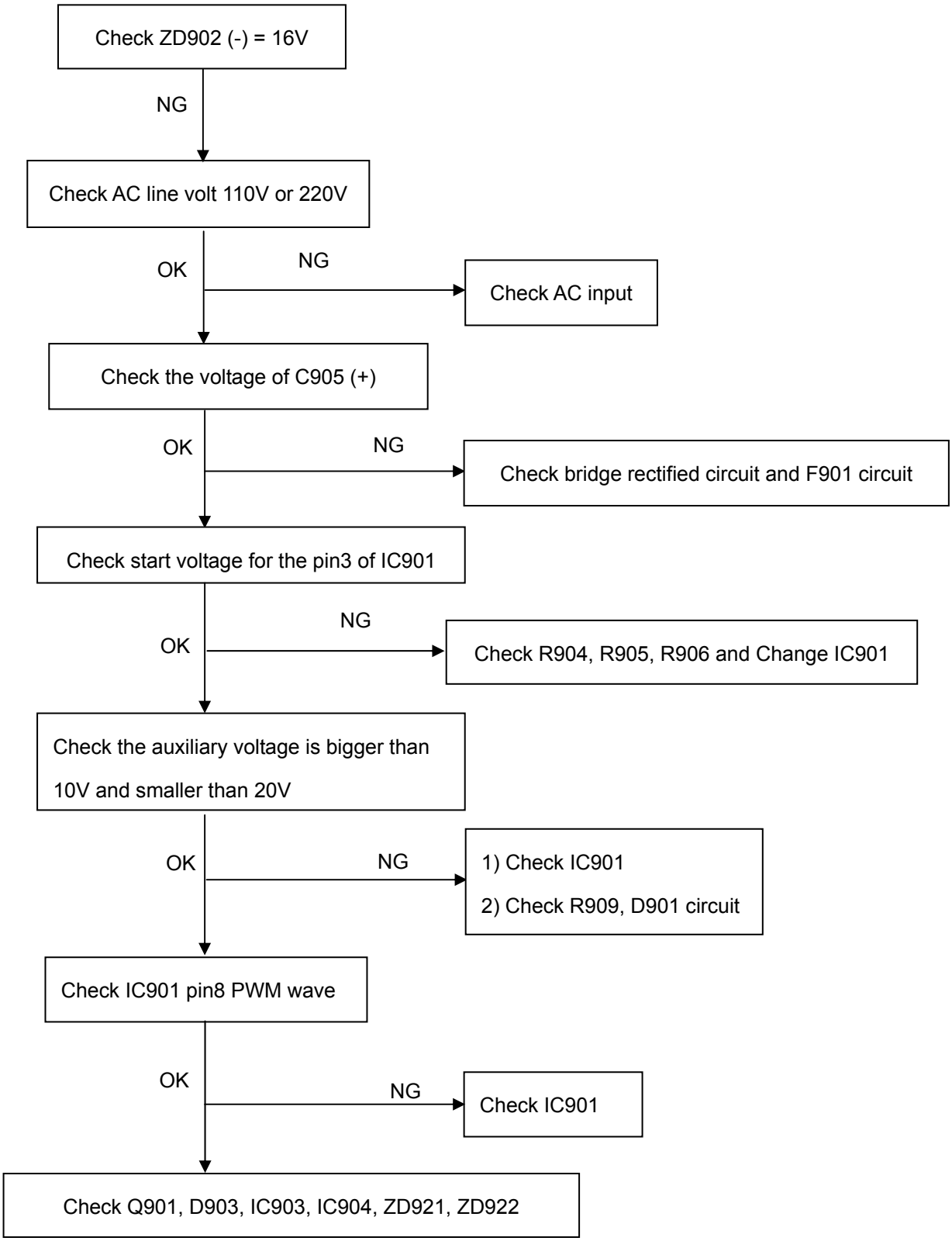

No picture
The button if under control
NG
X401 oscillate waveform is normal
NG
Replace X401
OK
Check reset circuit of U401 is normal
NG
Check Correspondent component
OK
Replace U401
OK
Measure U404 PIN2=3.3V
Q409 $V_{collector}$ =1.8V
NG
Check U404, Q409 and Q410
OK
X401 oscillate waveform is normal
OK
NG
Replace X401
Check HS VS from CN101 is normal
NG
Check Correspondent component
OK
Replace U401

(3). White screen

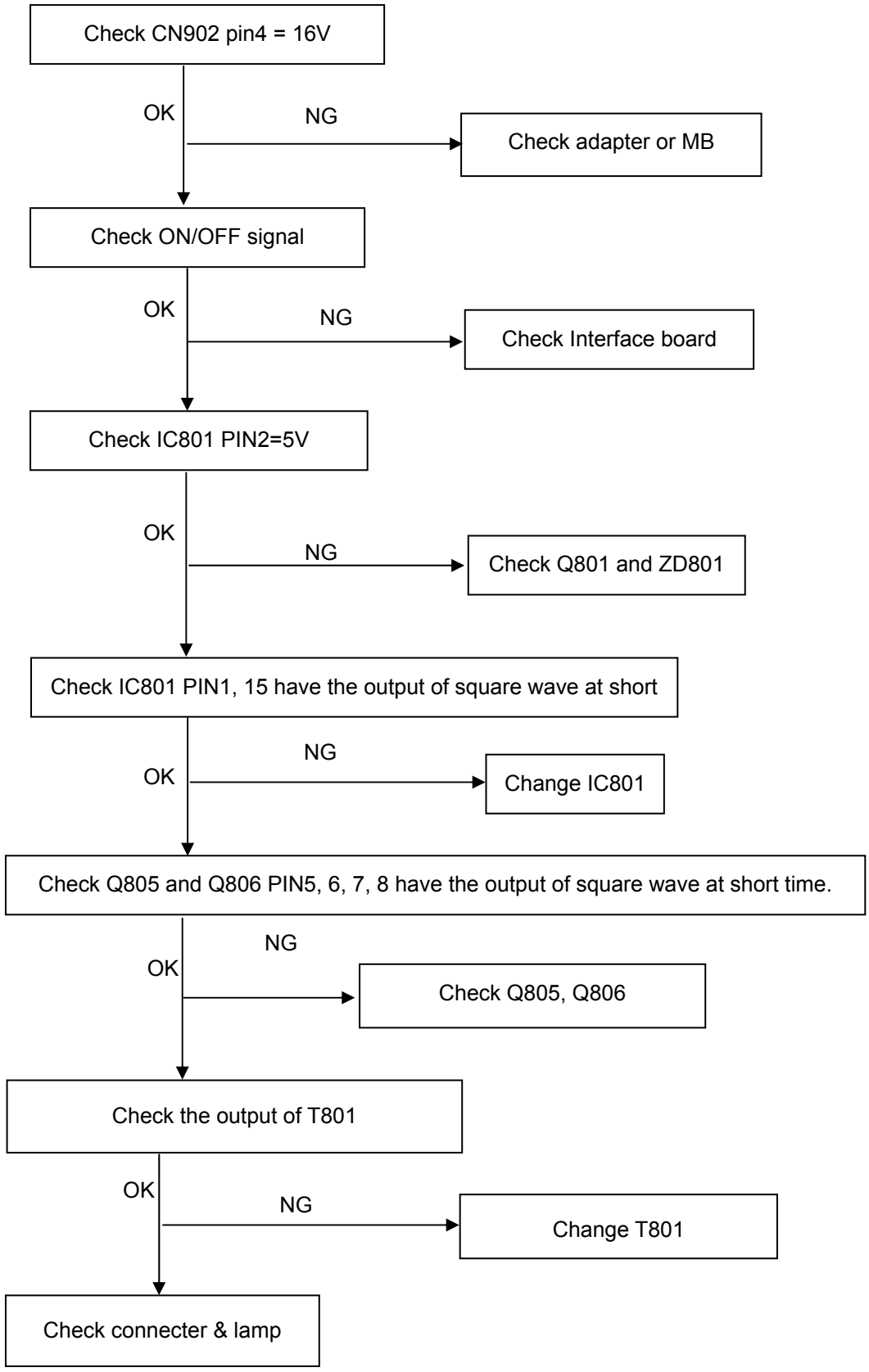


11.2. Power/Inverter Board

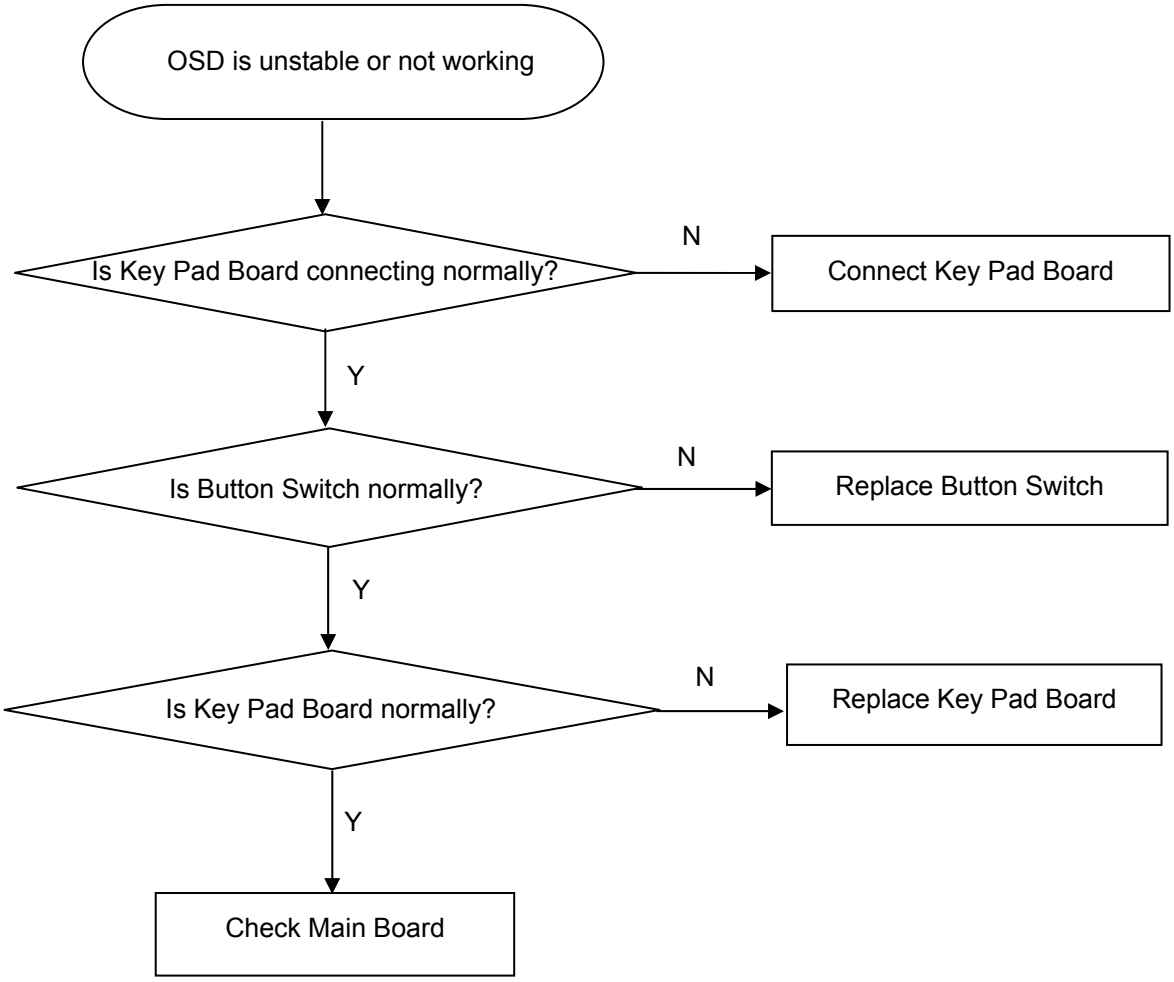
(1) No power



(2) W / LED, No Backlight



12.3 Key Board



13. ISP Instruction

1. When do the part, need the tools as follow:

a. An i486 (or above) personal computer or compatible.

b. Microsoft operation system Windows 95/98/2000/XP.

c. “ PORT95NT.exe” program

d. Software ISP SN Alignment kits

The kit contents:

