

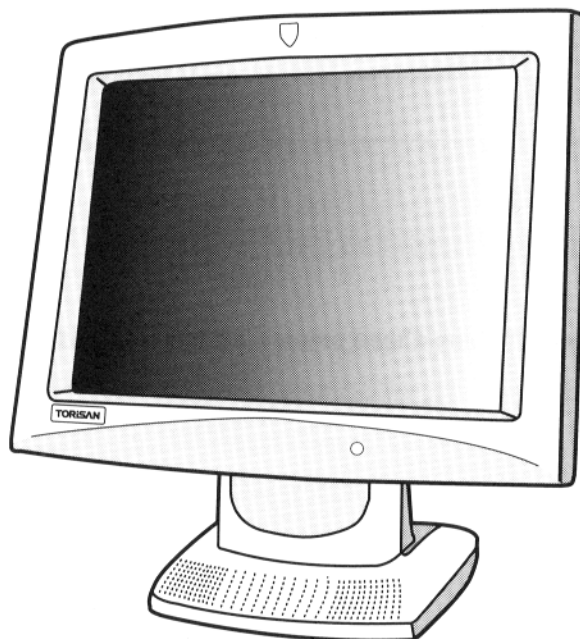


## SERVICE MANUAL

LCD COLOR MONITOR

LMU-TF150D1  
(GENERAL)

PRODUCT CODE NO.	
LMU-TF150D1	1 938 102 01



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Refer to the separate volume user's guide for instruction.

# Precautions

## Placement precautions

- Avoid placing the unit in humid or dusty places, or where it will be exposed to excessive heat (direct sunlight, heaters, etc.)
- Do not step on or set anything on the AC power cord. **DAMAGE TO THE AC POWER CORD IS A SAFETY RISK AND CAN CAUSE A FIRE.**
- Install the unit only on a stable and smooth surface.
- Do not connect the unit to the same AC as outlet with appliances that generate large amounts of interference (such as heaters with thermostats, appliances with motors, etc.). It is best to use a completely separate electrical outlet.
- Keep the unit away from water. If water accidentally enters the unit, unplug the AC power cord immediately. **DO NOT PLUG IN THE UNIT AGAIN.**

## Handling precautions

- Avoid bending, kinking or damaging the AC power cord.
- Never insert or remove the power cord with wet hands. Also, be sure to hold cord by the plug when removing it from the outlet.
- Do not remove any parts that are held in place with screws. (The unit does not contain any user-serviceable items.)
- Maintain standard room temperature (5°C to 35°C, or 41°F to 95°F) during use. Do not subject the unit to shock or vibration. Do not move the unit while it is in use.
- A rapid increase in room temperature in cool weather can cause condensation to form inside the unit. If this occurs, wait at least 15 minutes after turning the unit on before attempting to operate it.

## 1.MAIN SPECIFICATION

LCD	Panel Type	TFT	
	Screen Size	15.0"	
	Pixel Pitch	0.297 × 0.297mm	
	Pixel Format (dot)	1024 × 768	
	Surface Treatment	Nonglare	
	Brightness	200cd/m <sup>2</sup> max.	
	Response Time	40ms	
	Viewing Angle	Left & right ±50° , Up & down ±40°	
	Back Light	CCFL × 2	
VGA card	GA-TR01F4/PCI	32 bit PCI local bus slot card	
	V R A M	Standard 4 MB	
	Graphic controller	Trident 9385-1	
	Monitor output	Analog and digital monitors can be displayed simultaneously	
Colors		16.77million.	
External Control		Power switch, Brightness control volume	
Environment	Operating Temperature		5°C~35°C
	Humidity		30%~80% RH (no condensation)
Power Supply (AC Adapter)		Model Name : ADP 35WC 13.5 Input : 100-240V AC 1.0A-0.55A 50/60Hz Output : 13.5V DC 2.5A	
Power Consumption		18W (3W in Energy Saving mode)	
Dimensions		399(W) × 412(H) × 199(D)mm	
Weight		4.4 kg	
Accessories		AC Adapter & Cord, Signal Cable, VGA Card, Driver disk, User's Guide	

## 2. TROUBLE SHOOTING

When checking LCD digital monitor, LCD monitor and VGA card must be examined separately since it is difficult to distinguish which substance, LCD monitor or VGA card, has a defect.  
With items that service person examines the LCD monitor, it is required to use a computer with a new faultless VGA card.

