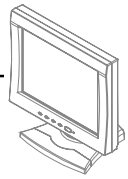

Preface

This manual is prepared for the maintenance service for the LCD Monitor. Maintenance procedures described in this manual are intended to isolate faulty parts and replace them in the field. It also aims to serve as a guide in procuring replacement parts for this product.

This manual includes system overview, major system assembly, components' description, and the "Troubleshooting" making explanations on how to detect errors. It also includes a flow chart for checking or correcting faults.

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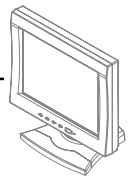
✍ *NOTICE :*

The information found in this manual is subject to change without prior notice. Any subsequent changes made to the data herein will be incorporated in further edition.

Manual Version 1.0
Document # 548-G04-02A



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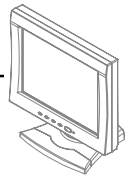
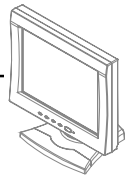




CHAPTER I

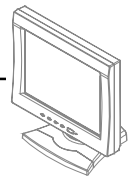
Introduction

This manual provides an integral technical information you need to maintain the LCD Monitor and this manual is applied to the mode 1024*768 pixels color TFT LCD Monitor. There are seven topics in this manual, you can immediately identify problems through this manual.

This manual is for the technicians and people who have the electronic background. Send the product back to the distributor for repair and do not attempt to do anything that is complex or is not mentioned in the troubleshooting.

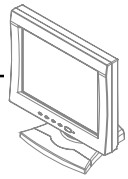
1-1 Product Features

- ❑ Direct analog RGB input
- ❑ Active matrix TFT LCD technology
- ❑ MicroTouch 15.1” Capacitive type touch screen
- ❑ 15.1" diagonal screen size
- ❑ 1024 x 768 addressable pixels
- ❑ Wide Viewing Angle technology
- ❑ 200cd/m^2 high brightness
- ❑ 24-60kHz horizontal scan
- ❑ 56-75Hz high refresh rate
- ❑ Auto-adjustment
- ❑ High quality full screen re-scaling capability
- ❑ Multifunction OSD user controls
- ❑ USB hub with 1 upstream and 4 downstream
- ❑ Dual signal input
- ❑ VESA DPMS power saving
- ❑ Pivot function *(optional)*

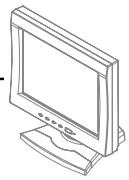


1-2 Technical Spec.

LCD Technology	active matrix TFT color LCD. 15.1" diagonal screen size 1024 x 768 addressable pixels 0.30mm x 0.30mm pixel pitch 200 cd/m^2(typ.)brightness 200:1(typ.) contrast ratio L/R=60° /60° ,U/D=45° /45° viewing angle, CR≥10 tr=20ms(typ.)/tf=30ms(typ.) response time 2 CCFLs backlight lamps w/40,000 hrs (typ.) life	
Display Resolution	1024 pixels(H) x 768 lines(V)	
Active Display Area	307.2mm (H) × 230.4mm (V)	
Displayable Color	16.7M colors	
Horizontal Scan	24kHz to 60kHz	
Vertical Refresh	56Hz to 75Hz	
Pixel Frequency	78.75MHz	
Compatibility	IBM & VESA VGA	640 × 350,70Hz 640 × 400,70Hz 720 × 400,70Hz 640 × 480, 60/72/75Hz
	VESA SVGA	800 × 600, 56/60/72/75Hz
	VESA XGA	1024 × 768, 60/70/75Hz
	Apple Macintosh	640 × 480, 67Hz 832 × 624, 75Hz 1024 × 768, 75Hz
Input Signal	video : analog RGB 0.7Vp-p sync. : separate sync. TTL level	
Touch Screen	MicroTouch capacitive type 85% light transmission	

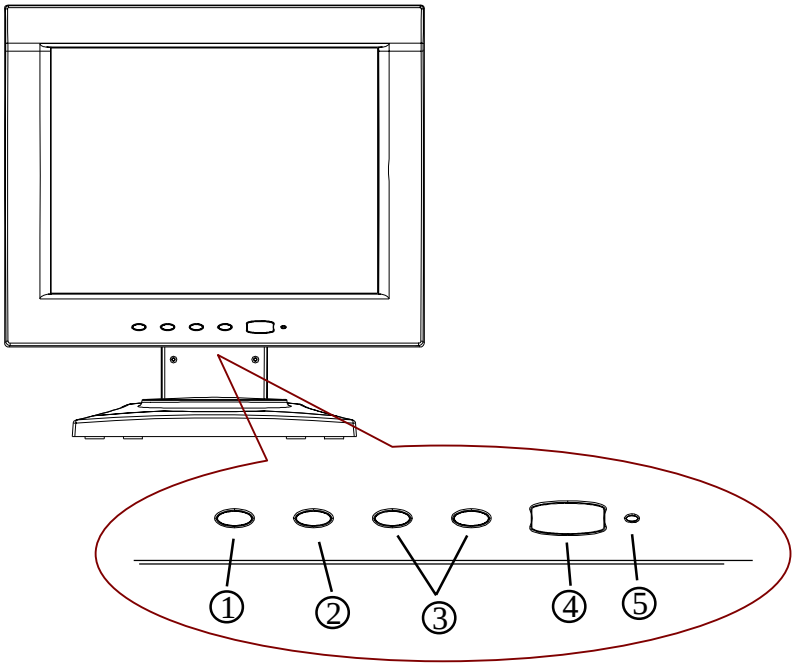


Auto-adjustment	yes
Re-scaling	High quality interpolation algorithm Re-scaling selection: original resolution, 1:1 re-scaling, full screen (default)
USB hub	1 upstream and 4 downstream ports on the base
Plug and Play	VESA DDC 1/2B
I/O Connectors	DC power in VGA in D-sub x2, male USB: upstream x 1/ downstream x 4
User Controls	multilingual on-screen menu adjustments (English, German, French, Spanish, Italian) auto-save and reset capability external auto-adjustment button external brightness adjustment screen image control items: ⏩ Main Menu Page 1 Contrast Re-scaling Source ⏩ Main Menu Page 2 Horizontal Position Vertical Position Frequency Tracking Reset ⏩ Main Menu Page 3 Display Mode OSD Off-Time Language Text-Graphic
Power Saving	VESA DPMS standard



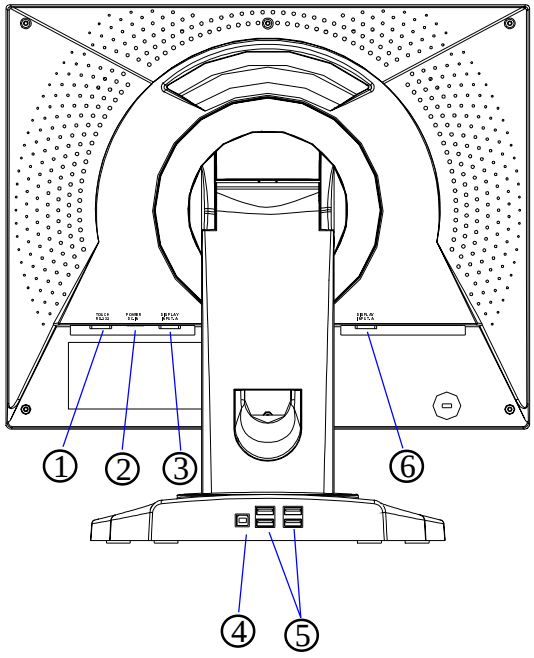
Power Consumption	50watt (max.), <8watt (off mode)
AC/DC Adapter	external power adapter universal type AC 100-240V(50/60HZ) output: DC 12V UL,CSA,TUV, CE Mark compliant
Stand	tilt (-5° ~ 45°) swivel (-45° ~45°)
Mounting interface	VESA Flat Panel Monitor Physical Mounting Interface (75mm)
Pivot	optional
Dimensions (W×H×D)	395 x 406 x 235 (mm)
Weight	8.1Kgs
Agency approval	FCC -B, CE -B, UL, CUL, TUV
Environmental	operating temperature: 5°~35°C / 41°~95°F humidity: 80% maximum storage temperature: -20°~60°C/-4°~140°F humidity: 80% maximum
Standard Package	the PV 751TMC contains the followings: • LCD monitor with stand • VGA signal cable *1 • USB cable • DDC 1/2B diskette • AC/DC power adapter • Power cord • RS232 series cable • User's manual *(English)* • Mac adapter *(optional)* • Pivot software *(optional)*

1-3 Front Panel Controls and LED



Item	Control	Function
1	"Menu" button	Pop up the OSD menus
2	"Select/Auto" button	*Select* - To select the adjustment items from OSD menus. *Auto* - To activate the "Auto Adjustment" function to obtain an optimum image.
3	"<" & ">" button	Change the display parameter in the selected item.
4	Power switch	Turn the monitor on and off.
5	Power LED	1. Green indicates the monitor is truned on and signal be received simultaneously. 2. Amber indicates the monitor is in power-saving mode.

1-4 Rear Panel Connectors

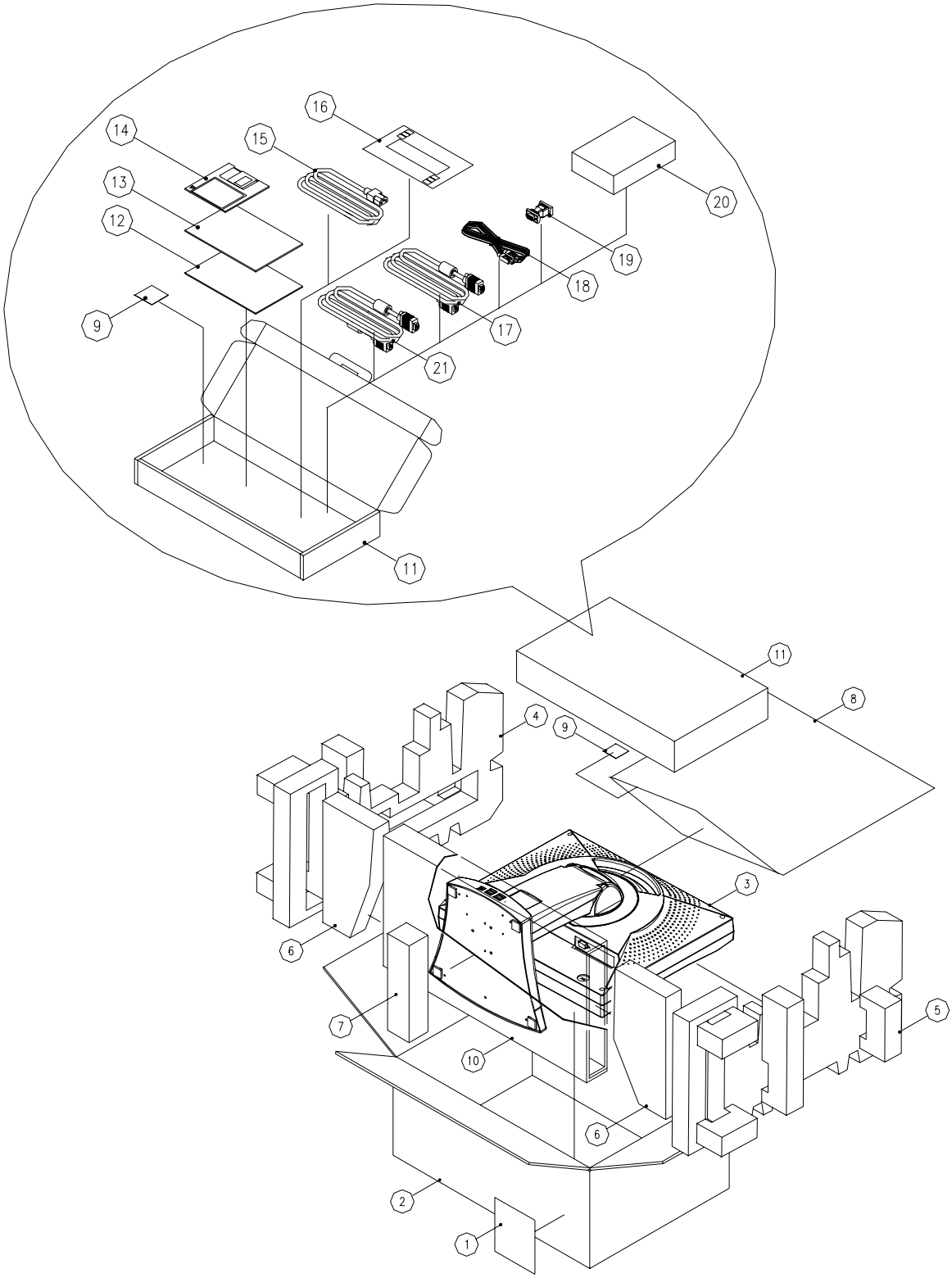


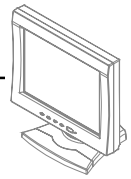
Item	Cable/Control	Function
1	Touch RS-232	Connect the RS-232 cable to COM1 of the computer
2	Power DC-In	Connect the power cable
3	Display Input-A	Connect the monitor to a computer
4	USB Upstream Port	Connect USB type peripheral devices such as keyboard, mouse, printer and so on
5	USB Downstream Port	Connect the USB upstream cable to a computer or other hub's USB port
6	Display Input-B	Connect the monitor to a computer