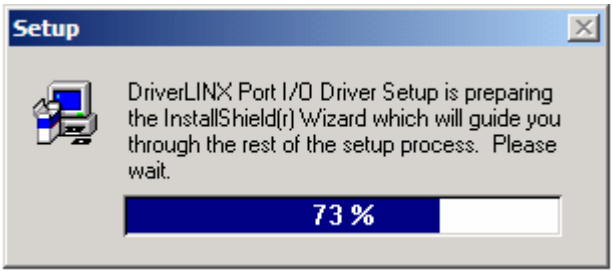
a. ISP BOARD x1

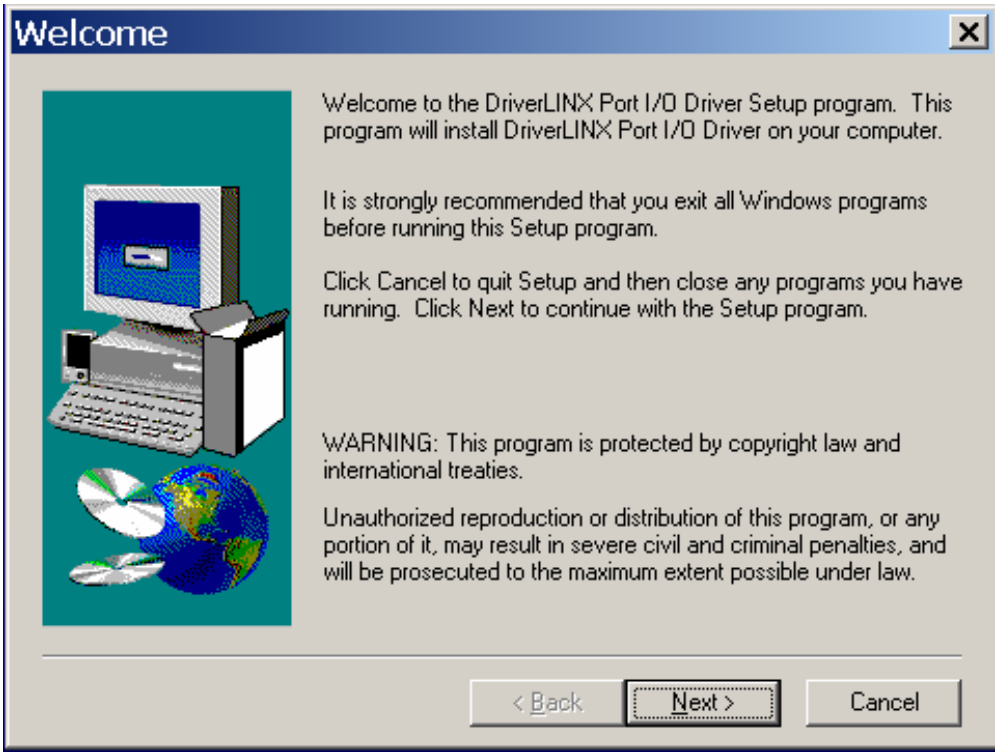
b. Printer cablex1

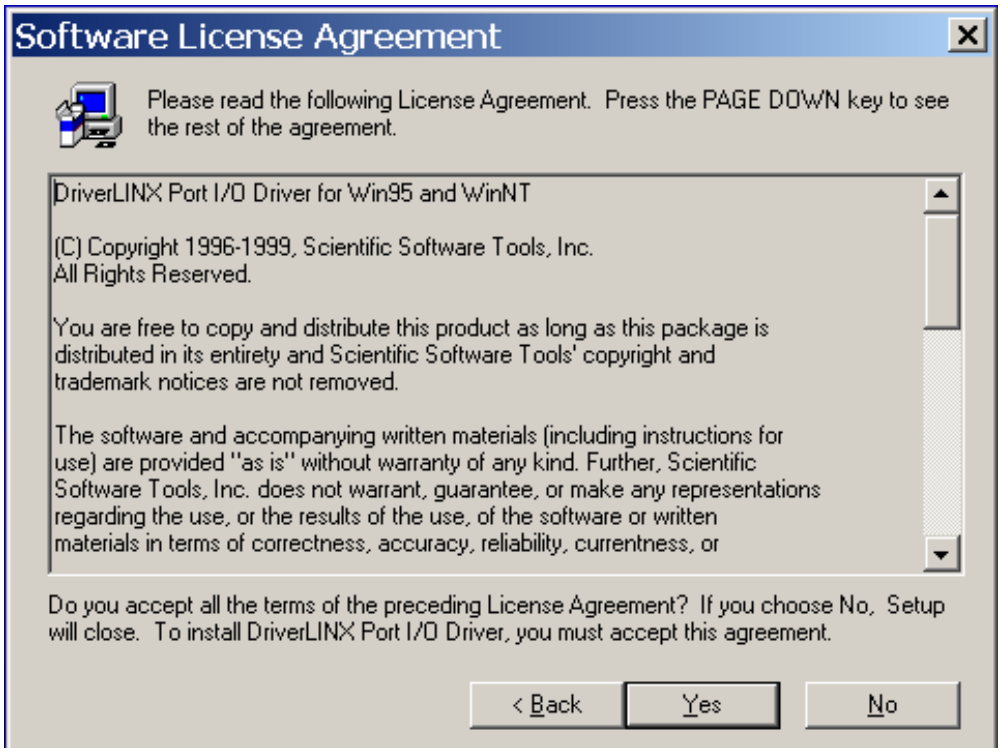
c. VGA cable x1

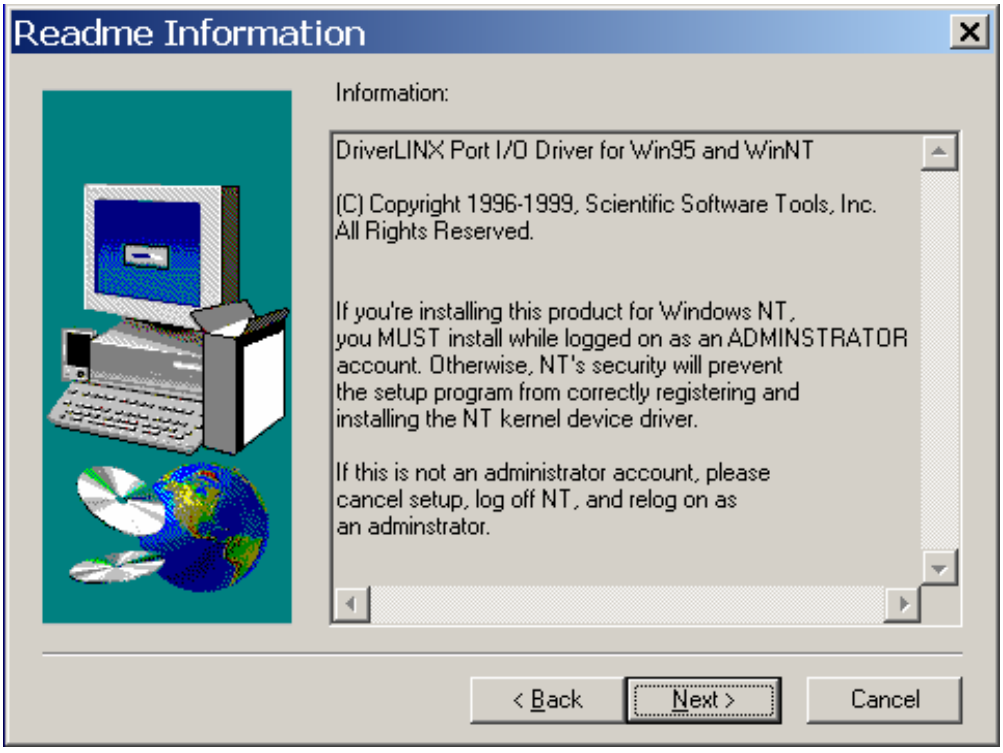
2. Install the “PORT95NT.EXE”, and restart the computer.

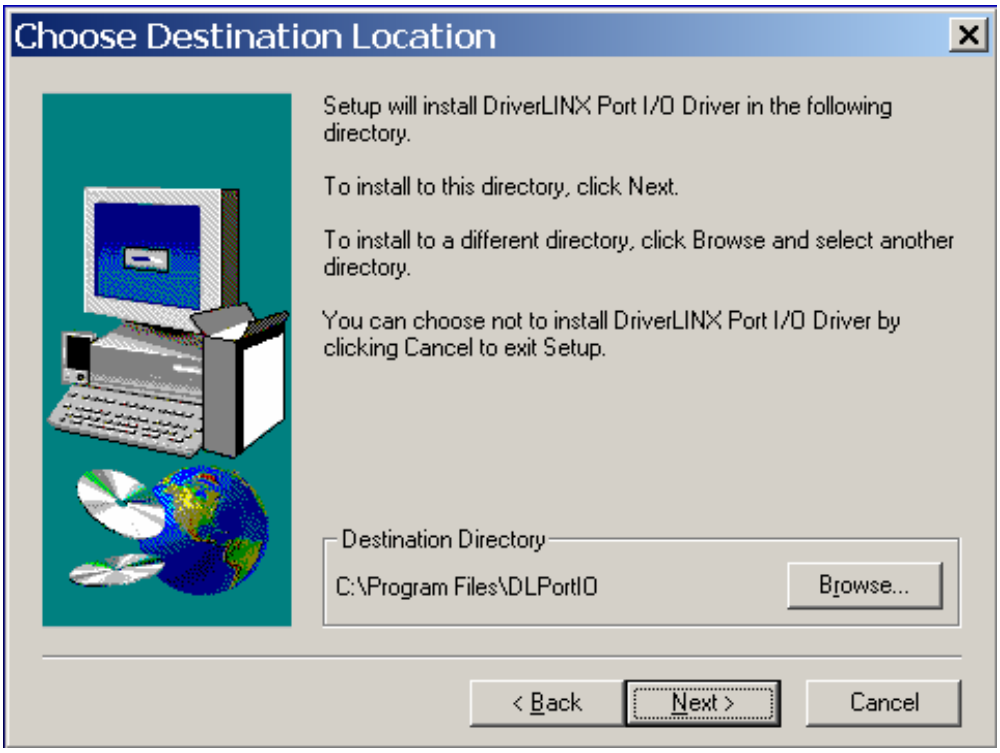
You must install the  at the first. The processing as follows:

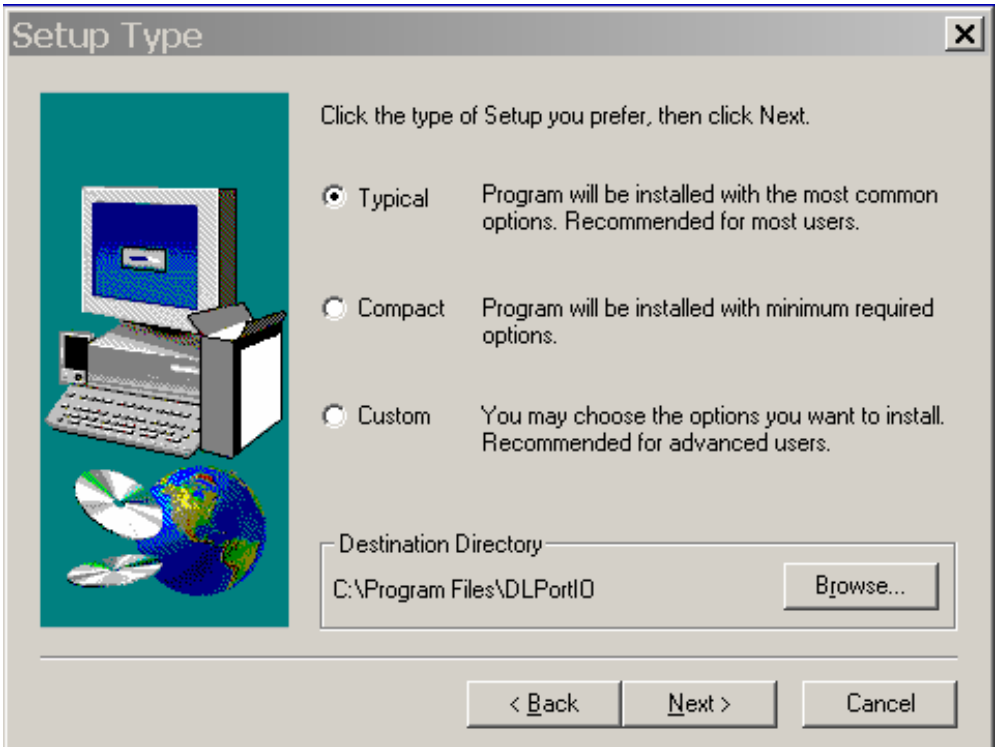


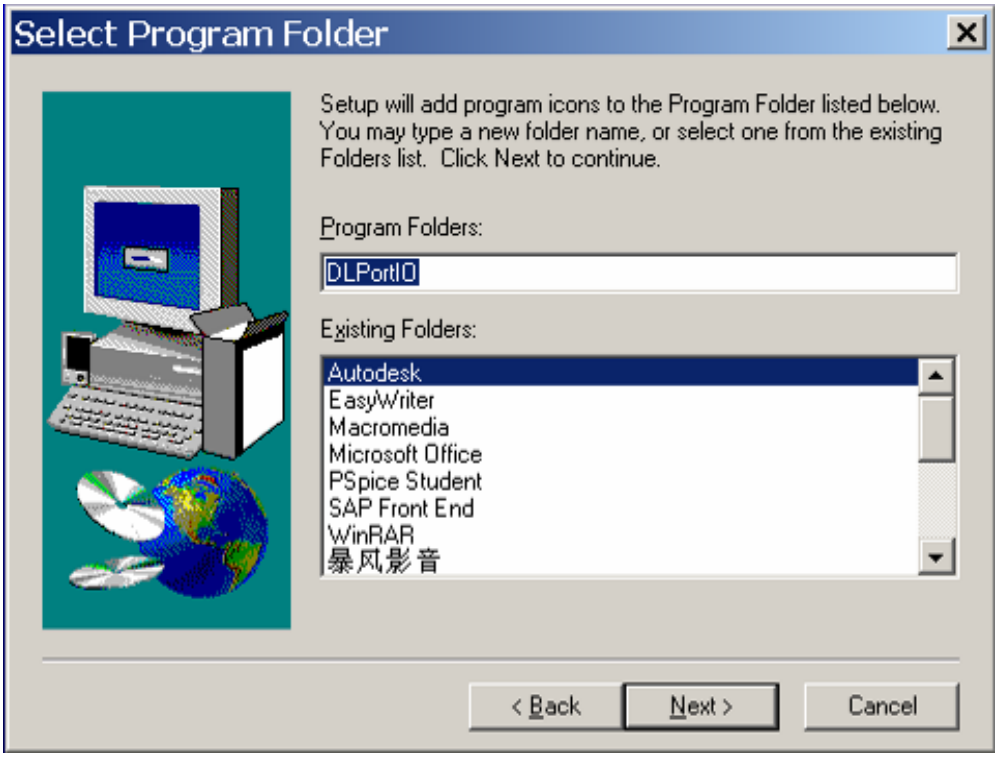


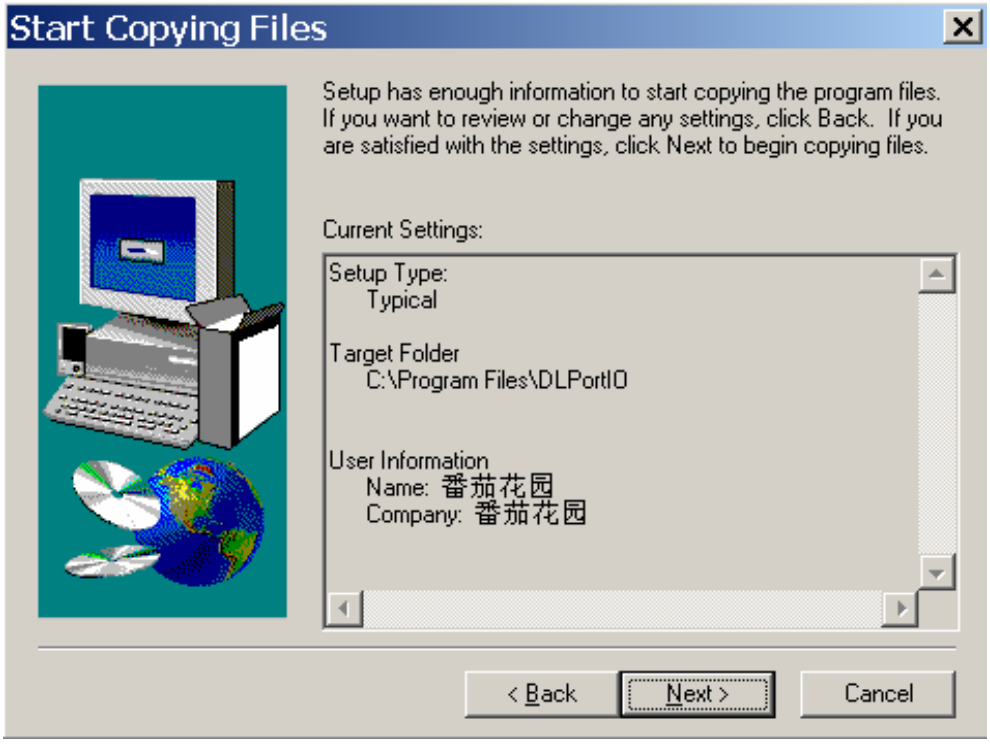

Software License Agreement
Please read the following License Agreement. Press the PAGE DOWN key to see the rest of the agreement.
DriverLINX Port I/O Driver for Win95 and WinNT
(C) Copyright 1996-1999, Scientific Software Tools, Inc.
All Rights Reserved.
You are free to copy and distribute this product as long as this package is distributed in its entirety and Scientific Software Tools' copyright and trademark notices are not removed.
The software and accompanying written materials (including instructions for use) are provided "as is" without warranty of any kind. Further, Scientific Software Tools, Inc. does not warrant, guarantee, or make any representations regarding the use, or the results of the use, of the software or written materials in terms of correctness, accuracy, reliability, currentness, or
Do you accept all the terms of the preceding License Agreement? If you choose No, Setup will close. To install DriverLINX Port I/O Driver, you must accept this agreement.
< Back
Yes
No

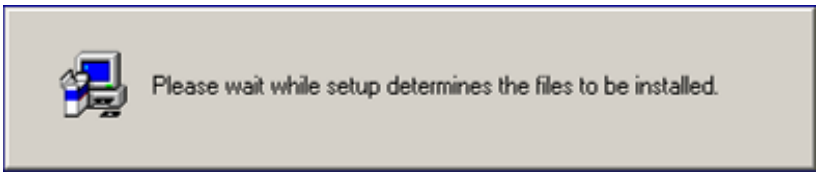

Readme Information
Information:
DriverLINX Port I/O Driver for Win95 and WinNT
(C) Copyright 1996-1999, Scientific Software Tools, Inc.
All Rights Reserved.
If you're installing this product for Windows NT, you MUST install while logged on as an ADMINSTRATOR account. Otherwise, NT's security will prevent the setup program from correctly registering and installing the NT kernel device driver.
If this is not an administrator account, please cancel setup, log off NT, and relog on as an adminstrator.
< Back
Next >
Cancel