### 2-1 Check for LCD monitor

	SYMPTOM	CAUSE	SOLUTION
1	Power LED does not light.	(1)The power might not be turned on.	◎Check the outlet, DC jack connection, and the power switch.
		(2)AC power supply voltage might not be normal.	△Stop plugging too many leads into a single socket. ◇Measure AC power supply voltage.
		(3)AC adapter might be out of order.	◇Measure DC plug voltage outputted from AC adapter. Replace AC adapter if it is out of order.
		(4)The main board (LED etc.) might be out of order.	◇Replace the main board.
2	No picture (when the power LED is fully on green.)	(1) A screen-saver program might be running.	◎Press any key or move the mouse to end the screen-saver program.
		(2) The connector between the main board and the liquid crystal module might not be connected securely.	◇Check the connection.
		(3) The connector between the main board and the inverter board, or between the inverter board and the liquid crystal module might not be connected securely.	◇Check the connection.
		(4) Connection between the main board and the volume board might not be secure.	◇Check the connection.
		(5) The volume board might be out of order.	◇Replace the volume board. Adjust the volume and check the screen.
		(6) The inverter unit might be out of order.	◇Replace the inverter unit. Adjust the brightness volume and check the screen.
		(7) The main board might be out of order.	◇Replace the main board. Adjust the brightness volume and check the screen.
		(8) The LCD module might be out of order.	◇Replace the LCD module. Adjust the brightness volume and check the screen.
3	No picture (when the power LED is fully on orange.)	(1) The computer might not be turned on.	◎Check the power of the computer.
		(2) The signal cable might not be connected securely.	◎Check the connection of the signal cable.
		(3) An extended cable might be used.	◎Stop extension of the monitor cable.

	SYMPTOM	CAUSE	SOLUTION
4	Screen's display range is incorrect.	(1) When using WINDOWS, the computer's screen size might not be set correctly.	◎Reset the screen size.
5	Picture is distorted.	(1) The signal cable might not be connected securely.	◎Check the connection of the signal cable.
		(2) AC power supply voltage might not be normal.	◎Stop plugging too many leads into a single socket. △Measure AC power supply voltage.
		(3) Outside noise ( by high voltage wire, trains etc.) might be led to the signal cable etc.	◎Change the location and direction of the monitor and cables.
		(4) The wire inside of the signal cable might be snapped.	◇Replace the signal cable.
		(5) The main board might be out of order.	◇Replace the main board.

## 2-2 Check for VGA card

	SYMPTOM	CAUSE	SOLUTION
1	No picture (when the power LED is fully on green.)	(1) VGA card might be out of order.	◇Replace VGA card.
2	No picture (when the power LED is fully on orange.)	(1)Connection between VGA card and LCD monitor cable might not be secure.	◎Check the connection.
		(2)Connection between VGA card and Computer slot might not be secure.	◎Turn off the power of the monitor and the computer. Check the connection of VGA card.
		(3)A graphic board might be inserted to another PCI slot of the computer.	◎Take off the graphic board.
		(4)VGA card might be conflicting with another graphic chip in the computer.	◎ Disable the graphic chip, if it is possible by a jumper inside of the computer.
		(5)VGA card might be out of order.	◇ Replace VGA card.
		(6)The computer might be out of order.	◇Try replacing the computer.
3	Picture is distorted.	(1)Connection between VGA card and LCD computer cable might not be secure.	◎Check the connection.
		(2)Connection between VGA card and Computer slot might not be secure.	◎Turn off the power of the monitor and the computer. Check the connection of VGA card.
		(3)VGA card might be out of order.	◇ Replace VGA card.