CHAPTER II

Mechanical Construction

2-1 Package Overview

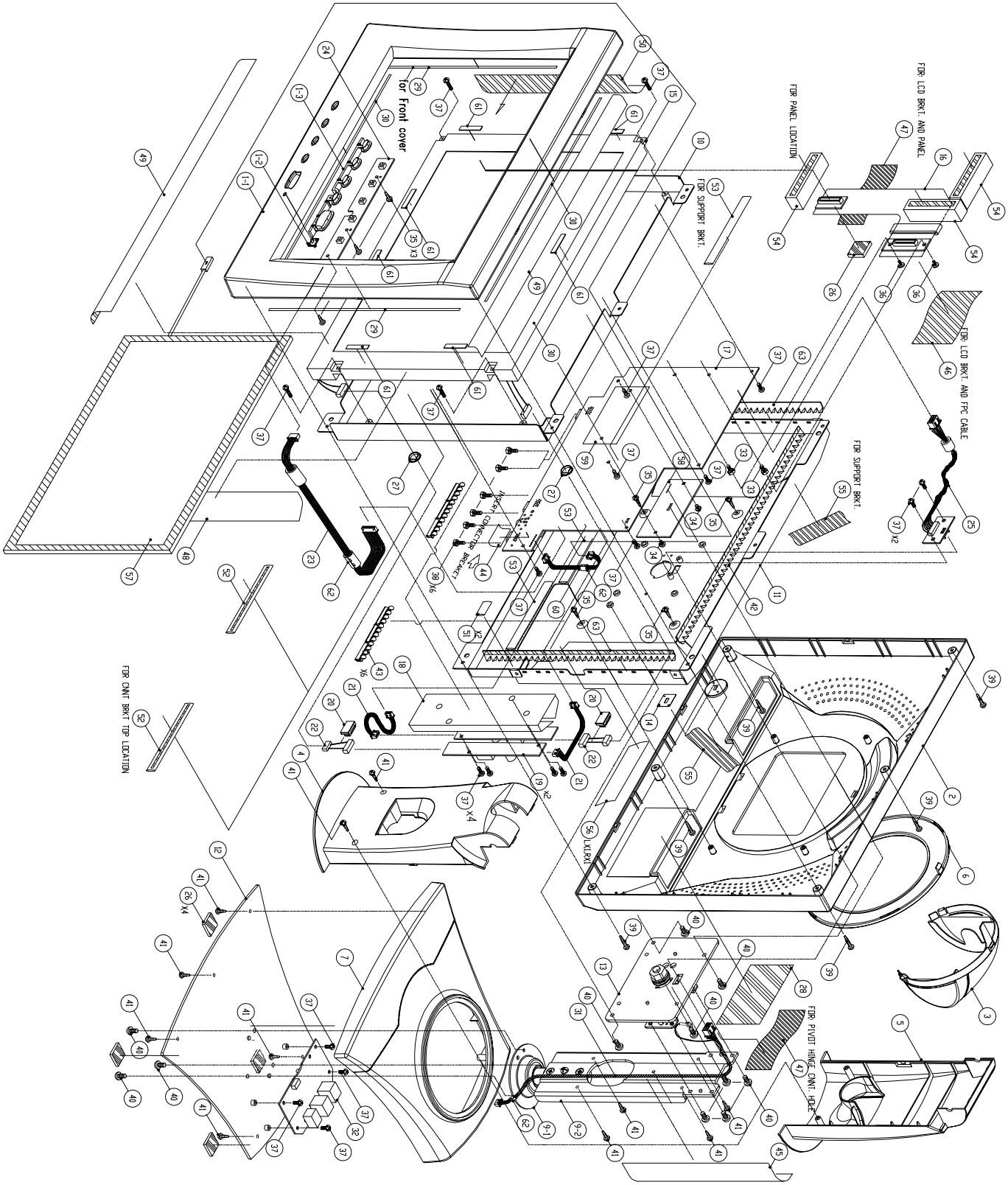


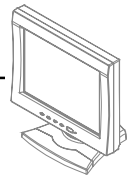


2-1.1 Replacement Parts List

Item	P/N	Description
1	35.52302.091	Carton Label 108*92 Blank
2	55.53401.011	Carton AB-18 507*485*275
3	DC.54804.001	D.C. PV751TMC
4	56.54801.001	R Cushion EPE
5	56.54802.001	L Cushion EPE
6	56.54803.001	Base Cushion EPE
7	56.54804.001	Support Cushion EPE
8	51.53409.001	ESD Bag LCPE
9	57.00001.001	Pack SiO2 Drier 20g
10	55.54801.001	Corrugate Base
11	55.53402.001	Box B 380*225*65
12	36.54801.011	User's Manual Multilingual
13		User's Manual Multilingual (Option)
14	70.53605.001	CTX Monitor Installation Disk V1.0
15	42.50115.001	Cable Power Cord 1830mm SP30+IS14
	42.50112.001	Cable Power Cord 1830mm SP-023+IS14 EUR (Option)
16	36.00007.004	Warranty Card, US
	36.00008.001	Warranty Card, UK (Option)
17	42.54601.001	VGA Cable 15P 1800mm Carbon/Blue
18	42.54605.001	USB Cable 4P 1800mm Black
19	42.53605.001	Mac Adapter 6-DIP
20	47.54801.001	Adapter In : 100-240V, Out : 12V/3.75A
21	42.52402.031	Touch Cable RS-232 9P 1800 (2 core)

2-2 Exploded Overview





2-2.1 Replacement Parts List

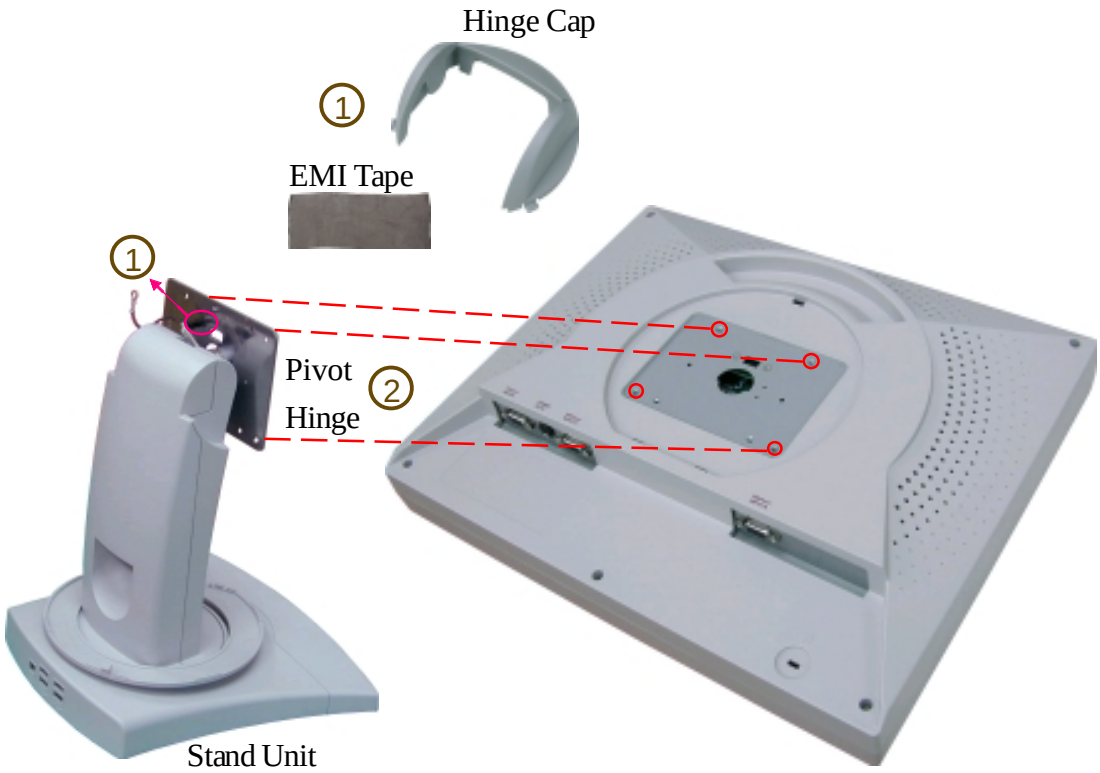
Item	P/N	Description
---	75.54801.001	ASSY Front Cover
1-1	51.54801.001	Front Cover
1-2	51.54809.001	LED Lens Acrylic Clear
1-3	51.54808.001	CTRL Knob
2	51.54802.001	Rear Cover
3	51.54803.001	Hinge Cap
4	51.54804.001	Front Arm
5	51.54805.001	Rear Arm
6	51.54806.001	Decorate Cap
7	51.54807.001	Stand Base
8	51.54017.001	Protect Film 329.8*254*2t
---	75.54802.001	ASSY Hinge Swivel
9-1	61.53608.001	Hinge Swivel
9-2	61.54803.001	Arm Plate
10	61.54801.061	LCD Bracket (LG)
11	61.54802.002	Support BRKT
12	61.54804.001	Stand Plate
13	61.54805.001	Pivot Hinge
14	61.56005.001	Lock BRKT Timplate 0.5t
15	48.54004.003	TFT LCD 1024*768 15.1" LG-LM15X2-D2CX
16	70.54803.001	ASSY Cable FPC-LG
17	80.54801.001	PCBA Main Board
18	51.30301.001	Insulator-INV Mylar
19	80.53603.003	INV-145 Inverter Model
20	51.00016.001	Wire Mount PG-FW-2K LMM-5020-RT
21	42.53002.001	W.A. 5P UL1571 #28 80mm
22	42.53904.001	W.A. SM02+XHP-6 UL3239 #24 30mm
23	42.54803.001	W.A. 12P UL1571 #28 290mm
24	80.54802.001	PCBA CTRL Board
25	42.56006.011	W.A. 8/8P UL1007 #26 200mm
26	52.53403.001	Rubber Foot
27	51.80510.001	Open Close Bushing
28	35.50702.001	Label Spec. 99*49 Blank

Item	P/N	Description
29	52.54802.001	EVA 245*3mm 1.5t
30	52.54801.001	EVA 315*3mm 1.5t
31	42.54802.001	W.A. 8/8P UL1571 #28 330mm
32	80.54804.001	PCBA USB Board
33	61.54005.001	Screw Hex M2*H5-M3*L5
34	85.1F123.050	Screw Pan Mech W/SF M3*5
35	85.UA123.080	Double Thread Screw Pan Tap M3*8
36	85.3A122.040	Screw Cap Mech M2*4
37	85.1F123.080	Screw Pan Mech W/SF M3*8
38	85.005AG.075	Screw WHex I/O #4-40*H4*L7.5
39	85.SA123.120	Screw Binding Tap Tite-P 2L M3*12
40	85.2A124.080	Screw Bin Mech M4*8
41	85.UA123.100	Double Thread Screw Pan Tap M3*10
42	61.54810.001	EMI-Spring with Double Tape 377.2mm
43	61.54807.001	EMI-Spring 28.5mm
44	41.54811.001	EMI Tape (80560) 12*15mm
45	41.54009.001	Metalized Fabric Tape W=25mm L=100mm
46	41.54803.001	EMI Tape (80560) 30*60mm
47	41.54804.001	EMI Tape (80560) 30*80mm
48	41.54805.001	EMI Tape (80560) 30*170mm
49	41.54806.001	EMI Tape (80560) 30*340mm
50	41.54807.001	EMI Tape (80560) 50*260mm
51	41.54808.001	EMI Gasket 773GT-7*2*40mm
52	41.54809.001	EMI Gasket 773GT-7*2*90mm
53	41.54810.001	EMI Gasket 773GT-7*2*100mm
54	41.54811.001	EMI Gasket 773GT-13*10.5*60mm
55	41.54812.001	EMI Tape (80013) 25*60mm
56	41.54813.001	EMI Tape (80013) 25*80mm
57	49.54801.001	Micro Touch Capacitive Sensor
58	49.54802.001	Micro Touch Controller for Cap
59	51.54810.001	Insulation Mylar Touch Board 0.2t
60	42.54806.001	W.A. 7/5P UL1571 #30 200mm
61	51.00026.001	Double Tape 3M-Y4609 6mm(W)*0.8mm(T)
62	41.54816.001	EMI Core
63	61.54811.001	EMI-Spring with Double Tape 266.8mm