Choose Destination Location
Setup will install DriverLINX Port I/O Driver in the following directory.
To install to this directory, click Next.
To install to a different directory, click Browse and select another directory.
You can choose not to install DriverLINX Port I/O Driver by clicking Cancel to exit Setup.
Destination Directory
C:\Program Files\DLPortIO
Browse...
< Back
Next >
Cancel

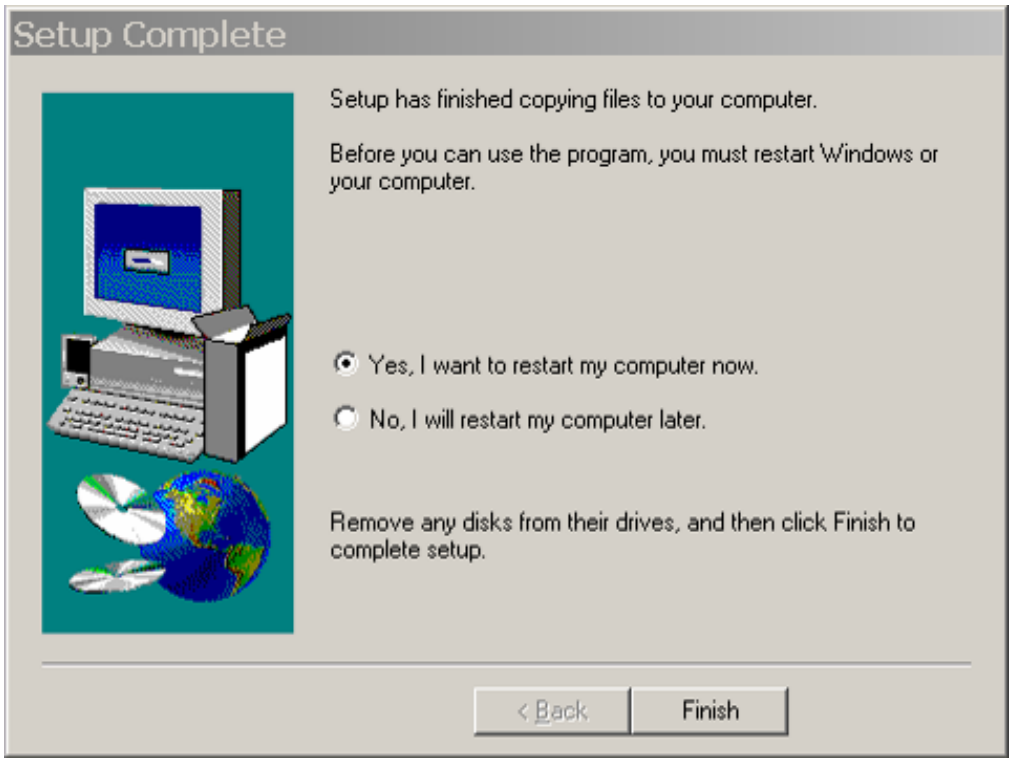

Setup Type
Click the type of Setup you prefer, then click Next.
Typical
Program will be installed with the most common options. Recommended for most users.
Compact
Program will be installed with minimum required options.
Custom
You may choose the options you want to install. Recommended for advanced users.
Destination Directory
C:\Program Files\DLPortIO
Browse...
< Back
Next >
Cancel





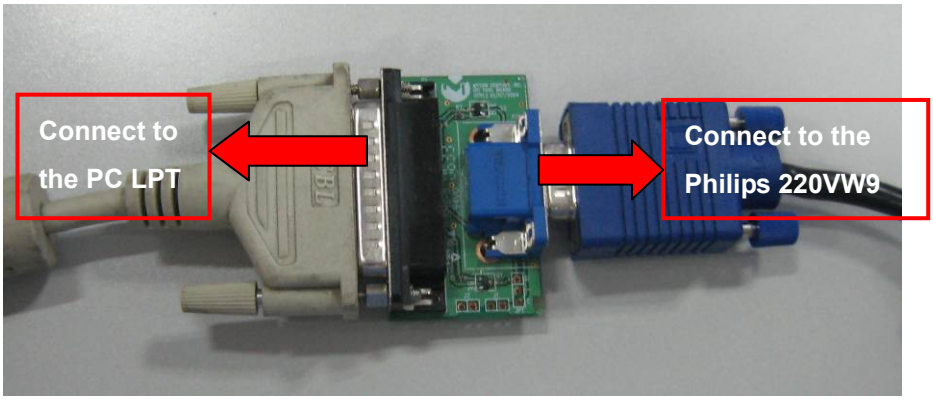


Click Finish to complete the installation.

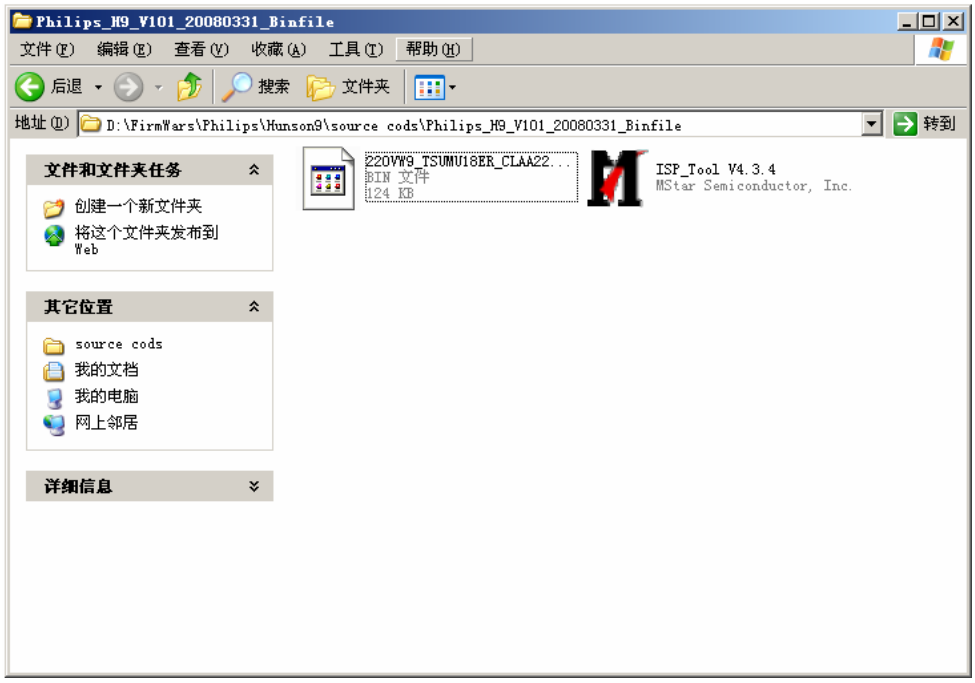


Note: After installation, you must restart the PC to take the setup to effect.

3. Connect the ISP board as follow:

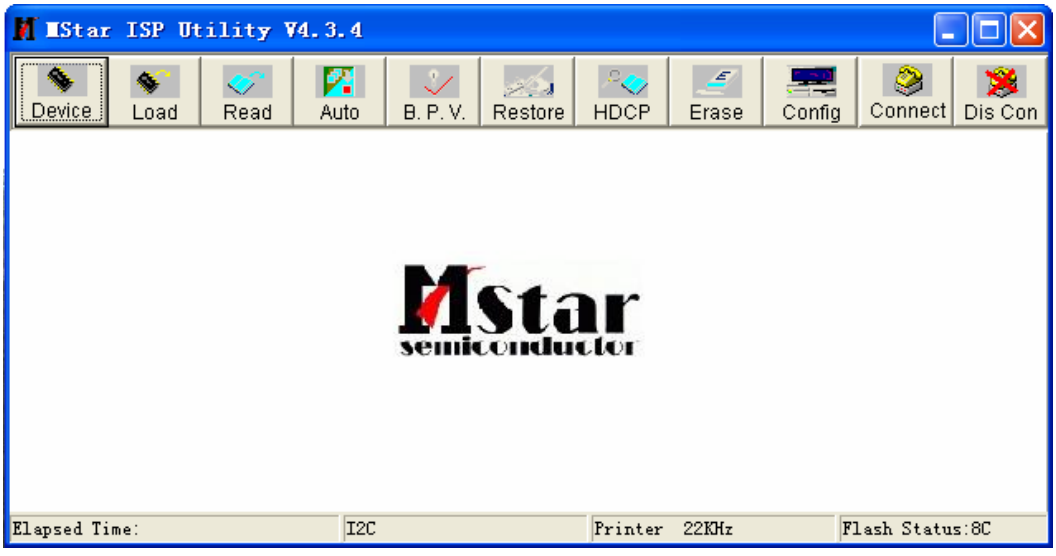


4. The process of ISP write is as follows.



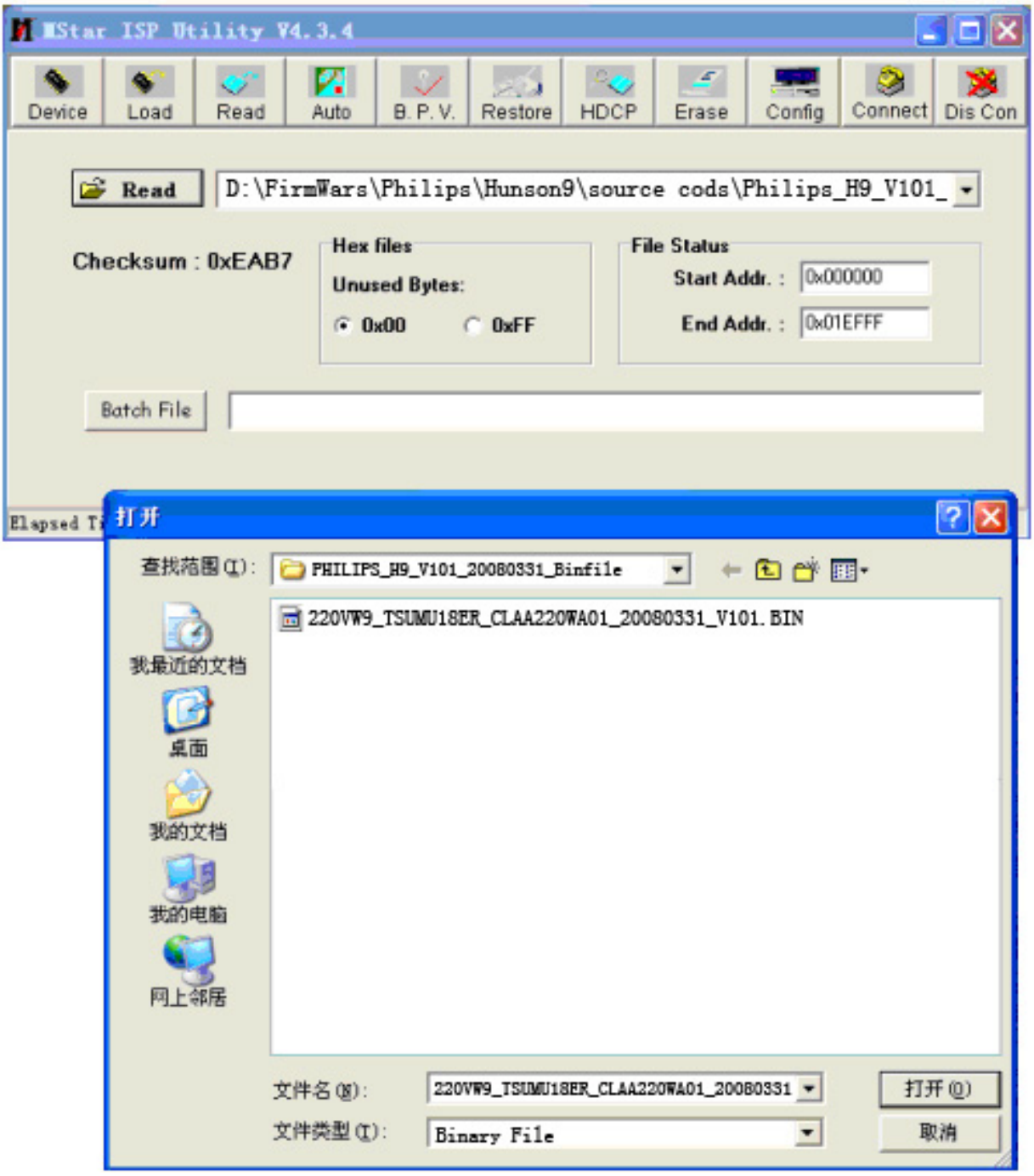
a. Double-click 

，running the program as follows:



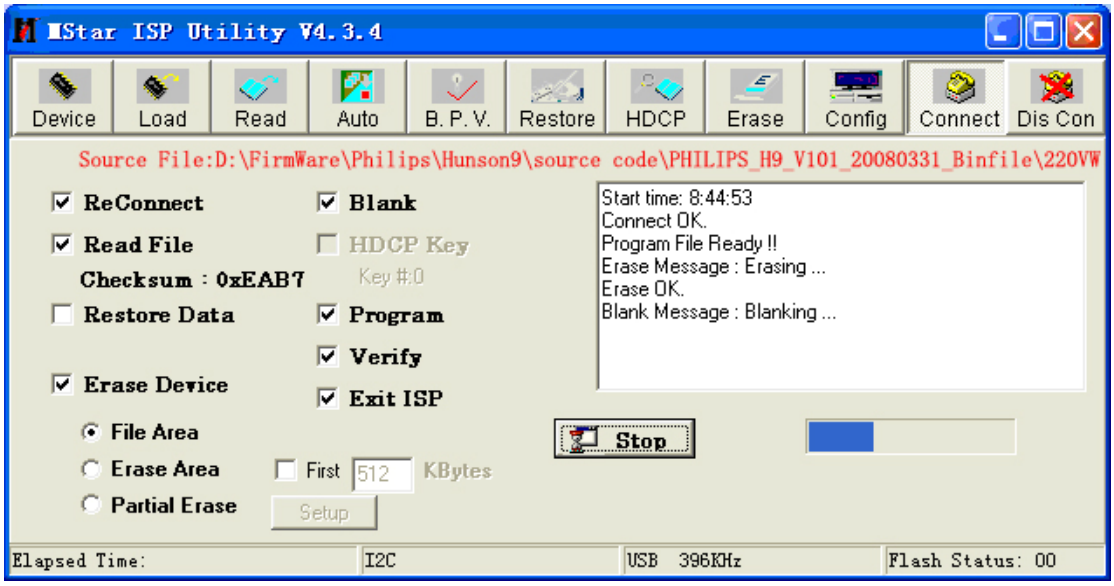
b. Click 

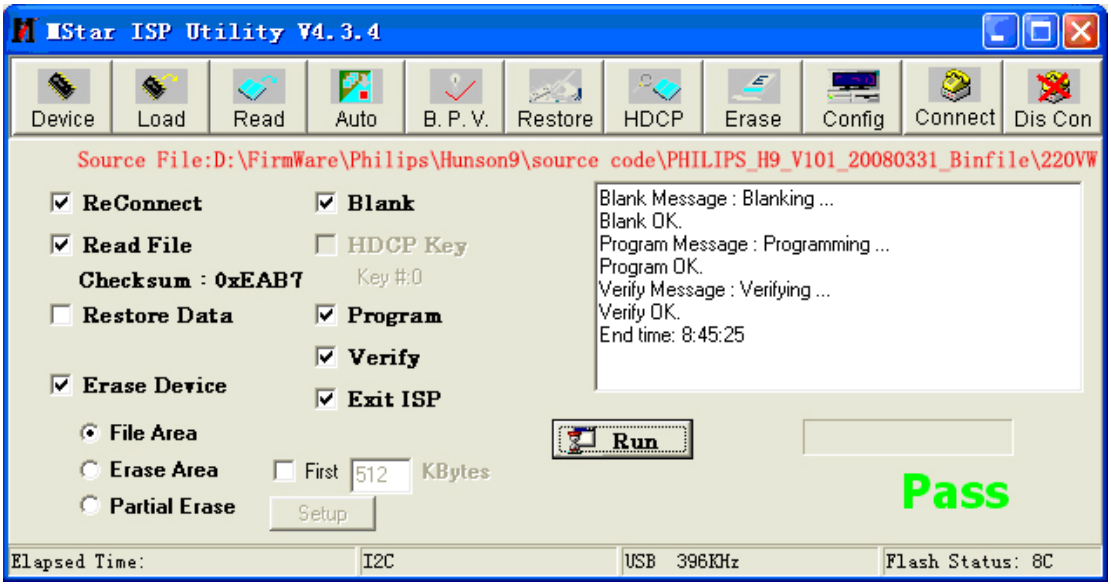
icon, search the program" 220VW9_TSUMU18ER_CLAA220WA01_20080331_V101", and click **open:**



c. Click 

icon, it will auto run. If burn in success, it will show as the follow picture:





14. DDC Instruction

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 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.