◎ :problem that users can cope with. ◇ :problem that users might be able to cope with.

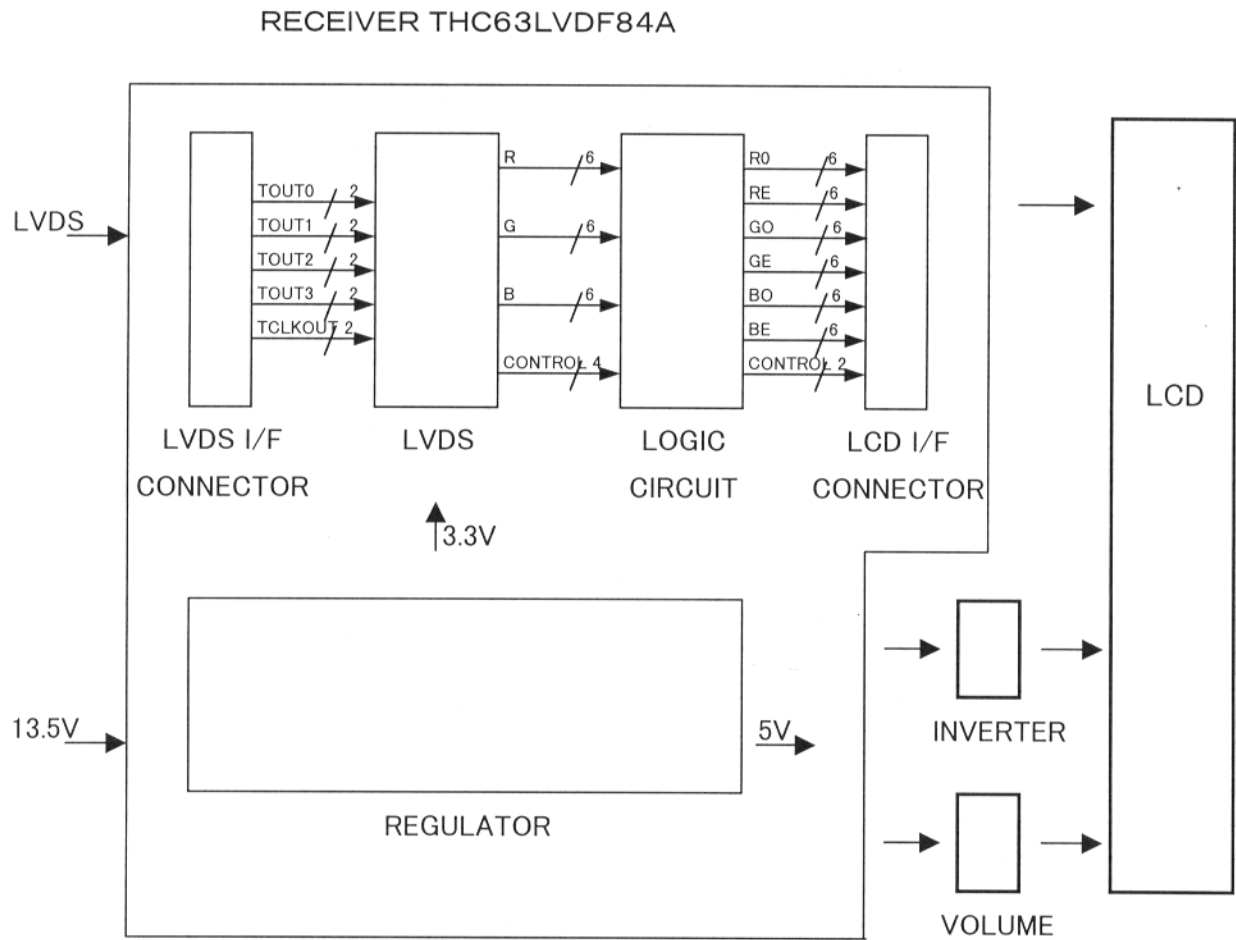
△ :problem that service person deals with.