CHAPTER III

The Procedure of Disassembly

3-1 Disassemble Stand and Main Body

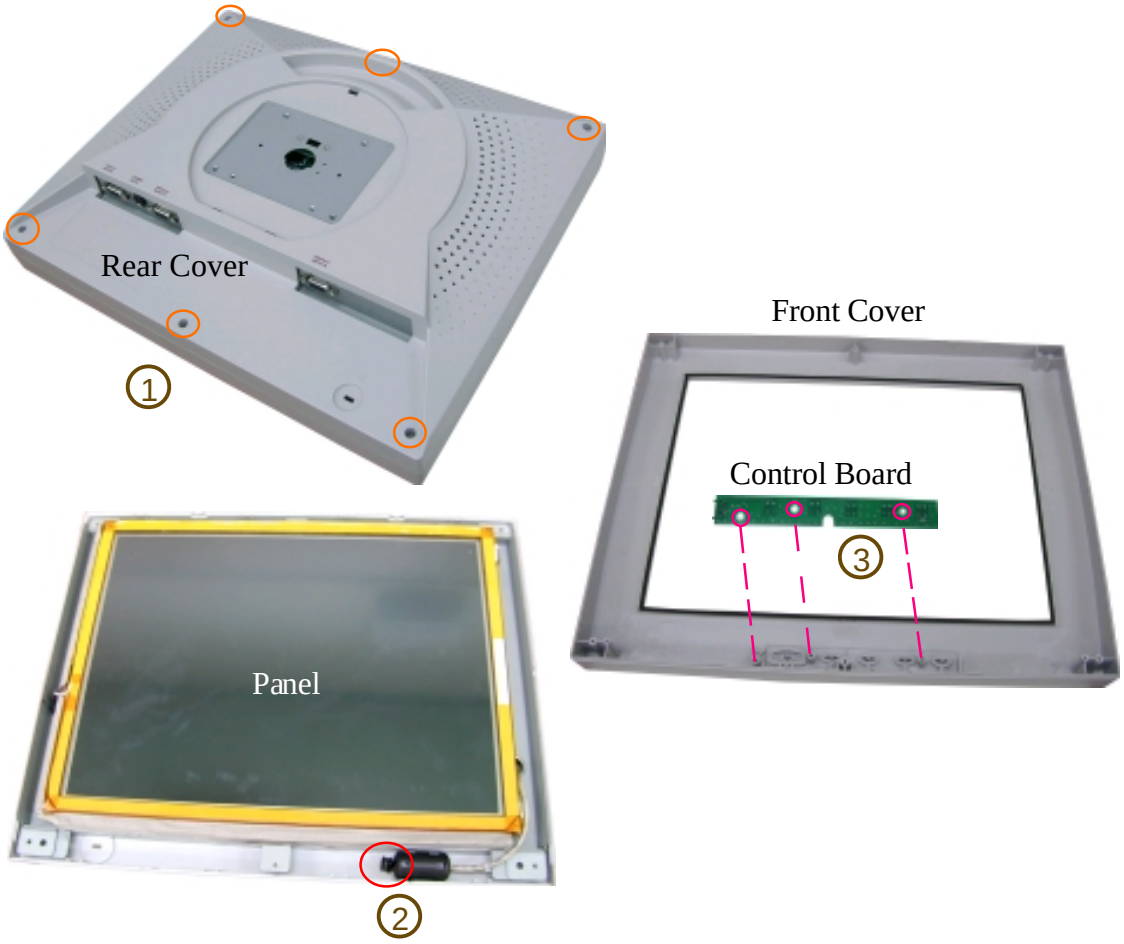


1. Press and pull out Hinge Cap, tear off EMI Tape and unplug USB cable.

2. Unscrew four screws on Pivot Hinge.

3. Remove Stand Unit.

3-2 Disassemble Front Cover and Control Board

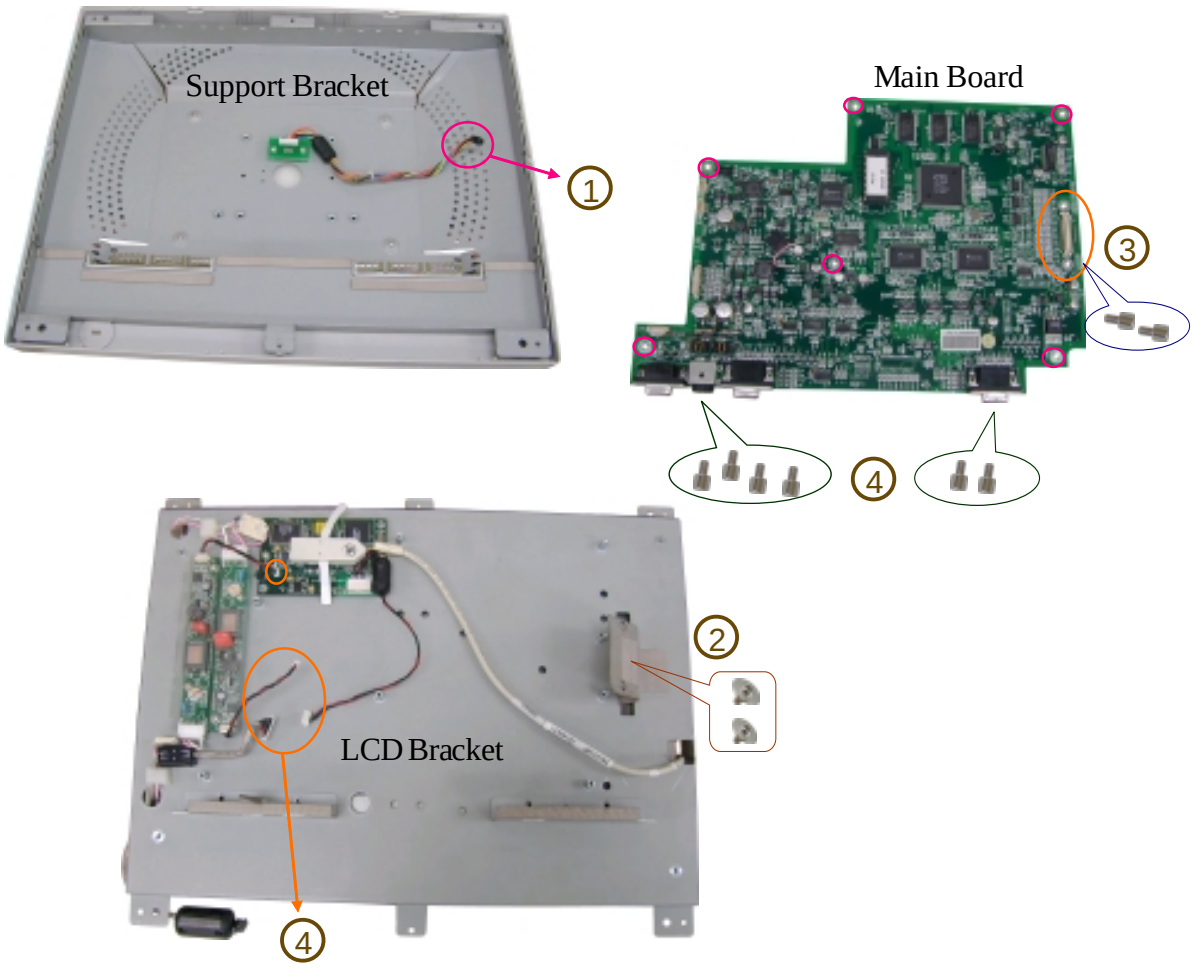


1. Unscrew six screws on Rear Cover.

2. Separate Front Cover from Panel & Rear Cover to unplug Control Board cable.

3. Unscrew three screws on Control Board to remove it.

3-3 Disassemble Main Board



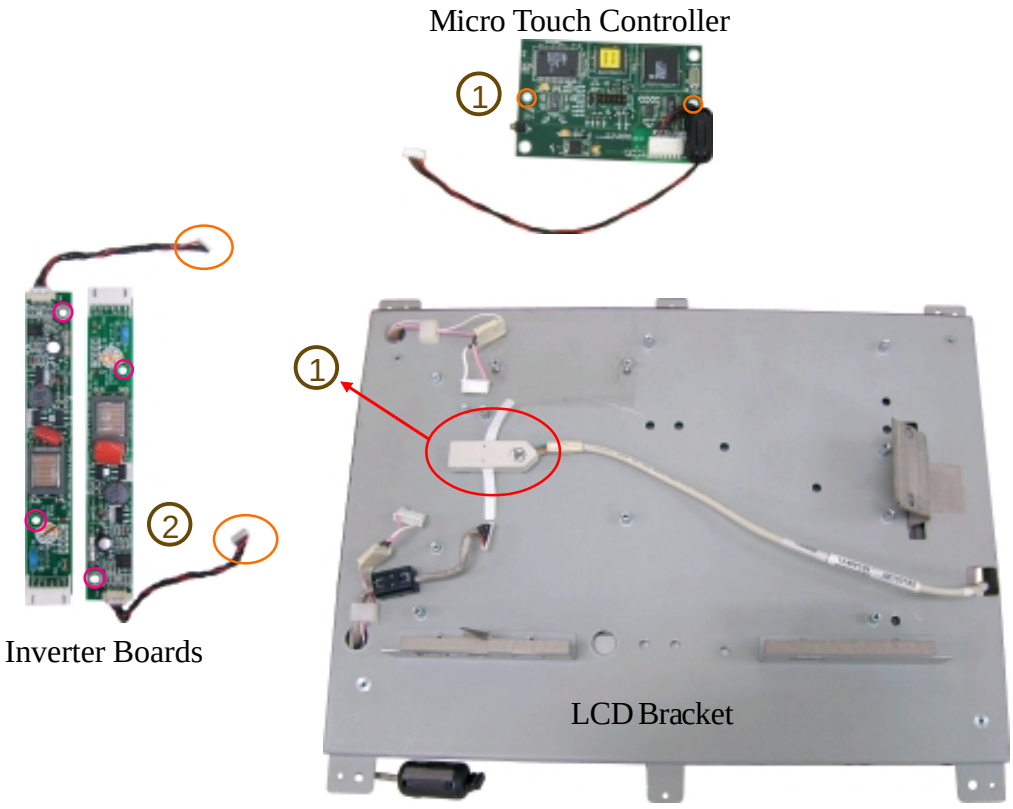
1. Lift up LCD Bracket from Support Bracket and disconnect one connector.

2. Turn over LCD Bracket, unscrew two screws on FPC cable.

3. Unscrew two hex screws and six screws on Main Board.

4. Unscrew six hex screws and unplug four cables to remove Main Board.

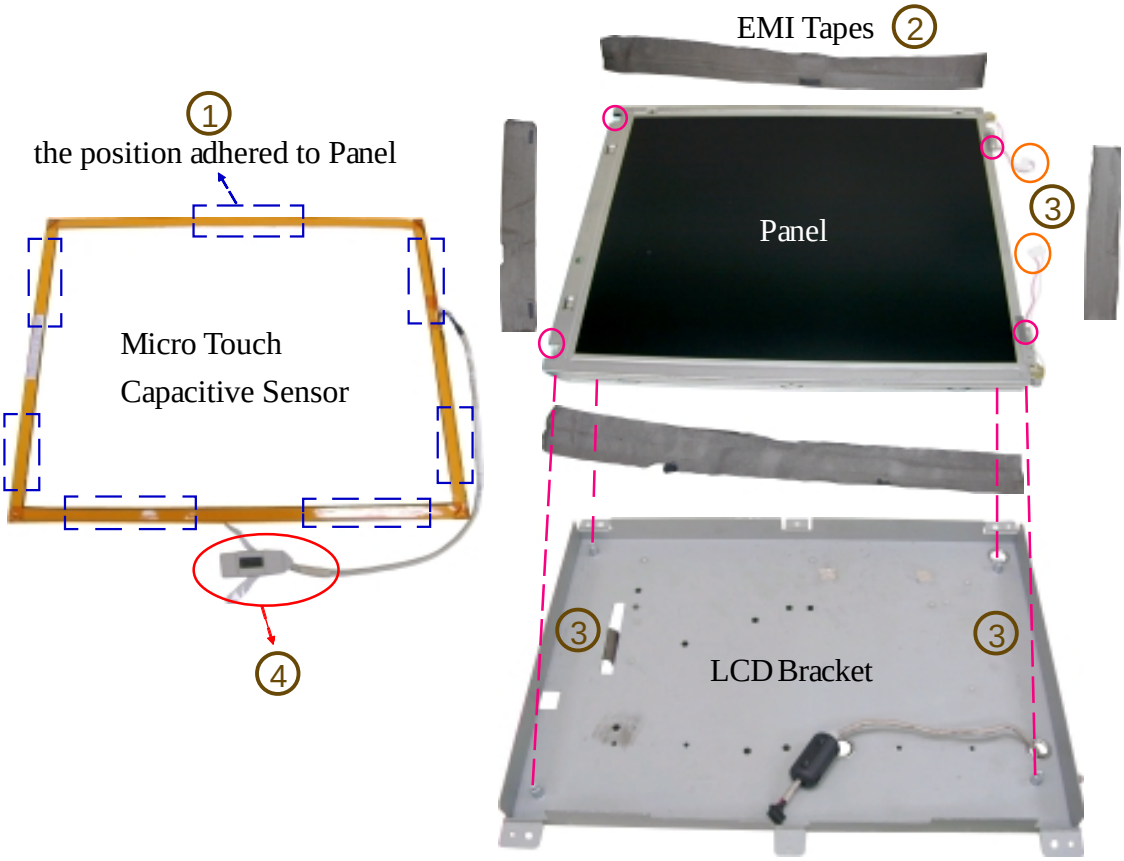
3-4 Disassemble Micro Touch Controller and Inverter Board



1. Unscrew two screws on Micro Touch Controller and unplug one cable to remove it.

2. Unscrew two screws and disconnect two connectors on two Inverter Boards to remove it.

3-5 Disassemble Micro Touch Capacitive Sensor and Panel

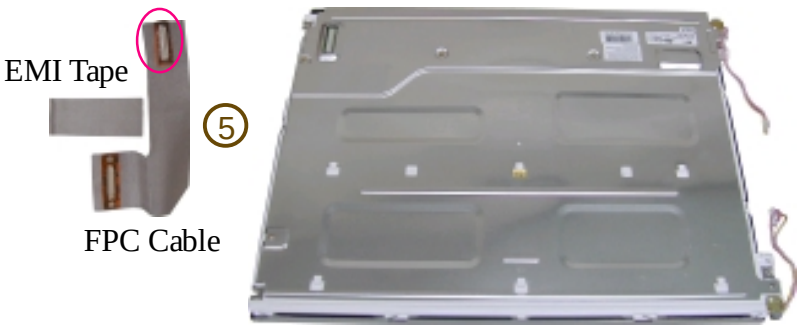


1. Use a knife to separate Micro Touch Capacitive Sensor from Panel.

2. Lift up Micro Touch Capacitive Sensor, and tear off four EMI Tapes around Panel.

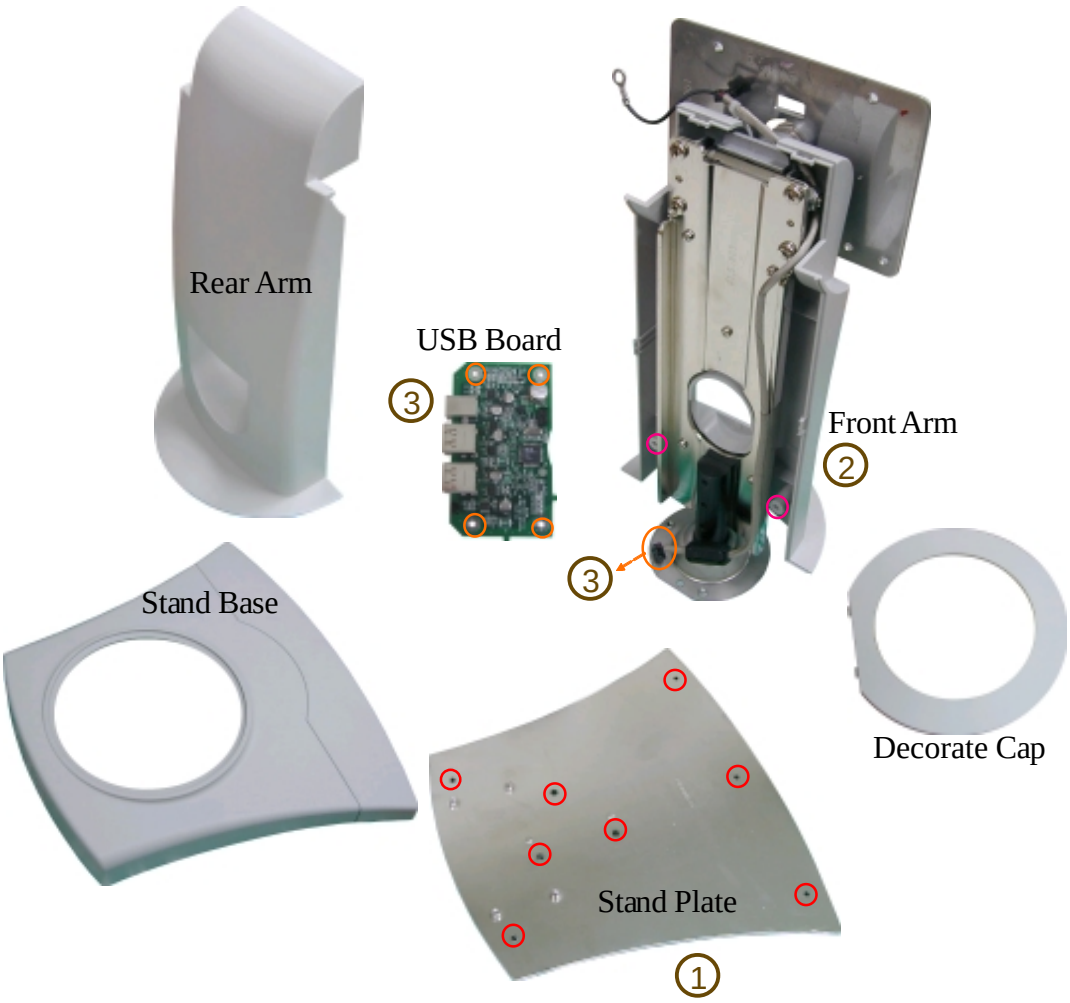
3. Unscrew four screws on Panel and pull out two cables to remove Panel.