1. An i486 (or above) personal computer or compatible.
2. Microsoft operation system Windows 95/98/2000/XP.
3. " PORT95NT.exe, WinDDC_ setup" program.
4. Software OSD SN Alignment kits

The kit contents:

a. OSD SN BOARD x1

b. Printer cablex1

c. VGA cable x1

d. Digital cable x1

e. 12V DC power source

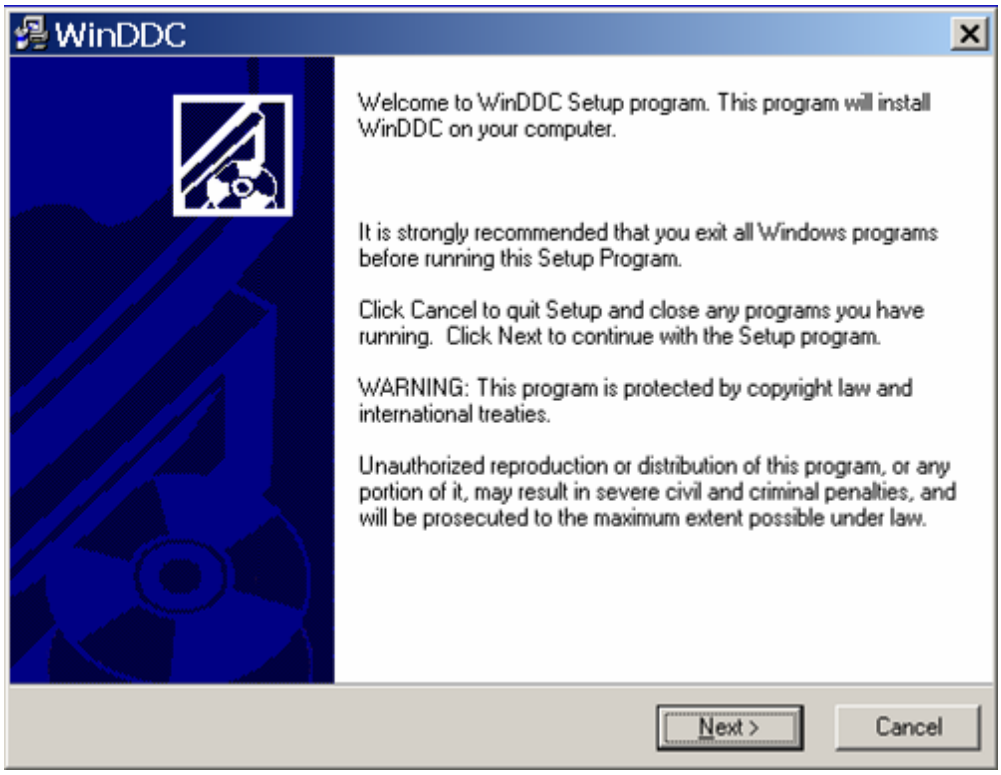
1. Install the "PORT95NT.EXE", and restart the computer.

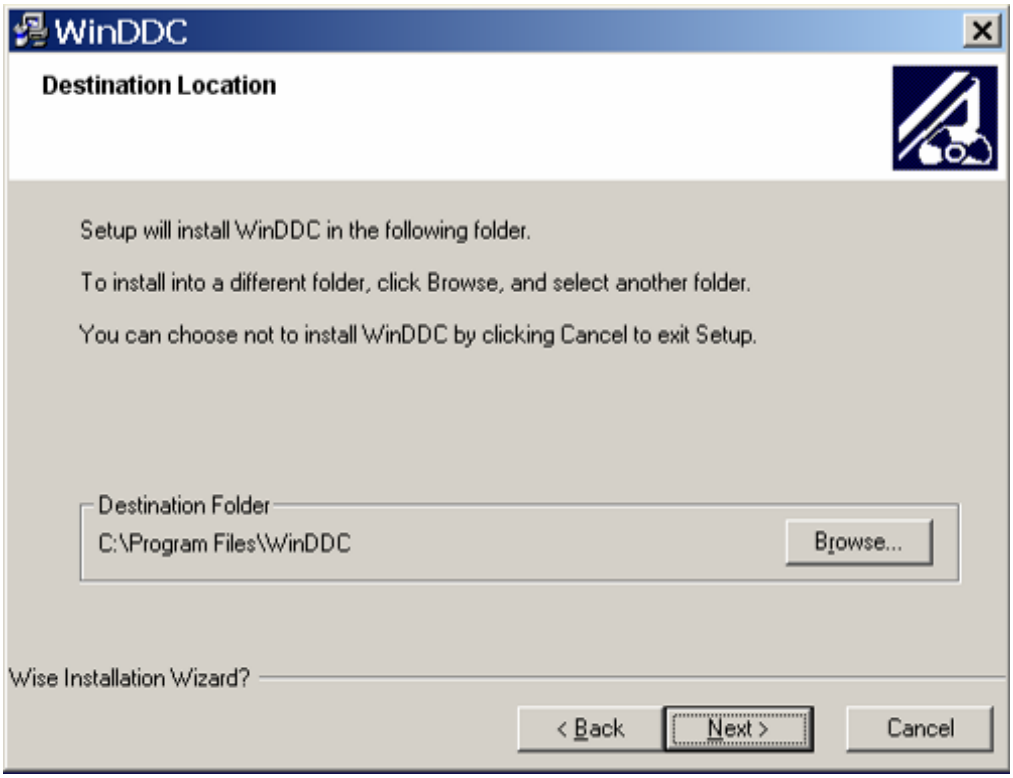
The process of installing "PORT95NT" has been specified in Item12, so it will not be specified again. If you have any problem, please read it in Item12.

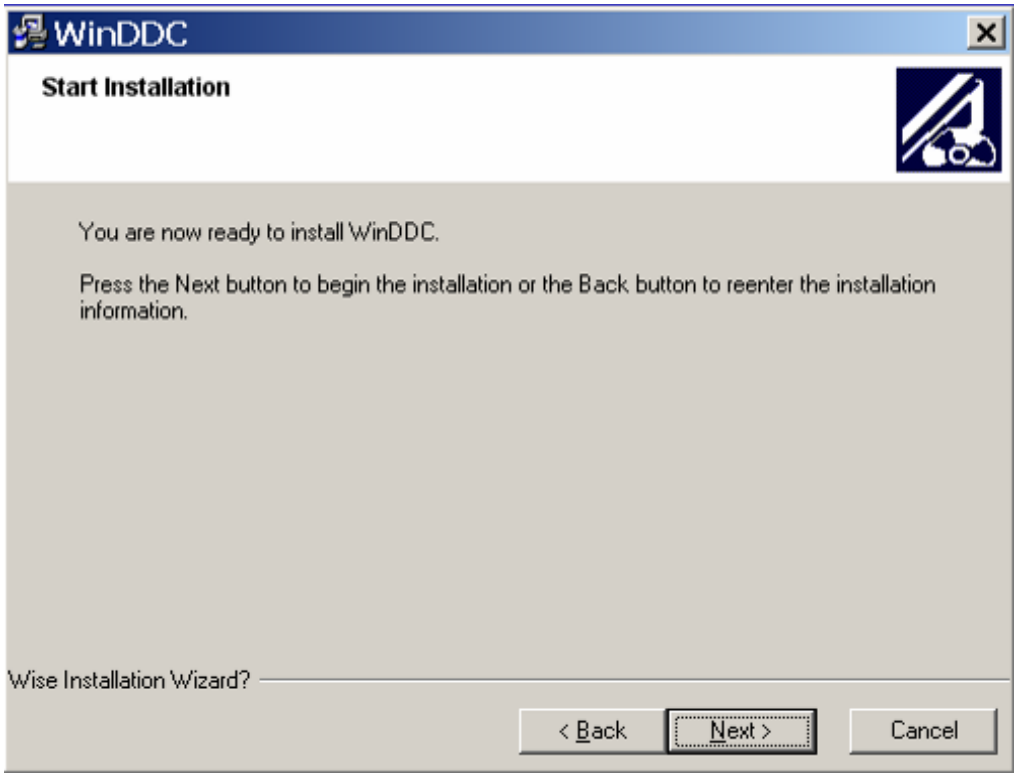
2. Install the "WinDDC_ setup"

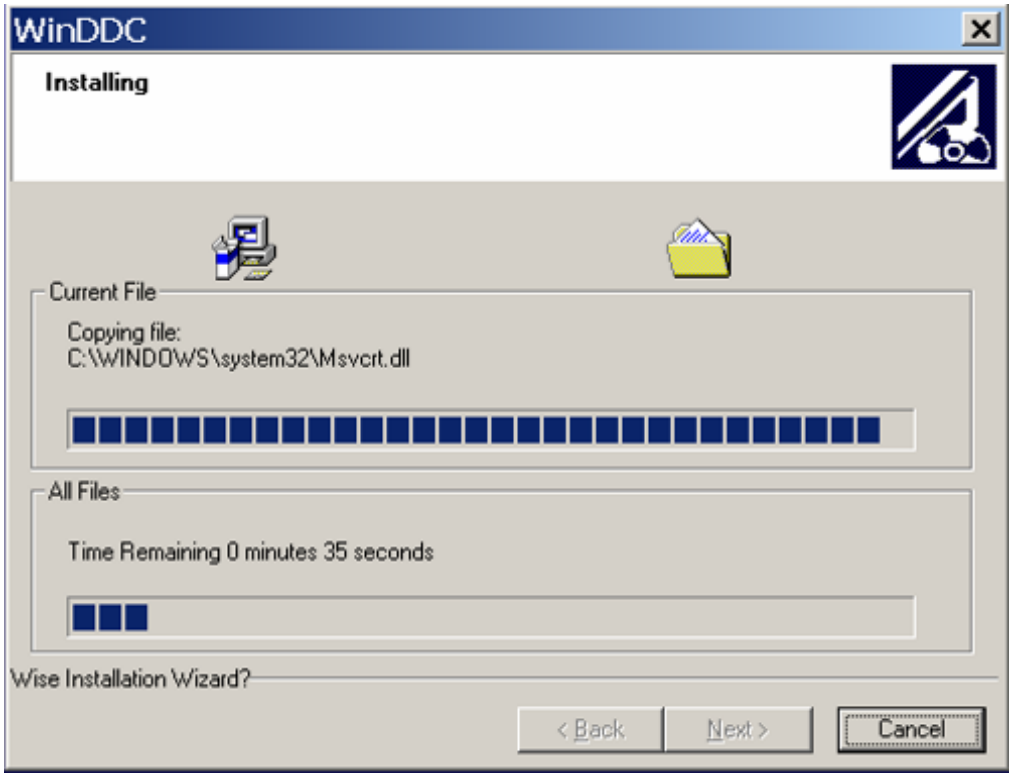
Second, you must install the 

. The processing as follows:



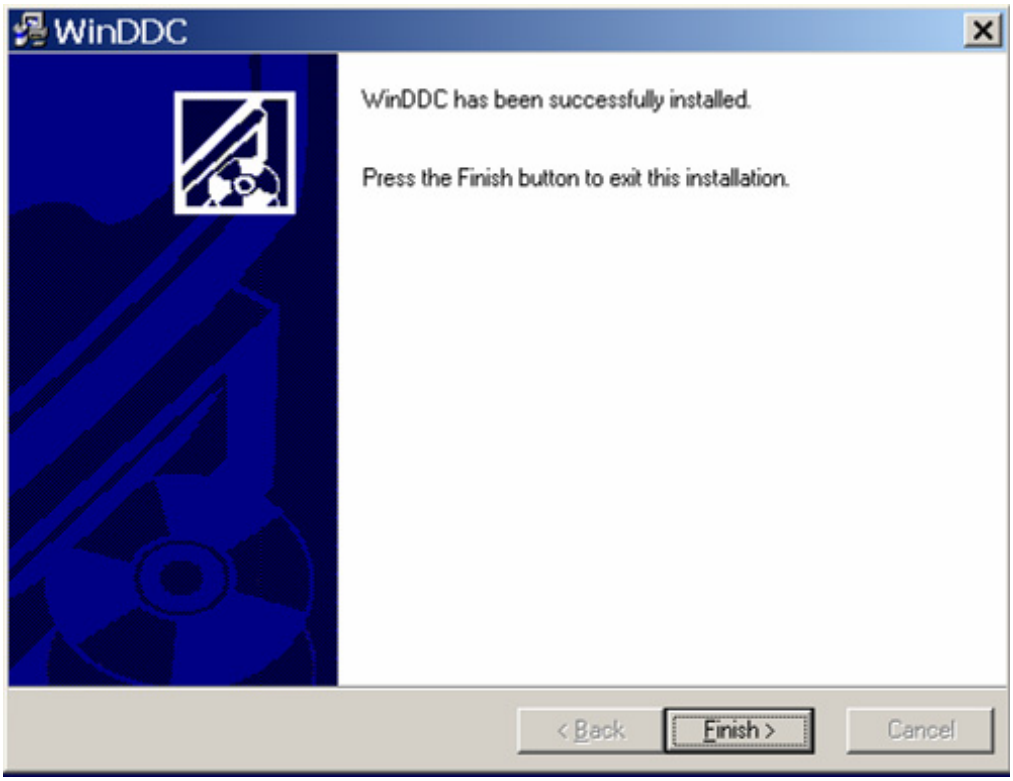



WinDDC
Start Installation
You are now ready to install WinDDC.
Press the Next button to begin the installation or the Back button to reenter the installation information.
Wise Installation Wizard?
< Back
Next >
Cancel

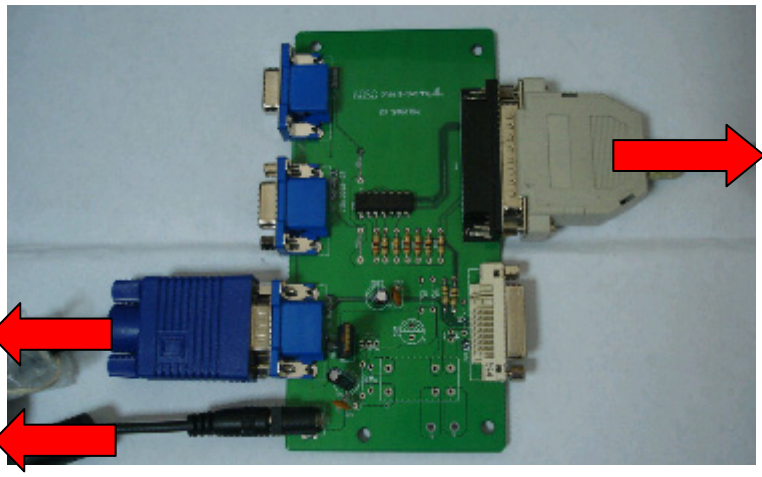

WinDDC
Installing
Current File
Copying file:
C:\WINDOWS\system32\Msvcrt.dll
All Files
Time Remaining 0 minutes 35 seconds
Wise Installation Wizard?
< Back
Next >
Cancel


Updating System Configuration, Please Wait...