### 3. MAINTENANCE

#### Removing the main parts

- (1) Removing the Stand Cover.  
Place your middle fingers in the depressions on the sides of the stand cover, press in and pull the cover towards you.
- (2) Removing the substance and the stand  
Remove four (4) screws of hinge between the substance and the stand.
- (3) Removing the cabinet
  1. Remove six (6) screws on back side of the cabinet.
  2. Holding the upper part of the panel, pull the hook toward the front to remove.
  3. Remove the connector between the LED board and the VR board.
- (4) Removing the LED board and the VR board.  
Remove three (3) screws fixed on the cabinet.
- (5) Removing the liquid crystal panel.
  1. Remove four (4) screws fixing the liquid crystal panel.
  2. Lifting up the liquid crystal panel, remove two (2) connectors on the inverter unit.
  3. Remove two (2) connectors on the main board.
- (6) Removing the inverter unit.
  1. Remove connectors on the inverter unit.
  2. Remove three (3) fixing screws.
- (7) Removing the main board.
  1. Remove four (4) fixing screws on the main board.
  2. Remove VR connector, Inverter connector, DC connector, LED connector and LCD connector.
  3. Remove two (2) screws fixing a metal fitting which holds LVDS connector.
- (8) Removing the DC/DC board.
  1. Remove four (4) screws.
  2. Remove the seesaw switch connector and the DC connector.
- (9) Removing the seesaw switch.
  1. Holding its hook, remove the seesaw switch.