4. Pull out Micro Touch Capacitive Sensor cable from LCD Bracket to remove it.



5. Turn Panel over and tear off one EMI Tape, disconnect the connector to remove FPC cable.

3-6 Disassemble Stand Unit (USB BD)



1. Unscrew eight screws on Stand Plate.

2. Unscrew two screws on Front Arm to remove Rear Arm.

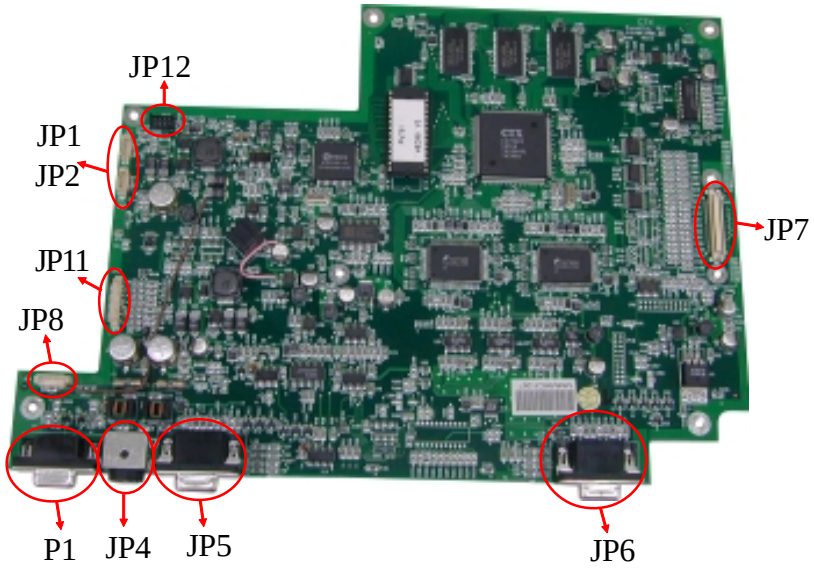
3. Move Stand Base away to unscrew four screws on USB Board and unplug one cable, then remove USB Board.

CHAPTER IV

Function of Boards

4-1 Main Board

4-1.1 The Position of Connectors

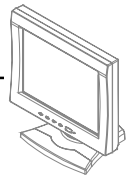


4-1.2 JP1 : Inverter Connector

Pin#	Signal Name	Function
1	+12VBL	12V Power
2	GND	Ground
3	BLONA	Backlight
4	BRIGHT	Brightness Control
5	GND	Ground

4-1.3 JP2 : Inverter Connector

Pin#	Signal Name	Function
1	+12VBL	12V Power
2	GND	Ground
3	BLONA	Backlight
4	BRIGHT	Brightness Control
5	GND	Ground

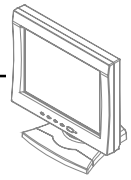


4-1.4 JP4 : Power-In Cnnector

Pin#	Signal Name	Function
1	12A	+12V Power
2	12B	+12V Power
3	GND	Ground
4	GND	Ground

4-1.5 JP5 : Computer 1 Connector

Pin#	Signal Name	Function
1	R-IN	Red Input
2	G-IN	Green Input
3	B-IN	Blue Input
4	N.C.	No Connection
5	N.C.	No Connection
6	GND	Ground
7	GND	Ground
8	GND	Ground
9	N.C.	No Connection
10	GND	Ground
11	GND	Ground
12	DCDAT	DDC Data
13	HSYNC	Horizontal Synchronic Input
14	VSYNC	Vertical Synchronic Input
15	DCCLK	DDC Clock

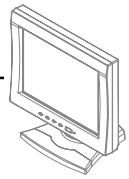


4-1.6 JP6 : Computer 2 Connector

Pin#	Signal Name	Function
1	R-IN	Red Input
2	G-IN	Green Input
3	B-IN	Blue Input
4	N.C.	No Connection
5	N.C.	No Connection
6	GND	Ground
7	GND	Ground
8	GND	Ground
9	N.C.	No Connection
10	GND	Ground
11	GND	Ground
12	DCDAT2	DDC Data
13	HSYNC2	Horizontal Synchronic Input
14	VSYNC2	Vertical Synchronic Input
15	DCCLK2	DDC Clock

4-1.7 JP12 : USB Connector

Pin#	Signal Name	Function
1	P5_USB	+5V Power
2	P5_USB	+5V Power
3	P5_USB	+5V Power
4	GND	Ground
5	IICCLK	Serial Clock (reserve)
6	GND	Ground
7	IICDAT	Serial Data (reserve)
8	GND	Ground

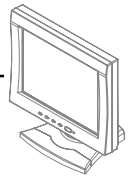


4-1.8 JP11 : KeyPad Connector

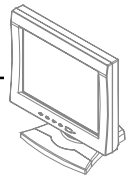
Pin#	Signal Name	Function
1	GND	Ground
2	PSW	Power Switch
3	GND	Ground
4	LED	Power Indicator
5	LEDB	Power On Indicator
6	GND	Ground
7	UP	Increase to adjust the value of item
8	DOWN	Decrease to adjust the value of item
9	N.C.	No Connection
10	SEL	Select Button
11	MENU	Menu Button
12	GND	Ground

4-1.9 JP7 : LCD Panel Connector

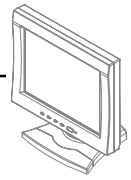
Pin#	Signal Name	Function
1	GAMMA	View Angle Control Voltage
2	GND	Ground
3	GND	Ground
4	V5V2	Power Supply +5V
5	V5V2	Power Supply +5V
6	V5V2	Power Supply +5V
7	N.C.	No Connection
8	-LCDV	Vertical Sync.
9	GND	Ground
10	-LCDH	Horizontal Sync.
11	GND	Ground
12	BB5	Blue Data
13	BB3	Blue Data
14	BB0	Blue Data
15	GND	Ground



Pin#	Signal Name	Function
16	GB5	Green Data
17	GB3	Green Data
18	GB0	Green Data
19	GND	Ground
20	RB5	Red Data
21	RB3	Red Data
22	RB0	Red Data
23	GND	Ground
24	BA5	Blue Data
25	BA3	Blue Data
26	BA0	Blue Data
27	GND	Ground
28	GA5	Green Data
29	GA3	Green Data
30	GA0	Green Data
31	GND	Ground
32	RA5	Red Data
33	RA3	Red Data
34	RA0	Red Data
35	GND	Ground
36	GND	Ground
37	GND	Ground
38	RA1	Red Data
39	RA2	Red Data
40	RA4	Red Data
41	GND	Ground
42	GA1	Green Data
43	GA2	Green Data
44	GA4	Green Data
45	GND	Ground



Pin#	Signal Name	Function
46	BA1	Blue Data
47	BA2	Blue Data
48	BA4	Blue Data
49	GND	Ground
50	RB1	Red Data
51	RB2	Red Data
52	RB4	Red Data
53	GND	Ground
54	GB1	Green Data
55	GB2	Green Data
56	GB4	Green Data
57	GND	Ground
58	BB1	Blue Data
59	BB2	Blue Data
60	BB4	Blue Data
61	GND	Ground
62	PCLKB	Pixel Clock
63	GND	Ground
64	DE	Data Enable
65	N.C.	No Connection
66	V5V2	Power Supply +5V
67	V5V2	Power Supply +5V
68	GND	Ground
69	GND	Ground
70	GND	Ground



4-1.10 P1 : Connector DB9

Pin#	Signal Name	Function
1	N.C.	No Connection
2	RXD	Received Serial Data
3	TXD	Transmitted Serial Data
4	N.C.	No Connection
5	GND	Ground
6	N.C.	No Connection
7	RTS	Request to Send
8	CTS	Clear to Send
9	N.C.	No Connection

4-1.11 JP8 :

Pin#	Signal Name	Function
1	PS_USB	+5V Power
2	PS_USB	+5V Power
3	RXD	Received Serial Data
4	GND	Ground
5	TXD	Transmitted Serial Data
6	GND	Ground
7	GND	Ground

4-2 Inverter Board

4-2.1 The Position of Connectors

4-2.1 CN1 : DC-In Connector

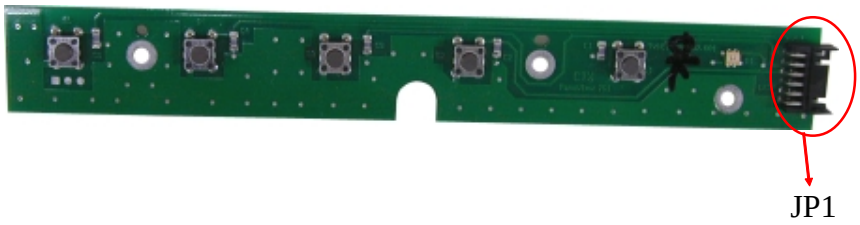
Pin#	Signal Name	Function
1	+12VBL	12V Power
2	GND	Ground
3	BLONA	Backlight
4	BRIGHT	Brightness Control
5	GND	Ground

4-2.2 CN2 : AC-Out Connector

Pin#	Signal Name	Function
1	HVa	High-Voltage
2	HVa	High-Voltage
3	N.C.	No Connection
4	N.C.	No Connection
5	HVb	High-Voltage
6	HVb	High-Voltage

4-3 Control Board

4-3.1 The Position of Connectors

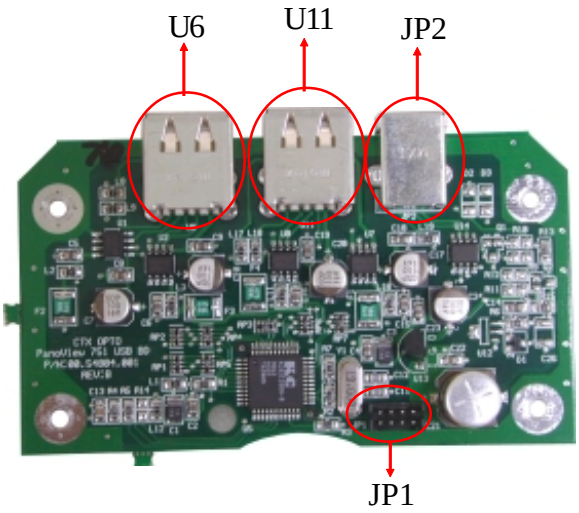


4-3.1 JP1 : KeyPad Connector

Pin#	Signal Name	Function
1	GND	Ground
2	PSW	Power Switch
3	GND	Ground
4	LED	Power Indicator
5	LEDB	Power On Indicator
6	GND	Ground
7	UP	Increase to adjust the value of item
8	DOWN	Decrease to adjust the value of item
9	N.C.	No Connection
10	SEL	Select Button
11	MENU	Menu Button
12	GND	Ground

4-4 USB Board

4-4.1 The Position of Connectors



4-4.1 JP1 : USB Connector

Pin#	Signal Name	Function
1	P5_USB	+5V Power
2	P5_USB	+5V Power
3	P5_USB	+5V Power
4	GND	Ground
5	IICCLK	Serial Clock (reserve)
6	GND	Ground
7	IICDAT	Serial Data (reserve)
8	GND	Ground

4-4.2 JP2 : USB Upstream Connector

Pin#	Signal Name	Function
1	V5V	+5V Power
2	UP DM	Serial Data
3	UP DP	Serial Data
4	GND	Ground

4-4.3 U6 : USB Downstream Connector

Pin#	Signal Name	Function
1	V5V	+5V Power
2	DNDM1	Serial Data
3	DNDP1	Serial Data
4	GND	Ground
5	V5V	+5V Power
6	DNDM2	Serial Data
7	DNDP2	Serial Data
8	GND	Ground

4-4.4 U11 : USB Downstream Connector

Pin#	Signal Name	Function
1	V5V	+5V Power
2	DNDM1	Serial Data
3	DNDP1	Serial Data
4	GND	Ground
5	V5V	+5V Power
6	DNDM2	Serial Data
7	DNDP2	Serial Data
8	GND	Ground