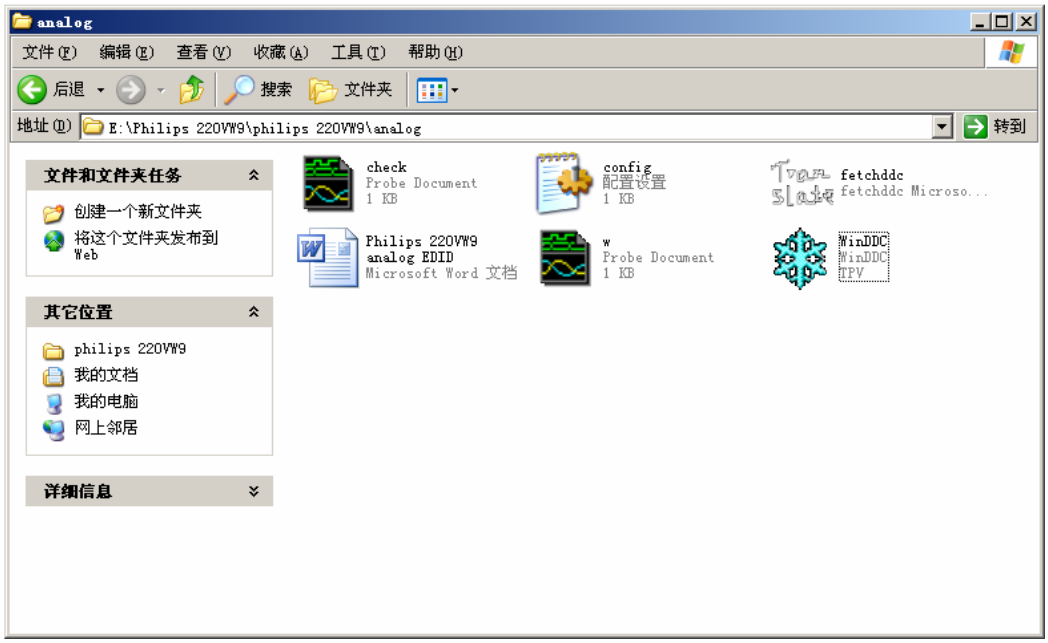
Click Finish to complete the installation.



3. Connect the DDC board as follow:

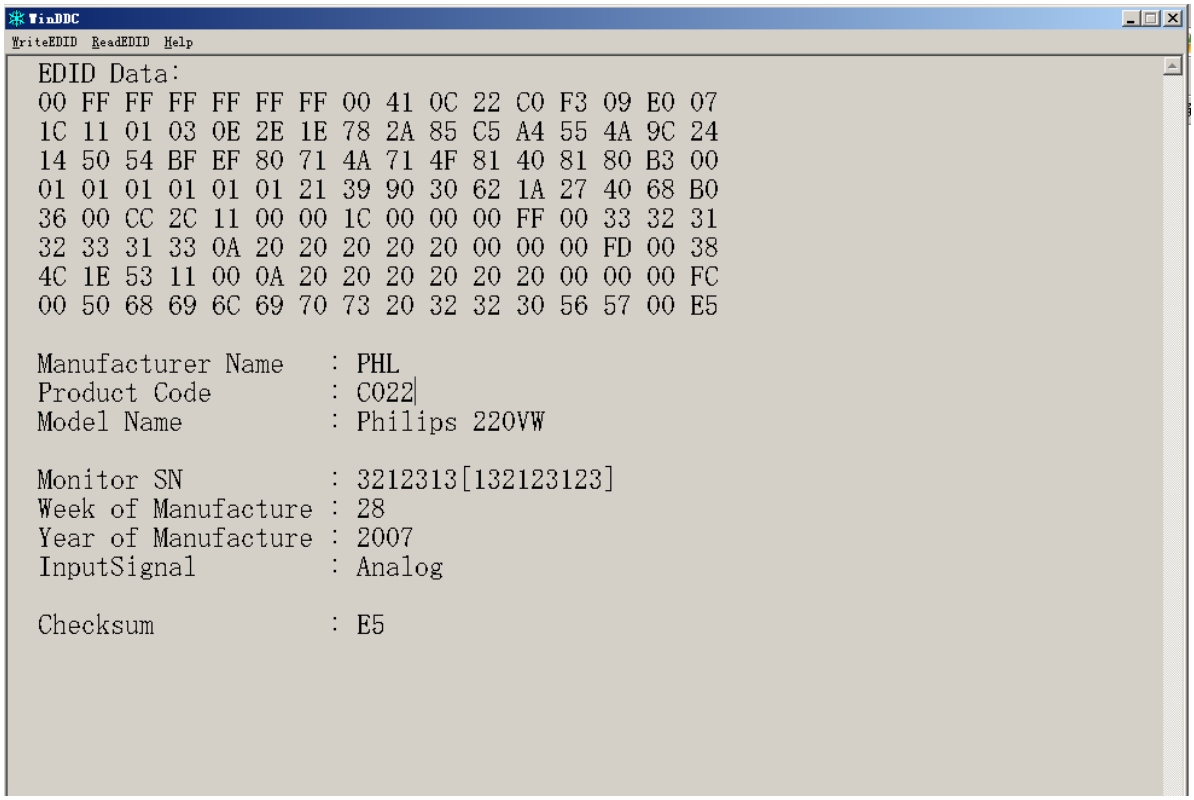


4. Take analog DDC write for example, as follow

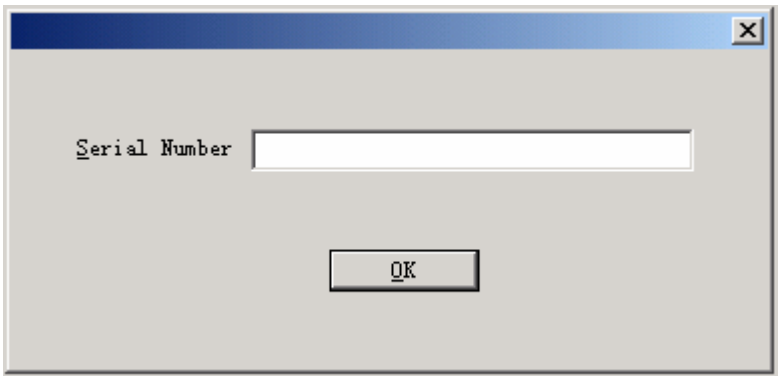


a. Double-click 

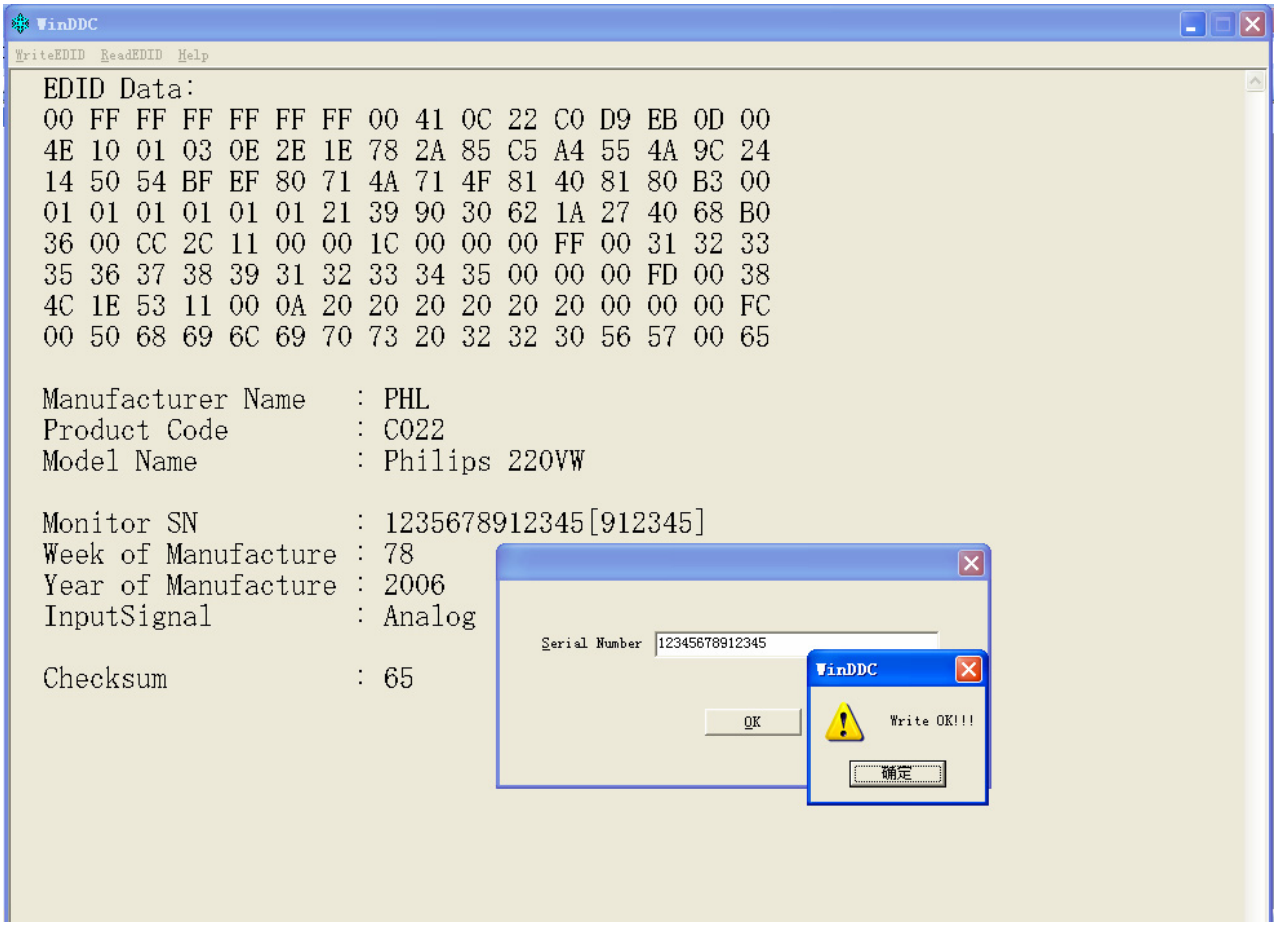
，appear as follow Figs：



b. Click WriteEDID.



c. Key 14 numbers in the Serial Number blank, then click “OK”. Now analog DDC Write completes, as follow.



220VW9 EDID

Analog

128 bytes EDID Data (Hex):

```
        x0 x1 x2 x3 x4 x5 x6 x7 x8 x9 xA xB xC xD xE xF

0:      00 FF FF FF FF FF FF 00 41 0C 22 C0 F8 C3 04 00
10:     15 0D 01 03 0E 2E 1E 78 2A 85 C5 A4 55 4A 9C 24
20:     14 50 54 BF EF 80 71 4A 71 4F 81 40 81 80 B3 00
30:     01 01 01 01 01 01 21 39 90 30 62 1A 27 40 68 B0
40:     36 00 CC 2C 11 00 00 1C 00 00 00 FF 00 31 32 33
50:     31 33 32 31 33 31 32 33 31 32 00 00 00 FD 00 38
60:     4C 1E 53 11 00 0A 20 20 20 20 20 20 00 00 00 FC
70:     00 50 68 69 6C 69 70 73 20 32 32 30 56 57 00 D2
```

Decoded EDID data

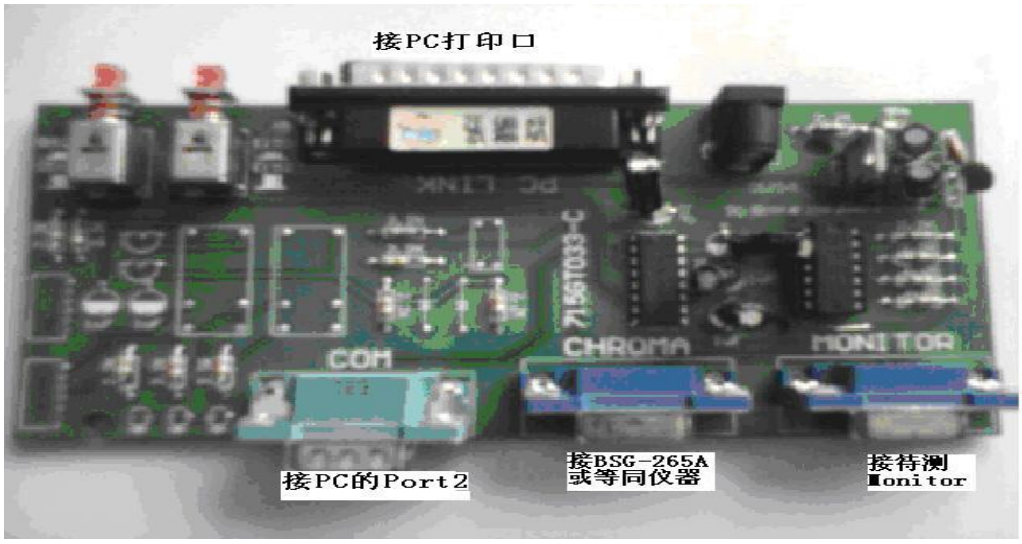
```
        <---Header--->

                Header: 00 FF FF FF FF FF FF 00

        <-x-Header-x->

        <---Vendor/Product Identification--->
                ID Manufacturer Name:       PHL
                ID Product Code:            C022
                ID Serial Number:           f8c30400
                Week of Manufacture:        21
                Year of Manufacture:        2003
        <-x-Vendor/Product Identification-x->

        <---EDID Structure Version/Revision--->
                EDID Version#:              01
                EDID Revision#:             03
        <-x-EDID Structure Version/Revision-x->

        <---Basic Display Parameters/Features--->
                Video i/p definition:       Analog
                Signal Level Standard:      0.700V/0.300V(1.000Vpp)
                Setup:                      Blank-to-Black not expected
                Separate Sync Support:      Yes
                Composite Sync Support:     Yes
                Sync. on green video supported:Yes
                Serration of the Vsync.Pulse is not required.
                Max. H. Image Size :        46cm.
                Max. V. Image Size :        30cm.
                Display Gamma:              2.2
                DPMS Features, Stand-by:    No.
                DPMS Features, Suspend:     No.
                DPMS Features, Active off:  Yes.
                Display Type:     R.G.B color display.
                Standard Default Color Space:    R.G.B color.
                Preferred Timing Mode:      In First Detailed Timing.
                GTF supported:  No.
        <---Basic Display Parameters/Features--->

        <---Color Characteristics--->
                Red x:              0.6425781250
                Red y:              0.3320312500
                Green x:            0.2890625000
```

```
        Green y:              0.6103515625
        Blue x:               0.1435546875
        Blue y:               0.0781250000
        White x:              0.3125000000
        White y:              0.3291015625
    <-x-Color Characteristics-x->

    <---Established Timings--->
    Established Timings 1:    BF
            -720x400 @70Hz VGA,IBM
            -640x480 @60Hz VGA,IBM
            -640x480 @67Hz Apple,Mac II
            -640x480 @72Hz VESA
            -640x480 @75Hz VESA
            -800x600 @56Hz VESA
            -800x600 @60Hz VESA
    Established Timings 2:    EF
            -800x600    @72Hz VESA
            -800x600    @75Hz VESA
            -832x624    @75Hz Apple,Mac II
           -1024x768    @60Hz VESA
           -1024x768    @70Hz VESA
           -1024x768    @75Hz VESA
           -1280x1024 @75Hz VESA
    Established Timings 3:    80
           -1152x870    @75Hz Apple,Mac II
    <-x-Established Timings-x->

    <---Standard Timing Identification--->
           -1152x864 @70 Hz
           -1152x864 @75 Hz
           -1280x960@60 Hz
           -1280x1024       @60 Hz
           -1680x1050       @60 Hz
    <-x-Standard Timing Identification-x->

    <---Detailed Timing Descriptions--->
    Detailed Timing:              1680x1050 @    60Hz.
    <-x-Detailed Timing Descriptions-x->

    <---Detailed Timing Descriptions--->
    Detailed Timing:FF (Monitor SN) '123132131231'
    Detailed Timing:FD (Monitor limits)
           Min. V. rate:      56Hz
           Max. V. rate:      76Hz
           Min. H. rate:      30KHz
           Max. H. rate:      83KHz
           Max. Pixel Clock:             170MHz
    Detailed Timing:              FC (Monitor Name) 'Philips 220VW'
    <-x-Detailed Timing Descriptions-x->

    Extension Flag:               00
    Checksum:                        D2
```