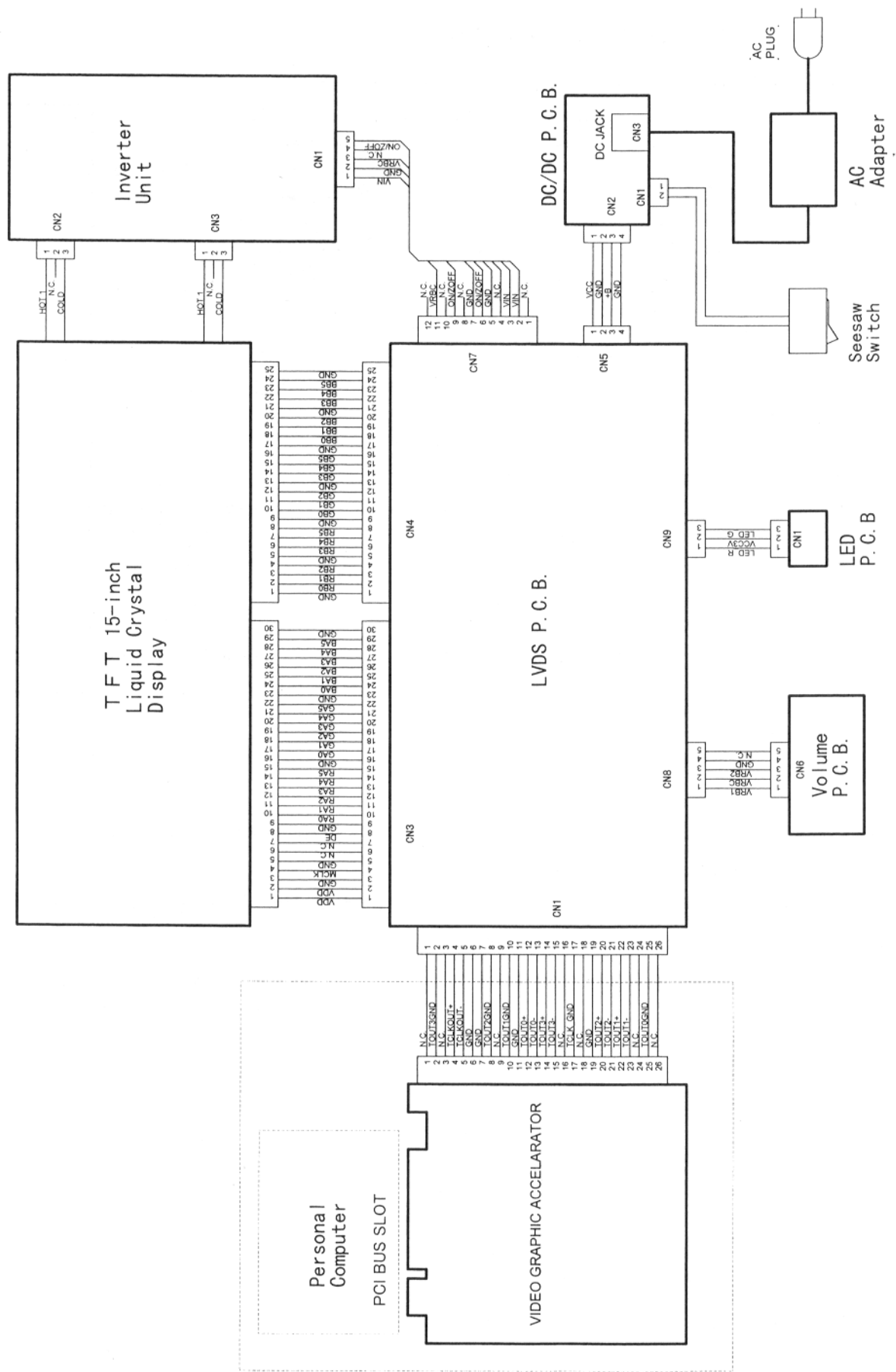
4. BLOCK DIAGRAM



1. IC of LVDS has PLL inside. It multiplies transmission clock frequency seven times, and transmits seven data to Serial on one line.
2. The transmitting side sends transmission clock as well as data. The receiving side samples transmission clock multiplying it seven times, and restores the original data.
3. LOGIC CIRCUIT converts picture data (serial to parallel), and divides it into odd and even numbers.