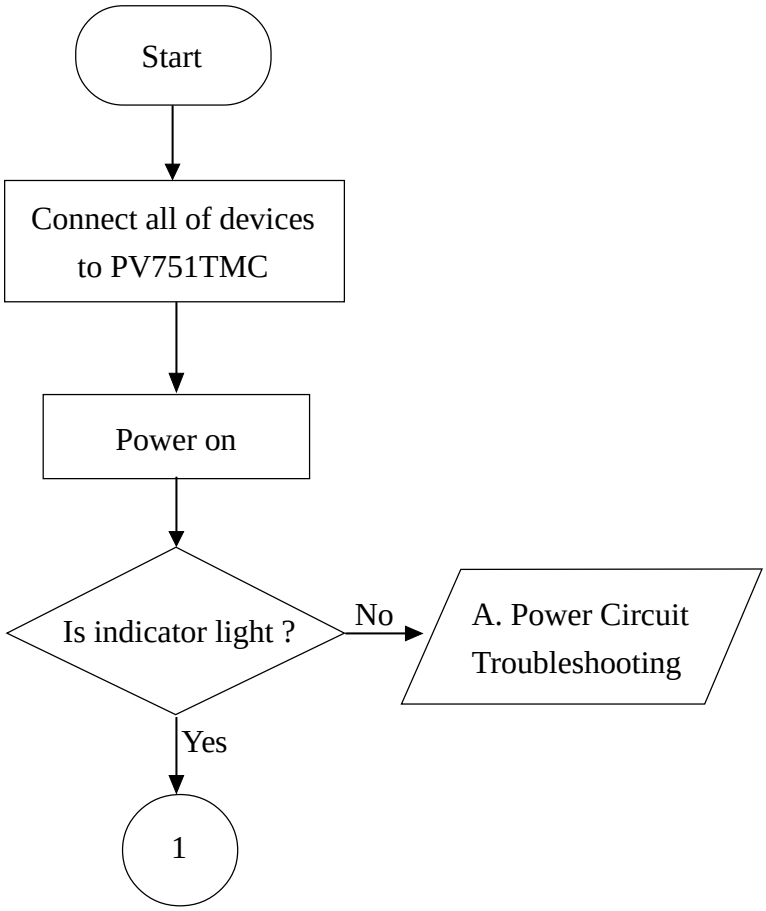
CHAPTER V

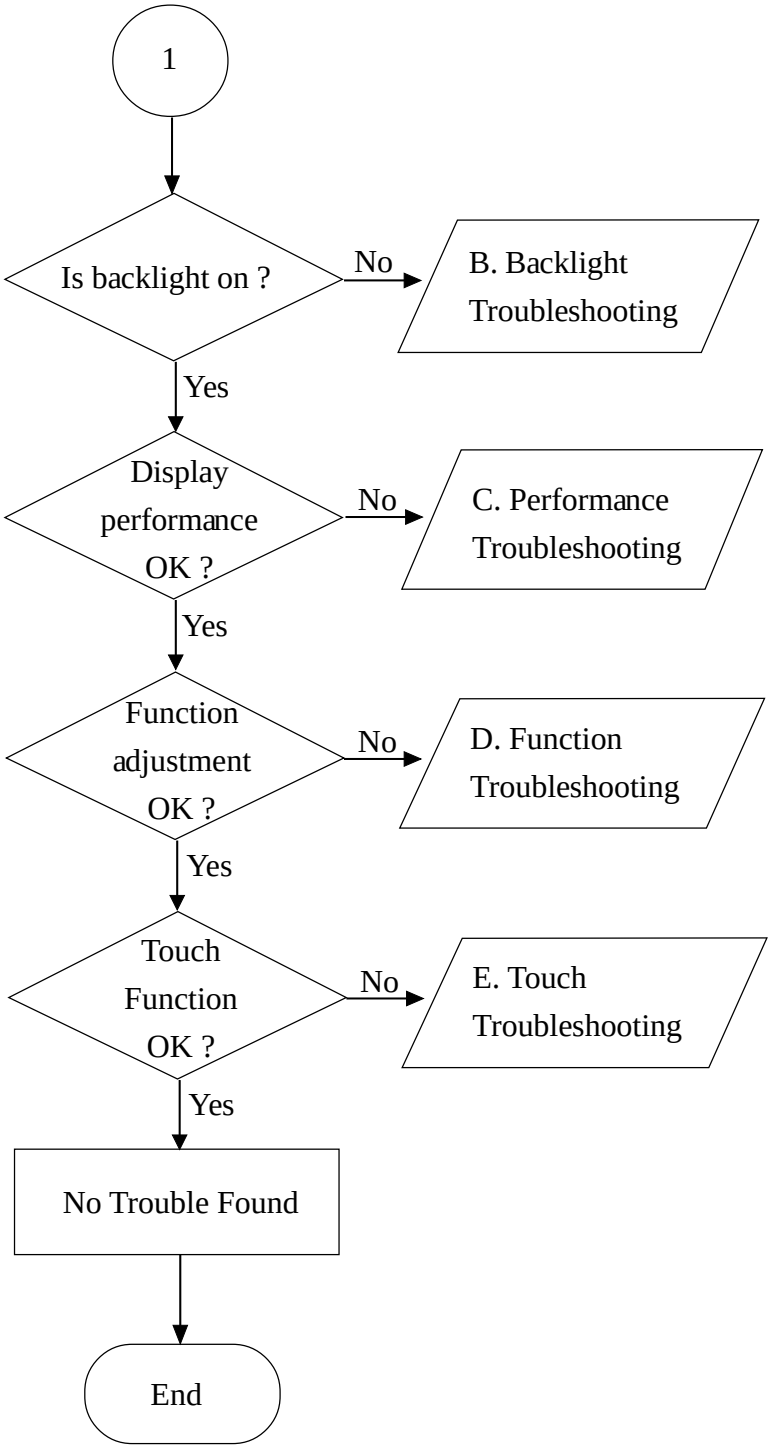
Troubleshooting

5-1 Equipment Needed

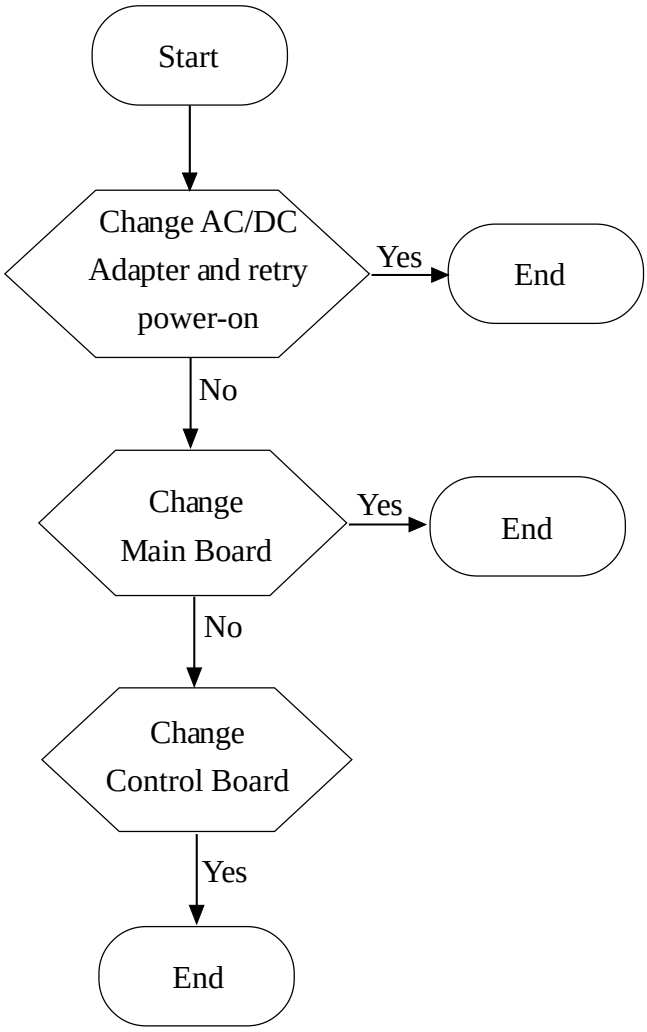
- ❑ PanoView 751TMC
- ❑ PC (Personal Computer) with XGA Card
- ❑ Screw Driver
- ❑ RS-232 Cable

5-2 Main Procedure

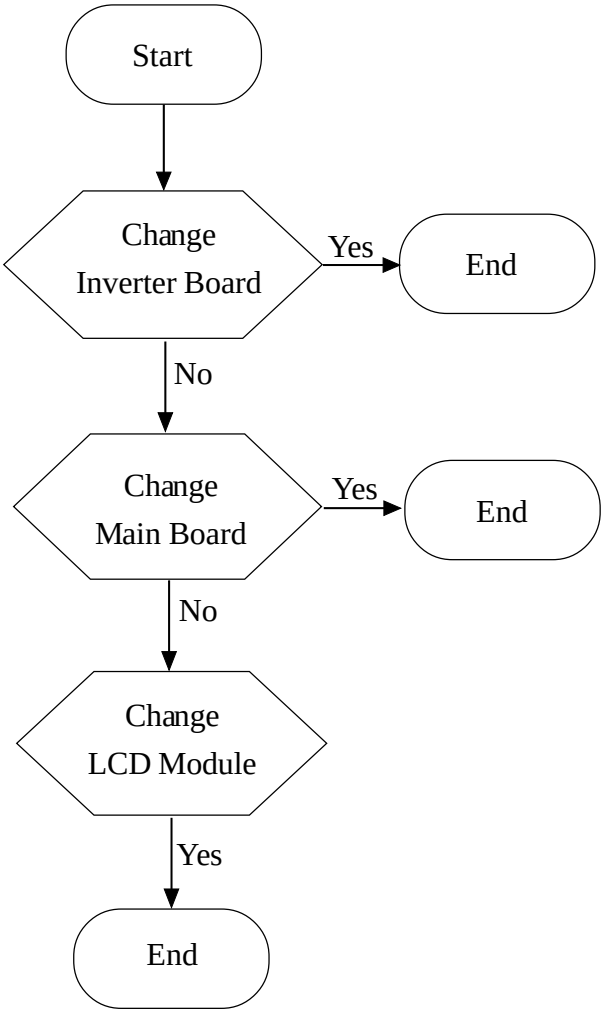



1
Is backlight on ?
No
B. Backlight Troubleshooting
Yes
Display performance OK ?
No
C. Performance Troubleshooting
Yes
Function adjustment OK ?
No
D. Function Troubleshooting
Yes
Touch Function OK ?
No
E. Touch Troubleshooting
Yes
No Trouble Found
End

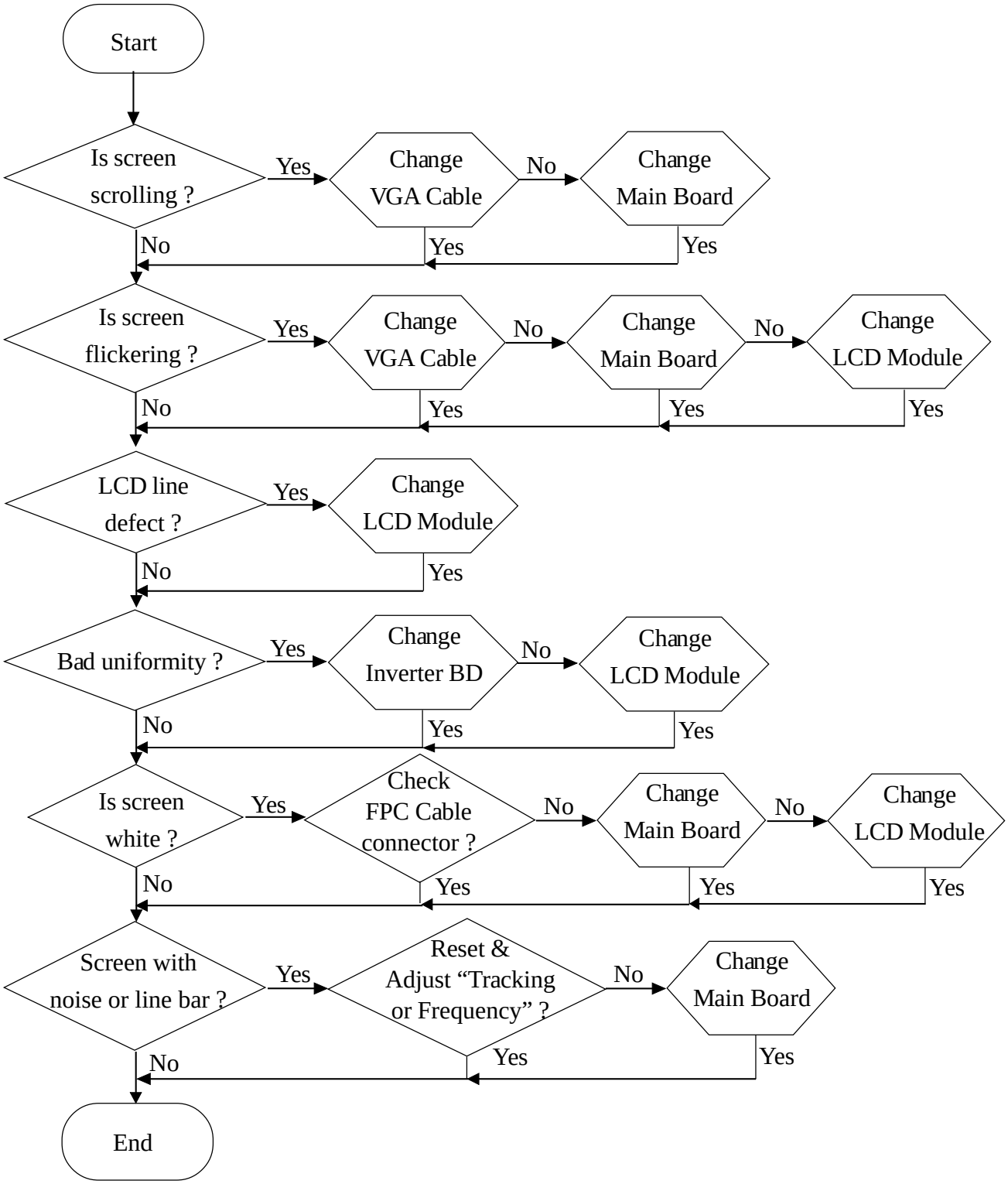
5-2.1 A. Power Circuit Troubleshooting



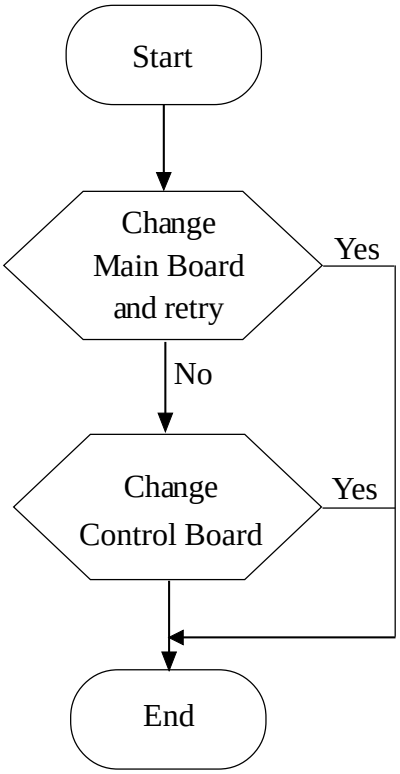
5-2.2 B. Backlight Troubleshooting



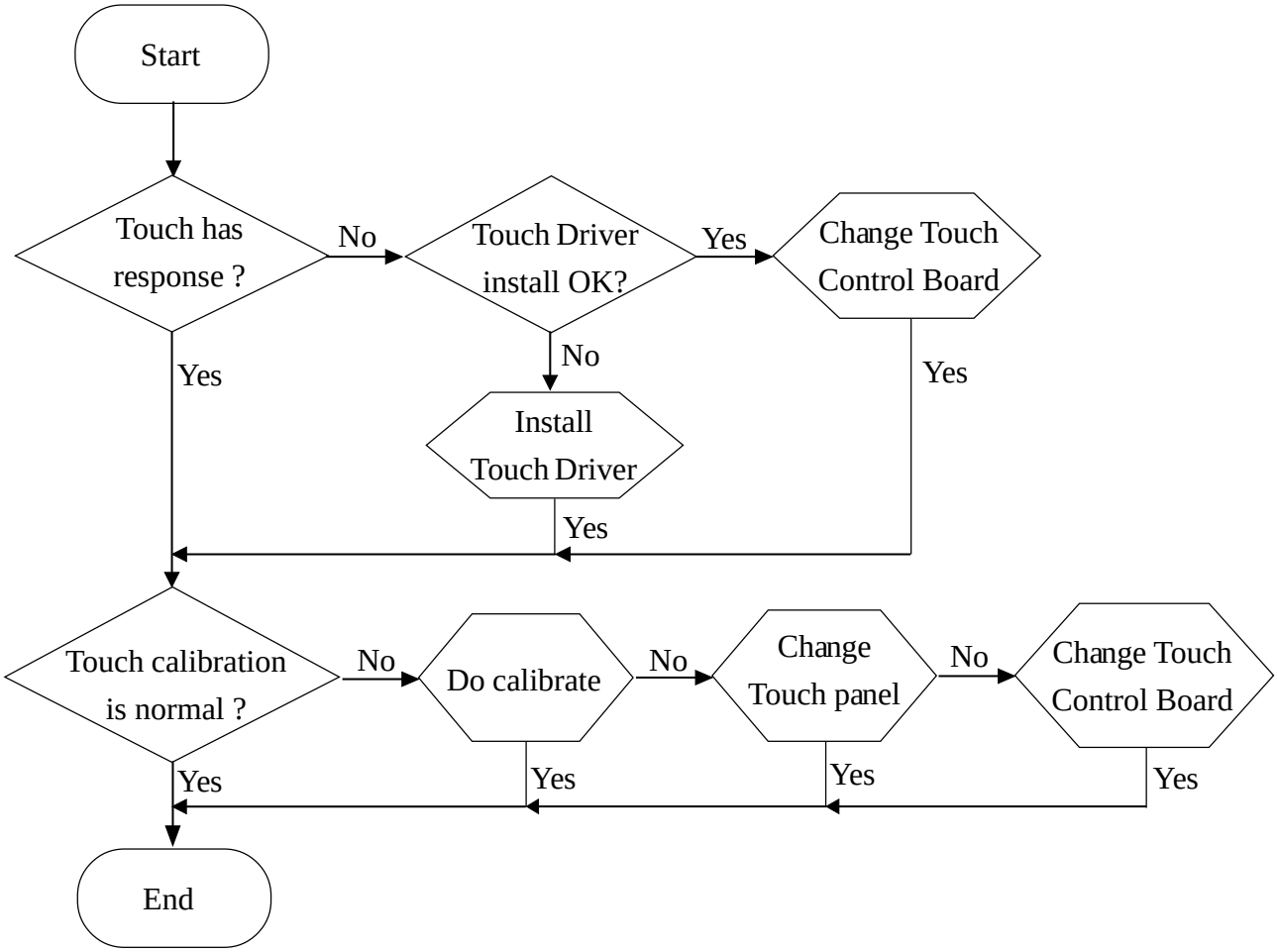
5-2.3 C. Performance Troubleshooting



5-2.4 D. Function Troubleshooting



5-2.4 E. Touch Troubleshooting



CHAPTER VI

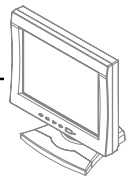
LCD Panel Specification

6-1 General Characteristics

Active display area	15.1 inches (38cm) diagonal
Outsize dimensions	35.6w*265.0h*18.5t (typ) mm (without inverter and user connector)
Pixel pitch	0.30mm*0.30mm
Pixel format	1024 horiz. by 768 vert. pixels
Weight	1500g (typ), 1600g (max)
Color depth	6-bit, 262,144 colors RGB vertical stripe arrangement
Display	Transmissive mode, normally white
Surface treatments	Hard coating (3H) Anti-glare treatment of the front polarizer

6-2 Environmental Spec.