15. White Balance, Luminance Adjustment

1. Apparatuses and program: analyzer CA-210, PC, tool, FGA adjustment program (PHILIPS170V9.DDCI), Pattern generator.
2. Equipment installation:
   a. Connect analyzer CA-210 to PC by USB connector, install drive program CA-SDK Ver4.00 for CA-210 and restart PC after finish installing.
   b. Install Port95NT drive program, set PC printer connector mode as ECP mode and restart PC after finish installing.
   c. Connect tools as follow:

   (Note: It is not necessary to connect Port2)



3. Adjustment

Preparation before adjustment:

(1) Monitor should be warmed up for more than half an hour.

(2) Make sure that the tools are connected right and drive programs have been installed OK.

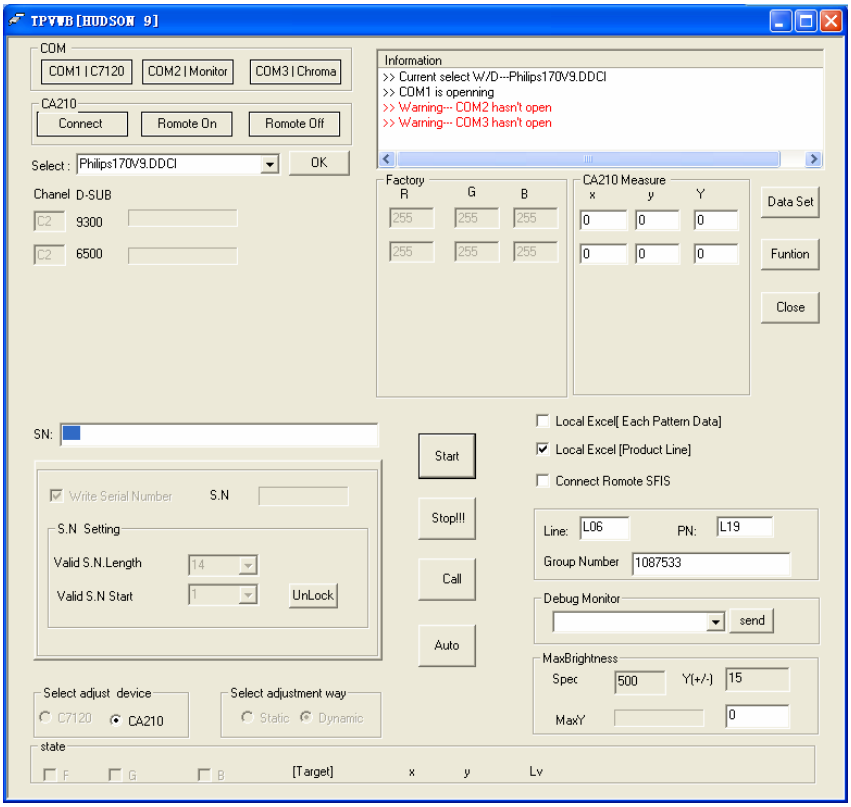
Adjustment process:

(1) Press the power of CA-210, shut off the lens, press 0-Cal and open the lens after analyzer reset.

(2) Start white balance adjustment program, select the right parameter according with the program and click OK.

(3) Make sure that the lens of CA-210 aims at the center of the screen, then click Start and start adjusting.

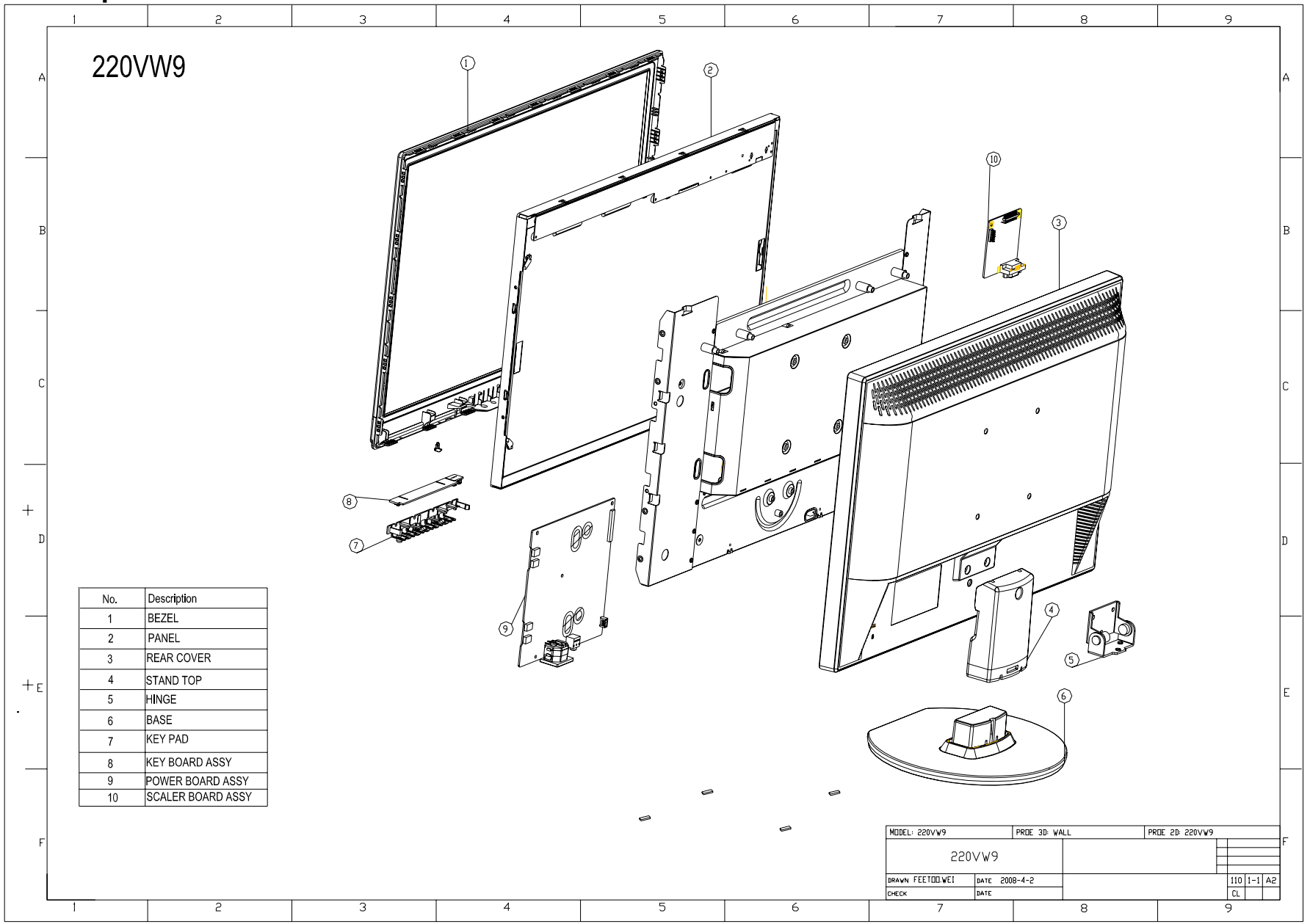
(4) After finish adjusting, the adjustment program displays pass, and the Start Button is changed to Next, which means you can adjust another monitor.



4. Color Temp confirmation

Connect the signal to the monitor, the monitor display white-picture, use CA-210 to measure the Color Temp of the screen center and select the OSD to make sure whether the Color Temps accord with the SPEC.

16. Monitor Exploded View



No.	Description
1	BEZEL
2	PANEL
3	REAR COVER
4	STAND TOP
5	HINGE
6	BASE
7	KEY PAD
8	KEY BOARD ASSY
9	POWER BOARD ASSY
10	SCALER BOARD ASSY

17. Recommended & Spare Parts List

220VW9FB/97

Item	Location	PCM Codes	Description	Philips 12NC	Remark
1	FQ106	A34G0752ADTC1B0130	BEZEL	996510015667	
2	E750	750GLCB6WA132M000F	PANEL CLAA220WA01 032 WJ CPT2	996510015681	
2	E750	750GLCB6WA142M000F	PANEL CLAA220WA01 043 WJ CPT1	996510015664	
2	E750	750GLCB6WA133M000F	PANEL CLAA220WA01 032 FZ CPT	996510016676	Second source
2	E750	750GLCB6WA143M000F	PANEL CLAA220WA01 043 FZ CPT	996510016677	Second source
3	FQ105	A34G0530ADT 6B	REAR COVER22"	996510015666	
4	FQ108	A34G0531ADT 1B0100	STAND	996510015563	
5	FQ110	Q37G0077011	HINGE	996510015668	
6	FQ109	A34G0753ADT 1B0133	BASE	996510015564	
7	FQ405	A33G0313ADT 1L	KEY PAD	996510015665	
9	FQ004	KEPC7QPHP	KEY BOARD ASSY	996510015677	
10	FQ003	PWPC7C41SQAL	POWER BOARD ASSY	996510015671	
11	FQ002B	CBPC7CMGP1QP	SCALAR BOARD ASSY (CPT2)	996510015682	750GLCB6WA132M000F
	E08902	089G 725HAA DB	D-SUB	996510014810	
	E08907	089G179E30N520	FFC CABLE	996510015662	
	E08901	089G404A15N IS	POWER CORD	996510015663	
	FQ202	Q44GC047813 2A	22 LCD PHILIPS CARTON	996510015670	
	FQ203	P45G 88609 37 R	EPE BAG	996510010007	
	FQ205	705GQ8CS005	CUSHION ASSY	996510015669	
	FQ204	Q70G2201813 1A	CD MANUAL	996520033961	
	FQ201	Q40G 22N813 1A	RATING LABEL	996520033962	
	U401	056G 562560	IC TSUMU18ER-LF LQFP-64 MSTAR	996510015674	
	U404	056G 563 52	IC AP1117D33LA TO252-3L ATC	996510005697	

	U102	056G 662 13	IC AZC099-04S SOT23-6L	996510014826	
	U103	056G 662 13	IC AZC099-04S SOT23-6L	996510014826	
	U403	056G1133 56	M24C16-WMN6TP	996500037783	
	U402	705GQ756055	MCU ASS'Y (CPT2)	996510015683	750GLCB6WA132M000F
	U402	705GQ756056	MCU ASS'Y (CPT1)	996510015676	750GLCB6WA142M000F
	T901	080GL22T 3 N	X'FMR 510uH YUVA-822	996510014838	
	PT801	080GL20T 33 DN	X'FMR 99.3uH TK.2018R.101	996510009155	
	F901	084G 56 4 B	FUSE 4A 250V	996510013724	
	F903	084G 56 4 B	FUSE 4A 250V	996510013724	
	X401	093G 22 53 J	14.31818MHZ/32PF/49US	996510014824	
	IC903	056G 139 3A	IC PC123Y22FZ0F	996500036055	
	IC901	056G 379 98	IC LD7552DPS SOP-8	996510014843	
	IC801	056G 608 10	IC OZ9938GN-B SOIC-16	996500036059	
	IC904	056G 158 12	KIA431A-AT/P TO-92	996500036054	

Service Kit

Description	PCM Codes	Philips 12NC	Remark
DDC KIT	715L2005C2	9965 000 43197	FOR ALL MODEL
OSD SN KIT	715GT033 C	9965 000 43252	FOR ALL MODEL
NOVATEK ISP KIT	715LT035A	9965 000 43198	FOR ALL HUDSON 7
			FOR 170A8, 190B8, 150S8, 170S8,190S8, 170V8,190V8
MSTAR ISP KIT	715GT039 A	996510010027	FOR 200CW8, 190VW9, 170V9, 190V9 AND 220VW9
REALTEK ISP KIT	715GT039 A	996510010027	FOR 170CW8

18. Different Part List

Diversity of 220VW9FB/27 compared with 220VW9FB/97						
Location	220VW9FB/27			220VW9FB/97		
	PCM Codes	Description	Philips 12NC	PCM Codes	Description	Philips 12NC
E08901	089G402A15N IS	POWER CORD		089G404A15N IS	POWER CORD	996510015663
FQ201	Q40G 22N813 2A	RATING LABEL		Q40G 22N813 1A	RATING LABEL	996520033962

Diversity of 220VW9FB/05 compared with 220VW9FB/97						
Location	220VW9FB/05			220VW9FB/97		
	PCM Codes	Description	Philips 12NC	PCM Codes	Description	Philips 12NC
E08901	089G410A15N IS	POWER CORD		089G404A15N IS	POWER CORD	996510015663

Diversity of 220VW9FB/62 compared with 220VW9FB/97						
Location	220VW9FB/62			220VW9FB/97		
	PCM Codes	Description	Philips 12NC	PCM Codes	Description	Philips 12NC
FQ205	705GQ834005	CUSHION ASSY		705GQ8CS005	CUSHION ASSY	996510015669

The BOM of 220VW9FB/00 is the same as 220VW9FB/97.