5. CONNECTION DIAGRAM

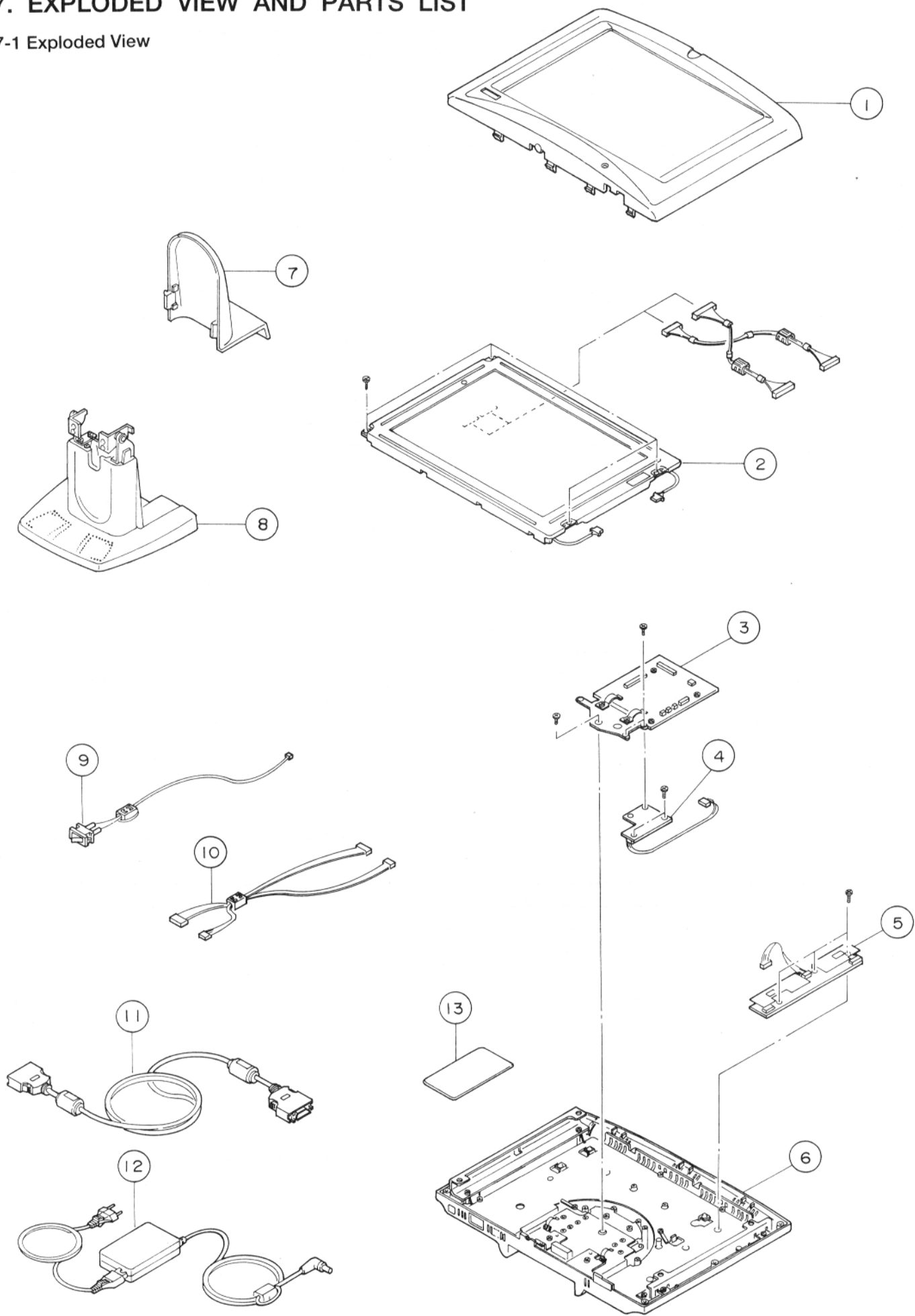


## 6. TABLE OF SIGNAL NAME


Symbol	Function	Location	Notes
TCLKOUT+	LVDS Transfer Clock	CN1-4	
TCLKOUT-	LVDS Transfer Clock	CN1-5	
TOUT0+	LVDS Transfer Data	CN1-12	
TOUT0-	LVDS Transfer Data	CN1-13	
TOUT1+	LVDS Transfer Data	CN1-22	
TOUT1-	LVDS Transfer Data	CN1-23	
TOUT2+	LVDS Transfer Data	CN1-20	
TOUT2-	LVDS Transfer Data	CN1-21	
TOUT3+	LVDS Transfer Data	CN1-14	
TOUT3-	LVDS Transfer Data	CN1-15	
RB0(EVEN)	Red Data [LSB]-EVEN	CN4-2	Positive
RB1	Red Data	CN4-3	//
RB2	Red Data	CN4-4	//
RB3	Red Data	CN4-6	//
RB4	Red Data	CN4-7	//
RB5	Red Data [MSB]-EVEN	CN4-8	//
GB0(EVEN)	Green Data [LSB]-EVEN	CN4-10	//
GB1	Green Data	CN4-11	//
GB2	Green Data	CN4-12	//
GB3	Green Data	CN4-14	//
GB4	Green Data	CN4-15	//
GB5	Green Data [MSB]-EVEN	CN4-16	//
BB0(EVEN)	Blue Data [LSB]-EVEN	CN4-18	//
BB1	Blue Data	CN4-19	//
BB2	Blue Data	CN4-20	//
BB3	Blue Data	CN4-22	//
BB4	Blue Data	CN4-23	//
BB5	Blue Data [MSB]-EVEN	CN4-24	//
MCLK	Data Clock	CN3-4	
DE	Data Enable	CN3-8	Negative
RA0(ODD)	Red Data [LSB]-ODD	CN3-10	Positive
RA1	Red Data	CN3-11	//
RA2	Red Data	CN3-12	//
RA3	Red Data	CN3-13	//
RA4	Red Data	CN3-14	//
RA5	Red Data [MSB]-ODD	CN3-15	//
GA0(ODD)	Green Data [LSB]-ODD	CN3-17	//
GA1	Green Data	CN3-18	//
GA2	Green Data	CN3-19	//
GA3	Green Data	CN3-20	//
GA4	Green Data	CN3-21	//
GA5	Green Data [MSB]-ODD	CN3-22	//
BA0(ODD)	Blue Data [LSB]-ODD	CN3-24	//
BA1	Blue Data	CN3-25	//
BA2	Blue Data	CN3-26	//
BA3	Blue Data	CN3-27	//
BA4	Blue Data	CN3-28	//
BA5	Blue Data [MSB]-ODD	CN3-29	//
VIN	Inverter Power	CN7-2,3	
VRBC	Controlled Voltage	CN7-11	
ON/ZOFF	Back Light Control	CN7-6,9	H : Light ON
VRB1.2	Brightness Volume	CN8-1,3	
VRBC	Brightness Volume	CN8-2	
LED R	Red LED Control	CN9-1	
LED G	Green LED Control	CN9-3	