Test Item		Conditions
Temperature	Operating Non-operating	0°C ~ 50°C -20°C ~ 60°C
Humidity	Operating Non-operating	20% ~ 80% RH (non-condensing) 5% ~95% RH (38.7°C max. wet bulb temperature)
Altitude		Operating : 12,000ft Storage : 40,000ft
Vibration test (non-operating)		Waveform : Random Vibration level : 1.0G RMS Bandwidth : 10 ~ 200Hz Duration : X, Y, Z, 20 min one time each direction
Shock test (non-operating)		Shock level : 100G Waveform : half sine wave, 2ms Duration : ±X, ±Y, ±Z one time each direction



6-3 Optical Spec.

Optical characteristics are determined after the unit has been "ON" and stable for approximately 30 minutes in a dark environment at 25°C. The values specified are at an approximate distance 50cm from the LCD surface at a viewing angle of Φ and θ equal to 0° and aperture 1 degree. The test equipment is PhotoResearch Prichard SpectroRadiometer Model 1980B-SC or equivalent. The input signal voltage and liming specification are V_{DD} of 3.3V and VESA XGA @60Hz respectively. The input current of backlight is 8mA (F_{BL} = 50KHz) at the ground terminals.

Optical Characteristics

Parameter	Symbol	Values			Units	Notes
		Min.	Typ.	Max.		
Contrast Ratio	CR	150	200	-		1
Average Brightness, White	SB_{WH}	170	200	-	cd/m^2	2
Brightness Variation	SB_V	-	-	30	%	3
Response Time	Tr		50	80	msec	4
Rise Time	TrR	-	20	30		
Decay Time	Tr_D	-	30	50		
CIE Color Coordinates						
Red	X_R Y_R	0.600 0.310	0.630 0.340	0.660 0.370		
Green	X_R Y_R	0.270 0.570	0.300 0.600	0.330 0.630		
Blue	X_R Y_R	0.110 0.070	0.140 0.100	0.170 0.130		
White	X_R Y_R	0.290 0.310	0.320 0.340	0.350 0.370		
Viewing Angle by CR ≥ 10					degree	5
X axis, right (∅ = 0°)	θ	55	60	-		
X axis, left (∅ = 180°)	θ	55	60	-		
Y axis, up (∅ = 90°)	θ	40	45	-		
Y axis, down (∅ = 270°)	θ	40	45	-		
Viewing Angle by CR ≥ 5						
X axis, right (∅ = 0°)	θ	70	75			
X axis, left (∅ = 180°)	θ	70	75			
Y axis, up (∅ = 90°)	θ	50	55			
Y axis, down (∅ = 270°)	θ	50	55			
Cross Talk						
Horizontal		-	-	2.5	%	6
Vertical		-	-	2.5		
Gamma Value		-	-	-		7

Notes :

1. Contrast Ratio (CR) is defined mathematically as :

$$\frac{\text{(Surface Brightness with all White Pixels)}}{\text{(Surface Brightness with all Black Pixels)}}$$

Contrast Ratio shall be measured at the center of the display (location 1).

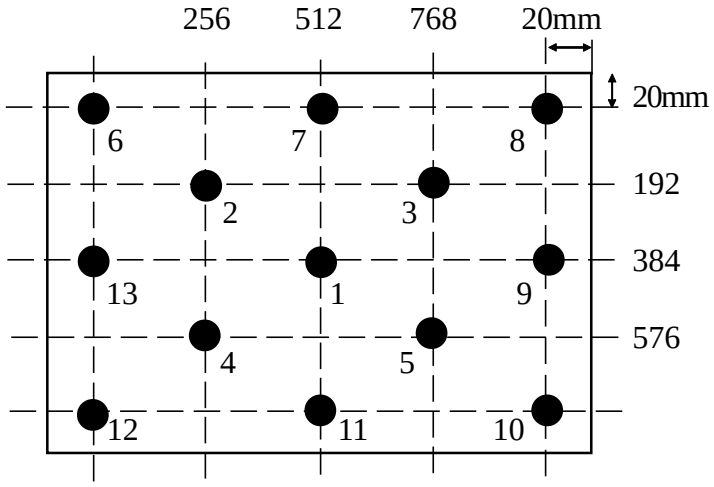
2. Average Brightness is the average of brightnessvalue at location 1 to 5 with all pixels displaying white.

$$B(AVE) = \frac{B1+B2+B3+B4+B5}{5}$$

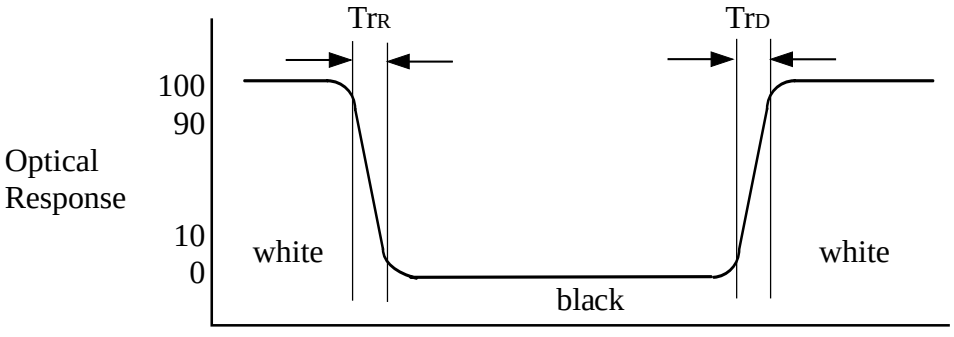
3. The variation in surface brightness, SB_V is defined as :

$$\frac{\text{Maximum (B1, B2, ...B13) - Minimum (B1, B2, ...B13)}}{\text{Average (B1, B2, ...B5)}} \times 100(\%)$$

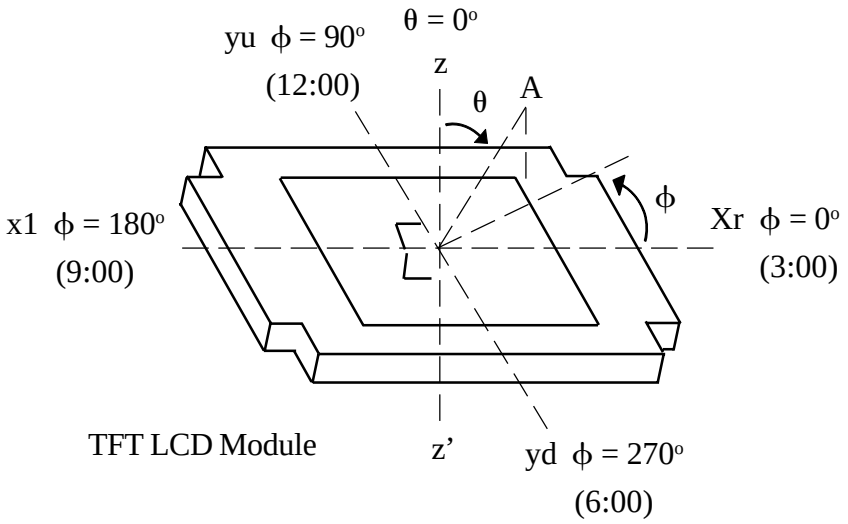
Where B1 to B13 are the brightness with all pixels displaying white at 13 locations.



4. The response time is defined as the following figure and shall be measured by switching the input signal for “black and white”.



5. Viewing angle is the angle at which the contrast ration is greater than 10.

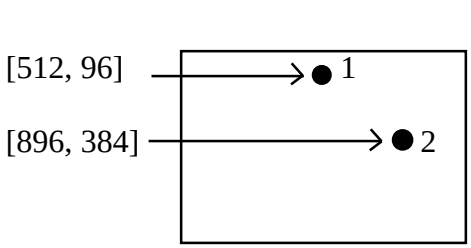


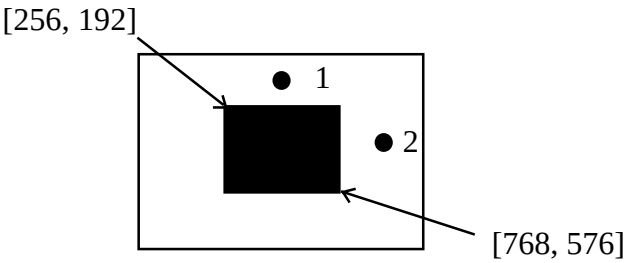
6. Cross talk shall be measured at two locations.

$$\text{Crosstalk Ratio} = 100 \times \frac{[\text{Brightness at pattern A} - \text{Brightness at pattern B}]}{\text{Brightness at pattern A}}$$

Pattern A
(Mid-gray : Gs(S) = 31)

Pattern B
(Background : Gs(S) = 31, Rectangular : Gs(S) = 0 & 63)





Vertical Crosstalk shall be measured at the location 1 and horizontal crosstalk shall be measured at the location 2.

7. Gamma values shall be measured at the center location.

n	Gs(S)	Relative Brightness (%)	
		min.	max.
0	0	-	0.67
1	7	-	1.8
2	15	2.3	4.3
3	23	5.4	9.4
4	31	10.4	20.4
5	39	22.8	34.8
6	47	41.1	55.1
7	55	66.7	82.7
8	63	100	100

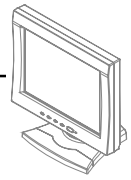
6-4 Dot Defect Spec.

A. *Bright Dot*: Bright Dot is defined as Dots (sub-pixels) which appeared brightly in the screen when the LCD displayed with dark pattern.

Bright dots	≤ 5 (Green dots ≤ 3)
Adjacent 2 dots	≤ 2
Adjacent above 3 dots	not allowed

B. *Dark Dot*: Dark Dot is defined as Dots (sub-pixels) which appeared darkly in the screen when the LCD displayed with bright pattern.

Dark dots	≤ 8
Adjacent 2 dots	≤ 1
Adjacent above 3 dots	not allowed



CHAPTER VII

Function Test and Alignment Procedure

7-1. Product :

- ❑ PV751TMC

7-2. Test Equipment :

- ❑ Color Video Signal & Pattern (or PC with SXGA resolution)
- ❑ Hi-pot & Grounding measurement

7-3. Test Condition :

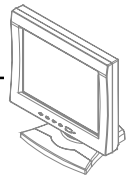
Before function test and alignment, each LCD Monitor should be run-in and warmed-up for at least 12 hours with the following conditions:

a). In room temperature,

b). With full-white screen,

c). With cycled display modes,

IBM & VESA VGA	640 × 350,70Hz
	640 × 400,70Hz
	20 × 400,70Hz
IBM & VESA VGA	640 × 480, 60/72/75Hz
VESA SVGA	800 × 600, 56/60/72/75Hz
VESA XGA	1024 × 768, 60/70/75Hz
Apple Macintosh	640 × 480, 67Hz
	832 × 624, 75Hz
	1024 × 768, 75Hz



7-4. Test Display Modes & Pattern

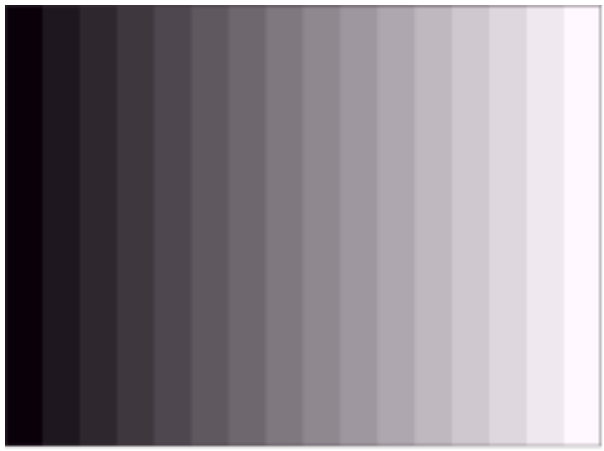
7-4.1 Compatible Modes

Standard	*Resolution*	*Vertical Refresh (Hz)*	*Horizontal Scan (KHz)*
IBM VGA	640*350	70	31.5
IBM VGA	640*400	70	31.5
IBM VGA	720*400	70	31.5
IBM VGA	640*480	60	31.5
VESA VGA	640*480	72	37.9
VESA VGA	640*480	75	37.5
VESA SVGA	800*600	56	35.2
VESA SVGA	800*600	60	37.9
VESA SVGA	800*600	72	48.1
VESA SVGA	800*600	75	46.9
VESA XGA	1024*768	60	48.4
VESA XGA	1024*768	70	56.5
VESA XGA	1024*768	75	60.0
Apple Mac LC	640*480	67	34.9
Apple Mac II	640*480	67	35.0
Apple Mac	832*624	75	49.7
Apple Mac	1024*768	75	60.0

7-4.2 Function Test Display Pattern

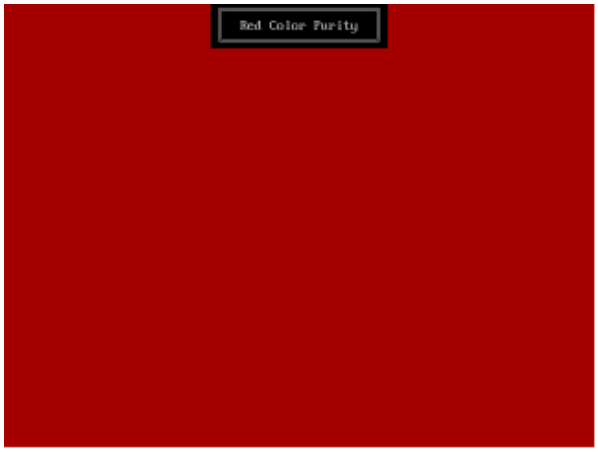
Item	Test Content	Pattern	Specification	Remark
1	Frequency & Tracking	Fine Line Moire	Eliminate visual wavy noise.	Figure 1
2	Contrast/Brightness	16 Gray Scale	16 gray levels should be distinguishable.	Figure 2
3	Boundary	Horizontal & Vertical Thickness	Horz. and Vert. position of video shuld be adjustable to be within the screen frame.	Figure 3
4	R,G,B, Color Performance	R.G.B Color Intensities	Contrast of each R,G,B, color should be normal.	Figure 4,5,6
5	Screen Uniformity & Flicker	Full White	Should be compliant with the spec.	Fgure 7
6	Deas Pixel/Line	White Screen Dark Screen	The number s of dead pixels should be compliant with the spe.	Figure 8