Diversity of 220VW9FB/75 compared with 220VW9FB/97						
Location	220VW9FB/75			220VW9FB/97		
	PCM Codes	Description	Philips 12NC	PCM Codes	Description	Philips 12NC
E08901	089G414A15N IS	POWER CORD	996510015859	089G404A15N IS	POWER CORD	996510015663
FQ103	705GQ834198	STAND_BASE ASS'Y 22'	996510016678	A34G0752ADTC1B0130	BEZEL 22"	996510015667

Diversity of 220VW9FB/93 compared with 220VW9FB/97						
Location	220VW9FB/93			220VW9FB/97		
	PCM Codes	Description	Philips 12NC	PCM Codes	Description	Philips 12NC
E08901	089G414A15N IS	POWER CORD	996510015859	089G404A15N IS	POWER CORD	996510015663
FQ106	A34G0752ADTD1B0130	BEZEL(22")	996510016679	A34G0752ADTC1B0130	BEZEL 22"	996510015667
FQ202	Q44GC047813 1A	22 LCD PHILIPS CARTON	996510016681	Q44GC0478132A	22 LCD PHILIPS CARTON	996510015670
FQ206	Q41G780081376A	220VW9 QSG	996510016680			
FQ103	705GQ834198	STAND_BASE ASS'Y 22'	996510016678			

Diversity of 220VW9FB/94 compared with 220VW9FB/97						
Location	220VW9FB/94			220VW9FB/97		
	PCM Codes	Description	Philips 12NC	PCM Codes	Description	Philips 12NC
FQ103	705GQ834198	STAND_BASE ASSY 22	996510016678			
FQ301	089G417A15N IS	POWER CORD	996510015866	089G404A15N IS	POWER CORD	996510015663

19. General Product Specification

CONTENTS

1. FOREWORD

This specification describes a 21.6" SXGA multi-scan color TFT LCD monitor with maximum resolution up to 1680 x 1050 /60 non-interlaced. All optical characteristics (including WHITE-D, Brightness, and so on) are determined according to panel specification after warming up approximate 30 minutes that brightness stability is optimal, and follow strictly after panel specification.

2. PRODUCT PROFILE

This display monitor unit is a color display monitor enclosed in PHILIPS styling cabinet which has an integrated tilt base.

2.1 LCD

Priority : 1. CPT

Type : TFT-LCD

Supplier offer the Panel specification.

Panel incoming specification : Follow Philips' specification.

LPL LM201W01-SLA1

Resolution	: 1680x1050 (WSXGA+)
Outside dimensions	: 493.7(H) x 320.1(V) x 16.5D)
Pitch (mm)	: 0.27675mm x 0.27675mm
Color pixel arrangement	: RGB strip arrangement
Display surface	: Hard coating(3H) & Anti-Glare treatment of the front polarizer
Color depth	: 16.7M colors
Backlight	: 4 CCFL edge light system
Active area (WxH)	: 464.94 x 290.5875mm
View angle (CR>10)	: 170/160 (typ) for Horizontal & Vertical
Contrast ratio	: 1000:1(typ)
White luminance	: 300 nit(typ)
Color gamut	:72%(typ)
Gate IC	:
Source IC	:
Response time	: 5 ms(typ)

2.2 Scanning frequencies

Hor. : 30 – 83 K Hz

Ver.: 56 - 76 Hz

Video dot rate: < 165 MHz

Power input: 90-264 V AC, 50/60 ± 2 Hz

Power consumption : <60W maximum, <50W (typ.)

Functions:

D-SUB analog R/G/B separate inputs, H/V sync separated, Composite (H+V) TTL level, SOG sync

2.3 Ambient temperature: 0 °C - 40°C

3. Electrical characteristics

3.1 Interface signals

1). D-Sub Analog

Input signal: Video, Hsync., Vsync

Video: 0.7 Vp-p, input impedance, 75 ohm @DC

Sync.: Separate sync TTL level , input impedance 2.2k ohm terminate

Hsync Positive/Negative

Vsync Positive/Negative

Composite sync TTL level, input impedance 2.2k ohm terminate (Positive/Negative)

Sync on green video 0.3 Vp-p Negative (Video 0.7 Vp-p Positive)

3.1.1 D-Sub Cable

Length : 1.8 M +/- 50 mm

Fix with monitor when packing, with transplant pin protective cover.

Connector type : D-Sub male with DDC2B pin assignments.

Blue connector thumb-operated jack screws.

Pin assignments :

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

3.2 Timing requirement

Factory Preset mode definition :

1.Perfect FOS while presenting those timings.

2.Will specify those timing in User's Manual

Preset mode definition :

1.Need to support those timings.

2.Perfect FOS after auto adjustment.

User mode

1.Can save those timing that not in Preset mode and can be showed (not over scalar or Panel spec.)

2.It needs to reserve the 10 timings space in memory size.

Mode storing capacity

Factory preset modes : 12

User modes : 24

3.2.1 Factory preset modes (12 modes)

Factory modes and preset modes are defined in the enclosed timing table file

Sync. On Green is request.

Detail timing data,

Resolution			Pixel Rate (MHz)	Horizontal (KHz)	Vertical (Hz)	V_Total (Line)	Polarity (H / V)
DOS		640x350/70	25.18	31.47	70.09	449	p / n
DOS		720x400/70	28.32	31.47	70.09	449	n / p
DMT	4:3	640x480/60	25.18	31.47	59.94	525	n / n
MAC		640x480/67	30.24	35.00	66.67	525	n / n
DMT	4:3	640x480/72	31.50	37.86	72.81	520	n / n
DMT	4:3	640x480/75	31.50	37.50	75.00	500	n / n
DMT	4:3	640x480/85	36.00	43.27	85.01	509	n / n
DMT	4:3	800x600/56	36.00	35.16	56.25	625	p / p
DMT	4:3	800x600/60	40.00	37.88	60.32	628	p / p
DMT	4:3	800x600/72	50.00	48.08	72.19	666	p / p
DMT	4:3	800x600/75	49.50	46.88	75.00	625	p / p
DMT	4:3	800x600/85	56.25	53.67	85.06	631	p / p
MAC		832x624/75	57.28	47.73	74.55	667	n / n
DMT	4:3	1024x768/60	65.00	48.36	60.00	806	n / n
DMT	4:3	1024x768/70	75.00	56.48	70.07	806	n / n
DMT	4:3	1024x768/75	78.75	60.02	75.03	800	p / p
IBM		1024x768/76	83.10	61.10	76.00	803	p / p
DMT		1024x768/85	94.50	68.68	85.00	808	p / p
		1152x864/60	79.90	54.00	60.00	900	p / p
		1152x864/70	94.50	63.90	70.00	912	p / p
DMT		1152x864/75	108.00	67.50	75.00	900	p / p
MAC		1152x870/75	100.00	68.68	75.06	915	n / n
SUN		1152x900/66	92.94	61.80	65.95	937	p / p
SUN		1152x900/76	105.56	71.71	76.05	943	p / p
CVT	16:9	1280x720/60	74.50	44.77	59.86	748	n / p
CVT	16:9	1280x720/75	95.75	56.46	74.78	755	n / p
CVT	16:9	1280x720/85	110.25	64.40	84.85	759	n / p
CVT	15:9	1280x768/60	79.50	47.78	59.87	798	n / p
CVT	15:9	1280x768/75	102.25	60.29	74.89	805	n / p
CVT	15:9	1280x768/85	117.50	68.63	84.84	809	n / p
CVT		1280x800/60	83.50	49.70	59.81	831	n / p
CVT		1280x800/75	106.50	62.80	74.93	838	n / p
CVT		1280x800/85	122.50	71.55	84.88	843	n / p
DMT	4:3	1280x960/60	108.00	60.00	60.00	1000	p / p
CVT	4:3	1280x960/75	130.00	75.23	74.86	1005	n / p
DMT	4:3	1280x960/85	148.50	85.94	85.00	1011	p / p
DMT	5:4	1280x1024/60	108.00	63.89	60.02	1066	p / p
SUN	5:4	1280x1024/66	117.00	71.70	67.00	1067	p / p

DOS	5:4	1280x1024/72	130.22	76.00	72.00	1064	p / p
DMT	5:4	1280x1024/75	135.00	79.98	75.03	1066	p / p
SUN	5:4	1280x1024/76	138.01	81.10	76.00	1066	n / n
DMT	5:4	1280x1024/85	157.50	91.15	85.02	1072	p / p
DMT	16:9	1360x768/60	85.50	47.71	60.02	795	p / p
CVT	16:9	1360x768/75	109.00	60.29	74.89	805	n / p
CVT		1440x900/60_RB	88.75	55.47	59.90	926	p / n
CVT		1440x900/60	106.50	55.94	59.89	934	n / p
CVT		1440x900/75	136.75	70.64	74.98	942	n / p
CVT		1440x900/85	157.00	80.43	84.84	948	n / p
		1600x1000/60					
DMT	4:3	1600x1200/60	162.00	75.00	60.00	1250	p / p
CVT	16:10	1680x1050/60_RB	119.00	64.67	59.88	1080	p / n
CVT	16:10	1680x1050/60	146.25	65.29	59.95	1089	n / p
CVT	16:9	1920x1080/60_RB	138.50	66.59	59.93	1111	p / n
CVT	16:10	1920x1200/60_RB	154.00	74.04	59.95	1235	p / n

3.2.2 Software control functions via OSD / control adjustable functions:

Please refer to following Hudson8 OSD definitions

Reset - No: Exit

Yes: Auto adjustment for displaying timing mode and recall factory preset

OSD Tree

Level 1	Level 2	Level 3	Default
Picture	Brightness	(0~100)	100
	Contrast	(0~100)	50
Color	Color Temp.	(5000K,6500K,7500K,8200K,9300K,11500K)	6500K
	sRGB		
	User Define	(Red:0~100)	100
		(Green:0~100)	100
		(Blue:0~100)	100
Language	English		(English)
	Espanol		
	Francais		
	Deutsch		
	Italiano		
	Portugues		
	Russia		
	S.Chinese		
OSD Setting	Horizontal	(0~100)	50
	Vertical	(0~100)	50
	Transparency	(Off, 1, 2, 3, 4)	Off
	OSD Time out	(5, 10, 20, 30, 60)	20
Setup	Phase	(0~100)	

	Clock	(0~100)	
	H.Position	(0~100)	
	V.Position	(0~100)	
	Reset	(Yes, No)	No
	Resolution Notification	(On, Off)	**Off**
	Information		
Input	Auto		Auto
	VGA		
	DVI		

3.3 Horizontal scanning/ Vertical scanning

Sync polarity : Positive or Negative

Scanning frequency : 30 – 83 K Hz

Sync polarity : Positive or Negative

Scanning frequency : 56 - 76 Hz

3.4. Power input connection

Power cord length : 1.8 M

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

3.5. Power management

The monitor must comply with the Microsoft On Now specification, and meet EPA requirements.

Mode	HSYNC	VSYNC	Video	Pwr-cons.	Indication	Rec. time
Power-On	On	On	active	< 60 W	Green LED	--
Off	Off	Off	blanked	< 2 W	Amber LED	< 3 s
DC Power Off			N/A	< 1 W	LED Off	

3.6. VGA Display identification

In accordance with VESA Display Channel Standard Ver.1.0 and DDC 2B capability

3.7. DDC /CI Support

In accordance with VESA DDC/CI and MCCS ver.2.0, the monitor should be workable with Philps SmartManage, SmartControl V6.1 and Protrait Display Tune at least.

3.8 Hot-key definition

Item	Key	Key press time	OSD Timeout	OSD Message
Monitor Controls Lock	[Menu]	6 sec	5 sec	MONITOR CONTROLS LOCKED MONITOR CONTROLS UNLOCKED (default)
Factory Mode	[AUTO]+[Menu]+[Power]			
DDC/CI On/OFF for VISTA	[MENU]+[DOWN]	5 sec	5 sec	DDC/CI ON (default) DDC/CI OFF

3.9 EDID

	Data for EDID & .inf file	
1	User visible strings on .inf file	Philips 220VW (22inch Wide LCD MONITOR 220VW9)
2	Manufacturer ID (EDID data)	PHL
3	Product ID, "xxxx" 4 codes	MSB(byte 12): C0
		LSB (byte 11): 22
4	maximum resolution	1680x1050
5	Horizontal Frequency Range	30~83 KHz
6	Vertical Frequency Range	56~76Hz
7	Monitor Name (13 characteries max.)	Philips 220VW

4. Visual characteristics

4.1 Test conditions

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

(1) Input signal : As defined in 3.3, 1680 x 1050
non-interlaced mode (1680X1050@60Hz 146.25MHz), signal
sources must have 75 ohm output impedance.

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

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

(4) Ambient light: 400 -- 600 lux.

(5) Ambient temperature: 20 ± 5 °C

4.2 Brightness

To follow Panel specification.

sRGB = 80 ± 10 nits (suppliers to input)

4.3 Image size

Actual display size 464.94 mm x 290.5875 mm

4.4 Brightness uniformity

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

$$\frac{B\_min}{B\_max} \times 100\% > 75\% \text{ (Follow panel spec.)}$$

Where B_max =Maximum brightness, B_min = Minimum brightness

4.5 Check Cross talk (S)

Apply Pattern 2. Set contrast and brightness at 100 %.

Measure YA. Then output Pattern 3 and measure YB.

the cross talk value :

$$\frac{ABS(YA - YB)}{YA} \times 100\% < 1.5\ \%$$

4.6 White color adjustment

There are seven factory preset white color 11500K, 9300K, 8200K, 7500K, 6500K, sRGB, 5000K

Apply full gray64 pattern, with brightness in 100 % position and the contrast control at 50 % position.

The 1931 CIE Chromaticity (color triangle) diagram (x , y) coordinate for the screen center should be:

Product specification

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

Production alignment spec.

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

4.7 Out of box settings

Resolution Notification default set to OFF in 200PW8 model.

Quality Inspection specification:

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

5. Mechanical characteristics

5.1 Cosmetic - Philips ID

5.2 Mechanical data files - ProE files required

5.3 Location of Philips logo - Per Philips make-up sheet

5.4 Gap between panel and front bezel < 1.4mm (typ)

5.5 Location of Control icons - Per Philips Graphic sheet

5.6 Color for resin/paint - Per Philips make-up sheet

5.7 Resins

- RoHS required
- WEEE required.
- Resin type/selection refer to Project Book Section 7.2 Plastic material.

5.8 If paint is used

- RoHS required
- WEEE require
- If new painting type need to implement, refer to UN-D 1235.

5.9 Plastic mold tooling

- Tooling to be designed to minimize cosmetic defects induced by molding process (sink, blush, weld lines, gate marks, ejector marks, etc.). Refer to “TYV61-90007”.
- Painting to cover up cosmetic defects due to molding is strongly discouraged.
- China RoHS mark requested

5.10 Plastics flammability

- Bezel/Rear cover to be Flame Retardant UL 94-HB.
- Base / Pedestal to be Flame Retardant UL 94-HB.
- All major plastic parts (bezel, back cover) need to be molded from same resin.
- Plastic resin type selection should be referred to “TY R83-2-9002-1”.

5.11 Texture/Glossing of housing

- The texture area and texture no should follow Philips make-up sheet.
- The exterior surfaces shall have a uniform texture.
- Philips must approve the mold texturing.
- Detail document for texture refer to “UN-D249”, “UN-D 600”.
- < = 20 gloss units

5.12 Tilt and swivel base

- Tilt angle : -5 ° +2/- 0 ° (forward)
  +20 °+0/-2 ° (backward)

5.13 Kensington Lock

- Must meet Kensington_slot.spec “TYE-M0004”.
- MMD request metal plate in Kinsington hole.

5.14 Label

- Regulatory label / Carton label should follow Philips requirement.
- China RoHS label
- Detail document refer to Philips Engineering Reference Book.

5.15 Product dimension / Weight (Refer to SHT 191)

- Unit dimension : 506mm (W) * 403mm(H) * 205mm(D)
- Packed unit dimension: 570mm(W) * 124mm(H) * 453 mm(D) for WW
  : 570mm(W) * 124mm(H) * 453 mm(D) for China
- Net weight : 5.0Kg (Including I/F cable 240 g)
- Gross weight : 6.2Kg for WW
  : 6.2 Kg for China

5.16 Transportation

Follow TPV standard.

5.16.1 Transportation packages

Packaging and wrapping shall be sufficient to protect the product against damage or loss during shipment from the supplier to the destination specified in the purchase order. All packaging materials are subject to test and evaluation per TYE-M0002. The cushion material shall be constructed using EPS material.