# 7. EXPLODED VIEW AND PARTS LIST



## 7-1 Exploded View



# CAUTION

Parts marked as  are very important to secure safety.  
In case of replacement, it is required to use designated parts for safety.

## 7-2 Parts List

REF No.	PART No.	DESCRIPTION	Q'ty	NOTES
INDIVIDUAL				
	(632 834 2815)	STYRO-FOAM CUSHION, R	1	FOR MONITOR FOR USER'S GUIDE FOR LVDS CABLE FOR AC ADAPTER, AC CORD
	(632 834 2839)	STYRO-FOAM CUSHION, L	1	
	(632 834 2891)	PAD, ACCESSORY	1	
	(632 297 9901)	POLYETHYLENE BAG	1	
	(632 607 4824)	POLYETHYLENE BAG,L180X270	1	
	(632 298 2376)	POLYETHYLENE BAG	1	
	(632 607 4794)	POLYETHYLENE BAG,L120X230	2	
	(632 840 4056)	PAD, CUSHION	1	
	(632 840 3639)	PAD	1	
	(632 842 9509)	PAD, FRONT	1	
ACCESSORY				
	(632 848 0449)	INSTRUCTION MANUAL,ENGLIS	1	
	(632 848 0456)	FLOPPY DISK	1	
CABINET1				
1	(632 855 1217)	CABINET ASS'Y, 150DT	1	
6	(632 855 1231)	BOTTOM LID ASS'Y, 150T	1	
13	 (632 855 1248)	RATING PLATE ASS'Y	1	
CHAGER				
8	(632 850 6071)	STAND ASS'Y	1	
7	(632 832 1957)	COVER, STAND	1	
CHASSIS ELC.				
2	(632 855 1293)	LIQUID CRYSTAL DIS. ASS'Y	1	
5	 (632 855 1262)	DC-AC INVERTER ASS'Y	1	
12	(632 851 2478)	AC ADAPTER ASS'Y	1	
9	(632 850 6095)	SEESAW SWITCH ASS'Y	1	
10	(632 855 1279)	WIRE HARNESS ASS'Y	1	
11	(632 838 5294)	CABLE, LVDS	1	
	(632 846 4197)	PW BOARD UNIT, GRAFIC	1	
PC BOARD1				
3	(632 855 3839)	PW BOARD ASS'Y, LVDS	1	
PC BOARD2				
4	(632 855 3846)	PW BOARD ASS'Y, DC/DC	1	