Fine Line Morie Pattern (Figure 1)



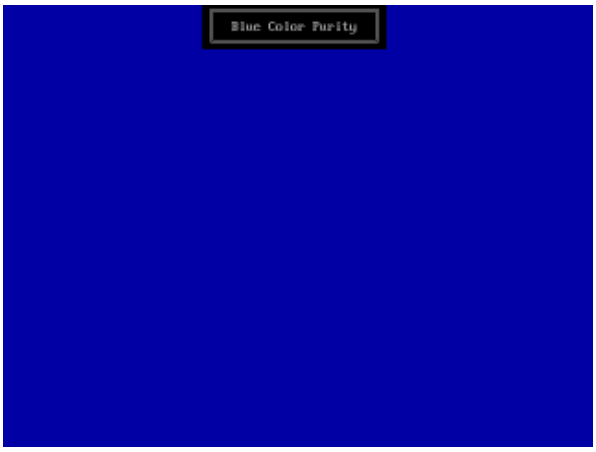
Gray Scale Pattern (Figure 2)

Horizontal & Vertical Thickness Pattern (Figure 3)



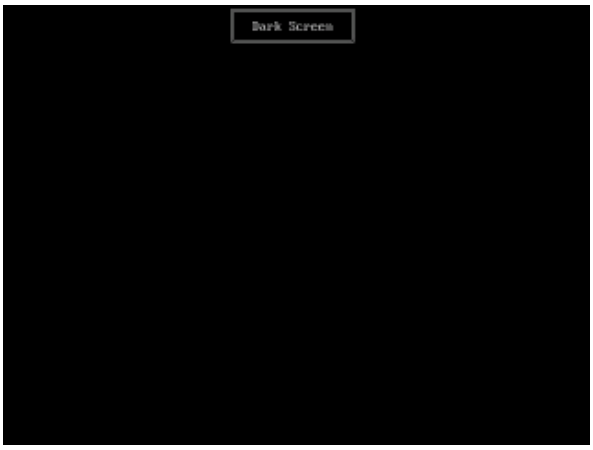
R. Color Pattern (Figure 4)

G. Color Pattern (Figure 5)

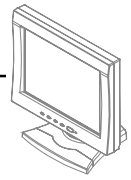


B. Color Pattern (Figure 6)

Full White Pattern (Figure 7)



Dark Screen Pattern (Figure 8)



7-5. Function Test And Alignment Procedure

7-5.1 All Mode Reset

Please press "+" and "-" functions on front bezel and trun on **Power** simultaneously and keep unreleased for 2 seconds. Then, the screen will show "**ALL MODES RESET**". This action will allow you to erase all end-user's setings and restore the factory defaults.

7-5.2 Auto Adjustment

Please select and enter "**Auto Adjustment**" function on Main Menu to see if it is workable. The "**Auto Adjustment**" function is aimed to offer a better screen quality by built-in ASIC. For optimum screen quality, the user has to adjust each function manually.

7-5.3 Frequency and Tracking

Test Signal : 1024*768@75Hz

Test Pattern : Line Moire Pattern

❖ Check and see if the image sharpness and focus is well performed.

❖ If not, readjust by the following steps :

(a) Select and enter "**Frequency**" function on "Advanced Menu" to adjust the screen to full screen and to eliminate visual wavy noise.

(b) Then, select and enter "**Track**" function to adjust the image to eliminate visual noise.

7-5.4 Boundary

Test Signal : 1024*768@75Hz

Test Pattern : Horizontal & Vertical Line Thickness Pattern

❖ Check and see if the image boundary is within the screen frame.

❖ If not, readjust by the following steps :

(a) Select and enter "**Position**" function on OSD Main Menu.

(b) Then, select and enter "**Horizontal Position**" and "**Vertical Position**" function to adjust the video boundary to be full scanned and within screen frame.

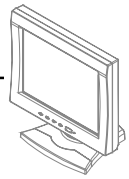
7-5.5 R,G,B, Colors Contrast

Test Signal : 1024*768@75Hz

Test Pattern : R,G,B Color Intensities Pattern and 16 Gray Scale Pwttern

❖ Check and see if each color is normal and distinguishable.

❖ If not, please return the unit to repair area.



7-5.6 Screen Uniformity and Flicker

Test Signal : 1024*768@75Hz

Test Pattern : Full White Pattern

❖ Check and see if it is in normal condition.

7-5.7 Dead Pixel and Line

Test Signal : 1024*768@75Hz

Test Pattern : Dark Screen Pattern

❖ Check and see if there are dead pixels on LCD panel with shadow gauge and filter film.

❖ The total numbers and distance of dead pixels should be compliant with the spec.

7-5.8 Check for Secondary Display Modes

Test Signal : IBM & VESA VGA 640 × 350@70Hz, 640 × 400@70Hz, 20 × 400@70Hz, 640 × 480@60/72/75Hz

VESA SVGA	800 × 600@56/60/72/75Hz
VESA XGA	1024 × 768@60/70/75Hz
Apple Macintosh	640 × 480@67Hz, 832 × 624@75Hz, 1024 × 768@75Hz

❖ Normally when the primary mode 1024*768@75Hz is well adjusted and compliant with the specification, the secondary display modes will be great possibile to be compliant with the spec. But we still have to check with the **general test pattern** to make sure every secondary is compliant with the specification.

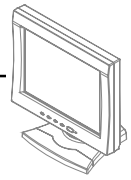
7-5.9 All Mode Reset

After final QC step, we have to erase all saved changes again and restore the factory defaults. Please press "+" and "-" functions on front bezel and trun on **Power** simultaneously and keep unreleased for 2 seconds. Then, the screen will show "**ALL MODES RESET**". This action will allow you to erase all end-user's setings and restore the factory defaults.

7-5.10 Touch Screen

Test Signal : 1024*768@75Hz

❖ The deviation should be less than 1 cm. If the screen can't be compliant wth the specification, it's suggested to do calibration, and then test it again.



7-6. Hi-pot & Grounding Test

Hi-Pot Specification : 1.5KV, 10mA, 2 Sec
Grounding Specification : 12VDC, 25A, 0.1Ω

7-7. Cleaning

Please use non-alcohol cleanser to clean LCD panel and cosmetics material with soft cotton.

CHAPTER VIII

DDC Key-in Procedure

8-1 Equipment

❒ Fixture, PC set ✕1, (Adapter & Power cord) ✕1, VGA cable ✕1

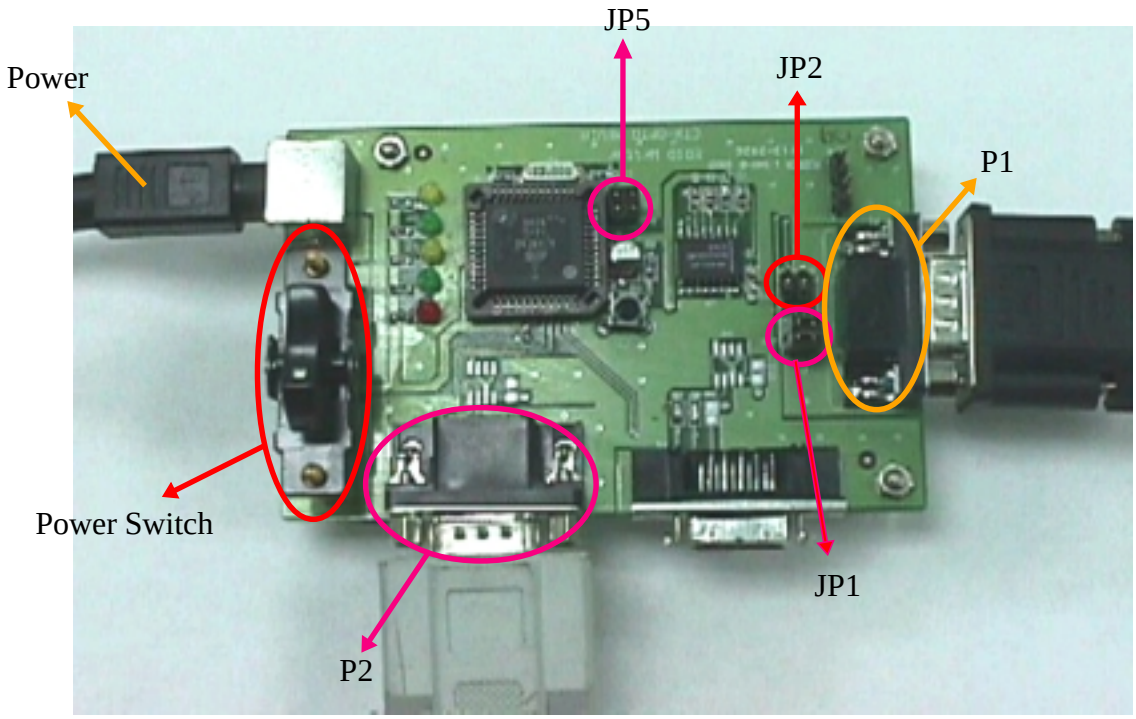
❒ PanoView 751TMC

❒ EDID Driver : Depends on the model

8-2 Procedure

1. Plug in the power of the fixture (with the same adapter as the one used for TFT450).

2. JP1 and JP5 on the fixture are close, and JP2 is open. (Fig. 1)



(Figure 1 : Fixture)

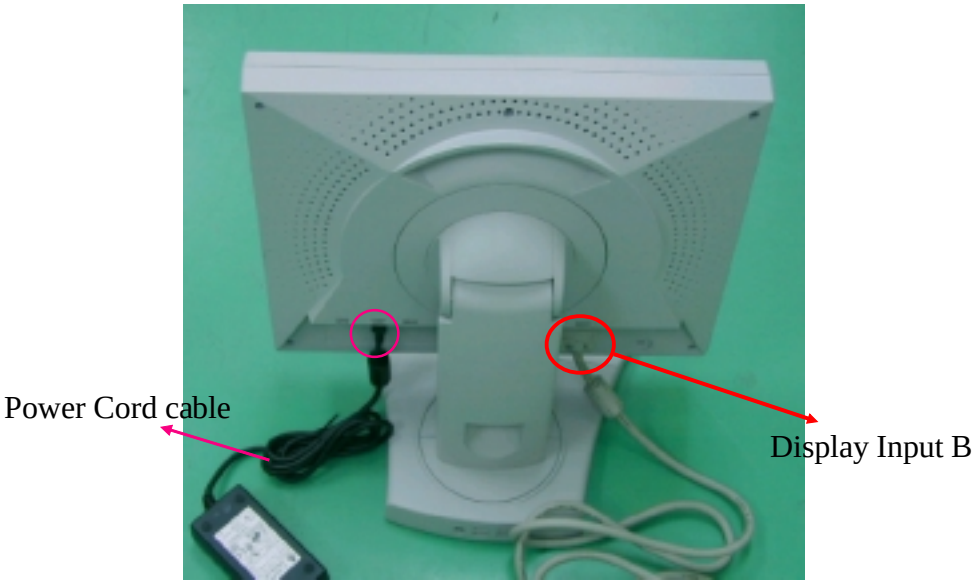
3. Connect P1 connector of the fixture to COM1 port of PC. (Fig. 1 & Fig. 2)

(Figure 2 : PC)

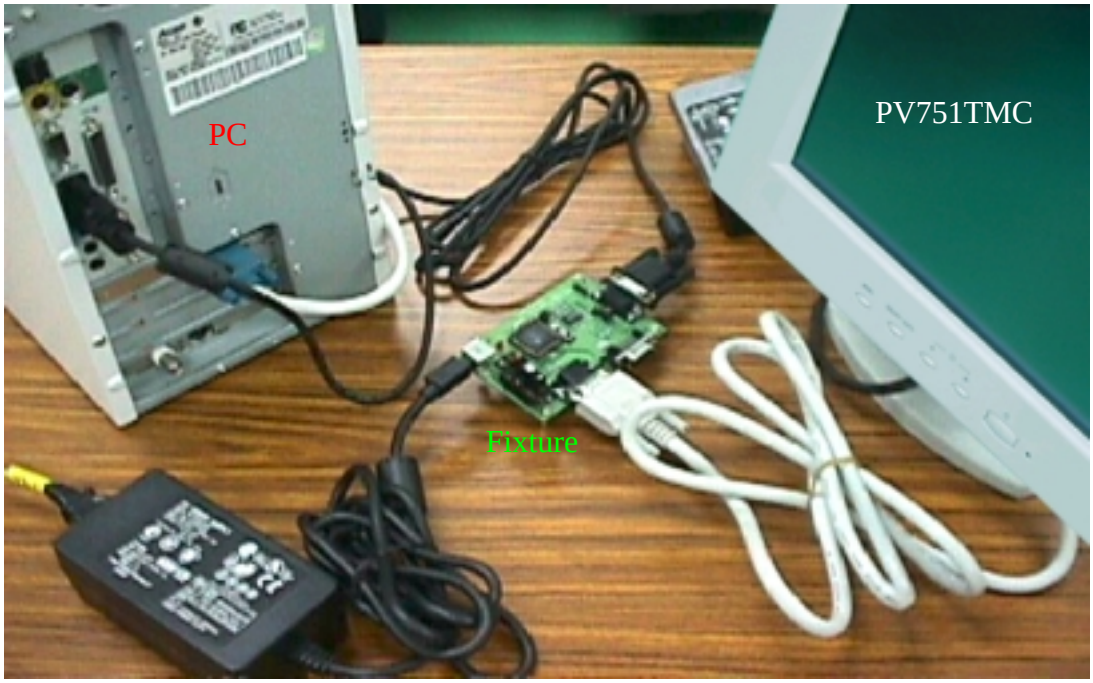
4. Connect Display Input B of PV751TMC to P2 connector of the fixture. (Fig. 1 & Fig. 3)