5.16.2 Transportation Test

Follow TPV standard

A. Transportation test specification for all regions except China/India

- Package test
  1. Random Vibration test
  2. Drop test
  3. Up-package test

B. Transportation test specification for China/India

- Package test
  1. Random Vibration test
  2. Drop test
- Un-package test
  1. Sine vibration (operating)

5.17 Pallet / Container loading

Transportation standards refer to TYE-M0002 and UAW-0309.

- Air shipment -
- Sea container 20'(pallet/slip sheet)
- Sea container 40'(pallet/slip sheet)
- Sea container 40' High Cube (pallet/slip sheet)
- Land 53‘ MEGA Trailer (pallet/slip sheet)
- Land 53‘ MEGA Trailer per HQ (pallet/slip sheet)
- Truck shipment-

Transportation request for all region except China/India

A. Air shipment
B. Container loading for WW
C. Land 53‘ MEGA Trailer

Transportation request for China and India

A. Container loading for China and India
B. Truck loading

6. Environmental characteristics

The following sections 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

Operating

- Temperature : 0 to 40 degree C

- Humidity : 20~90%RH (non-condensed)
- Altitude : 0-10000 ft

Storage

- Temperature : -20 to 60 degree C
- Humidity : 10~90%RH (non-condensed)
- Altitude : 0-30000 ft

Note: Pls also refer to DQE requirements

Operating

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

Storage

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

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

6.2 Transportation tests

Refer to 5.15.2

6.3 Display disturbances from external environment

According to IEC 801-2 for ESD disturbances

6.4 Display disturbances to external environment

7. Reliability

7.1 Mean Time Between Failures

System MTBF (Including the LCD panel and CCFL) : 50,000 hrs

8. Quality assurance requirements

8.1 Acceptance test

According to MIL-STD-105D Control II level

AQL: 0.4 (major)

1.5 (minor)

(Please also refer to annual quality agreement)

Customer acceptance criteria: UAW0377/00

9. Philips' Flat Panel Monitors Pixel Defect Policy

Philips' Flat Panel Monitors Pixel Defect Policy

BRIGHT DOT DEFECTS	**ACCEPTABLE LEVEL**		
MODEL	**220VW9**		
1 lit sub-pixel	3		
2 adjacent lit sub-pixels	1		
3 adjacent lit sub-pixels (one white pixel)	0		
Distance between two bright dots	15mm or more		
Bright dot defects within 20 mm circle	0		
Total bright dot defects of all type	3		

BLACK DOT DEFECTS	ACCEPTABLE LEVEL		
MODEL	**220VW9**		
1 dark sub-pixel	5		
2 adjacent dark sub-pixels	2		
3 adjacent dark sub-pixels (one white pixel)	1		
Distance between two black dots	15mm or more		
Black dot defects within 20 mm circle*	1		
Total black dot defects of all type	5		

TOTAL DOT DEFECTS	ACCEPTABLE LEVEL		
MODEL	**220VW9**		
Total bright or black dot defects of all type	5		

Fig 1: Measurement locations of Brightness Uniformity

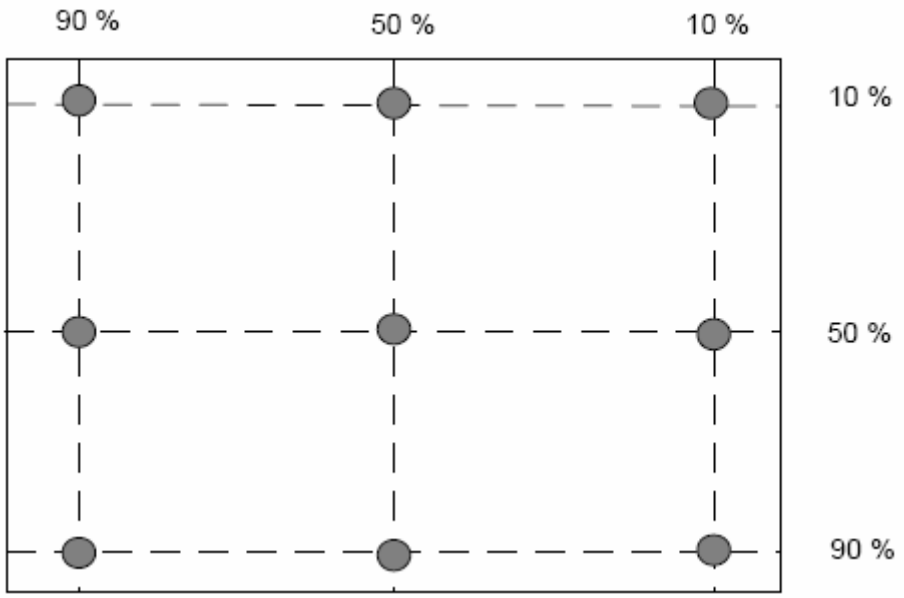


Fig 2: Cross talk pattern

Gray level 46 (64 Gray level)

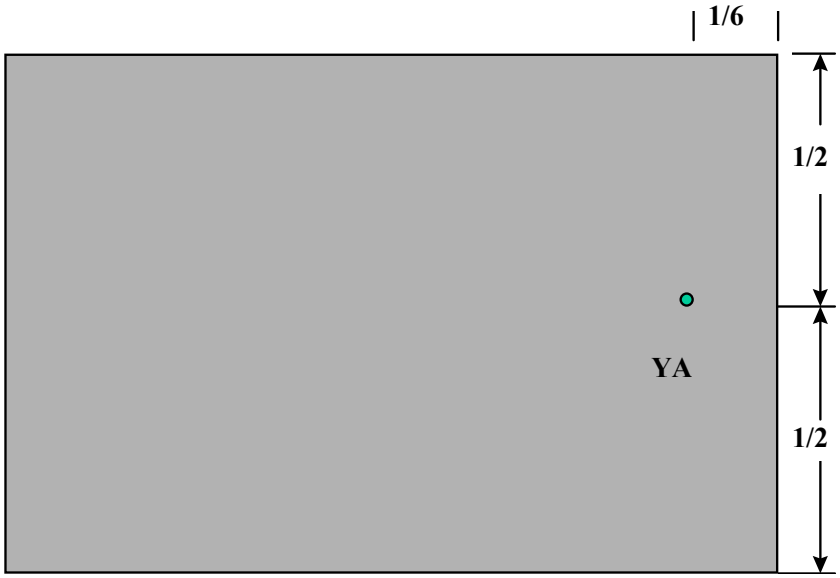
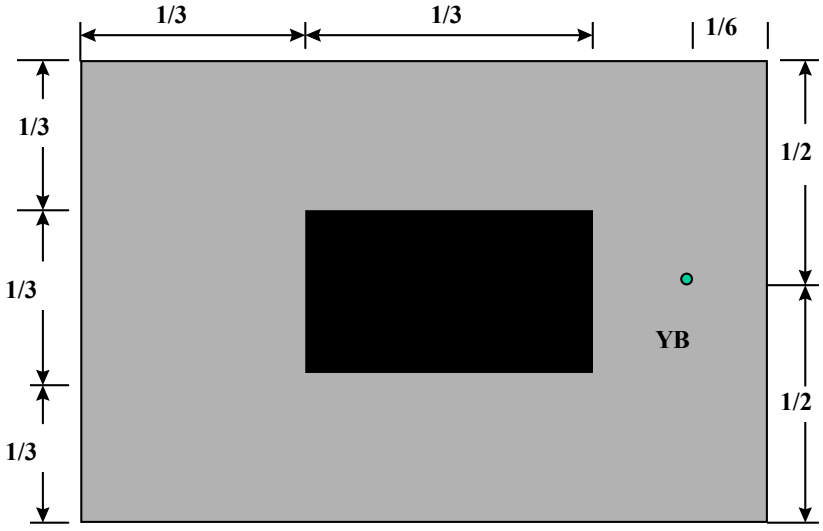
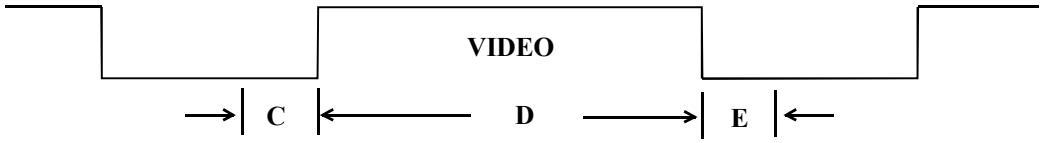


Fig 3: Cross talk Pattern

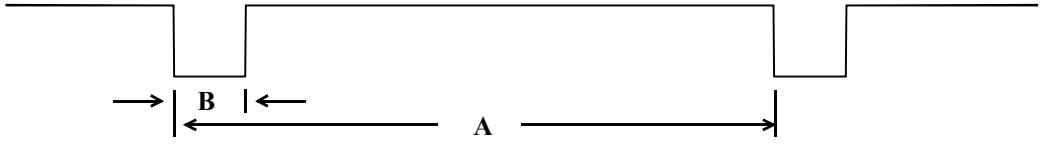
Center at Gray level 0 (Black)

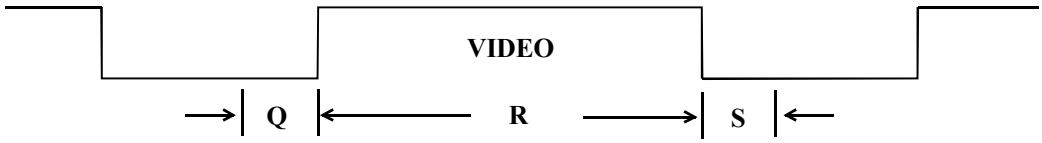


SEPARATE SYNC.

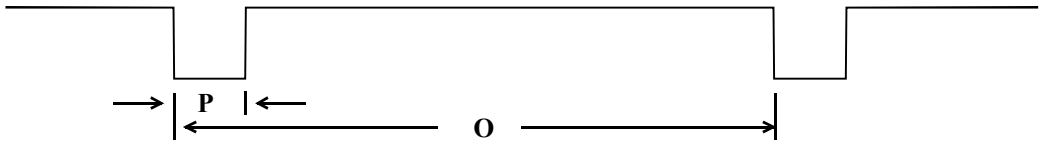


HORIZONTAL

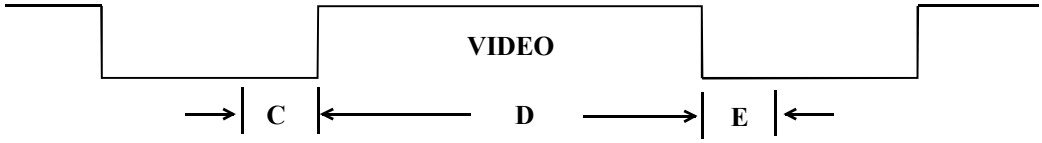




VERTICAL



COMPOSITE SYNC.



HORIZONTAL

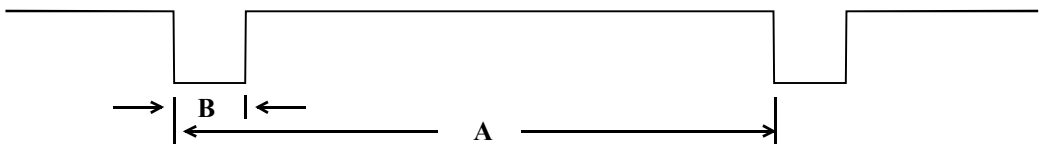


FIG-4 TIMING CHART -1

10. REGULATORY COMPLIANCE

10.1 Worldwide Regulatory

International Regulatory Specification

INTERNATIONAL	Sa	IEC60950-1:2001. Group -and national differences of all countries listed in CB Bulletin No. 107A	CB Report and CB certificate
EUROPE	Sa	European Low Voltage Directives 73/23/EEC and 93/68/EEC	Declaration of Conformity
	E	European Electromagnetic Compatibility Directive 89/336/EEC amended by the directive 93/68/EEC. EN 55022:1998 Class B	Declaration of Conformity and Full EMC/CE test report
		EN 55024: 1998	
		EN 61000-3-2: 2000	
		IEC 61000-3-3: 1994/EN61000-3-3: 1995	
		CISPR 22:1997 Class B International EMC standard	
GERMANY	Sa	EN60950-1:2001	TUV certificate
	O	ISO 13406-2: 2001 & PREN 50279:1998	TUV-ERG certificate
	O	GS-Mark / EK1-ITB 2000	TUV-GS certificate
SWEDEN	Sa	EN60950-1:2001	SEMKO certificate
	O	TCO 99 (TCO03)	TCO99 (TCO03) report + certificate
RUSSIA	Sa	GOST R 50377-1992	GOST certificate
SOUTH AFRICA	Sa	SABS IEC 60950	Certificate of Conformity
USA	Sa	UL 60950-1: 2003	UL certificate

	E	FCC Part 15 Class B	FCC ID grant
	O	Energy Star	EPA registration
CANADA	Sa	CSA C22.2 No 60950	CSA certificate
	E	ICES-003 issue 3	Statement on label
MEXICO	Sa	NOM-019-SCFI-1994	NOM certificate
KOREA	Sa	Korean Safety Control law IEC 60950	EK certificate
	E	Regulations laws: EMI 1996-78, 80. EMS 1996-79,81	MIC certificate
SINGAPORE	Sa	IEC60950	PSB certificate
CHINA	Sa	GB4943-2001	CCC certificate
	E	GB9254-1998; 17625.1-2003	
TAIWAN	Sa	CNS-14336 (IEC 60950-1)	BSMI certificate
	E	CNS-13438 (CISPR22) Class B	

Sa = Safety

E = Electromagnetic Compatibility

O = Other which including recycling, energy saving, ergonomics, Green Mark

10.2 EMC Requirements

Supplier DVT EMI test result must be submitted prior to DVT samples delivery, and PVT EMI test result must be submitted again prior to PVT samples delivery, which also has to meet Philips' immunity testing specification.

10.3 RoHS

Restriction on the use of certain hazardous substances.

Lead, Cadmium, Mercury, Hexavalent Chromium, Polybrominated Bipheny1 (PBB) and Polybrominated Bipheny1 Ether (PBDE)(flame retardant).

10.4 WEEE

Producer (Philips) responsible for retailer take back schemes and recycling.

--System implemented.

--Collection and recycle targets.

10.5 Ongoing Regulatory

There's a possibility that other regulatory certificates will be required during the life of the product. It is the responsibility of the supplier to provide related documentation.

TELEVISION/MONITOR SAFFTY 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, barries, covers, strain reliefs, and other hardware have been installed in accordance with the original design.
3. Soldering and wiring must be inspected to locate possible cold solder joints,solder splashes,sharp solder points, frayed leads, pinched leads, or damaged insulation (including the 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 safety operated without danger of electrical shock.

* Broken line

Implosion

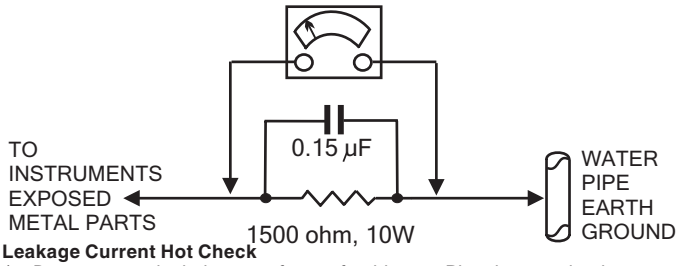
1. All picture tubes used in current model receivers are equipped with an integral implosion system. Care should always be used, and safety glasses worn,whenever handling any picture tube. Avoid scratching or otherwise damaging the picture tube during installation.
2. Use only replacement tubes specified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