5. The fixture powers on.

6. Plug in the power cord and turn PV751TMC on (Fig. 3).

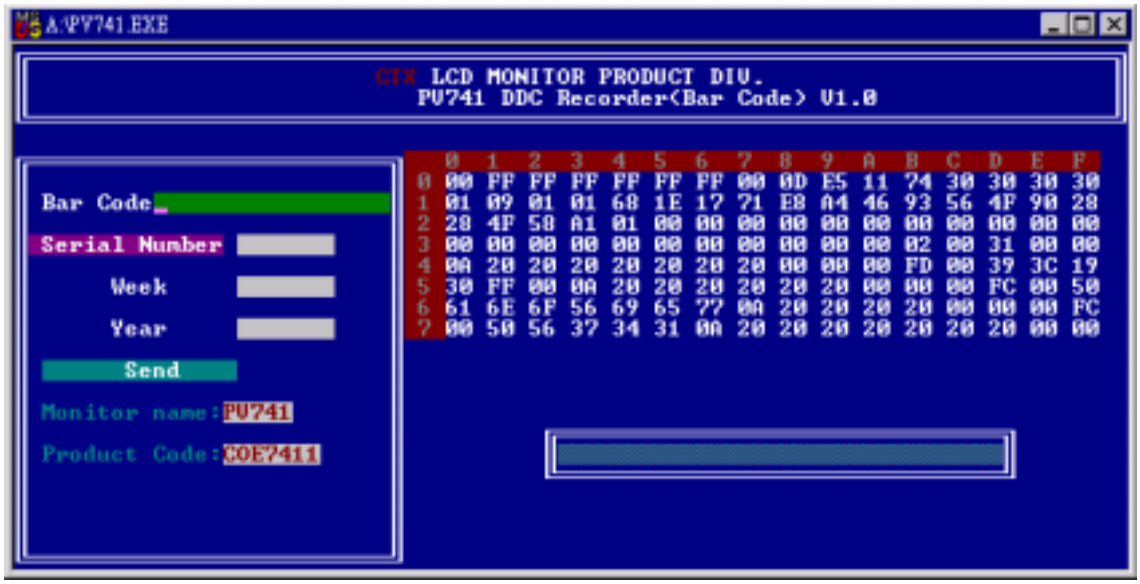


(Figure 3 : PV751TMC)



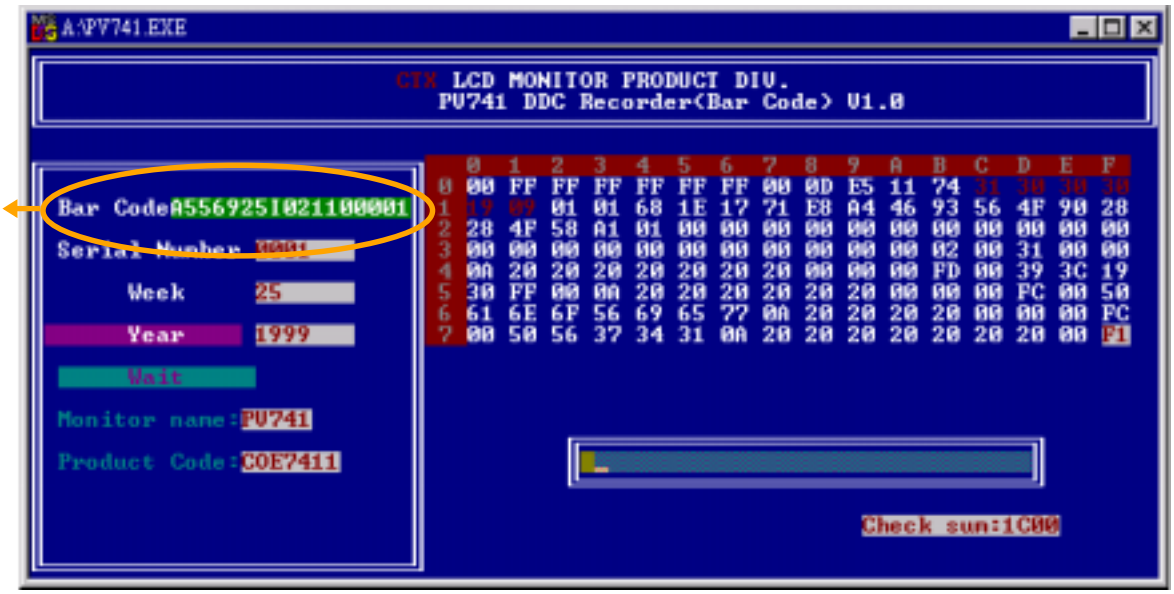
(Figure 4 : Finish connecting)

7. Turn on the computer and run ***EDID*** program in the computer. (Shown as Figure 5)



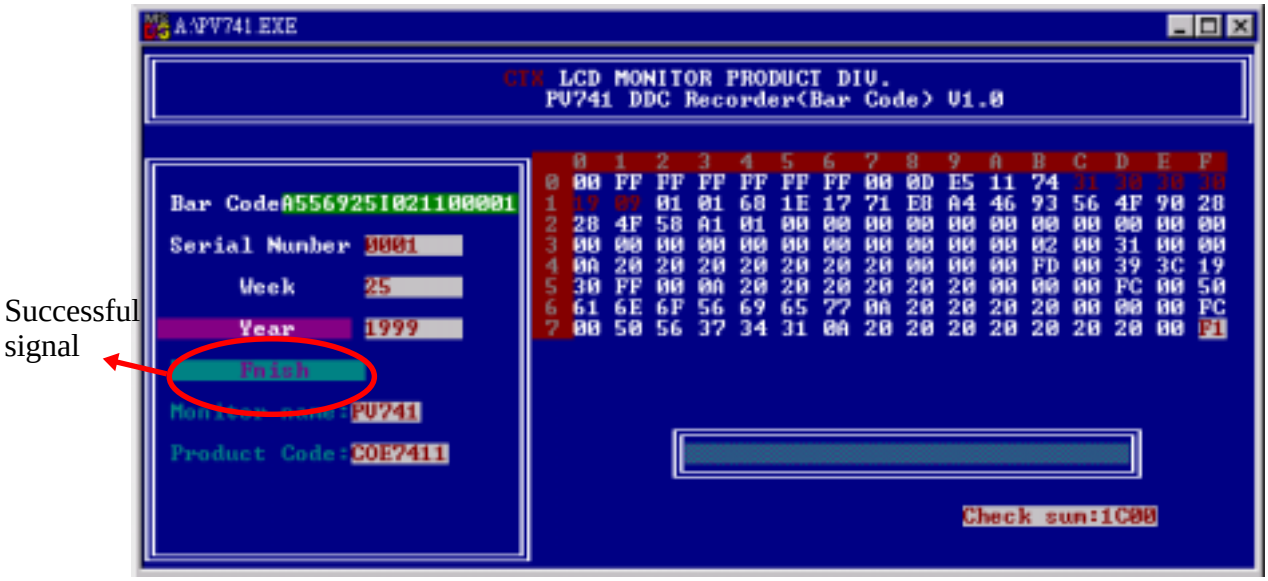
(Figure 5 : The screen of running EDID program)

8. Key S/N into the blank space beside Bar Code, then press “Enter” button on keyboard to begin programming. (Refer to Figure 6)



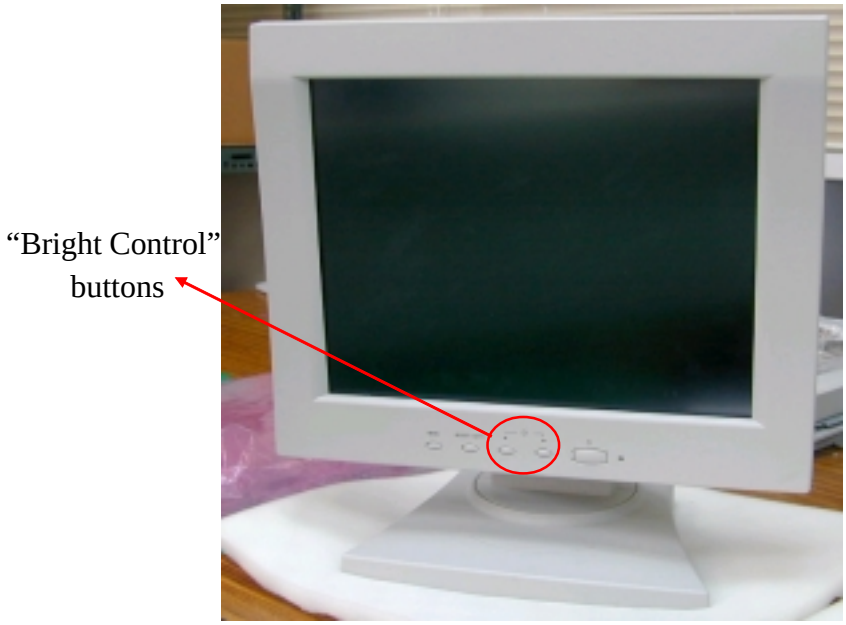
(Figure 6)

9. After finishing the above actions, “Finish” will be shown on the screen. (Refer to Figure 7).



(Figure 7)

10. Press both the “Bright Control” buttons (Refer to figure 8) and powers on at the same time. (Switch to the auto running mode)



(Figure 8 : PV751TMC)

11. Press “Menu” in PV751TMC and hold for a second to see the S/N, and check if the S/N is the same as the one you key in.

12. If S/N is the same, it is successfully finished and please continue the following steps. If not, please repeat above Step 7 ~11 again.

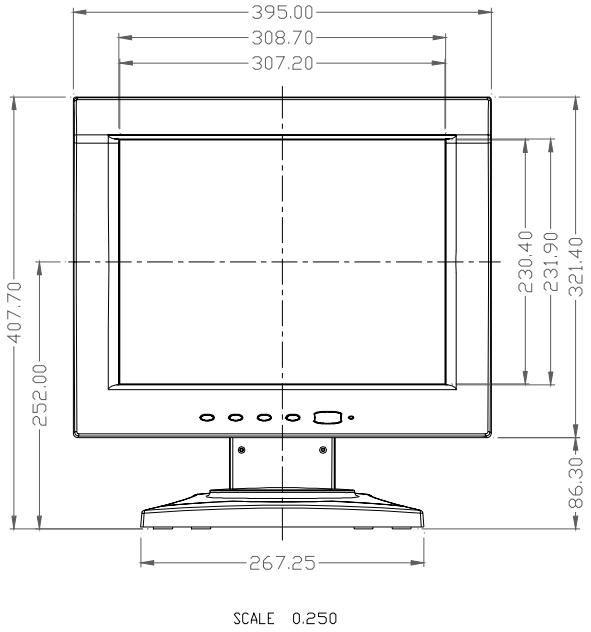
13. Turn off PV751TMC and disconnect the VGA cable from P2 of the fixture, then connect it to another PC to get a VGA signal.

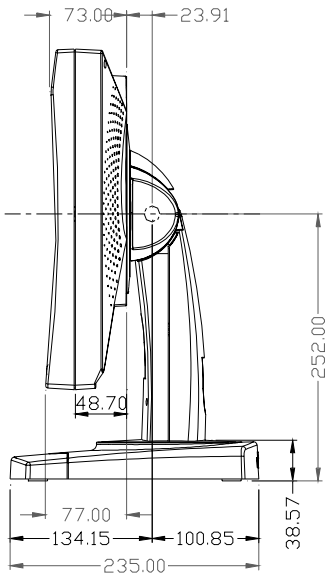
14. Repeat Step 10. (Switch to All Mode reset)

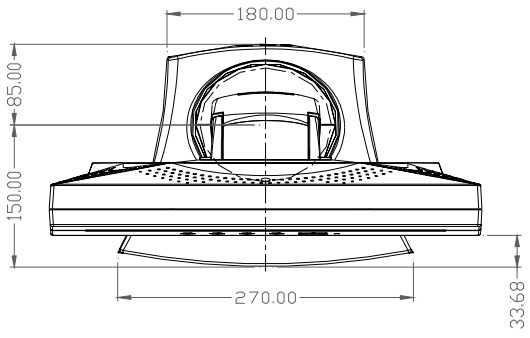
CHAPTER IX

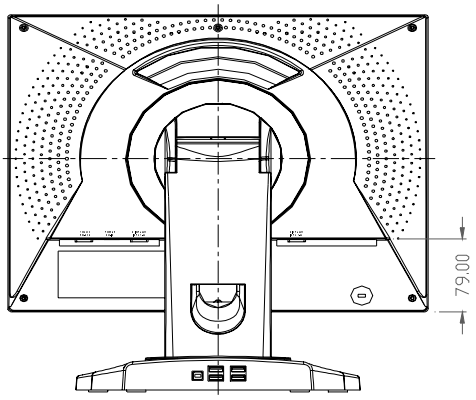
Appendix

9-1 Outline Dimension









9-2 The Serial Number System Definition

9-2.1 The Serial Number for LCD Monitor

A BBB Y WW C D BEMO EEEE
① ② ③ ④ ⑤ ⑥ ⑦ ⑧

① : A = Optoma, B~Z = OEM

② : Product Code (ex : 548 = PanoView751TMC)

③ : Y = Last number of the year (ex : 1999 - 9, 2000 - 0)

④ : Week of Year

⑤ : Panel vendor code

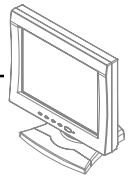
⑥ : Electrical classification

⑦ : B : BIOS version, E : PCB board version
M : Mechanical version, O : Optical version

⑧ : Serial code (from 0001~)

EX : I548020G041100013

“I548020G021100013” represents the whole serial number of PanoView751TMC.
It includes version 1st of PCB board, and version 4th of BIOS. The model is produced on 22 weeks of 2000, and its serial code is 0013.



9-2.2 The Serial Number for Main Board

L BB M Y M A1 AAAA
① ② ③ ④ ⑤ ⑥ ⑦

① : L = LPP, M = LMT

② : Model Code (ex : 93 = PV751TMC)

③ : M : Main Board, A : A/V Board, D : Driver Board

④ : Last number of the year (ex : 199<u>9</u> - 9, 200<u>0</u> - 0)

⑤ : M = Month (Jan. ~ Sept. = 1 ~ 9, Oct. ~ Dec. = X, Y, Z)

⑥ : A1 = Version (A1 ~ AZ, B1 ~ BZ)

⑦ : Serial code (from 0001~)

EX : M93M05C31297

The label of “M93M05C31297” represents the version C of Main Board for PV751TMC on 2000. It’s produced on May, 2000.

M93M05C31297
25mm*14mm

∗ *Reader's Response* ∗

Dear readers:

Thank you for your backing our service manual up. In order to refine our content of the service manual and satisfy your requirement. We expect you can offer us some precious opinions for reference.

Assessment :

A. What do you think about the content after reading PV751TMC Service Manual?

Unit	*Excellent*	*Good*	*Fair*	*Bad*
1. Introduction				
2. Mechanical construction				
3. Procedure of disassembly				
4. Function of boards				
5. Troubleshooting procedure				
6. Specification				
7. Function Test and Alignment Procedure				
8. DDC Key-in Procedure				
9. Appendix				

B. Are you satisfied with the PV751TMC service manual?

Item	*Excellent*	*Good*	*Fair*	*Bad*
1. Service Manual Content				
2. Service Manual Layout				
3. The form and listing				
4. Print and book binding				

C. Do you have any other opinion or suggestion about this service manual?

Reader's basic data:

Name:		Title:	
Company:			
Add:			
Tel:		Fax:	
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After your finishing this form, please send it back to Optoma Customer Service Group by fax: 886-3-563-5333 or e-mail to service@optoma.com.tw. Thanks :)